U.S. Department of Transportation
United States Coast Guard

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TRACEN YORKTOWN INST M1550.1
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TRAINING CENTER INSTRUCTION Ml 550.1

Subj: TRAINING CENTER YORKTOWN HUMAN PERFORMANCE TECHNOLOGY (HPT)/INSTRUCTIONAL SYSTEMS DESIGN (ISD) HANDBOOK

1. PURPOSE. This handbook promulgates the application of updated principles of HPT and ISD to Training Center (TRACEN) level analysis, design, development, implementation, and evaluation work. It also establishes the are& of responsibility the Command has assigned to TRACEN instructors, course designers and developers, and training and performance support managers.

2. ACTION. Division, Branch, and Section Chiefs shall ensure compliance with the provisions of this handbook within their areas of responsibility.

3. DIRECTIVES AFFECTED. RTCINSTS 1550.1, 1550.2, and'1550.4 are canceled.

4. REQUESTS FOR CHANGES. Individuals may recommend changes in writing via the chain of command to Chief, Performance Technology Center, TRACEN Yorktown.

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Coast Guard
Human Performance Technology (HPT)/Instructional Systems Design (ISD) Handbook

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Chapter 1: What is HPT?

Definition

The Coast Guard defines Human Performance Technology (HPT) as a careful and systematic approach to solving problems--or realizing opportunities--related to the performance of people, groups, or organizations. Practicing HPT results in solutions that improve a system in terms of achievement of the organization values.

NOTE: The process the Coast Guard uses for front-end Analysis (FEA) is part of Human Performance Technologies' (HPT's) **Accomplishment Based Curriculum Development (ABCD)** system. Since many people who work at Coast Guard Headquarters, training centers (TRACENs) and the Auxiliary have attended ABCD workshops and use HPT's system and job aids to conduct FEA efforts, we have also included HPT's definition for performance technology:

"**Performance Technology** is the process of analyzing, designing, developing, implementing, and evaluating projects to most cost-effectively influence human performance that is of value to the basic business goal of the organization." HPT's definition extracted from HPT's "Preview of the Accomplishment Based Curriculum Development (ABCD) Process," p. 2).

If you search the literature, you can find many other definitions for HPT. All are very similar and contain many of the same components. We have chosen these two because one is the official Coast Guard definition for HPT and the other is familiar to TRACEN staff--who have been trained in the FEA process. One of the purposes of this SOP is to ensure TRACEN Yorktown instructors, course designers and developers are on "the same sheet of music" as other Coast Guard people doing the same jobs.

Definition Components

- **"Performance of people, groups, or organizations."** Note that the word "performance" recurs in the definitions. For the Coast Guard, human performance is what our people do--jobs, tasks and duties--that allow the organization to accomplish its missions (e.g., drug interdiction, search & rescue, etc.) to the standards the organization expects.

Definition Components (continued)

HPT differs from other approaches in its constant focus on performance--what we want and need our people to achieve, do, and accomplish.

- **"Systematic approach."** HPT has often been compared to engineering. Both disciplines use methodical and systematic approaches to doing business. Both contain many specialties that differ (e.g., civil and aerospace engineering, organizational performance analysis, and job task analysis). The right engineering specialty (e.g. civil engineering to improve facilities) is required to conduct an engineering project properly. The same is true of HPT. A subject matter expert (SME) is the best person to perform task analysis--a trained and experienced performance consultant (PC) is the better resource to conduct an organizational performance analysis (OPA).

- **"Results in solutions."** There is no point in using HPT to solve human performance problems unless the analysis project comes up with solutions (e.g., interventions to change the current state of performance). Note that "solution" is in its plural form. Throwing one solution--training, new policy or a new tool--at a problem is not likely to fix it. One of the prime differences between the HPT and other approaches is its focus on examining **all** influences on human behavior, and thereby arriving at solution sets that address any areas with gaps or deficiencies. Given HPT' s systematic and careful approach, the Coast Guard has confidence that an HPT-derived solution set will, indeed, fix the problem.

- **"Improve a system in terms of achievement of the organization values."** Note that the improvements (i.e., achievement) HPT recommends **MUST** be of value to the organization. That mandate keeps PCs focused on the organization' s business goals, values and culture, a most important focus for ensuring recommendations are implemented.

Definition Components (continued)

- **"Cost-effectively influence human performance**." One of the ways HPT differs from previous models is in its focus on what is valuable to the organization--its business goals. That focus allows those using HPT to develop solutions to performance problems that link back to the Coast Guard' s business goals.

It also means that those practicing HPT are dedicated to finding the most cost-effective solutions to performance problems. In our current flat-line budget climate, there is no sense identifying solutions to problems that the organization can' t afford.

Why Use HPT?

All organizations need a process that lets them know how their people are performing. They also need a process that tells them how to develop appropriate solutions if there are problems with human performance. The Coast Guard uses HPT to:

- Determine how our people are performing.
- Identify appropriate solutions to fix performance problems.

NOTE: We' ll discuss why the Coast Guard is using HPT more fully in the next chapter.

Where Did HPT Come From?

HPT grew out of the instructional design field in the 1970s as a way to improve the impact of resident-delivered training programs. PCs began to analyze and address factors (in addition to training) that affected performance in the workplace (e.g., tools, motivation, feedback, and so forth). When they successfully addressed these other factors, PCs were able to improve on-the-job performance--not only by improving training (e.g., better targeting training to workers' needs), but also by making the work environment a more fertile place for training to take hold. Over time, as successes mounted, HPT became standard practice in industry.

Where Did HPT Come From? (continued)

As the field of HPT grew, the tools and methodologies used to address problems outside the traditional training arena become increasingly more sophisticated. Specialties were first developed for all of human resources and then for entire organizations.

The growth of HPT in the Coast Guard paralleled what happened in industry. First TRACENs brought early methodologies to the service as a way to make resident courses more successful. Over time, better analysis and better evaluation led to better and better training. By the early 1990s, just improving training was not enough to improve on the job behaviors, so PCs began analyzing and addressing those other factors affecting performance on the job. In the late 90s, PCs began work on performance issues outside the traditional training arena. Today, Coast Guard PCs are working on organization-wide, cross-programmatic issues that affect the whole organization:

- Human resource systems (e.g., advancing, evaluating, etc.)
- Rating mergers and realignments
- Entire work systems on new cutters

This evolution, fueled by successes and paralleling a similar growth in industry, has caused demand for Coast Guard PCs to skyrocket.

Thus, the answer to the question--"why use HPT?"--is that it provides **performance analysis (PA)** processes, methods, tools, and techniques that can be applied to large and small organizational problems. Unlike approaches that select one solution to "fix" just one system, the HPT philosophy says we should look at all the influences that affect a person' s, a group' s, or an organization' s behavior.
To use HPT to solve organizational performance problems means systematically addressing performance with a whole array of performance analysis methods, tools, and techniques that provide solutions that really work.

In a highly competitive global society, many experts believe that what distinguishes one agency or company from another is its people. HPT is a way to ensure we recruit, retain and grow the people who have made the Coast Guard great.

Are Performance Analysis and HPT the Same Thing?

NOTE: We will discuss PA--specifically organizational performance analysis (OPA)--more fully in the next chapter.

What is PA? It is a systematic process used to determine what is causing ongoing performance problems or to anticipate performance opportunities and potential problems in new acquisitions and the rollout of new systems.

The Coast Guard' s HPT analysis program includes two levels of PA:

- Organizational Performance Analysis (OPA)
- Front-End Analysis (FEA)

Typically, a PA effort compares a desired state to the actual situation. The resulting difference, or gap, is caused by a variety of reasons that are uncovered through analysis. The outcome of a PA is a comprehensive list of recommended solutions to eliminate any performance gaps. New or improved training, equipment, processes, policy, and revised incentives are examples of what could be included in a recommended solution system.

The answer to the question, "are PA and HPT the same thing?", is, "no, they are not." Instead, they are related entities. To see what we mean by that statement, we need to look at how the Coast Guard defines the relationship between HPT and PA.

Let' s first go back to the root word, "analysis," and find out how the Coast Guard defines that term.

Analysis is study PRIOR to action. In other words, before we jump to solutions or throw large amounts of our budget at a project, the Coast Guard is committed to studying the problem or opportunity first, through analysis. A good example is the approach the Coast Guard is taking to its Deepwater major acquisition project: analyze first before buying.

Are Performance Analysis and HPT the Same Thing? (continued)

For human resource or people problems, the Coast Guard has embraced an HPT approach as its preferred model and overarching methodology to use for analyzing human problems and opportunities. The tool (i.e., different methods) HPT practitioners use to analyze human problems is PA.

As we' ve already told you, PA is a systematic process used to determine what is causing ongoing performance problems or to anticipate performance opportunities and potential problems in new acquisitions and the rollout of new systems. But maybe it would be more accurate to say PA is like an enormous tool bag of systematic processes, methods, tools and techniques the Coast Guard can dig down into to find just the "right" method and tools to solve performance problems with different scopes and goals.

Under PA' s umbrella, there are several different analysis processes :

- Organizational Performance Analysis (OPA)
- Front-End Analysis (FEA):
  - New Performance Planning (NPP) FEA
  - Diagnostic FEA
- Program Level Performance Analysis (PLPA)
- Occupational Analysis (OA)
- Job Task Analysis (JTA)
- Task Analysis (TA)
- Cost-Benefit Analysis (CBA)
- Subject Matter Analysis (SMA)
- Targeted Audience Analysis (TAA)
- Learning Context Analysis (LCA)
- Training Needs Analysis (TNA)
- Needs Assessment (NA)
- Needs Analysis (NA)
- Extant Data Analysis (EDA)
- Goal Analysis (GA)
- Feasibility Assessment (FA)
- Workload Assessment (WA)
- Root Cause Analysis (RCA)
- Quality Process Analysis (QPA)
- Staffing Standards Study (SSS)
- Competency Analysis (CA)

Are Performance Analysis and HPT the Same Thing? (continued)

So, the relationship between HPT and performance analysis is this: HPT is the model and overarching philosophy we use to solve human performance problems, and PA makes up the wide range of processes, tools and techniques we use to practice HPT.

The following analogy may help you see the relationship between HPT and PA better.

If a medical center decided to practice medicine using a holistic approach, that would be similar to the Coast Guard' s decision to solve its human resource problems using HPT. To continue the analogy, the doctors at a holistic approach medical center would have a wider range of tools than more traditionally-oriented centers. For example, along with traditional diagnostics and high-tech intervention equipment, they would probably add acupuncture and herbal medicine to their list of possible tools and interventions. So too, the Coast Guard' s PCs use traditional tools (e.g., training) to improve performance, but also develop solutions for a wider range of influences (e.g., assignment and selection, motivation, work design, human factors, etc.)

Analogy

Yet another way to grasp HPT is to consider the following analogy:

Imagine that you are suffering from lower back pain. You know you can' t do your Coast Guard job to standards (your performance) if that pain stays the same or gets worse. So, you go to the doctor (HPT practitioner--performance consultant) to find out how to solve your problem.

You would be unpleasantly surprised if the doctor asked how much you know about the causes of lower back pain or gave you lower back pain literature to read. You might have a gap in knowledge about back problems, but knowing more about lower back pain (training and education) is not likely to be a total "fix" to your problem.

Analogy (continued)

You would be equally surprised if the doctor asked you how your back brace (tool) is working and then gave you a prescription for buying a new one. Both lack of knowledge about lower back pain and a bad back brace may be contributing to your problem, but it isn' t very likely that training or a new back brace will solve your problem. Until the doctor identifies the root causes for your back pain and examines all influences on the problem, your substandard job performance from lower back pain is likely to continue.

Focus on Performance

The analogy sums up how most organizations used to treat performance problems: give the problem some training or fix a particular influence (e.g., write new policy) instead of systematically identifying root causes, gaps, and designing solution sets to close those gaps.

The HPT process is similar to a doctor troubleshooting symptoms. Those who practice HPT know that performance is affected by many influences, so instead of concentrating on just one influence (lack of knowledge or skills), they focus on **performance** itself. By focusing on performance rather than possible solutions, they have a better chance of figuring out all the influences affecting the problem, and ultimately, a much better chance of solving the real problem.

How Does HPT Work?

The HPT process starts by identifying the accomplishments we want our Coast Guard people to perform and to what standards those accomplishments should be performed. That' s our "desired state." Next, we use different tools to determine how our workers are performing now--that' s the "current state."

By defining the differences between the those two states, we come up with deficiencies--what people are **NOT** doing now; that' s the gap. From there, we develop solution sets for closing the gap. That means examining all the **influences** that led to the gap or lack of something:

How Does HPT Work? (continued)

- Assignments and selections
- Incentives and rewards
- Data, information and feedback
- Environmental support, resources and tools
- Individual capacity
- Motives and expectations
- Skills and knowledge

Then, for those influences where there was a gap, we develop a set of solutions to close the gaps:

- Changed environment or ergonomics
- New motivational tools
- New policies for assignment and selection
- New policy
- Training

Those solution sets are what we call **interventions.**

Solution Sets

The important idea to keep in mind is this: it stands to reason that if many influences are causing a problem, it will take a variety of solutions to solve that problem. When you use HPT to diagnose a problem, you may find that more than one influence is causing the problem. If that happens, you will need to come up with more than one solution for fixing the problem. Fixing only one aspect of the problem is not likely to result in success.

Example

The Coast Guard is in the process of migrating to Standard Workstation III (SWSIII). Let' s say the organizational expectation of acquiring this new technology is that everyone' s performance will improve by at least 50%. But a few months after some of the people in the organization migrate to the new computer, performance is uneven. Some people are performing better; some are performing less productively than they were before they were migrated to SWSIII.

Example (continued)

What' s the problem? Well, some people have been migrated, and others have not been migrated. Some have PCs at home and already know how to use the "latest and greatest." Some don' t have PCs at home. Some have gotten training and learned all sorts of new things, but don' t yet have the computer on their desks. Others have the computer, but don' t know how to use all of its applications. Still others are using Word all the time, but don' t have any work that calls for using Excel or Access or don' t know what those applications can do for them. Some are products of the Nintendo Age and jump right into new technologies. Others are older and find it harder to make the transition from one application to another.

You can easily see that focusing on the solution--putting on a training program, for example--isn' t likely to solve this problem, although it may help some people in the organization. However, if you focus on performance, you will quickly see that many influences are causing the problem. And, when you get to the "fix-it" stage, you will recommend several solutions to fix the problem. That' s exactly the approach HPT takes:

- Many influences contribute to organizational problems.
- All of those influences have to be identified, if we' re going to be successful at fixing a problem.
- An integrated set of solutions works best at fixing performance problems.

A careful and systematic approach to solving problems, or realizing opportunities, related to the performance of people, groups or organizations. HPT results in solutions that improve a system in terms of achievement the organization values.

- Performance Analysis (PA)
- Job Task Analysis
- Occupational Analysis
- Task Analysis
- Cost-Benefit Analysis
- Organizational Performance Analysis
- Subject Matter Analysis
- Root Cause Analysis
- Workload Assessment
- Staffing Standards Study
- Training Needs Assessment
- Competency Analysis
- Feasibility Study
- Extant Data Analysis
- Front End Analysis NPP Diagnostic
- Quality Process Analysis
- Program Level PA
- Needs Analysis
- Target Audience Analysis
- Needs Assessment
- Learning Context Analysis
- Goal Analysis

Chapter 2: Why is the Coast Guard Using HPT?

Helps Identify Right Human Performance Requirements

HPT is emerging in the Coast Guard as a kind of supra-system that uses some of the tools and processes of Total Quality Management (TQM), instructional systems design (ISD), organizational development, leadership, human psychology and behavior, and other fields. It is getting a great deal of attention right now for just one reason: HPT helps the Coast Guard convert its missions, business goals ("Family of Plans") and needs into the right human performance requirements:

How does the Coast Guard recruit, retain, and grow the "best" people to carry out its missions?
What is the Coast Guard workforce currently doing? Is that what it should be doing?
What accomplishments give the greatest pay back to the Coast Guard? Where should we spend our scarce funds?
How do we accomplish multi-missions on optimally crewed ships with increasingly fewer people?

HPT is the process the Coast Guard uses to answer those questions.

Why HPT?

It is a very flexible process. Individuals, small groups, and the larger organization can all use HPT processes to help solve human performance problems.

The current and continuing trend is to reduce government. The Government Performance Review Act (GPRA) requires each Federal agency to develop business goals, tie organizational accomplishments to those business goals, and measure how well the organization is doing by how well its people are carrying out those business goals. HPT is so useful to the Coast Guard because it does just that: it lets us tie business goals to Coast Guard workforce performance and determine if we' re getting the best bang for the buck.

Why HPT? (continued)

HPT begins by looking at an organization' s outcomes (or products and processes) which are based on its mission, strategies and business goals. Focusing on outcomes helps Coast Guard working groups identify "desired states," "current states," and gaps between the two states. Working groups can then analyze the gaps by developing a data collection plan, collecting appropriate data, analyzing root causes, and identifying and recommending solutions sets for closing those gaps.

During his tour as Commandant, Admiral Loy said the Coast Guard views HPT as "..one of the core enablers of our productivity improvement strategy for the foreseeable future. We have already started down this road, using HPT methods to look at major elements of our workforce. Including the studies completed and those in progress, over two-thirds of the Coast Guard workforce are being restructured to focus their skills, knowledge, ability and attitudes toward meeting Coast Guard organizational needs." (extracted from Admiral Loy' s message to a local chapter of International Society for Performance Improvement (ISPI), 22 April 1998)

How Did This Change Come About?

In 1980, the Coast Guard established the Instructional Technology (IT) Advanced Education Program and began developing a core cadre of ITs to help the Coast Guard with its training business goals. From 1980 until the 1990s, those ITs partnered with civilian education specialists and instructional systems specialists at Coast Guard Headquarters and TRACENs to keep the formal Coast Guard training system operating in accordance with the best practices of the IT field. However, despite excellent work in aligning training efforts with the ISD model, several studies of the Coast Guard formal training system indicated:

Formal training programs were unresponsive to the field' s needs.
We could train only limited numbers of people per year.
Formal training had not yet addressed distance learning and alternative delivery needs.
The field didn' t always get the performance it wanted and needed from newly returned students.

Emergence of HPT in the Coast Guard

By the 90' s, the IT field had improved and broadened its focus to incorporate the thoughts and tools of several other fields into one process called HPT. Spurred on by HPT success stories from the private sector, our ITs began showing the Coast Guard inherent problems associated with trying to use training as the answer to every performance problem. Professional and private sector studies were increasingly showing that training solved only an estimated 17% of performance problems. Yet, since most United States military organizations had a strong cultural bias toward training, they continued to view training as the universal band aid for every performance problem those organizations had.

First HPT Success Story

The prototype HPT project for the Coast Guard was the Aviation Workforce Structure Study. Instead of just concentrating on how to make aviation maintenance training better, the working group looked at all the causes for performance problems:

Out-dated ratings
Rating structure stagnation
Workforce frustration with lack of promotions
Selection and assignments improperly tracked with skills and knowledge sets

The study looked at training needs too--but just as another influence that affected the problem--not as the problem' s whole focus.

HPT processes also helped the working group focus their efforts on the aviation workforce' s performance. That focus helped the Coast Guard redefine those jobs to capture what the organization considers most important. Because of that focus, the project' s end result was a restructuring of the aviation workforce from five to three ratings.

Another plus of using HPT for the Aviation Workforce Structure Study is that it gave the Coast Guard a process for tying the cost of solutions back to the value of solving a problem. The Coast Guard realized dramatic savings from the project. If it hadn' t, the project would not have been "worth" solving.

First HPT Success Story (continued)

It is exactly that sort of focus--determining return on investment (ROI)--that Congress was thinking about when it passed the GPRA and other similar legislation. These acts were meant as a wake-up call to government agencies to start really concentrating on ROI, lest they "go bankrupt."

Based on the success of its aviation workforce project, the Coast Guard began to turn to HPT processes and methodologies more and more to solve its workforce performance problems in a cost-effective fashion.

Is HPT Just About Saving Money?

Does that mean HPT is just another one of those concepts an organization fastens on in a climate of "dollars are driving everything?"

If you make that assumption, you might also make another assumption that HPT is just one more way to erode the training and benefits our people deserve and need.

You would be correct in tying HPT to "right" dollars to spend when an organization has a decreasing amount of dollars to apply to any one problem. That is one reason why HPT is so valuable to our organization.

The HPT process helps us identify exactly where we need to spend our limited dollars to realize the greatest amount of benefits for our workforce. But, you would be incorrect in tying HPT to decisions that ultimately cheat our people out of what they need to do their job. In fact, just the opposite is true: HPT is exactly the process and the tools the Coast Guard uses to make sure our people have ALL they need to perform well.

Along with other federal agencies and businesses that have adopted HPT processes, the Coast Guard is using HPT because this process lets them look at all of the causes for performance gaps rather than fastening on one solution that may not work. In short, since many influences cause performance problems, it makes sense to explore all of those influences when we want to improve performance.

Is HPT Just About Saving Money? (continued)

Once we' ve identified causes, we can design and implement appropriate interventions to close performance gaps. For example, if there is a real gap in skills and knowledge, we can close that gap with the right education and training. But if a group of people expected to perform a Coast Guard job don' t have the "individual capacity" (physical strength, for example), we won' t design a training course to improve their strength. Instead, we' ll concentrate on selecting the right people for that particular job.

What is the Difference Between HPT and Training?

One of the differences between using HPT, as opposed to the "training-is-the-solution" approach, is that HPT professionals may become involved in the design of interventions--even when those interventions are not training solutions.

Other Intervention Examples

Those of you who are assigned to a TRACEN may have the title "instructor" or "course designer and developer" as your designator. From those titles, you might suppose all you will ever do is instruct or design training programs.

But, with the advent of HPT, some of you may find yourselves helping in designing a new selection system when one outcome of an FEA you worked on was "wrong people assigned to the job." In that case, your input might spell out which characteristics are most important for producing the outcomes that spell success in a particular job. Or you might find yourself working on converting a former training program to an Electronic Performance Support System (EPSS) because people weren' t performing very well when they had to wade through several technical manuals to find what they needed. Or if lack of feedback is an outcome of an FEA, you might design a feedback system that lets people know both what is expected and when they are doing things right. A good feedback system can be good leadership, but it can also be a technological system that provides feedback to the desktop or an ergonomic system that provides better feel in the flight controls for the pilot.

Other Intervention Examples (continued)

Whatever the example, HPT processes and tools help you identify just what your shipmates need to perform better. And in our smaller, streamlined service with its optimally-crewed cutters, that' s just what our people need! By identifying the real cause(s) of performance problems and recognizing that the "fix" is a set of solutions--not just one solution--you will be helping the Coast Guard operate at maximum productivity for minimum cost.

ISD Section

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Chapter 3: What is Instructional Systems Design (ISD)

Definition

People at Coast Guard TRACENs need to know about ISD because it is the model we use to "fix" a skills and knowledge problem. Once analysis says training is the "right" intervention, you turn to ISD to tell you what to design, develop, implement, and evaluate.

What is ISD? It is a systems approach to analyzing, designing, developing, implementing, and evaluating any instructional experience.

The ISD is the backbone of the Coast Guard' s formal training system. The Coast Guard and other organizations use the ISD model to ensure we produce the right skill and knowledge intervention for the right people at the right location at the right time and for the right cost.

When your analysis work tells you there is a skills and knowledge gap and you do need to do some training, you will turn to ISD to help you create and maintain efficient and effective training. Following the model properly will truly ensure that you train the right tasks to the right persons, at the right time, at the right place, and for the right cost.

What is a "system"?

As you know, a system is a composite of parts that work together as a whole to produce results that could not otherwise be realized. Some examples of systems with which you're familiar are:

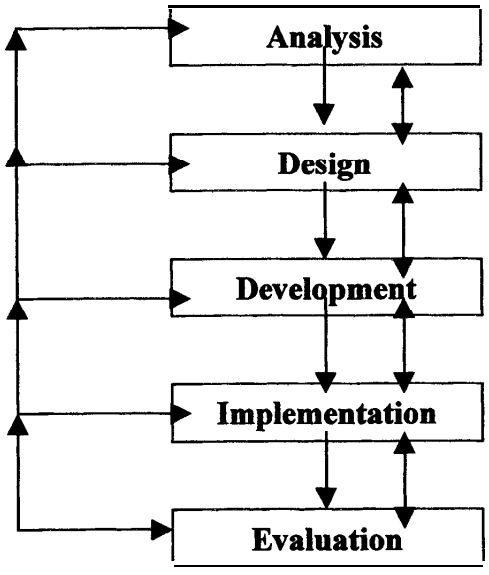
- **A ship's electrical system**
- **City transportation system**
- **A sewage system**

What is a Systems Approach?

When you design training, you have to work with many parts or pieces--lessons, tests or assessments, evaluations, unit needs, and student needs. These parts must all work together to produce the trained student that the field needs.

What is a Systems Approach? (continued)	To put all of these pieces together into one effective and efficient whole, you need a systems approach. That is what the ISD model is--a process for connecting and combining all the training parts or pieces into one effective and efficient course or training program.
ADDIE	ADDIE is a **mnemonic** (i.e., memory jogger) for remembering the ISD model' s five phases: analysis, design, development, implementation and evaluation = ADDIE.

ISD MODEL



Chapter 4: Why Is the Coast Guard Using ISD?

Why Use ISD?

Commandant (G-WTT) mandates that Coast Guard instructors and course designers use the ISD model to go about their work. It is also the model that all American and many foreign military services use for those same purposes.

The connection between HPT and ISD is this: When front-end analysis (FEA) work identifies training as one of the "right" performance interventions, or training needs analysis (TNA) says job aids need to be designed, or one kind of delivery system is superior to another, HPT professionals turn to ISD to make sure they develop effective and efficient training programs. You can better understand why ISD is mandated if you have a complete understanding of how the model works.

5 Phases

The ISD model (sometimes called ADDIE) has 5 phases, or system parts, that work together to create the desired training result.

- ANALYSIS--figuring out what you need to close the performance gap
- DESIGN--creating plans to end up with what you need
- DEVELOPMENT--actually creating the intervention
- IMPLEMENTATION--delivering or conducting the intervention
- EVALUATION--figuring out if the intervention works and if it is indeed closing the performance gap

Phase 1: Analysis

This phase can take the longest time, but it' s more than worth the time you spend.

We use analysis to identify the end goal of training--the performance we' re trying to affect--and the influences (i.e. feedback, assignment and selection, training, policy) required for our people to operate at peak performance. We also use analysis tools to break jobs down into the tasks and task steps that make up Coast Guard performance. Who performs? Under what conditions? With what tolerances? Which tasks should we train, and which tasks do our students already know how to do?

Phase 1: Analysis (continued)

What is the best training delivery choice: a stand-up instructor in a resident classroom or the computer desktop, an interactive videoteletraining room or a video? As a result of having trained a cadre of ITs, the Coast Guard has a variety of state-of-the-art analysis tools it has bought, learned, or developed.

SOP Analysis Phase Tasks

This SOP contains a chapter for each of the various types of analysis tasks a Coast Guard course designer or developer may be asked to perform. In the next chapters, you' ll learn to:

- Conduct Organizational Performance Analysis (OPA)
- Conduct Occupational Analysis (OA)
- Conduct TRACEN-Level Triage
- Conduct Front-End Analysis (FEA)
- Conduct Enlisted Rating & Performance Qualifications Review
- Conduct Job Task Analysis (JTA)
- Select Appropriate Delivery System(s) (Media Selection)
- Conduct Job Aid Analysis
- Conduct Off-the-Shelf (OTS) Analysis
- Conduct Cost-Benefit Analysis (CBA)
- Design and Draft an Instructional Plan (IP)

Phase 2: Design

In the design phase, we create a blueprint (or roadmap) for instruction. We ask questions such as: What kind of learners will use this training program, and how should we design instruction so it is best tailored to meet their needs? What are the tasks we' re working with made up of? What do we need to know about the tasks to design effective instruction? Which instructional methods (role play, simulation, case study, etc.) will work best for this set of learners and for this kind of material? What strategies can we employ to help learning occur and to ensure students transfer what they learn to on-the-job performance? What kinds of learning assessments or tests should we create to ensure learning took place?

Phase 2: Design (continued)

How should we design job aids so that they are easy to use and capture all pertinent task information? What specific strategies and testing methodologies work best for computer-delivered instruction? How should we present all this design information to developers such that they will know exactly what to develop?

SOP Design Phase Tasks

This SOP also contains a chapter for each of the design tasks a Coast Guard course designer or developer may be asked to perform. The design phase chapters will tell you how to:

- Design Performance-Based Training
- Identify the Target Audience
- Conduct Task Analysis
- Conduct Content Analysis
- Write Performance Objectives
- Design Level 2 Evaluations (Tests)
- Identify Instructional Methods and Strategies
- Group and Sequence Objectives (Design a Course Map)
- Design Job Aids
- Design and Develop Electronic Performance Support Systems (EPSSs)
- Design Interactive Courseware (ICW)--CBT, WBT, IVT
- Design & Develop Level 1 Evaluations (Student Critiques)
- Complete Design Tasks & Draft a Learner Plan (LP)

Phase 3: Development

The development stage is when we actually sit down and create all the materials we are going to need to put on a training program. If the training program is being delivered electronically, the development stage is when we use Authorware or a web-based training development tool to create instructional materials. This is the phase where we write lesson plans, write the programs (called "authoring") for computer-based training, prepare student handouts, and work on scripts for a video.

SOP Development Phase Tasks

This SOP provides a chapter for each of the development phase tasks a Coast Guard course designer or developer may be asked to perform. In those chapters, you will learn to:

- Utilize Existing Instructional Modules (Learning Objects)
- Develop Job Aids
- Develop Instructional Materials and Training Aids
- Develop Lesson Plans
- Develop Interactive Courseware (ICW)--CBT, WBT, IVT
- Complete Development of Level 2 Evaluations (Tests)
- Conduct Formative Evaluations and Conduct a Pilot Evaluation
- Develop Training Program Documentation (Curriculum Outlines)

Phase 4: Implementation

This is the phase where we provide the actual training. That can mean standing up in front of a class to deliver an interactive lesson, demonstrating proper use of a job aid, or helping a student perform hands-on in the lab. Those methods use people to deliver instruction. Other types of implementation you' ll see more and more are those which lend themselves to "distance" learning: web-based training (WBT), computer-based training (CBT) or interactive videoteletraining (IVT) classrooms with remote sites. Those methods rely on equipment and often self-pacing to deliver the instruction. Whatever the delivery method, implementation happens when we actually deliver the intervention to the students--at the schoolhouse, a remote learning center or at a distant site, or to the student' s desktop.

SOP Implementation Phase Tasks

This SOP has chapters to help you in performing implementation phase tasks. In these chapters, you will learn to:

- Attend Instructor Development Course (IDC) and/or Course Designer Course (CDC)

SOP Implementation Phase Tasks (continued)

- Attend Continuous Professional Development Sessions (CPDS)
- Conduct Instruction
- Implement Level 2 Evaluations (Tests)
- Implement Level 1 Evaluations (Student Critiques)
- Conduct Instructor Evaluations
- Conduct Summative Evaluations

Phase 5: Evaluation

This is the phase where we take steps to find out if students reacted well to the training we provided (level 1 evaluations) and if students really learned (level 2 evaluations). This phase is also where the Coast Guard takes steps to see if learning transferred to on-the-job performance (level 3 evaluations), and if the ROI for the training intervention makes it worthwhile to the organization to continue training (level 4 evaluations). The Coast Guard uses levels 3 and 4 to validate the analysis, design, development, and implementation work done so far.

Evaluation asks questions such as: Did the training do what it was intended to do? Do the supervisors in the field agree that students do know how to do what they need to do for optimal performance? Senior Coast Guard managers use level 4 evaluations to find out if training interventions have helped the Commandant reach the Coast Guard' s business goals.

Remember, all training has a cost--both the cost of developing and delivering training and the cost of taking people away from their jobs. Evaluation is the tool we use to see if the ROI means the Coast Guard got more from its training dollars than it spent in making training happen. Commandant
(G-WT) policy on evaluation, COMDTINST 1550.23, Training Evaluation Policy, of 21 July 1998, tells us the evaluation work the Coast Guard wants us to do.

SOP Evaluation Phase Tasks

As a Coast Guard course designer or developer, you may be asked to:

- Conduct Level 1--(Student Critiques)
- Conduct Level 2--(Tests)
- Provide Objectives and Performance Indicators for Level 3--(External Evaluations)
- Level 4--Organizational Evaluation of Results

NOTE: We didn' t put a verb in front of level 4 because you probably will not be asked to conduct level 4 evaluations. Level 4 is a Headquarters responsibility. However, staff at Coast Guard Headquarters may ask you to provide input to level 4 evaluations.

ISD is an iterative process

The picture of the ISD model in Chapter 3 may make you think applying the ISD model to training problems is a straight line (linear) process. However, even though the charts we' ve shown you have boxes and arrows with many lines, the ISD is **NOT** a linear process.

Instead, it' s**iterative**--a word that means, "say or do over again and over again."

You analyze to try to determine the right training for the right people, etc., and then you evaluate to see if you hit the bull' s eye in your analysis work. And maybe, in that case, when you evaluate, you find out something has changed drastically since you did the analysis work, or the analysts made a mistake, and evaluation indicates you need to make some changes. Or, when you pilot the new course, you may find you have to go back to the design stage because some part of the course just isn' t working and level 2 evaluation results indicate that students haven' t learned. Maybe all you need to do is add more examples and a few more practice sessions. Then again, maybe you made some assumptions about the target audience that didn' t turn out to be true: you thought the students would be experienced E-6 petty officers, and it turns out that relatively inexperienced E-5s are showing up in your class.

ISD is an iterative process (continued)

When the Coast Guard acquires new equipment (a "new start"), you' ll probably do the right thing. But, for a course that has been around for a long time, you may find yourself doing phase 4 (implementation) which then throws you back to phase 2 (design) and then phase 3 (development), until you finally throw up your hands and say: Why didn' t anybody ever do analysis (phase 1) before we implemented this training program?

Analysis is, without a doubt, the most important phase of ISD, but all of its phases offer opportunities for systematic improvement. As you' ll soon find out, when you enter this instructor or course designer business, the ISD (remember, ADDIE!) model is one of the most powerful tools in your tool bag. This SOP will help you make sure you don' t neglect to use any of its power--just because you didn' t know what it was all about or how it worked.

Does ISD Have Any Limitations?

The ISD model has been applied and used by both the military and private sector for many years now. Limitations in applying the model have been identified:

- **Too time and resource intensive**
- **Too linear and procedural**
- **Not very adaptable to different situations**
- **Doesn't always promote "faster, better, cheaper"**
- **Has a "waterfall" effect (the output of each phase "falls" as an input into the next phase)**

ISD Variations

To combat these limitations, ITs of the 90s have looked at more holistic and creative ways of achieving performance improvement. The newer models keep ISD's five phases. Improvements are gained by enriching or improving the traditional model. Newer models are more aligned with a global economy and "faster, cheaper, better." They also put more stress on iteration, creativity, speed and flexibility.

ISD Variations (continued)

NOTE: If you' re interested in knowing more about ISD model variations, you can purchase books that tell you about these models, or the Coast Guard' s ITs and ISSs can give you more information. The Continuous Professional Development Sessions (CPDS) will also cover this subject so you can learn more by attending that particular session.

Will the Coast Guard Change the ISD Model?

The Coast Guard is constantly changing, growing, and evolving. It continuously acquires a more diverse workforce, procures new equipment and technology, takes on new missions, and makes process improvements to carrying out traditional missions. Given those changes, the Coast Guard constantly seeks to improve any of the processes it uses.

Based on the findings of cross-TRACEN working groups and annual CBT conferences, the Coast Guard's Performance Technology Center (PTC) has done some exploration and application of systemic models for ISD. Examples of this work include:

- **Analyzing customer's performance needs and using client input and staff to quickly design EPSS prototypes.**
- **Converting existing courses such as Deliberate Planner to interactive videoteletraining (IVT).**

As emerging technologies and the need for speed increasingly drive the Coast Guard's formal training system, other changes to the ISD model will, no doubt, take place.

What Parts of the ISD are Constant?

One constant you can count on is that the Coast Guard is committed to doing an **analysis** of the performance problem before it designs any interventions to improve performance. Analysis work is critical to ensure that we:

Fully capture all influences on performance
Spend time and money and our valuable work force only on developing the "right" solution sets

What Parts of the ISD are Constant? (continued)

The second constant you can count on is that your work as a Coast Guard instructor will involve some of the analysis, design, development, implementation, and evaluation tasks explained in this SOP.

Learning and applying the tasks listed in the SOP will help you design and develop *right* training for the *right* people at the *right* time at the *right* place and for the *right* cost.

Chapter 5: ISD Audit Trail

Introduction

Do you recall that we said the ISD model is a **systematic process**? We also compared ISD to a road map that shows you the route to follow to end up where you need to arrive.

ISD is also something like a budget. You know you have only a limited amount of dollars to spend running your unit. So you start out each fiscal year planning how you' ll spend that money. Sometimes you deviate from your budget for a higher priority, but mostly you stick to it. If you didn' t, your unit' s finances would be in a constant tangle.

Think of ISD as a kind of plan for how you' re going to "spend" your limited resources. The budget analogy is a good one, too, for helping you see your role in the whole process. You' re not the comptroller, responsible for the entire base' s budget. You just worry about your part of the budget. In much the same way, you will probably never be responsible for the whole ISD process. Sometimes you' ll take the lead role in one of ISD' s processes. Sometimes you' ll follow someone else' s lead, and sometimes you won' t have a role at all.

For ISD to really work for the Coast Guard, it is important that everyone at a TRACEN knows what the ISD is and what role he or she plays in making the process happen. To avoid redundancy, it is also critical that you know what everybody else is doing in the ISD process. In our downsized Coast Guard, you would not want to waste your time trying to redo a job that has already been done by someone else. For all of these reasons, one of your most important tasks is keeping records or maintaining an "**audit trail**."

Definition

What is an audit trail?

Let' s say your job is course designer at a TRACEN school. You' ve been told you will be leading a team to design training for the MTU diesel engine or Incident Command System (ICS) positions or the SPS-73 Surface Searching Radar.

Definition (continued)

Having gone through course designer training, your first thought is, "I guess I have to do a front-end analysis." Good news!--actually, you don' t. Each of those areas has already undergone an FEA. What your office should have is complete files--paper or electronic. When you start a course design project, your first and most important job is to make sure the files are up to date and that you have everything you need. When you look in the files to find out what has happened--or add your own work to those files--you' re using and maintaining an audit trail.

Why Do I Need an Audit Trail?

As a military organization creating training, we have two big challenges to overcome.

One of those is that our shipmates are constantly cycling in and out. That fact means there will be a lot of recreating wheels if we don' t take steps to make sure that doesn' t happen.

The other challenge is that we' re a handful of people trying to do gigantic amounts of work. In that kind of climate, it is easy to forget to share what you' ve done with other people.

Maintaining a good audit trail can go a long way toward solving both of those problems. This SOP will tell you what you should find or put in the audit trail for every job you accomplish in the ISD process. It will also offer suggestions for what to do if you can' t find something critical. Finally, it will make recommendations for who should get copies of products you create. It will also give you samples of ISD products.

Those samples provide models and templates for how your own products should look--a big time saver! They also help you with audit trail work. We want to make sure you don' t spend hours looking for an FEA report when you don' t even know what one should look like!

Chapter 6: Where Does It All Start?

As you see, designing, developing, implementing and evaluating training all starts with **analysis** of some kind. This work may have already been done for you. Check your course audit trail to answer that question.

First Step

Look for an FEA or JTA Report. Every training program should have a **problem statement** (skills or knowledge deficiency or gap the training is trying to correct), and every course should have had an FEA or a JTA.

"A" Schools

If you are designing or revising an "A" School course, the Coast Guard doesn' t necessarily do an FEA. Instead, it takes the E-4 pay grade qualification factors (commonly called "quals") derived from a recent OA and rating review, and designs its resident and nonresident training around those quals. So, what you want to look for with an "A" School is a list of approved E-4 qualification factors.

Also look to see if a JTA has been done.

NOTE: This SOP will tell you all about JTAs in Chapter 13.

The results of a JTA are very useful because they tell you which quals require development of:

- **Job aids**
- **Job aids with training**
- **On-the-job (OJT) training**
- **No training**

Alternative Deliveries

A JTA report also suggests recommended deliveries. These are only suggestions. If you see that some of the quals could be converted to CBT, don' t take that to mean you must develop a CBT program.

Alternative deliveries cost so much up-front to develop that the Coast Guard uses a very efficient process to decide if that is what it wants to do.

Alternative Deliveries (continued)

When instructors or course developers think they should design or convert a training program to an alternative delivery, they first have to put together an instructional plan (IP). That IP is the same thing as a business proposal. It captures different training program design options (usually at least three) and costs out each of these proposals. The IP also shows the ROI information (or savings) the alternative delivery will provide for the Coast Guard.

Why an IP?

The reason for the IP concept is to ensure we don' t waste anybody' s time. You don' t want to start developing a training program in Toolbook II software only to find out the Coast Guard common operating environment only supports Authorware. And, you don' t want to start putting all your training in a WBT program only to find out the Coast Guard doesn' t have enough bandwidth to support that type of delivery system.

Also, even if you develop such products in-house, they have a people cost. The staff dedicated to authoring alternative deliveries won' t have time to do anything else! Since we have fewer billets at today' s TRACENs and we must be responsive to the field' s needs, it will probably be more efficient to have a contractor develop many of the Coast Guard' s alternative deliveries. The instructor or course designer role will more likely be SME, helping contractors develop the right material, or training program maintainer, making necessary changes and updates to already developed courseware.

"Getting Started" Example

Let' s say you' re tasked with developing a revised "A" School curriculum, and you don' t find any of the documents we' re talking about in the audit trail:

- **No FEA**
- **No FEA reports on specific equipment that will be trained in the "A" School (e.g., MTU diesel engine, ICS organization stand up, etc.)**

" Getting Started" Example (continued)

- **No JTA**
- **No information about alternative deliveries**

In fact, the only document your careful search shows up is an old and tattered curriculum outline with a last approved date of 1990 on it.

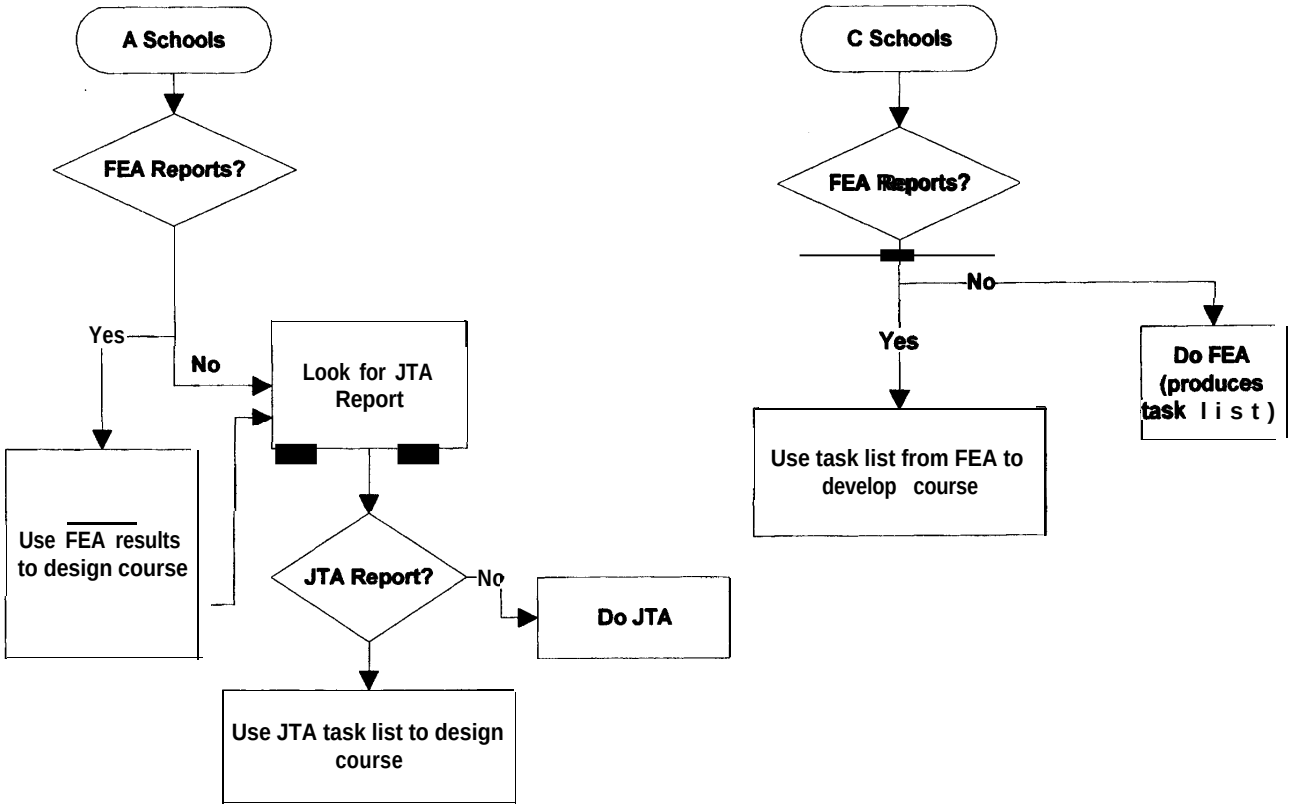
What Do You Do?

The flowchart on the next page shows you how to get started.

If the flowchart tells you to do a JTA, go to Chapter 13 of this SOP. If you need to do an FEA, go to Chapter 11.

That is how this SOP works. It gives you flowcharts that help you easily decide what you need to do. Once you know what to do, just find the appropriate SOP chapter (i.e., module), and it will tell you what you need to do to complete the task at hand.

Where Does It All Start?



Analysis Section
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Chapter 7: Introduction to Analysis

Analysis efforts make up the most critical work of the Coast Guard formal training system. The reason for this is that analysis--and only analysis--can tell the "right" intervention or interventions for improving our peoples' performance.

Drivers for Change

Numerous drivers have had a large impact on how the Coast Guard views analysis efforts. They are:

- The 1994-95 Training Infrastructure Study Group (TISG) results
- An increasing use of HPT methods to solve Coast Guard performance problems
- Emerging technologies
- The Workforce Performance and Training Strategy results
- A continuing effort to train headquarters and TRACEN staff in HPT's ABCD model
- Streamlining
- The assignment of ITs to TRACEN staffs

TISG Results

The 1994-95 Training Infrastructure Study (TIS) recommended splitting Coast Guard formal training system analysis work between Coast Guard Headquarters and TRACEN staff. Since Headquarters IT and ISS staffs were co-located with Coast Guard program managers and more familiar with program issues, the TIS model thought they should conduct FEA and OA and consult with rating managers performing rating and qualifications reviews. TRACEN ITs and ISSs, on the other hand, helped Coast Guard instructors design, develop, and implement instruction. Therefore, the TIS recommended that TRACEN staffs should conduct JTA; select appropriate media for delivery; and conduct task, content, audience, and job aid analyses. The TIS group was also responsible for the concepts of:

- "Triage" (a kind of scrub effort of a TRACEN's resident course inventory).
- The IP (a kind of business proposal for program and training managers' use in selecting which performance intervention they wanted to fund).

TISG Results (continued)

However, the TIS group disbanded before they fleshed out either of those concepts into workable models.

Increasing Use of HPT

As the Coast Guard' s training manager, G-WTT, has gained more and more trained ITs, the concepts of HPT have begun to have more effect on the Coast Guard. The first large HPT project was the Aviation Workforce Structure Study. Its success spurred other equally successful HPT studies: the Non-Rate Study, the Joint Rating Review (JRR), Enlisted Advancement Study Team (EAST), and so forth. When training problems surfaced for initial and follow-on crews for the Coast Guard' s new buoy tender fleet (i.e., WLMs/WLBs), the Coast Guard hired a contractor and used PA methodology to identify the exact performance support needed by WLM/WLB crews to perform to standards. By 1999, it was clear that routinely using human performance analysis models as a way to solve performance problems had fully emerged in the Coast Guard.

Emerging Technologies

Emerging technologies have had a tremendous effect on the Coast Guard' s formal training system. Since the Service' s acquisition system' s work starts years ahead of the actual procurement of new equipment, acquisition staffs are very interested in procuring and embedding emerging technology training that won' t be dated by the time initial and follow-on crews use that equipment. For the same reason, mission essential applications are using new and emerging technologies to deliver training on new Coast Guard information systems (e.g., MISLE, CMPlus, etc.).

However, although new technologies are very attractive, they are also very costly. Sometimes the people buying these technologies are not very familiar with life cycle management costs or with off-the-shelf software products that may do the job just as well as buying Coast Guard-specific training. In some cases, even though the equipment is new, training may not be the answer. Instead, an EPSS may be the more appropriate and cost-effective performance support.

Workforce Performance and Training Strategy Study Results

Since the TISG was able to do very little work with emerging technologies and alternative deliveries, the next large formal training system study, the Coast Guard' s 1998 Training 2000 study, and its follow-up, the Workforce Performance and Training Strategy (WPTS), focused on the strategies training and performance managers needed to develop and the impact emerging technologies were having on Coast Guard training. The first phase of the study, Training 2000, used a modified form of triage to identify potential other-than-resident-training delivery systems for all Coast Guard, DoD and other vendor training. The data that resulted was then inputted into a training system database.

The WPTS study also underscored the need for analysis before choosing an alternative delivery system. Alternative deliveries typically have high up-front costs but promise long-term savings. To ensure the Coast Guard can afford the up-front costs of a specific alternative delivery and that its ROI justifies that initial expenditure, it is absolutely essential to analyze cost-benefits before procuring a "whizz-bang" training program.

To avoid these problems, WPTS recommended several strategies that, if implemented, would better position the formal training system to meet the challenges of its future.

CG Trains People in ABCD Process

Coast Guard Headquarters and TRACENs have continued to train their staffs in HPT' s ABCD model. This model has several strengths for TRACEN staff:

- It is thoroughly focused on performance--not subject matter.
- Following the model through the analysis, design, and development stages helps TRACEN staff develop performance-based training (i.e., ONLY what the person needs to perform the job)--regardless of the delivery system.

CG Trains People in ABCD Process (continued)

- The model helps TRACENs make the critical decision about whether to train (store information in long-term memory) or job aid (store information in a job aid). Once that decision has been made, the model also helps TRACEN staff design and develop stand alone job aids (no training), provide job aids with extensive training or provide job aids with only introductory training. Combined with emerging technologies, the model' s outcomes can make an excellent business case for developing EPSSs.
- The model addresses "new starts" with one analysis process and problems in performance with another type of analysis.
- If training is one solution recommended, the end result of either type of analysis is a list of tasks sorted into those that do not require training, those that should be job aided, and if any training is required for using the job aids, whether it should be introductory or extensive training. This is exactly the result TRACENs need to determine if training is an appropriate intervention, and--if it is--design, develop and implement that training.

Streamlining

Streamlining has been another powerful driver for changes in how the Coast Guard formal training system conducts analysis. Headquarters lost a considerable amount of its staff as a result of the Coast Guard' s streamlining effort. The staff left is simply not large enough to do all the analysis work the formal training system requires. To offset that problem, headquarters has tasked the Auxiliary (trained in HPT' s ABCD process), Reserves, TRACENs, PTC, and Quality Process Consultant (QPC) staffs with analysis efforts. As a result, in larger numbers than used to be the case, staff outside of headquarters find themselves engaged in PA, FEA, and other types of analysis efforts.

Assignment of ITs to TRACENs

The assignment of increasing numbers of ITs to Coast Guard TRACEN staffs (and the presence of a large number of ISSs at the PTC) have also had an effect on analysis efforts. Given their expertise levels, TRACEN IT and ISS staffs have had leadership roles in the Joint Rating Review (JRR), 110' pipeline analysis, and the contractor-developed PA for the WLM/WLB fleet. As new communications techniques (e.g., video teleconferencing) make location less important, the more traditional view of analysis project roles and responsibilities is beginning to blur.

Coast Guard View of HPT and Performance Analysis

These seven drivers have influenced and changed how we do business. Today, the Coast Guard uses HPT as its overarching philosophy and model for how the organization should view performance and performance improvement projects. Coast Guard practitioners from different disciplines (e.g., instructional technology, human factors engineering, human resources, process improvement, etc.) have accumulated several methods, tools, and techniques for analyzing and solving human performance problems. These methods, tools and techniques now fall under the larger HPT umbrella, and are known collectively as "performance analysis (PA)." Those who practice such methods and use those tools and techniques are called performance consultants (PCs).

Coast Guard TRACENs also have PC staff who are sometimes involved with organizational performance analysis (OPA) projects, but more often conduct FEA efforts to identify if there will be training or performance support needed for new equipment and what delivery system that training or performance support ought to use.

Given streamlining, emerging technologies and less stress on the location at which work is done, the different ways of doing analysis are becoming less distinct and more "blurred." Very often, the outputs of one type of analysis effort (e.g., OA) are used as the inputs for another type of analysis effort (e.g., enlisted rating and qualification reviews).

Coast Guard View of HPT and Performance Analysis (continued)

Additionally, different types of analyses efforts are being performed at all levels of the organization by people from a rich mix of diverse professional backgrounds.

The end result is that TRACENs are no longer just about training. Today, they are much more like one-stop-shops that provide doctrine, training programs, interactive courseware, IVT-delivered courseware, training support packages (e.g., turnkey structured on-the-job training (OJT)), job aids, and a variety of performance supports (e.g., EPSSs, simulations, and virtual tours of new vessels and equipment).

NOTE: We have targeted this SOP toward TRACEN-level instructors, course designers and developers, and their training managers. Those jobs need to be done, and done better than ever. However, in one sense, we are all PCs because we are trying to improve Coast Guard human performance.

Where Are We Today?

Occupational analysis (OA) has moved to TRACEN Yorktown. The OA staff works in conjunction with Coast Guard Headquarters program and rating managers and TRACEN resident and nonresident staff to ensure enlisted training is capturing the right performances.

Coast Guard Headquarters (G-WTT) keeps track of what acquisition projects are doing and tasks TRACEN-level staff with a variety of analysis projects.

Additionally, TRACEN PCs and instructor staff are often asked to do FEA projects and sometimes, job task or training needs analysis. Other times, TRACEN staff are asked to develop an IP, and as part of that work, they will be required to conduct a cost-benefit analysis.

Where Are We Today? (continued)

Alternative delivery and performance support projects bring their fair share of off-the-shelf (OTS) searches and media selection projects as well. COMDTINST 1554.1 has designated the PTC as the Coast Guard' s Center of Excellence for CBT. That means TRACEN or program staff involved in media selection, or OTS research should coordinate with PTC staff to ensure they select and design only those delivery systems that TISCOM and OSC Martinsburg are prepared to support.

Training-related analysis projects have not gone away. TRACEN SMEs and PCs will continue to need to conduct task and content analysis, rating and qualifications reviews, and job aid analysis.

What Are the Types of Analysis?

PA encompasses many different kinds of analyses. Projects range from huge to small and unique to fairly routine. Some of the types of PA efforts with which you may be involved are:

- Organizational Performance Analysis (OPA)
- Occupational Analysis (OA)
- TRACEN-Level Triage
- Front-End Analysis (FEA)
- Rating & Qualifications Review or Joint Rating Review
- Job Task Analysis (JTA)
- Selecting Delivery System(s) (Media Selection)
- Job Aid Analysis
- Off-the-Shelf (OTS) Analysis
- Cost-Benefit Analysis (CBA)
- Instructional Plan (IP) Design and Development
- Training Needs Analysis (TNA)

And there are other types we haven' t listed. That is just the point. There is no "cookbook"-type job aid for some kinds of PA because they are too huge and too unique. Every project is different. Other types of PA are smaller and more routine.

What Are the Types of Analysis? (continued)

Some types of analysis are even mandated by Coast Guard policy. You will understand all this better when you have had a chance to read through the different levels and types of analysis.

SOP Analysis Tasks

The chapters in the Analysis Section of this SOP are:

- Conduct Organizational Performance Analysis (OPA)
- Conduct Occupational Analysis (OA)
- Conduct TRACEN-Level Triage
- Conduct Front-End Analysis (FEA)
- Conduct Rating and Qualifications Review
- Conduct Job Task Analysis (JTA)
- Select Appropriate Delivery System(s) (Media Selection)
- Conduct Job Aid Analysis
- Conduct Off-the-Shelf (OTS) Analysis
- Conduct Cost-Benefit Analysis (CBA)
- Design and Develop an Instructional Plan (IP)

How Do I Know Which Analysis to Do?

With all those different kinds of analyses, you are probably wondering how you figure out which ones you should do. And, how do you know when you should do a particular type of analysis? In short, what do these many types of analyses mean to you and your job?

The "Introduction to Analysis" chapter you are reading now and each SOP will help you in learning how it all works. Each SOP chapter has a flowchart so you can get a picture of where one type of analysis work starts and ends. Every chapter also has a job aid you can use as a checklist to make sure everything gets done – whether by you or somebody else.

Before you start, it might be helpful to have an overall picture of the different kinds of analysis work and why and when you want to do them. Take a look at the flowcharted processes at the end of this chapter. It will help you figure out under what circumstances you are likely to have to do some type of analysis.

Why Do I Need to Do Analysis?

If we' re at a TRACEN and we think people need training, why wouldn' t we just go ahead and design that training? Isn' t that our job? The answer to that question is, "yes, that' s exactly what we should do-*if we know that training is the appropriate intervention for fixing the performance problem.*" But, as research tells us, when an organization thinks it has a performance problem (e.g., technicians on-the-job can' t accurately diagnose and fix a boiler, inspectors aren' t inspecting the right things, or CASREPs indicate our people are deficient in something), training may be:

- The solution
- Part of the solution
- Not related to the solution at all

There are very few cases on record in which training alone has fixed performance problems.

Why Doesn' t Training Fix Most Performance Problems?

Performance is affected by many influences. We can all relate to the story of people being sent to take a computer software training course only to return to the job and find their computer does not yet have that software loaded. By the time the software is procured and loaded, they can no longer remember how to apply what they learned. Or, maybe people receive training on the "right" method for doing something but when they return to the job, they discover the supervisor doesn' t want the job done that way. Since they perceive punishment will follow doing the job the "right" way, they quickly revert to doing the job the way the supervisor wants.

HPT research indicates that there are many influences affecting performance. Unless we use a method such as front-end analysis to identify ALL those influences, we are likely to lose time, money and discourage our people by designing one solution to a problem that requires many solutions before it will be "fixed."

What Questions Does Analysis Answer?

- What indicators or symptoms suggest that change is needed in on-the-job performance (new equipment, new technology, record of recurring mistakes)?
- What is the root cause(s) of the performance problem?
- What role, if any, can training play in remedying the performance problem?
- What is the monetary value of solving the problem? How does "fixing" the problem by a specific solution (i.e., training) tie into the Coast Guard' s business plans? (In short, if it' s a $2 problem, do we want to design a $20K training program to fix it?)
- Would an improvement--but less than a complete remedy--be acceptable? (An 80% solution may work just as well, and be much more cost effective--than a 100% solution).

Is Training Ever the Right Intervention?

Yes. If analysis indicates that:

- One of the influences contributing to substandard performance is a lack of skills and knowledge

Or:

- One of the influences on an anticipated performance (e.g., workers using new equipment) will be training new skills and knowledges

then the TRACEN staff can begin the very important work of designing and developing a training solution.

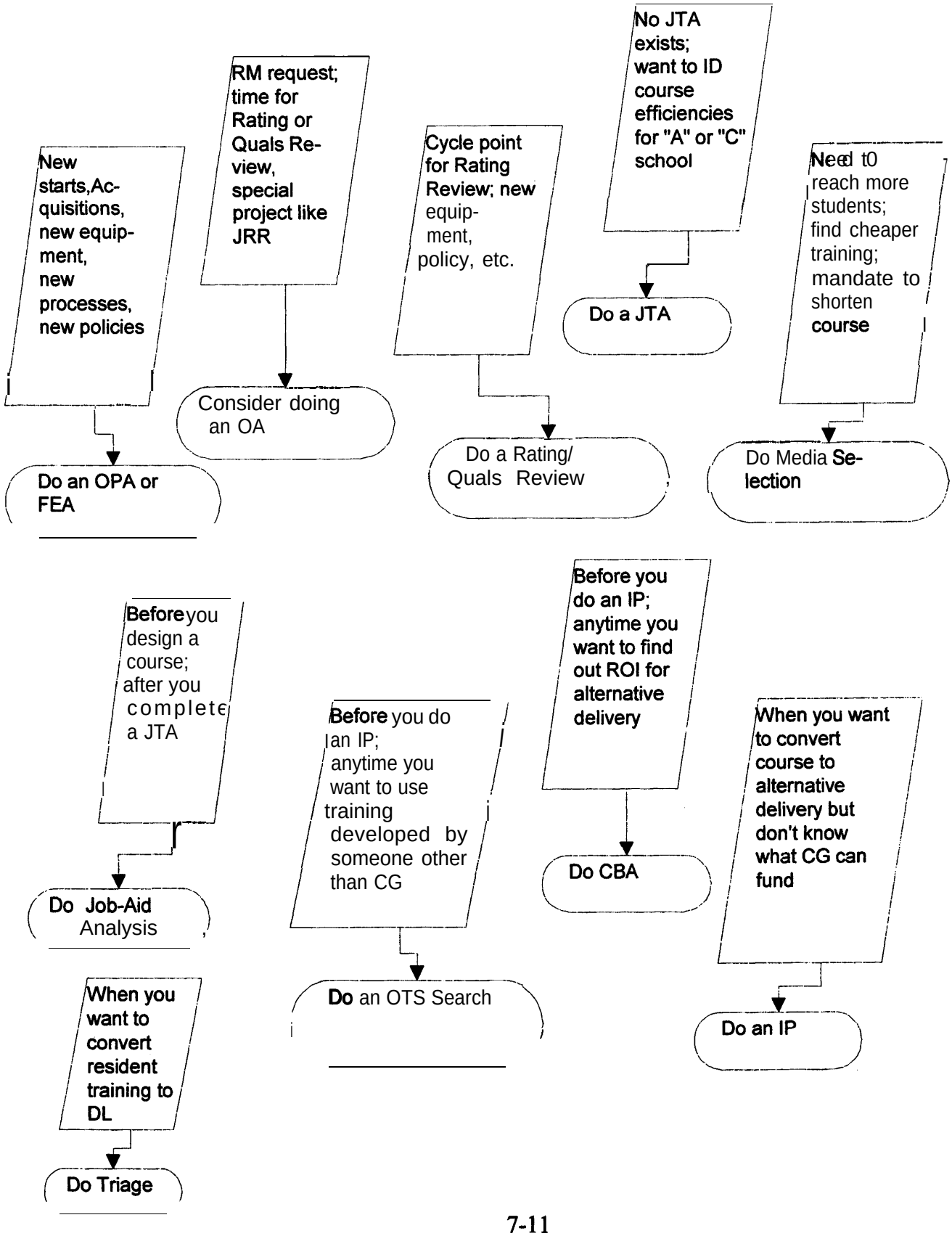
Key Questions

The key questions you want to answer in any analysis work you do are:

- Has the appropriate analysis work been done?
- Have all key stakeholders accepted the results?

A "yes" to those two questions means you have the green light to go ahead with designing and developing a training solution.

Coast Guard Performance Analyses



Chapter 8: Conduct Organizational Performance Analysis (OPA)

What Is It?

As you know, the Coast Guard' s HPT philosophy and methodology is the umbrella under which many types of performance analysis (PA) processes fall. Since PA includes so many different analysis methods, tools, and techniques, it is a very flexible approach to solving a wide range of human performance problems. However, due to their high visibility, you may know PA best when they take the form of organizational performance analyses studies. An organizational performance analysis (OPA) is the type of analysis methodology the Coast Guard uses to analyze some of its "large-issue" performance problems.

OPA is the level of PA used in projects that call for multiple program involvement and that have wider organizational impact. This type of PA is cross-functional and requires a more **systemic** approach. Usually, the PCs who conduct (OPA) are IT graduates with considerable experience in HPT methodologies, tools, and techniques.

OPA studies answer questions such as:

- How do we create an optimal aviation workforce structure?
- With 2010 in mind, how do we best position the 10 ratings that operate or maintain electronic systems?
- Will our chief petty officers (CPOs) be well enough prepared to meet the challenges of 21st Century leadership?
- Are we providing the professional development opportunities our petty officers, junior and senior officers, civilians, Reserves, and members of the Auxiliary need to meet the challenges of tomorrow?

Performance problems of this magnitude cover a very broad range of issues. Analyzing data to answer these questions probably means looking at many jobs, not just one; analyzing many types of equipment and tools, not just one system; talking to lots of people in lots of places, not just those assigned to one class of ship or one type of shore unit.

What Is It? (continued)

To effectively and efficiently address performance problems of this magnitude, the Coast Guard typically conducts a specialized kind of PA called OPA.

NOTE: There is more than one method for conducting OPA. Additionally, large work force performance studies must often draw upon and repurpose data the organization is already collecting. Thus, each project is usually quite unique in its methodology. There is no cookbook for conducting OPA. For the purposes of this SOP, we will cover a process most of these projects have in common. Keep in mind that each project will have a different data collection and analysis plan. The data collection and analysis plans are some of the factors that make each performance analysis project unique.

What drives an OPA effort? The answer is many things. Sometimes the results of one study suggest the need for further analysis. An example of that kind of dynamic is the first Coast Guard Workforce Cultural Audit (WCA). That study' s results drove the need for further studies: The Nonrate Study, The CPO Study, and other studies that have examined the professional development needs of different slices of the Coast Guard work force. Generally speaking, the factors that drive an OPA effort are:

- Multiple program involvement.
- Very wide organizational impact.
- Scope of the study (i.e. the wider the scope, the higher the level of analysis).
- Project' s goal (e.g., a standard rating review for ETs calls for a lower level and a different type of analysis methodology from the JRR that analyzed 10 ratings simultaneously).
- Is the cost of the problem worth undergoing an OPA effort?
- Are the right resources available to conduct an OPA?

How Does the Coast Guard Conduct an OPA?

First, the Coast Guard receives a stimulus for taking action. That stimulus can take many forms. It might be that data the organization collects and the results of several studies are all pointing to a large and cross-programmatic performance problem that needs to be solved. Or, it might be that the Coast Guard recognizes it needs to analyze its workers' performance now to ensure their performance in the near future is what it needs to be.

Although the drivers, scope, and goals that start OPA are different from other types of PA, just as with any other type of effort, an OPA starts from stakeholders drafting a charter that states the OPA' s mission, purpose, deliverables, funding source, team leader, and team members. The team then:

- Identifies the current state ("actuals").
- Identifies the desired state ("optimals".)
- Determines gaps between the two states.
- Develops a data collection and analysis plan for analyzing the gap.
- Collects data.
- Analyzes the gap.
- Develops solutions for closing the gap.
- Drafts an OPA report.
- Presents report, data, and follow through implementation recommendations to stakeholders.

NOTE: The data collection plan and subsequent analysis of the data received (i.e., the analysis plan) are critical components of the OPA process. Although those conducting PA often use extant data analysis (i.e., analysis of data the organization already has or is collecting), most OPA efforts also require the use of survey instruments, interviews, and follow-up focus group interviews. That is one reason why OPAs are generally conducted by PCs who have attended IT programs and who have considerable experience in applying PA tools and techniques.

How Long Will It Take?

The answer to that question depends on the scope of the project and the type of PA methodologies, tools, and techniques used. It is not unusual for an OPA to take a year to complete. However, other OPA efforts may be completed in a few months.

Among the variables that affect the time it takes to conduct OPA are:

- The presence or absence of extant data.
- The time required to develop data collection instruments (i.e., surveys, interview questions).
- Time required to administer surveys, or conduct on-site or focus group interviews.
- The amount of time necessary to thoroughly analyze collected data.
- The time required to draft and present OPA final results.

Recognizing that today's organizations are all driven by the need for "faster, cheaper, better" results, several experts in the performance technology field have developed ways to speed up an OPA effort. You can find out more about their ideas and methods by looking in the following sources:

- "First Things Fast" by Allison Rossett
- The American Society for Training and Development (ASTD) "Info-Lines"
- "Analyzing Performance Problems," co-authored by Robert F. Mager and Peter Pipe
- "What Every Training Manager Should Know" by Robert F. Mager

What Will We Get Out Of It?

We can best illustrate what you get out of an OPA by asking you to consider the following example.

One of the ongoing performance problems the Coast Guard is attempting to solve is continuing to attract and retain the best people.

What Will We Get Out Of It? (continued)

This is a broad problem made up of many issues--recruitment, diversity, retention, and so forth.

The Coast Guard could try to solve these problems by "old" solutions: offer training in diversity or develop a bonus program for increasing retention. However, unless the Coast Guard knows for sure that lack of skills and knowledge about diversity is affecting performance in that arena, or that bonuses are the "right" incentive tool to increase retention, such programs, though well intentioned, will have little long-term effect on performance.

In contrast, using OPA offers the Coast Guard a way to increase the likelihood of improved organizational performance in these areas. Why? Because OPA helps us figure out what is really wrong and what to do to make it right.

The OPA process starts by focusing on performance rather than solutions. It recognizes that there are many influences on performance--incentives and motivation, skills and knowledge, assignment and selection, tools, policy--just to name a few. All of these influences need to be considered and properly analyzed before solutions to the performance problem are identified.

Thus, using the OPA process gives you:

- A systematic process for arriving at solutions.
- Solution sets that cover all the influences on performance that were contributing to deficient performance.
- Confidence that the solution sets will improve performance.

So, what you get out of using the OPA process to solve performance problems are *the right things to fix to ensure performance really improves*.

Why and When Do We Conduct an OPA?

Why:

The Coast Guard uses OPA because it provides a better model for affecting positive changes in organizational performance.

When:

OPA methodologies are used to analyze large performance problems such as those looked at by the Aviation Workforce Structure Study or the JRR. When the organization needs to look at a performance problem or opportunity of that magnitude, it will typically turn to the OPA process to find answers.

As with all types of PA, OPA is also closely tied to the organization' s business goals. How important is it to the Coast Guard to solve the performance problem? Is conducting an OPA worth the resource drain? Those problems that are very important to the Coast Guard and that merit the resource drain will most likely be looked at by OPA studies.

What Is My Role?

If you are asked to be part of an OPA effort, probable roles you might play are:

- Survey taker or interviewee who fills out a survey or is interviewed.
- Team member for a team conducting an OPA.
- Leader of an OPA effort .

Who Can Help Me?

This SOP includes a References Section. If you are tapped to be part of an OPA effort, you may want to look into some of the books and articles listed in that section of the SOP.

COMDT (G-WTT) is the Coast Guard expert on conducting OPAs. Staff from our TRACENs and the PTC's Performance Analysis Branch have served on or been PCs for OPA efforts. We suggest you consult with their staffs for help in conducting an OPA.

Who Can Help Me? (continued)

Don' t forget the web. It is a wonderful source for quickly finding process and procedural information about different kinds of analyses. You will find a list of current web sites in the References Section of this SOP. However, since web site URLs change frequently, we suggest you enter the name of a university or college, followed by "edu." Using that URL will allow you to access several web sites that contain information about performance technology:

For example, a web site URL containing information about analysis is:

http://edweb.sdsu.edu/courses/EDTEC540/Syllabus/Buffy/buffy_analysis1.html

NOTE: Web site URLs change frequently. Be sure to use the most current URL to find the information you need.

What Is the Process for Getting Started?

OPA efforts that look at larger performance issues usually start at Coast Guard Headquarters and are driven by the Commandant, several Coast Guard program managers or Headquarters staff. Therefore, it is unlikely you will start the process. Instead, you will more likely receive tasking from Coast Guard Headquarters to participate in a group conducting an OPA or be surveyed or interviewed by a group conducting an OPA.

OPA Job Aid

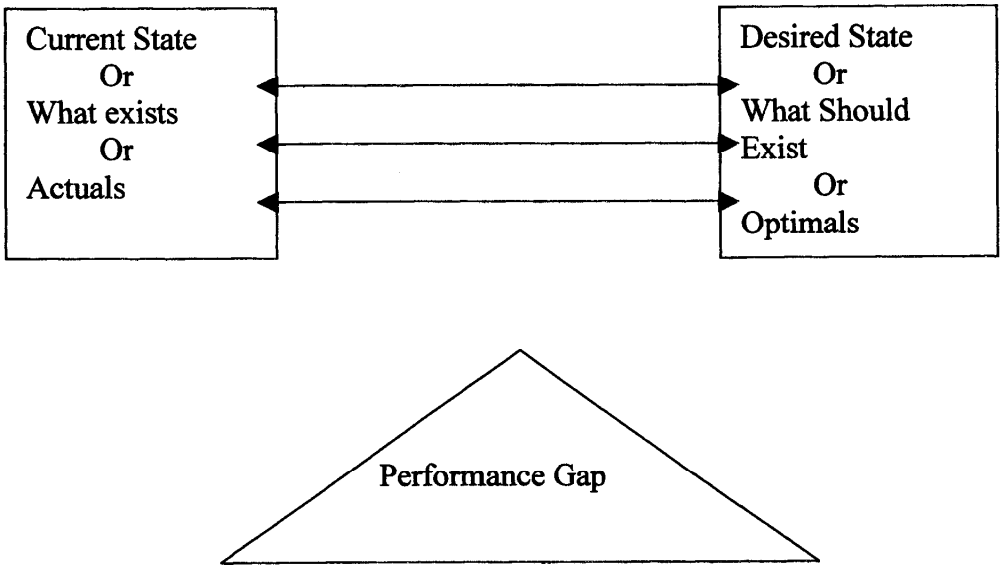
NOTE: You recall that we said there is no job aid or cookbook for a project as large and varied as an OPA. Each project is unique and different, in some aspects, from any other project. However, there are common threads, and we have captured those as "steps" in the process. The stimulus that "starts" an OPA is:

- A copy of a charter that names you as one of the people who will be involved in an OPA effort.
- A request to develop a charter for conducting an OPA.

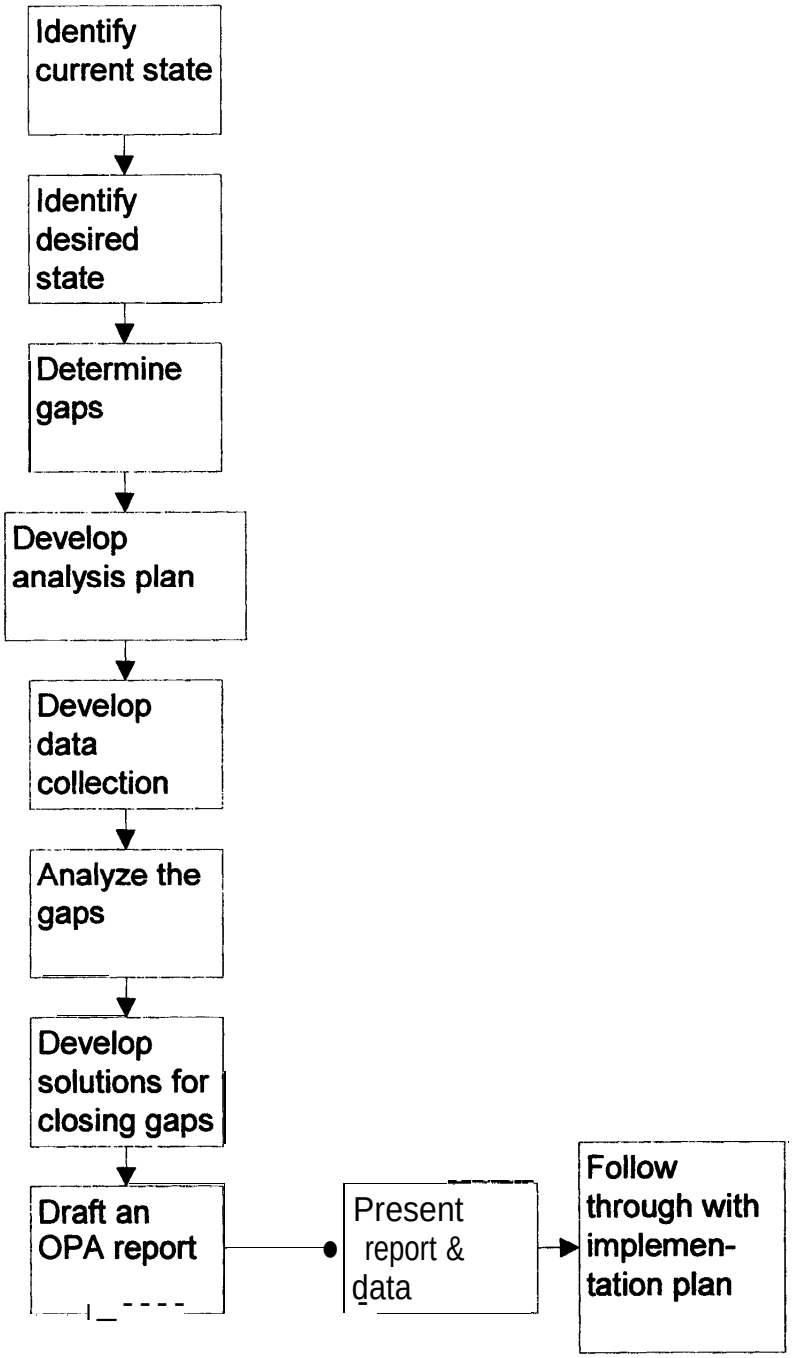
Steps for Conducting OPA (continued)

Once the charter is received or developed, the steps for conducting an OPA are:

Step 1: Identify the current state.
Step 2: Identify the desired state.
Step 3: Determine gaps between the two states.
Step 4: Develop a data collection and analysis plan for analyzing the gap.
Step 5: Collect data.
Step 6: Analyze the gap(s).
Step 7: Develop solutions for closing gap(s).
Step 8: Draft an OPA report.
Step 9: Present report, data and follow through implementation recommendations to stakeholders.


Current State
Or
What exists
Or
Actuals
Desired State
Or
What Should
Exist
Or
Optimals
Performance Gap
Interventions are those things we can do to move from
The current to the desired, closing the performance gap

Organizational Performance Analysis (OPA) Job Aid



Chapter 9: Conduct Occupational Analysis (OA)

What Is It?

As is the case with all organizations, the Coast Guard has a recurring need to look at the jobs its people are performing. The idea is to find out if these jobs have changed:

- Are yeomen still doing the same kinds of tasks?
- Has the work boatswain' s mates (BMs) and quartermasters (QMs) do become more similar or is it very different?
- How have emerging technologies changed the jobs of electronics technicians (ETs) and electrician' s mates (EMs)?
- Are our junior officers (JOs) doing the work they need to do?

The job analysis work the Coast Guard does to find out the answers to these questions is called occupational analysis (OA). The procedures used to analyze military jobs are called OA because military organizations look at an "occupation" or job family--several related jobs rather than a single job. Essentially, occupational analysts (OAs) take a "snapshot" of the world of work at a particular point in time to see how a rating or job is doing.

For enlisted ratings, the prime customer for an OA is the rating manager (RM) since OA outputs provide some of the data rating managers need to manage the rating. However, OA type efforts are increasingly addressing the whole organization by undertaking needs assessments for specific populations: junior officers, civilians, and so forth.

OA work isn' t something just the Coast Guard does. The United States Armed Forces, Canada, Great Britain, Australia, Germany, Belgium, France, and other military organizations conduct OA to measure the content of their occupations. The end result--OA reports--give these organizations accurate, current, task-level information about the jobs their people are doing.

What Is It? (continued)

OA reports answer organizational questions such as:

- What do machinery technicians (MKs) do?
- How are Coast Guard JOs performing?
- What are the professional development needs of civilians?

Although there are many ways of conducting an OA, all methods ask people in the job what they do and how much time they spend doing it. The Coast Guard uses the information from the OA report to help in planning:

- Entry level and subsequent performance standards
- Appropriate training
- Proper staffing

How Does the Coast Guard Conduct an OA?

The OA process starts with the development of a task inventory. A task inventory is a compilation, or list, of all the tasks the RM expects that rating (e.g., field) to perform. The task inventory includes tasks currently performed by all pay grades within the rating and covers all jobs within the Coast Guard to which people in that rating are assigned (i.e., small boat stations, 270s, etc.). If the RM suspects that a change in jobs or equipment means that tasks are being performed that were not formerly part of the rating, those tasks will be included as well. The task inventory may also try to capture future trends that the RM anticipates may impact the rating.

The development of the task inventory is primarily an RM responsibility, but the OA helps by providing OA process information. The RM also works with the OA to develop an interview plan. The RM provides the names of SMEs to interview and a list of locations for on-site interviews.

Once the task inventory and interview plan are developed, the OAs conduct on-site interviews to gather data that will refine the task inventory. They also use these visits to gather information about equipment people in the rating use and the schools they have attended.

How Does the Coast Guard Conduct An OA? (conducted)

At the completion of this phase of OA, the analysts refine the task inventory and other data, add job satisfaction items, and convert data to a scannable format survey which is then sent to the vendor (i.e., NCS) for printing. At this point in the process, Coast Guard Human Resources Service and Information Center (HRSIC) provides mailing labels to the OA analysts. Once surveys are prepared for dissemination, the analysts send them to unit command master chiefs (CMCs) who ensure each person at that unit who works in the rating being analyzed receives a survey. The CMC makes sure all surveys are completed and then sends the results to the OA office. Analysts scan and analyze the result, prepare a report, and provide that report to the RM.

The steps for conducting an OA are:

Step 1: RM and OA jointly develop initial task inventory.
Step 2: RM provides OA with names of SMEs recommended for interviews.
Step 3: OAs conduct on-site interviews with SMEs to develop task inventory and list of schools and equipment used by the rating.
Step 4: Analyst adds a list of 36 job satisfaction questions and any added background questions of interest to the RM.
Step 5: OA develops a scannable survey with a comprehensive task list.
Step 6: OA forwards survey booklet to NCS for printing.
Step 7: CG HRSIC provides mailing labels to OAs.
Step 8: PTC sends surveys to each unit' s CMC for dissemination to each rating incumbent at the unit.
Step 9: CMC ensures surveys are complete and returns surveys to PTC.
Step 10: OAs scan surveys, analyze results and prepare a report.
Step 11: OAs provide report and amplifying information to the RM.

How Long Will It Take?

The time required to conduct an OA differs depending on the size of the project. Also, new technologies are affecting how long it takes to do an OA.

The Joint Rating Review (JRR) recently conducted OAs for 10 ratings that operated or maintained electronic systems in less than a year.

In July 1999, the Coast Guard' s OA function was transferred from Headquarters to the PTC, Yorktown, Virginia. Now a part of the Performance Analysis Branch, OA staff anticipates the new cycle time for OA will be 6 months or less.

Given the Coast Guard' s migration to SWSIII and new technologies, OA' s cycle time is likely to be even more drastically reduced in the future.

What Will We Get Out of It?

The output of an OA is a report.

Traditionally, Coast Guard OA reports have contained information such as:

- What job incumbents do in individual pay grades, unit types, and particular job titles.
- What equipment job incumbents use.
- What schools job incumbents have attended.
- Which tasks people in the rating perform and which tasks they don' t perform
- How much time is spent performing specific tasks.
- Demographics
- Job satisfaction measures.

In 1998, the Coast Guard established a study group called the JRR with the mission of best positioning 10 enlisted ratings for optimum performance up to the year 2010. Given its future-oriented focus, the JRR team used a different type of OA instrument. It focused its data collection efforts on Coast Guard systems and missions. It also solicited amplifying information from commanding and flag officers. The JRR' s OA results allowed users to compare rating overlaps and redundancies with a high degree of confidence.

What Will We Get Out of It? (continued)

However, the JRR was an atypical project. The OA staff' s more traditional approach is to survey a specific rating. They focus on tasks grouped into major performance qualification factors that generally mirror a ship' s major systems. To accurately determine the rating' s current state, they collect as much detailed information as possible about the rating and the specific equipment it uses.

Why and When Do We Conduct OAs?

Why:

RMs are the prime customer and trigger for OA efforts. As the people who manage individual ratings within the workforce structure (e.g, yeoman, storekeeper or boatswain' s mate), RMs must ensure that a rating' s members are able to perform the duties assigned. Since OA results allow RMs to compare the rating' s current state to its desired state, they are very interested in OA' s results.

TRACENs are also interested in OA efforts because they know they have traditionally been the starting point for a rating' s review cycle. Once an OA report is generated, the RM will most likely convene a rating and qualifications review panel. From that effort, new quals will be developed. Those new quals will change the content of current Class "A," "C," and correspondence course training.

When:

Former policy stated OAs should be administered every 5 years, but recent studies have indicated that they should be conducted more often. The JRR also had an impact on how OAs are conducted. Given the rate with which new technologies are emerging, we may see more "joint" rating review efforts in the future. The need to reduce training costs may also drive joint OA efforts with other military services.

Why and When Do We Conduct OAs? (continued)

Additionally, the Coast Guard' s WCA identified a need to analyze the differing professional development needs of various segments of the workforce. So far, OA-related studies have been conducted for the Coast Guard' s nonrate workforce, junior officers, CPOs, Senior Enlisted, the civilian workforce, and so forth.

Each of these efforts has a different cycle time, but you can count on certain trends to affect future Coast Guard OA work:

- Current and future soft and hardware procurements will continue to speed up OA efforts.
- The Coast Guard will use OA and OA-related projects more and more to help in making data-driven decisions.
- OA results will increasingly pinpoint exactly what type of work the Coast Guard needs done.
- All stakeholders with an interest in OA results will have that information simultaneously and in a manner that is very responsive to their needs.
- The ability to quickly change training and training deliveries to meet real field needs will be much enhanced.

What Is My Role?

As instructors and course designers and developers in a TRACEN, your role in OA is most likely to be user of the results. OA results will be very helpful in comparing the current content of courses with what is really happening in the field. Also, knowing OA' s results will help you act as a member or observer of a quals review panel.

The increased knowledge you gain on how the rating is really performing in the field will also help you identify appropriate target audiences for your training programs, and develop courseware that really meets the field' s needs. Examining OA results before you change or design a training program will give you a much better chance of aligning training efforts with what the field really needs…and a much better chance of making timely changes to instruction to meet changing needs.

What Is My Role? (continued)

You may also serve as a SME for your rating and help the RM by developing a task inventory.

Finally, OA results will help you understand what your students are like and what they need to perform well on the job. You may even be able to identify ways to help with retention problems and to keep our great resource, our people, well satisfied with their life in the Coast Guard.

Who Can Help Me?

If you want to know more about OA, PTC OA staff can give you information. They are in the process of creating a web page on this topic that will tell you many facts about the process.

If you are really interested in finding out more about the topic, you may want to research the whole topic of occupational and job analysis. The internet has several web sites on these and related topics.

What Is the Process for Getting Started?

Once the OA process is fully reengineered, cycle time will probably be dictated by policy (i. e., ratings will undergo OA every year, every two years, and so forth – depending on how fast the technical requirements of the rating change). At this point in time, an OA is initiated by a request from the RM via COMDT (G-WTT) to Commanding Officer, TRACEN Yorktown. The RM funds OA costs.

As an instructor or a course developer, you can bring up the need for an OA any time you think one is called for. Just discuss your concerns with the program or rating manager.

Steps for Conducting an OA

The steps for conducting an OA are:

Step 1: RM and OA jointly develop initial task inventory.
Step 2: RM provides OA with names of SMEs recommended for interviews.

Steps for Conducting an OA (continued)

Step 3: OAs conduct on-site interviews with SMEs to develop task inventory and list of schools and equipment used by the rating.
Step 4: Analyst adds a list of 36 job satisfaction questions and any added background questions of interest to the RM.
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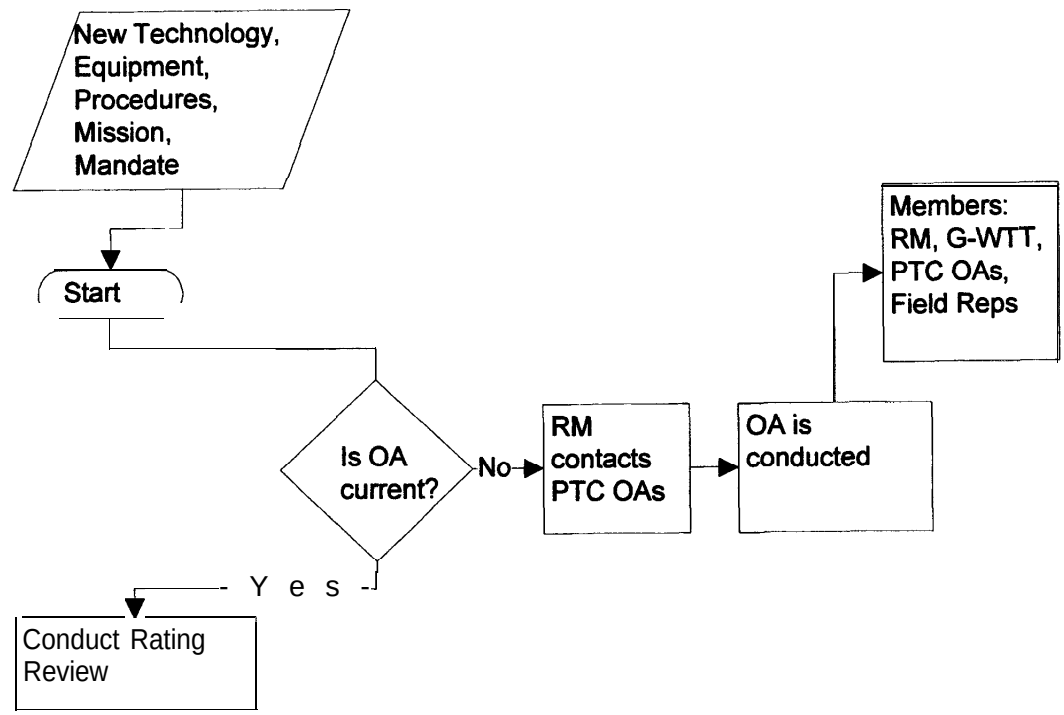
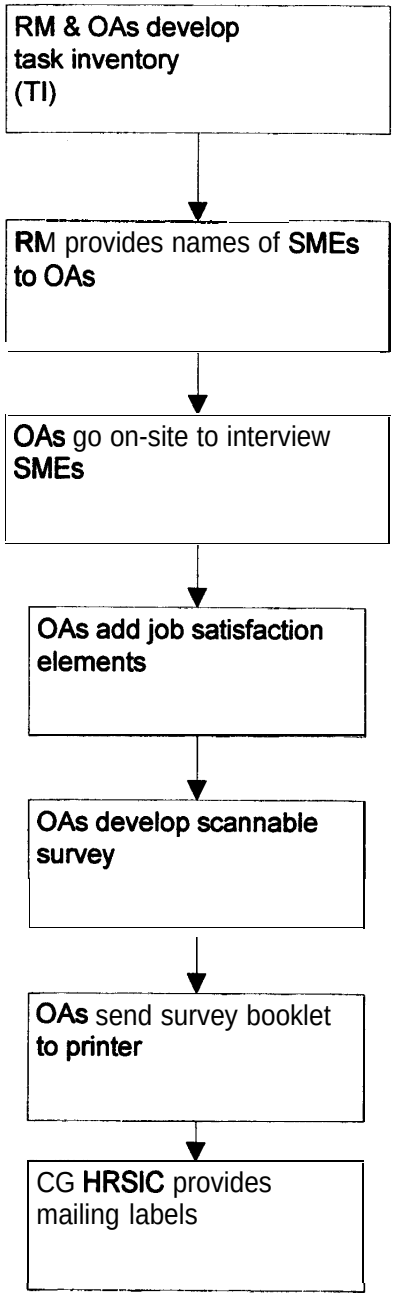
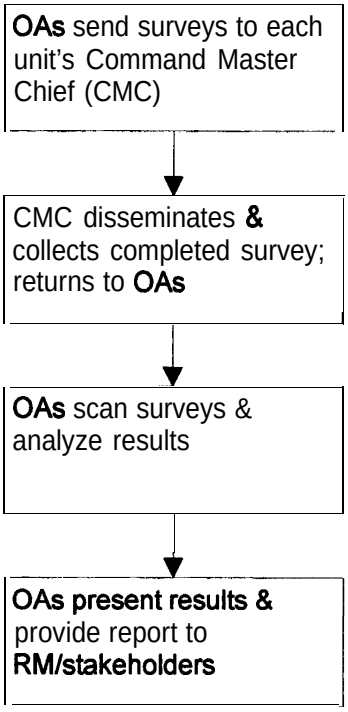
Occupational Analysis Process



Conduct Occupational Analysis Job Aid



Conduct Occupational Analysis
Job Aid (cont.)



Joint Rating Review Occupational Analysis for:
BM QM FT GM MK TC RD

Purpose of Survey: 'The purpose of this survey is to find out what you and other members of your rating do at your current assignments. Your answers give us a clearer picture of what these ratings do and where they fit into the Coast Guard as a whole. The information you provide will help improve the way BM's, QM's, FT's, GM's, MK's, TC's, and RD's are trained, assigned, and employed.

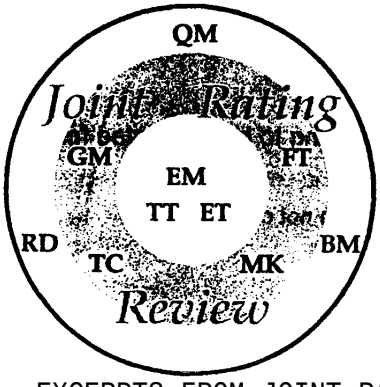
PRIVACY ACT STATEMENT

A. Authority: 5 USC 301; 14 USC 632; Executive Order 9397.
B. Purpose: The information requested in this survey will be used in research designed to improve the training, assignment and development of the-Coast Guard personnel. The information will not be used to evaluate you as an individual, your supervisor, or your unit. The information will not be entered in your personnel file.
C. Effect on individuals not providing information: Participation is voluntary. Providing the information requested will make the survey results more meaningful.

Introduction

Please read the directions carefully. You may wish to take several sittings to complete it. However, we would like you to return the completed survey within two weeks of your receipt. When you have completed the booklet, put it into the enclosed envelope, and drop it into the mail.

Your input is of tremendous value to the Coast Guard. Thank you for taking the time to complete this long survey. We believe that completing this survey may be the single most important thing you can do to affect the future of our ratings.



EXCERPTS FROM JOINT RATING REVIEW OCCUPATIONAL ANALYSIS SURVEY

Marking Instructions

- Use a No. 2 pencil only
- Do not use ink, ballpoint, or felt-tip pens
- Make solid marks that fill the response completely
- Erase cleanly any marks you wish to change
- Make no stray marks on this form

CORRECT: ●

Use No. 2 Pencil

INCORRECT: ⊘ ✓ ✗ ○ ◐

The survey will consist of four parts:

Part One: *Demographics*

Part Two: **Operational** *Tasks*

Part Three: *System Maintenance*

Part Four: *Collateral Duties*

Please refer to the separate page included with your survey for definitions of terms used in sections Two and Three.

Part 1 - Demographics

Instructions: This first section asks some questions about you and your unit's type and location. The purpose is so that we can group responses and draw general conclusions such as differences between East Coast versus West Coast, wtiat happens at shore units versus cutters, etc.

-1. What is your current duty status?

① **Active**
② **Reserve**
③ **ADSW-AC**
④ **ADT**

2. How long have you been at your present unit?

① **Less than 3 months**
② **3-6 months**
③ **6-11 months**
④ **1-2** years
⑤ **2-3 years**
⑥ **3-4 years**
⑦ **4 or mot-e years**

3. Education level (please fill in all ovals that **apply):**

① **GED**
② **High School**
③ **Trade School**
④ **Associate's**
⑤ **Bachelor's**
⑥ **Master's**
⑦ **A C E T**
⑧ **other**

4. Are you currently in pipeline training?

① **Yes**
② **No**

5. Are you currently performing as:

① **Officer** In Charge **(OinC)**
② **XPO**
③ EPO
④ Other _____
⑤ Not Applicable

6. Would you be willing to be contacted for follow-up questions?

① **No, please do not contact me.**

② **Yes, please phone me at**

③ **Yes, please e-mail me :**

Introduction

This survey tries to capture the "World of Work" of your rating. The best way to do this is to ask **you** what jobs and tasks you perform.

In this section we ask you to indicate which tasks you do in your present job. Please mark **only** those tasks which are part of your **present** assignment.

Relative Time

Relative Time Spent **is a comparison of time you spend doing this task relative** to the average time you spend on **all other tasks.**

- Rate each task on a scale from " 1" to "9"
  - ⇒ " 1" is the lowest amount of relative time spent
  - ⇒ "9" is the greatest amount of relative time spent
- The more of your time you spend on a task, the larger the number you should mark.

Survey Development

This survey was developed by **BM's QM's, FT's,** GM's, **MK's, TC's, RD's** ET's, **TT's,** and EM's like yourself. Probably no one individual performs every task listed in this survey. Additionally, this survey was developed to capture the world of work for 10 ratings at the same time.
So...it is anticipated that you *may* have a large number of ovals which you do not fill in -- because they do not apply to you.

Format

- Questions in this section are called mission essential tasks. Operators do these things to accomplish the Coast Guard's work.

- These activities are separated into seven categories which are defined below.

Your interactions

Your degree of involvement with a particular task depends on a lot of things, such as your duty assignment, experience, and the tools & equipment available.

By the nature of these tasks, some "action verbs" may not fit. The rule to follow is, **if you don't "do it" then don't fill in the oval.**

(Continue on next page)

Relative Time Spent is a comparison of time you spend doing this task relative to the average time you spend on all other tasks. Remember: If you don't do it now, don't fill in the oval. 5

Extremely Above Average
Well Above Average
Above Average
Slightly Above Average
About Average
Slightly Below Average
Below Average
Well Below Average
Extremely Below Average

I. Ordnance

1 2 3 4 5 6 7 8 9

A. SLTG *(line throwing equipment)*

1. Brief/Debrief 1 2 3 4 5 6 7 8 9
2. Train/Receive Training 1 2 3 4 5 6 7 8 9
3. Supervise/Manage 1 2 3 4 5 6 7 8 9
4. Perform 1 2 3 4 5 6 7 8 9
5. Prepare/Plan. 1 2 3 4 5 6 7 8 9
6. Logs/Records/Reports 1 2 3 4 5 6 7 8 9
7. Maintain 1 2 3 4 5 6 7 8 9

B. AA&E handling/transport

1. Brief/Debrief 1 2 3 4 5 6 7 8 9
2. Train/Receive Training 1 2 3 4 5 6 7 8 9
3. Supervise/Manage 1 2 3 4 5 6 7 8 9
4. Perform 1 2 3 4 5 6 7 8 9
5. Prepare/Plan. 1 2 3 4 5 6 7 8 9
6. Logs/Records/Reports 1 2 3 4 5 6 7 8 9
7. Maintain 1 2 3 4 5 6 7 8 9

C. Small **Arms** *(issue, mint. control) weps* ***quals)***

1. Brief/Debrief 1 2 3 4 5 6 7 8 9
2. Train/Receive Training 1 2 3 4 5 6 7 8 9
3. Supervise/Manage 1 2 3 4 5 6 7 8 9
4. Perform 1 2 3 4 5 6 7 8 9
5. Prepare/Plan. 1 2 3 4 5 6 7 8 9
6. Logs/Records/Reports 1 2 3 4 5 6 7 8 9
7. Maintain 1 2 3 4 5 6 7 8 9

D. Pyrotechnics *(issue,* maint, *control)*

1. Brief/Debrief 1 2 3 4 5 6 7 8 9
2. Train/Receive Training 1 2 3 4 5 6 7 8 9
3. Supervise/Manage 1 2 3 4 5 6 7 8 9
4. Perform 1 2 3 4 5 6 7 8 9
5. Prepare/Plan 1 2 3 4 5 6 7 8 9
6. Logs/Records/Reports 1 2 3 4 5 6 7 8 9
7. Maintain 1 2 3 4 5 6 7 8 9

II. Boat/Cutter & Shoreside Operations

1 2 3 4 5 6 7 8 9

A. Small Boat Ops *(Coxn, Crew, Eng)*

1. Brief/Debrief 1 2 3 4 5 6 7 8 9
2. Train/Receive Training 1 2 3 4 5 6 7 8 9
3. Supervise/Manage 1 2 3 4 5 6 7 8 9
4. Perform 1 2 3 4 5 6 7 8 9
5. Prepare/Plan. 1 2 3 4 5 6 7 8 9
6. Logs/Records/Reports 1 2 3 4 5 6 7 8 9
7. Maintain 1 2 3 4 5 6 7 8 9

B. Navigation

1. Brief/Debrief 1 2 3 4 5 6 7 8 9
2. Train/Receive Training 1 2 3 4 5 6 7 8 9
3. Supervise/Manage 1 2 3 4 5 6 7 8 9
4. Perform 1 2 3 4 5 6 7 8 9
5. Prepare/Plan 1 2 3 4 5 6 7 8 9
6. Logs/Records/Reports 1 2 3 4 5 6 7 8 9
7. Maintain 1 2 3 4 5 6 7 8 9

C. Special Evolution/WQSB *(Unrep, Refuel, Helo ops, Towing...)*

1. Brief/Debrief 1 2 3 4 5 6 7 8 9
2. Train/Receive Training 1 2 3 4 5 6 7 8 9
3. Supervise/Manage 1 2 3 4 5 6 7 8 9
4. Perform 1 2 3 4 5 6 7 8 9
5. Prepare/Plan 1 2 3 4 5 6 7 8 9
6. Logs/Records/Reports 1 2 3 4 5 6 7 8 9
7. Maintain 1 2 3 4 5 6 7 8 9

E. Weather *(Observations)*

1. Brief/Debrief 1 2 3 4 5 6 7 8 9
2. Train/Receive Training 1 2 3 4 5 6 7 8 9
3. Supervise/Manage 1 2 3 4 5 6 7 8 9
4. Perform 1 2 3 4 5 6 7 8 9
5. Prepare/Plan 1 2 3 4 5 6 7 8 9
6. Logs/Records/Reports 1 2 3 4 5 6 7 8 9
7. Maintain 1 2 3 4 5 6 7 8 9

F. Shipboard Training Teams

1. Brief/Debrief. 1 2 3 4 5 6 7 8 9
2. Train/Receive Training 1 2 3 4 5 6 7 8 9
3. Supervise/Manage 1 2 3 4 5 6 7 8 9
4. Perform 1 2 3 4 5 6 7 8 9
5. Prepare/Plan. 1 2 3 4 5 6 7 8 9
6. Logs/Records/Reports 1 2 3 4 5 6 7 8 9
7. Maintain 1 2 3 4 5 6 7 8 9

Part III - System Maintenance

Introduction

This survey tries to capture the "World of Work" of your rating. The best way to do this is to ask **you** what jobs and tasks you perform.

In this section we ask you to indicate which tasks you do in your present job. Please mark **only** those tasks which **are** part of **your present** assignment..

Relative Time

Relative Time Spent **is a comparison of time you spend doing this task relative** to the average time you spend on **all other tasks.**

- Rate each task on a scale from **"1"** to **"9"**
  - ⇒ **"** 1" is the lowest amount of relative time spent
  - ⇒ "9" is the greatest amount of relative time spent
- The more of your time you spend on a task, the larger the number you should mark.

Survey Development

This survey was developed by **BM's QM's, FT's,** GM's, **MK's, TC's, RD's** ET's, **TT's,** and EM's like yourself. Probably no one individual performs-every task listed in this survey. Additionally, this survey was developed to capture the world of work for 10 ratings at the same time.

So...it is anticipated that you *may* have a large number of ovals which you do **not fill in -- because they do not apply to you.**

Format

- Questions are grouped by **system.** Technicians interact with systems to accomplish the Coast Guard's work.

- These interactions (or activities) are separated into eight categories which are defined on the separate instruction page.

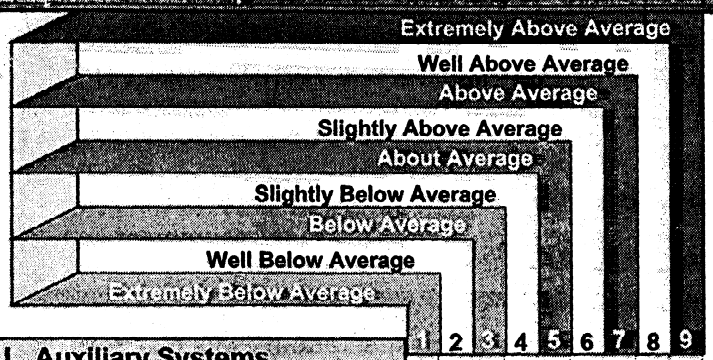
Your interactions

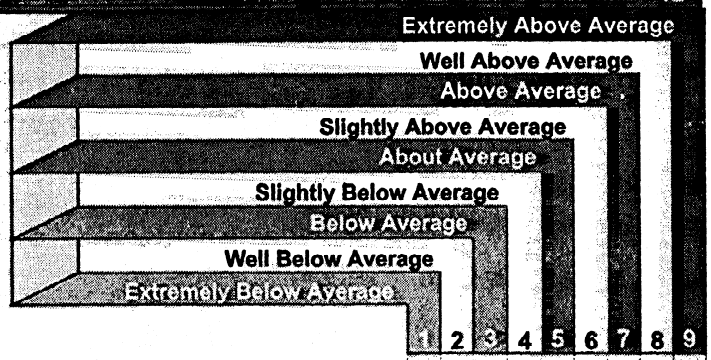
Your degree of involvement with a particular system depends on a lot of things, such as your duty assignment, experience, and the tools & equipment available.

By the nature of these systems, some "action verbs" may not fit. The rule to follow is, **if you dont "do it" then dont fill in the oval.**

(Continue on next page)

Relative Time Spent is a comparison of time you spend doing this task relative to the average time you spend on all other tasks. Remember: If you don't do it now, don't fill in the oval. 12





I. Auxiliary Systems

A. Potable Water System
(includes Brominator, U/V purifier, evaporator, reverse osmosis, salinity indicator, hot water heater, etc.)

1. Install / De-install
2. Preventative Maintenance
3. Troubleshoot
4. Corrective Maintenance
5. Operate
6. Provide or Receive Training
7. Manage
8. Design

B. Fire Suppression System
(Incl. halon, AFFF, Gaylord hoods, magazine sprinkler, etc.)

1. Install / De-install
2. Preventative Maintenance
3. Troubleshoot
4. Corrective Maintenance
5. Operate
6. Provide or Receive Training
7. Manage
8. Design

C. Sanitation Systems

1. Install / De-install
2. Preventative Maintenance
3. Troubleshoot
4. Corrective Maintenance
5. Operate
6. Provide or Receive Training
7. Manage
8. Design

D. Compressed Air/Gas Systems *(includes dry air systems, pneumatics, nitrogen and environmental systems)*

1. Install / De-install
2. Preventative Maintenance
3. Troubleshoot
4. Corrective Maintenance
5. Operate
6. Provide or Receive Training
7. Manage
8. Design

E. Fuel Oil System *(includes FOP)*

1. Install / De-install
2. Preventative Maintenance
3. Troubleshoot
4. Corrective Maintenance
5. Operate
6. Provide or Receive Training
7. Manage
8. Design

F. Lube Oil System
(includes LOP)

1. Install / De-install
2. Preventative Maintenance
3. Troubleshoot
4. Corrective Maintenance
5. Operate
6. Provide or Receive Training
7. Manage
8. Design

G. Oily water separator

1. Install / De-install
2. Preventative Maintenance
3. Troubleshoot
4. Corrective Maintenance
5. Operate
6. Provide or Receive Training
7. Manage
8. Design

H. Davits

1. Install / De-install
2. Preventative Maintenance
3. Troubleshoot
4. Corrective Maintenance
5. Operate
6. Provide or Receive Training
7. Manage
8. Design

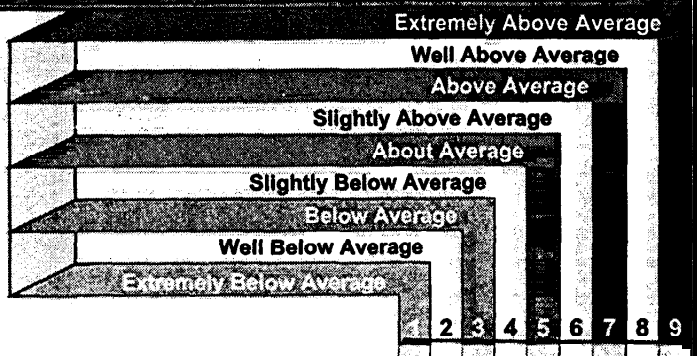
I. Booms / Cranes

1. Install / De-install
2. Preventative Maintenance
3. Troubleshoot
4. Corrective Maintenance
5. Operate
6. Provide or Receive Training
7. Manage
8. Design

Relative Time Spent is a comparison of time you spend doing this task relative to the average time you spend on all other tasks. Remember: If you don't do it now, don't fill in the oval. 24

n

Part IV - Collateral Duties

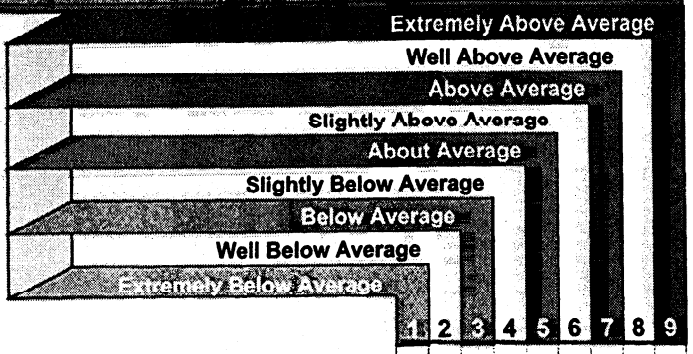


1. Command Enlisted Advisor (CEA)	1	2	3	4	5	6	7	8	9
2. Contracting Officer Technical Rep (COTR)	1	2	3	4	5	6	7	8	9
3. System Operator	1	2	3	4	5	6	7	8	9
4. Property Officer / Custodian	1	2	3	4	5	6	7	8	9
5. Training Petty Officer	1	2	3	4	5	6	7	8	9
6. Damage Control Petty Officer (DCPO)	1	2	3	4	5	6	7	8	9
7. Classified Material Control Officer (CMCO)	1	2	3	4	5	6	7	8	9
8. Supply Petty Officer	1	2	3	4	5	6	7	8	9
9. ADPSSO	1	2	3	4	5	6	7	8	9
10. 3M Coordinator	1	2	3	4	5	6	7	8	9
11. CMAA / MAA	1	2	3	4	5	6	7	8	9
12. Career Information Specialist (CIS)	1	2	3	4	5	6	7	8	9
13. Small Arms Instuctor	1	2	3	4	5	6	7	8	9
14. Command Drug and Alcohol Representative (CDAR)	1	2	3	4	5	6	7	8	9
15. Educational Services Officer (ESO)	1	2	3	4	5	6	7	8	9
16. Other	1	2	3	4	5	6	7	8	9

Please respond to the statements below by indicating your relative job satisfaction.

25

Job Satisfaction Questions:



1. My present job as a whole
2. The geographical location of my present job
3. My Coast Guard career to date
4. The task direction & support given by my superiors
5. My present working conditions
6. The performance of my immediate superiors
7. The morale of my unit
8. The cooperation & support I receive from my co-workers
9. My present living conditions
10. The opportunity for advancement in my career field
11. The performance of my co-workers
12. The way I get along with my superiors
13. The benefits aside from pay
14. The pay I receive for the amount of work done
15. The amount & timeliness of information Im given to do my iob
16. 'The resources (equipment, supplies & staff) I am given to accomplish my job
17. The feedback my superiors give on my performance
18. The training I received for this job
19. The way my skills, knowledge & training are used
20. The kinds of duties I perform on my job
21. The amount of work I must do
22. The kinds of additional duties I perform on my job
23. The time Im given to complete my duties
24. The contribution my work makes to meeting objectives'
25. The amount of challenge my job provides
26. The amount of recognition I receive for doing good work
27. The amount of responsibility I have on my job
28. The opportunity to exercise personal initiative on my job
29. My unit as a whole
30. The Coast Guard as a whole
31. The requirements for advancement within my rating
32. The availability of further rate-related training
33. The amount & availabilitv of selective reenlistment bonus
34. The military retirement system as it applies to me
35. The support I receive from support ratings HS, SK, FS & YNs

Comment Section

1. Would you like a copy of the survey results sent to you? (Y) (N)

If you would like it by e-mail, please indicate your e-mail address: _____

2. Please write in any comments you would like to address to the Joint Ratings Review group:

When you have completed the survey, please return it to the Coast Guard Institute in the envelope provided. Once again, your time, effort and insight are greatly appreciated.

If the envelope is missing, the return address is:

US Coast Guard Institute
PO Box 890900
Oklahoma City, OK 73189-9915

Chapter 10: Conduct TRACEN-Level Triage

What Is It?

We all know the term "triage" from its usage in battlefield situations. Medical emergencies are pouring in, and there is not enough staff to treat everyone. In such crisis situations, the medical team "prioritizes" cases, and treats **first** those patients with the most hope of surviving.

The triage analogy has some application to the Coast Guard formal training system.

Modernization efforts mean adding training for new acquisitions, but at the same time, we also have to maintain a considerable amount of training for legacy equipment and systems.

Current Coast Guard training is primarily delivered in resident mode at TRACENs. Because that mode means bringing students to a schoolhouse (high travel and per diem costs) and therefore maintaining "bricks and mortar," resident training is the most expensive method for delivering training.

Between the need to add new training while maintaining what we' ve got and delivering most of our training in resident mode, the Coast Guard' s training costs are always caught in an upward spiral.

We know we could reduce training costs by converting training to alternative delivery. But, this conversion effort is very expensive in the short run, even though it reduces training costs in the long run.

We also know that resident training limits the amount of students we can train in a year. In contrast, distance learning alternatives can simultaneously reach all those who need the training.

It seems like an obvious conclusion that we should explore converting our current course inventory to distance learning alternatives. But, given the very high cost of conversions, which training should we attack first? What conversions will give us the greatest bang for our buck?

What Is It? (continued)

The triage process answers those questions by prioritizing which courses we should consider converting first.

Triage is a three-phase process:

- **Phase I:**
  - Cost-out all training delivered at the schoolhouse.
  - Rank-order all courses from most to least expensive.
- **Phase II:**
  - Create a matrix for capturing specific training characteristics that indicate a high probability for successful conversion to alternative delivery.
  - Analyze all courses for those training characteristics.
  - Use analysis results to rank-order those courses from those with the most to those with the least potential for alternative delivery.
- **Phase III:**
  - Examine **first** the top-ten ranked courses (most expensive and most likely to be successfully turned into alternative delivery).
  - Use a series of job aids to capture further data about the top ten: e. g., Has the course ever had an FEA? A JTA? If yes for a JTA, how recent? And so forth.
  - If necessary, continue down the list of rank-ordered courses until 10 have been identified that have a proven capability to improve performance (FEA or JTA completed).
  - Provide program and training mangers with:

What Is It? (continued)

- A list of those courses that will give the Coast Guard the best pay-back for FEA or JTA work (most expensive, excellent potential for alternative delivery, but no FEA or JTA conducted).

- A list of those courses that will give the Coast Guard the best pay-back from conversion to alternative delivery or job-aids (most expensive, best potential for alternative delivery or job aids and FEA or JTA completed)

The end results of triage are lists of courses:

- "Top-ten picks" for conducting FEAs or JTAs.
- "Top-ten picks" for converting to alternative delivery

That' s TRACEN-level triage, a process that helps you and the training and program managers figure out what training conversions will be most successful and provide the greatest payback (i.e., ROI) for the Coast Guard.

How Do I Conduct Triage?

When you conduct triage, you put together a team and follow a three-phase process, using the triage you can obtain from PTC.

In Phase I, you rank-order your TRACEN's courses from most to least expensive.

In Phase II, you rank-order those same courses for most potential to least potential for alternative delivery.

In Phase III, you use triage tools (job aids) to determine if these courses have had a recent FEA or JTA.

The outcome of this work should be:

- A list of the top-ten ranked courses with best potential for saving the most money by conversion to alternative delivery or job aids. When converting courses to alternative delivery, tackle these first

How Do I Conduct Triage? (continued)

- A list of the top-ten ranked courses which should be tackled first for FEA or JTA efforts. When conducting FEA or JTA efforts, tackle these first

How Long Will It Take?

The good news for TRACEN Yorktown is that we' ve already gone through the triage process once. That means we have "baseline data." All we need to do is periodically revisit the baseline data to be sure it is still current. That means any triage work we do will take no longer than a week.

What Will I Get Out of It?

Conducting TRACEN-level triage on a periodic basis provides the Coast Guard with several benefits:

- You and your managers will know which courses should be the first to receive FEA or JTA efforts. You won' t waste valuable time on such efforts for courses that aren' t really worth it.

- By conducting triage, the TRACEN operates in a proactive, rather than a reactive mode. It can present triage results to programs. Both the programs and the TRACENs can have confidence that resulting implementation plans are cost-efficient and based on a solid analysis effort.

- A TRACEN triage effort can proceed the Coast Guard' s need to develop an organizational Distance Learning Plan (DLP) and provide the accurate data that effort needs to be successful.

There are also benefits for TRACEN instructors, course designers, and developers:

- Triage results give you the initial data you need when you ask a program or training manager to consider funding alternative delivery methods for any course. In other words, you will be able to say with confidence that the course is a very good candidate for alternative delivery.

What Will I Get Out of It? (continued)

- A periodic revisit of triage results will help you with school, branch or division measurements. Have you been successful in getting FEAs or JTAs for those courses that most need such work? Have you begun efforts for converting those courses with the most potential to alternative delivery?

- Obviously, as work gets accomplished and situations change, periodic triage revisions will be a great help in keeping your course designer work on track.

- Your triage results will probably be baseline data for any DLP the Coast Guard puts together.

- Triage results should be the first entry in your audit trail for any course.

Why and When Do I Conduct Triage?

Why:

We need to conduct triage to effectively and efficiently manage the conversion of resident courses to alternate delivery and to ensure FEAs or JTAs for these courses are on track.

When:

Using the baseline data obtained from the first triage study, TRACEN Yorktown needs to periodically update that data to ensure:

- Our "to do" list is still on track.
- Those courses that have received FEAs or JTAs move up on the list for alternative deliveries or job-aiding.
- New information is added into the process so our prioritization efforts stay current.

NOTE: For example, the first TRACEN Yorktown triage effort did not include our new Port Safety Unit (PSU) courses.

Why and When Do I Conduct Triage? (continued)

How often is "periodic"? It probably makes good sense to revisit triage on a yearly basis. We don't need to redo all the data. All that is necessary is to update data already obtained.

As an example, the training officer (TO) may direct that triage results be validated. Each school would then validate its own triage data and provide results to the TO. Based on how these results tied into the TRACEN's strategic plan and business goals, the TO could then prioritize work across branches to achieve TRACEN strategic goals.

Other TRACENs that have not yet undergone an initial triage process may want to do so as soon as possible to develop their own baseline data.

What Is My Role?

As a TRACEN instructor or course designer, your role(s) in a triage effort are likely to be:

- SME validating cost-out data. Has the program asked that we add on more convenings? Has a course been cancelled? Are fewer or more students attending a course? Has course length changed? All of these data will change course costs

- SME providing input on course characteristics. You are the best person to know the answers to questions in triage's Phase II (i.e., if the course has a high percentage of knowledge, is redundant with a correspondence course, is primarily targeted at a Coast Guard or other audience, is of greater or lesser benefit to the Coast Guard, and so forth)

- SME providing history of course. Has the course had an FEA or JTA? If so, how recent and at what confidence level? Have the quals for an "A" School recently been reviewed? What was the process used?

- Helper or manager revising top-ten picks for FEA or JTA work and top-ten picks for alternative delivery

Who Can Help Me?

There is a job aid that lists the steps for conducting TRACEN-level triage at the end of this chapter. The tools for triage (templates and job aids) take up quite a bit of space and are costly to copy. If you want a copy of the triage process and tools, contact PTC at (757) 898-2391. If you don' t understand the process or how to use the job aids, contact PTC. They can coach you in conducting triage.

It is also a good idea to discuss the triage process with your program and training managers. They may have some other issues you need to add to the process.

What Is the Process for Getting Started?

At this point in time, there is no formal Coast Guard policy that says you must conduct triage. Headquarters asked all TRACENs to conduct a modified triage process to provide baseline data for the Training 2000 study. Since data changes very quickly, you may be asked to revalidate baseline data by redoing the modified triage process. You can also anticipate that the triage process will be an integral part of the Coast Guard' s DLP.

On the other hand, your TRACEN may require a periodic review of triage for internal management. You can see that the results of triage would really help managers in figuring out which courses need FEA or JTA work and which courses are most ripe for alternative delivery efforts.

Even if there is no requirement or policy that dictates revisiting triage, you may want to do so anyway. It is an excellent process for figuring out "where to go next."

Triage Job Aid

NOTE: The tools (course cost out formula, matrix and job aids) for triage were developed by the PTC. Contact them to get copies of the process and tools.

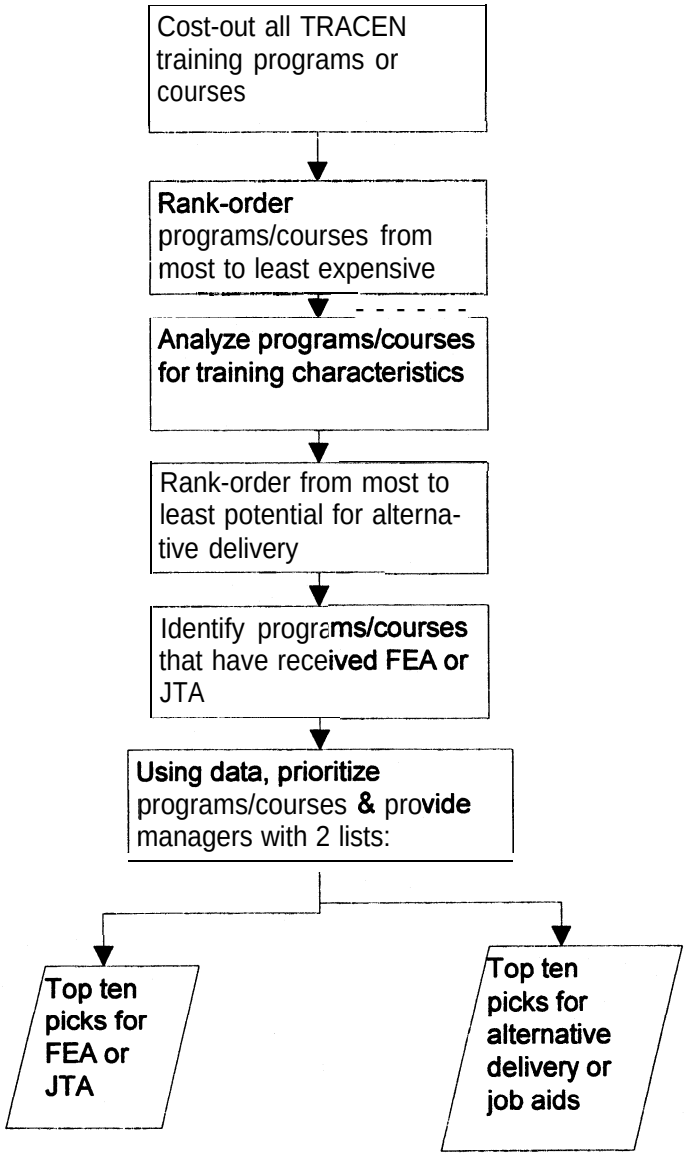
Steps for the triage process are:

Triage Job Aid (continued)

Step 1: Cost-out all TRACEN courses or training.
Step 2: Rank-order from most to least expensive.
Step 3: Analyze all courses or training for training characteristics.
Step 4: Rank-order from most to least potential for alternative delivery.
Step 5: Identify those courses or training that have received FEA or JTA efforts and note date of effort.
Step 6: Using data, prioritize courses and provide program, training and TRACEN managers with two lists:

- Top-ten picks for FEA or JTA efforts
- Top-ten picks for alternative delivery or job aids

Conduct TFWCEN-Level Triage Job Aid



Chapter 11: Conduct Front End Analysis (FEA)

What Is It?

FEA is a systematic process for:

- Determining the inhibitors to competent performance.
- Describing new performance.

In addition to identifying the skill and knowledge required of performers, the FEA process also identifies the motivational issues, personnel selection criteria, germane policy issues, and other environmental factors, which can be either a barrier or catalyst to competent performance.

NOTE: The FEA methodology the Coast Guard uses was developed by Dr. Joe Harless and is distributed by HPT.

How is FEA different from OPA? The Coast Guard uses OPA to analyze broad-brush, cross-programmatic performance issues. In contrast, the Coast Guard uses FEA to focus on jobs at the performer level, and to recommend very specific interventions to improve actual workforce performance.

Let' s look at a real-life example that illustrates the difference between the two types of analysis.

The Coast Guard is in the process of acquiring a new buoy tender fleet (WLMs/WLBs). A major acquisition is a broad-brush issue. Staffing for such an acquisition will cross different programs. There are many operational and support issues to consider. As a **first** step, OPA is the correct process to figure out what to do next--to identify the "right" approach to achieving the desired performance.

However, once **actual job-level performance has been identified**, using FEA methodology is the appropriate approach to define the jobs associated with the new buoy tenders and to recommend interventions for actual performers in those jobs.

So, in our example, the Coast Guard uses OPA to analyze WLM/WLB fleet-level performances:

- What jobs are required to operate and maintain the fleet?

What Is It? (continued)

- What should staffing for the new fleet be?
- What maintenance philosophy should the fleet adopt?
- What kind of contractor support is appropriate?

Using the OPA process allows analysts to determine the overall performance needs of our new WLMs/WLBs.

But for job level performance analysis, the Coast Guard uses FEA:

- Have job level performance challenges started to show up?
- Are there new performance expectations workers have to meet?

Using the Harless-developed FEA process, analysts can determine what interventions (i.e., skills and knowledge, motivation, environment, work design, assignment, and selection) workers on the new buoy tenders need to improve their job-level performance.

Why did the Coast Guard decide to use the Harless-developed FEA process for job level performance issues? There are several answers to that question.

- As an organization, we are relatively new to the human performance technology business and consequently need to validate a large training inventory (over 700 courses). The Harless-developed FEA process helps us validate our training inventory because it answers the "Train/No train" question.

- The process also provides the answer to a question critical to trainers: where should the information people need to perform their jobs be stored? Do we expect people to store information in long-term memory (i.e., training), or do we want to put that information in a job aid (i.e., job aids can either stand-alone or be the foundation of a training course)?

What Is It? (continued)

- The Harless-developed FEA process also helps the Coast Guard when we think we have a performance problem and therefore, a need for performance interventions. FEA helps our analysts focus on job-level performance issues.

- Because the method focuses on a job' s major accomplishments and the tasks required to produce those major accomplishments, one of its outputs is a task list. That task list is just the product TRACENs need to produce the right skill and knowledge or performance support intervention.

- The Harless-developed FEA method is also useful in helping the organization standardize its analysis efforts so that all Coast Guard analysts are collecting the same kind of data even though they are analyzing different types of performance problems.

- Yet another consideration is that the Harless-developed FEA process is part of a larger model called the Accomplishment Based Curriculum Development (ABCD) system. ABCD is particularly useful to TRACENs. When the FEA shows a gap in skills and knowledge, ABCD provides additional help in follow up curriculum design and development work. Taken as a whole, ABCD gives TRACEN staff all they need to design and develop efficient and effective performance interventions.

- Finally, the Coast Guard has already spent money training headquarters and TRACEN staff and the Auxiliary in the Harless-developed FEA processes (i.e., New Performance Planning (NPP) and Diagnostic FEAs). Since we have trained a large cadre of our people in this method, it is only prudent that we use it.

The Harless-developed FEA process consists of two methodologies:

What Is It? (continued)

- **New Performance Planning (NPP) FEA** used to analyze new starts--different performance expectations for a new ship, for example, or new policy such as using the Incident Command System (ICS) for responding to "all risks/all hazards."

- **Diagnostic FEA** used to analyze why a group of people aren' t performing as expected (e.g., CASREPS indicate that boilers are having to be replaced too frequently).

There is one more feature of the FEA process that makes it different from other analysis work discussed in this SOP.

Early on in the Harless-developed FEA process, analysts are asked to find **accomplished performers (APs) or exemplars.** An AP or exemplar is someone who has figured out how to do the job most efficiently and effectively. For example, Michael Jordan is an AP for basketball playing. By using APs as the people they interview, analysts can try to incorporate the "best practices" these people use into the performance interventions they design and develop. When that happens, the Coast Guard is moving its workforce performance from mediocre to "best of the best."

Let' s finish up the answer to "What Is It?" by looking at a real-life FEA in progress:

We' ve begun putting SPS-73 Surface Searching Radar on our cutters, and we' re getting feedback that there are performance problems. Do we need to design an SPS-73 course? Should we add the training to RD "A" School? Do we or does the Navy already have a training course that works? Are there other influences (policy, ergonomics, motivation) that might be affecting the field' s performance? Should we consider some kind of delivery system that could reach more people more cheaply--maybe CBT?

What Is It? (continued)

Conducting a Harless-developed FEA allows the analyst to collect the data needed to answer all those questions and more. That' s why FEA is such a valuable tool for the Coast Guard.

How Do I Conduct an FEA?

The Harless process and job aids for conducting an FEA are proprietary products. However, Coast Guard staff certified by HPT to deliver FEA workshops can be found at TRACENs Petaluma and Yorktown and at COMDT (G-WTT).

NOTE: Because the process is proprietary, this SOP chapter will give you only an overview of how the process works.

Dr. Harless developed methodologies for two types of FEAs:

- **NPP** for new starts
- **Diagnostic** for existing problems

When someone attends an HPT FEA workshop, each of these methodologies is trained by means of job aids. Those job aids then become the tools that person uses to conduct actual FEAs.

The outputs from either type of FEA--NPP or Diagnostic--are data-supported recommendations for interventions (skill and knowledge, environmental, incentive and motivation) to improve performance.

CAUTION: If you have never received FEA training, attend an HPT-sponsored FEA workshop. Also check with G-WTT to see if you need to team up with a PC.

The steps below provide an overview of the Harless-developed FEA process:

Step 1: Receive tasker to conduct an FEA.
Step 2: Determine FEA type--diagnostic NPP.
Step 3: Set up alignment meeting with stakeholders.

How Do I Conduct an FEA? (continued)

Step 4: Conduct alignment meeting, using the Harless-developed job aid for that purpose.
Step 5: Distribute results of alignment meeting to stakeholders for concurrent clearance.
Step 6: Follow Harless job aids for NPP or diagnostic FEA.
Step 7: Do **NOT** deviate from the job aids or skip any of their steps.
Step 8: Use worksheets (or PTC-developed EPSS tool) to collect interview data.
Step 9: Use guidance contained in job aids to analyze data collected.
Step 10: Use job aid template to produce final report (TRACEN Petaluma and TRACEN Yorktown' s PTC also have templates and sample reports you can use).

How Long Will It Take?

The answer is that the time differs, depending on how big the project is. For example, will you have to travel to many remote locations to interview people? Will operational commitments mean you have to wait to interview people? Do you have enough staff to split the work up among several people?

On an average, FEA projects take about 3.5 months to complete.

What Will I Get Out of It?

All FEA efforts produce reports--at a minimum, a final report and sometimes, interim reports.

An NPP FEA will produce an alignment meeting report, perhaps some interim reports, and a final report that identifies:

- Major accomplishments
- Tasks to perform each major accomplishment
- Recommendations to address gaps in other influences (e.g., personnel assignment and selection, motivation, environment, etc.).

What Will You Get Out of It? (continued)

A diagnostic FEA will produce an alignment report, perhaps interim reports, and a final report that identifies:

- Root performance deficiency
- Causal factors of that deficiency
- Recommended interventions to resolve the deficiency

Why and When Do I Conduct an FEA?

Why:

Why do you need to conduct FEAs? The best answer to that question is because you need to identify any barriers or catalysts to performance and then recommend interventions to ensure performance is at the desired standard. But, headquarters is also concerned with proliferating training requirements--especially if analysis might show that training is not the appropriate intervention to improve performance. As our Coast Guard training manager, G-WTT is constantly faced with answering questions such as:

- How much training--if any at all--do we need for the diesel engine on our new patrol boat?

- Do our Coast Guard engineering petty officers need to be certified as gas free engineers?

- Do we need to add a new course on ICS position specific training to our inventory, or would job aids deployed during field exercises do a better job of improving performance?

FEA efforts provide the answers to these kinds of questions, and that is why we do them. Managers need the data-supported recommendations FEAs provide to make decisions about how best to improve and support Coast Guard workforce performance.

When:

As for the "when do we do them?" question, you conduct an FEA when you receive a formal tasking letter requesting you to undertake the project. That statement does not mean someone at TRACEN level may not see the need to conduct an FEA.

Why and When Do I Conduct an FEA? (continued)

Conducting TRACEN-level triage, for example, might provide data that indicates several FEAs need to be conducted. However, to conduct an FEA, you need program advocacy and support, alignment and funding. Therefore, FEA efforts should not be undertaken until you receive formal tasking from the programs that own and manage the performance at issue.

What Is My Role?

Typically, TRACEN personnel have been analysts or lead analysts conducting FEAs. It is a good idea to include a seasoned PC as a team member for several reasons:

- Helps with the intense interviewing work
- Adds another insight
- Brings analyst experience to obtaining and interpreting statistical results
- Gives added credibility to the project (no fox/hen house issues)
- Makes special statistical software available for crunching data.

NOTE 1: Don' t forget that you need training to conduct an FEA. The Harless methodology relies on a series of job aids that can be obtained only by going through a formal HPT owned course of instruction.

NOTE 2: FEAs require a significant amount of data collection and ultimate crunching. To speed up your efforts, we suggest you team up with a PC from the PTC. They have tools that speed up data collection. They also have permission to use software that can help your efforts.

Who Can Help Me?

COMDT (G-WTT) can provide guidance. At TRACEN Yorktown, the chief, Performance Analysis Branch and staff can provide assistance. TRACEN Petaluma has one of the Coast Guard' s most experienced FEA experts. TRACENs Cape May and ATTC have staff who have attended FEA workshops.

What Is the Process for Getting Started?

Dialogue between you and your program, training and rating managers may precede an FEA effort. However, the trigger that really starts the process is a formal tasking letter sent to the commanding officer of your unit.

Conduct FEA Job Aid

You need to attend HPT' s FEA workshop to learn how to conduct an NPP or Diagnostic FEA.

As part of course attendance, you' ll obtain job aids to help you do this work.

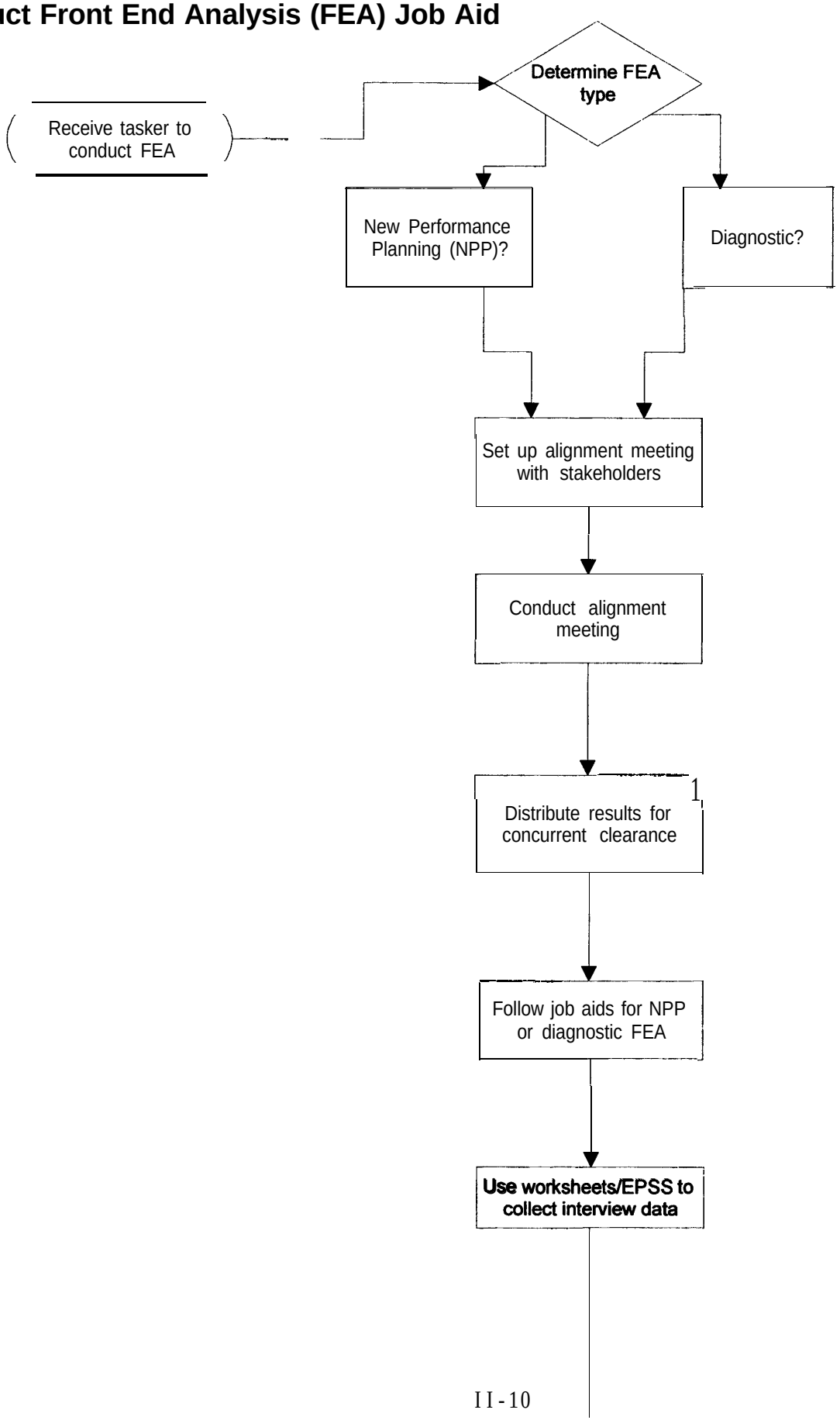
NOTE: Do **NOT** deviate from those job aids--even a little bit--when you conduct the FEA. The Harless method depends on your using the job aids exactly as they were designed to be used.

NOTE: PTC has an access database they' ve developed that makes it much easier to use the job aids when interviewing people. It helps the interviewee better understand the questions, and it captures all the data you collect in a database. See PTC to find out how to use this EPSS-like tool.

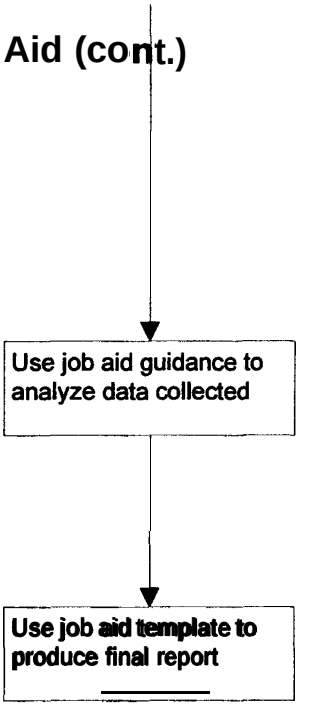
The steps for conducting an FEA are:

Step 1: Receive tasker to conduct an FEA.
Step 2: Determine FEA type--diagnostic NPP.
Step 3: Set up alignment meeting with stakeholders.
Step 4: Conduct alignment meeting, using the Harless-developed job aid for that purpose.
Step 5: Distribute results of alignment meeting to stakeholders for concurrent clearance.
Step 6: Follow Harless job aids for NPP or diagnostic FEA.
Step 7: Do **NOT** deviate from the job aids or skip any of their steps.
Step 8: Use worksheets (or PTC-developed EPSS tool) to collect interview data.
Step 9: Use guidance contained in job aids to analyze data collected.
Step 10: Use job aid template to produce final report (TRACEN Petaluma and TRACEN Yorktown' s PTC also have templates and sample reports you can use).

Conduct Front End Analysis (FEA) Job Aid



Conduct Front End Analysis (FEA) Job Aid (cont.)

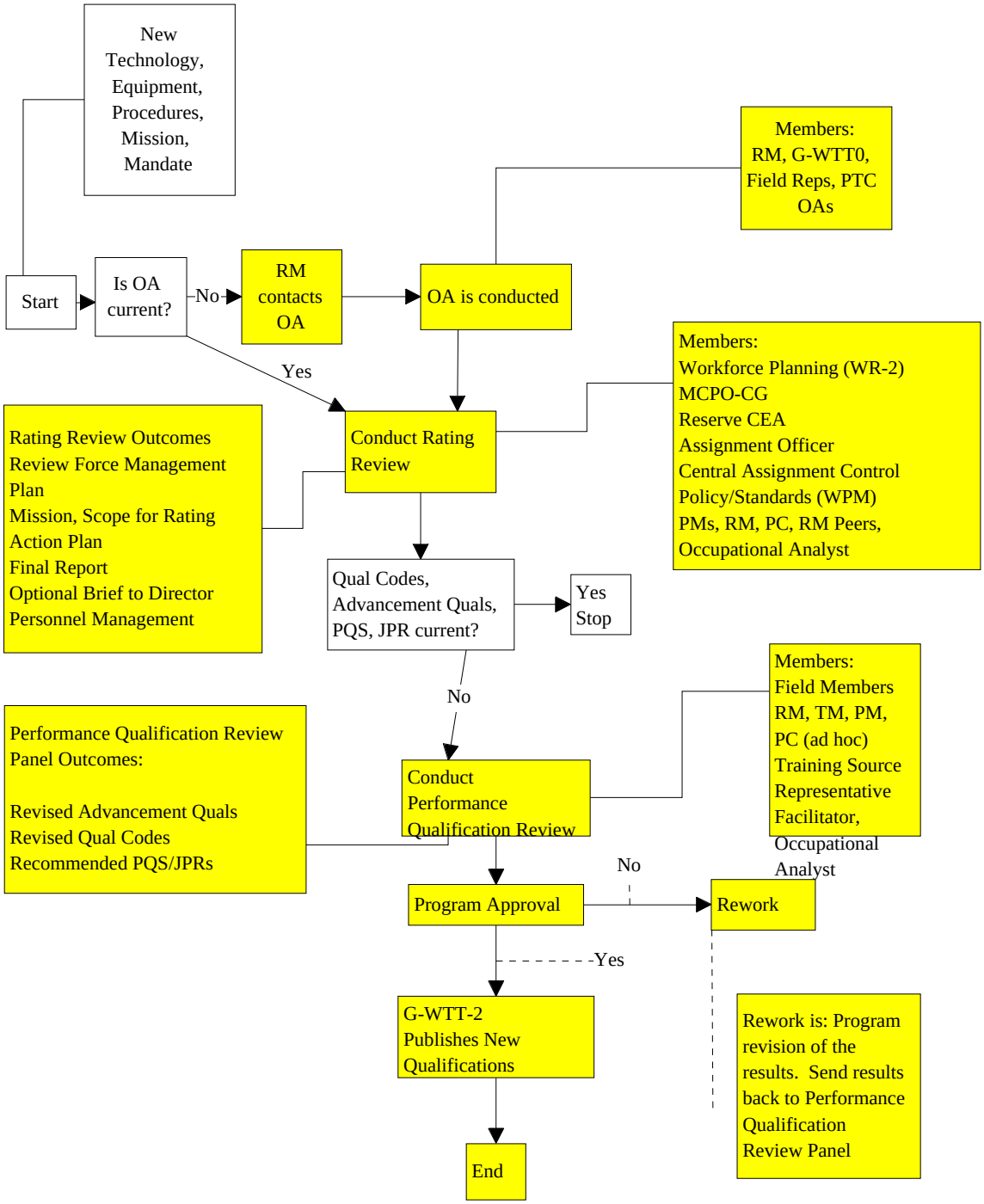


Chapter 12: Conduct Rating and Qualifications Review

NOTE: Coast Guard Headquarters (G-WTT) is currently working on changes to this process. We' ve included a draft flowchart of how the process "might" look. However, until headquarters defines and promulgates policy for how the process works, we will leave this chapter of the SOP to be determined (TBD). The Coast Guard has moved the Occupational Analysis (OA) function to the Performance Technology Center, stood up a Joint Rating Review Implementation Team and has a constantly evolving Human Performance Improvement system. All of those drivers (and more) may change how we conduct rating and qualifications reviews.

Once Coast Guard Headquarters promulgates policy for the process, we will include it in this SOP.

Enlisted Qualificaton Review Process



Chapter 13: Conduct a Job Task Analysis (JTA)

What Is It?

JTA is a systematic process for identifying those **duties and tasks** a person has to do in conjunction with a particular **Coast Guard job**. The JTA process also helps us find out what people are actually doing on the job.

The JTA process provides a methodology for:

- Determining what tasks are being performed and what tasks are not being performed--at various duty stations throughout the Coast Guard.
- Assigning a numerical value to each task, based on how it is related to accomplishing the mission.
- Sorting each task into the following categories:
  - Tasks that do not require training.
  - Tasks selected for training.
  - Tasks that should be job-aided and trained using the job aid.
  - Tasks that are best trained on the job.

The end result of the JTA process is a final report that contains a list of tasks weighted, sorted, and filtered by their difficulty, importance, and frequency. Using its results, program and training managers and TRACEN staff are better able to determine which tasks should be selected for formal training and which tasks should be job-aided.

Additionally, and when available, the JTA report has also been used by rating managers as a tool for enlisted performance qualifications reviews. Along with current OA outputs, it provides more data for participants to use in making rating review decisions.

NOTE: Although an NPP FEA is the preferred tool for new starts, the JTA process can also be used to scope out the job, duties, and tasks of a new position. For example, if the Coast Guard creates a new rating to capture the work an Instructional Technologist (IT) does, it could use the JTA process to scope out job tasks and duties that a Coast Guard IT would need to perform.

What Is It? (continued)

You may be thinking that a JTA sounds very much like an OA. They are very similar processes; for example, both analyze jobs. However, they are quite different in scope and purpose:

When the Coast Guard wants to find out what is happening in its world of work (the big picture), it uses OA as a tool to define a job. For example, if the Coast Guard wants to know what is happening in gunner' s mates (GMs) world of work, they will use OA to capture the tasks GMs perform at different pay grades and at different assignments. As you saw when the Coast Guard convened the Joint Rating Review, it also uses OA to discover any task overlaps among ratings.

But, suppose all the Coast Guard needs to do is design one course, or figure out if its current "A" School training is efficient. OA would not be an appropriate tool for these tasks since its scope is too large. We would not want to tie up the time of the MK rating manager as well as the 1,500 plus MKs just to find out appropriate tasks to train in a resident MK "A" School. JTA, though, is just the tool needed to tackle that job. You' ll soon see why JTA is the tool of choice for those tasks as you go through this chapter of the SOP.

However, your logic in seeing a relationship between OA and JTA is excellent. They **are** related. The first step in the JTA process is to develop a task or quals list for the pay grade, job, or piece of equipment being analyzed. Therefore, the task inventory (TI)--task list--developed by the OA staff for a specific rating, job, or pay grade in the Coast Guard--can save much work by serving as a starting point for a JTA effort.

As you probably already suspect, there is also a relationship between the JTA and FEA processes. When you are looking at a new acquisition or a new piece of equipment, and you are fairly sure some kind of training or performance support will be needed, you will probably choose an NPP FEA as your methodology.

What Is It? (continued)

That' s good because the outcomes of that type of FEA are major accomplishments and a matrix that tell you which tasks need to be:

- Trained to memory
- Converted to job aids and presented with introductory training
- Converted to job aids and presented with extensive training
- Just converted to job aids

So, when an NPP FEA has been conducted, the JTA process is rolled in and done too. There is no need to redo work. From that NPP FEA, you will have a valid and efficient task list, and once you' ve finished the other analysis tasks, you will be ready to go onto course design.

How Do I Conduct a JTA?

There are several different ways to go about conducting a JTA:

- Panel method (convene a jury of experts at one site).
- Mail surveys to the field.
- On-site, purposive sample survey.
- Focus groups for validation.
- Telephone interviews of key people in the field.
- New equipment or job (go to another organization that has the equipment or job, obtain technical manuals from the manufacturer, observe workers performing the job, and attend factory acceptance tests).

None of these is the only right way to do a JTA. However, improved processes and technology have taught us some lessons we want to be sure we capture in any JTA effort:

How Do I Conduct a JTA? (continued)

- **Panel method**: The panel method may be good for generating a task list. However, it won' t give you a true statistical sample for the tasks performed by the job or rating, and it may have negative aspects such as perceptions of "fox and hen house," and "cronyism" issues. If you' re going to convene a panel, don' t use in-house resources only.

  Also, use a software package such as GroupWare to speed up work and let everyone freely participate, without fear of attribution. Then, validate your findings with a larger sample population.

- **Mail survey**: This is a good way to survey a whole population or enough numbers of people to make up a statistically valid sample. But, beware! You' ll soon read Aviation Technical Training Center's (ATTC's) story about what can happen when you survey by mail. The field is so overburdened with work that the right people may never fill out the survey. So, if you use the mail survey method alone, you may end up with questionable results.

- **On-site, purposive sample survey**: This method is one of the most accurate you can use, particularly for a large rating such as MK. First, you work out a survey plan that matches numbers of people at specific units to the sample population you want to survey. For example, if 40% of MKs are assigned to small boat stations, you would identify 40% of your sample MK population to be surveyed from MKs assigned to small boat stations. Second, you go on-site to administer the survey so you can be sure the right people are filling in surveys and because that gives you current information about field needs.

- **Focus Groups**: This is a good way to help validate mail surveys. You use initial data from mailed surveys, and then "validate" and expand on those results by using small groups that make up a sample population.

How Do I Conduct a JTA? (continued)

- **Telephone surveys**: This is a very accurate method--if you telephone everybody--or, at least, a valid statistical sample! However, it uses up staff very quickly. It is probably better to use telephone surveys as a way to expand on and validate mailed responses rather than as your sole method.

- **New equipment analysis**: This is the kind of JTA that' s very useful for a new acquisition. You can' t convene a panel because no one has used the equipment yet. You could use the technical manuals and have a group of SMEs try to determine the right tasks from those references. Or you might observe people doing the work at another organization that owns the equipment, attend factory acceptance tests or interview vendors and manufacturers for the data you need.

NOTE: There are many, many issues involved in the Coast Guard acquiring new equipment. And, new acquisitions cost lots of money. For these reasons, it is more likely that Headquarters program and training managers will use the FEA process for a new acquisition--not a JTA process. The good news for course designers and instructors is this: if a Harless-method FEA has been done for a new acquisition, there is no need to do a JTA.

All of these methods "work." The trick is to find the method that works best for your project and make sure that method gives you statistically valid data. JTAs can take a lot of time and have a fairly high cost! You don' t want to spend a lot of effort and then find out that nobody believes the results.

How Long Will It Take?

JTAs used to take a long time, and that was one reason why programs viewed training as not very responsive to their needs. Now, a new, streamlined process for doing JTAs has been developed that reduces cycle time to about 1.4 months and reduces the cost as well.

In 1996, when the PTC first stood up, the Training Infrastructure Study pointed to the JTA process as one of the first areas the PTC needed to make faster, better and cheaper. So, the PTC staff went down to TRACEN, ATTC Elizabeth City to learn some lessons from their recent JTA.

ATTC' s staff told a story of mailing out surveys and getting back data that said survival swimmers weren' t accomplishing the tasks expected of them. The reason for this startling information was that the one survival swimmer at the unit surveyed was too busy saving lives to fill out the survey! So one of the first lessons PTC learned was to conduct JTAs on-site, if at all possible. That way, you can be sure the people you need to answer the survey are the same ones filling out the paperwork.

The first time PTC was asked to do a JTA was when it was tasked with validating the E-4 quals for a revised MK "A" School curriculum.

In 1995, the MK rating manager held a rating and quals review at TRACEN Yorktown. From that work, course designers revised MK "A" School to capture new quals. The only problem was that this new curriculum lengthened the course by four weeks--that meant a $5 million dollar price tag over the next ten years. The Coast Guard just couldn' t spend that much money. So they asked the PTC to "validate" the quals list.

How Long Will It Take? (continued)

The PTC decided a JTA of the quals was the method to use, and PTC and MK"A" School staff developed a plan and a survey to administer on-site. Still, as with most new methods, the staff soon ran into problems. The software for using a Scantron scanner wouldn' t produce the right kind of survey, so results had to be tabulated by hand. But out of that prototype effort, a lot of new lessons were learned. Later, PTC did a JTA for MST "A" and MSPOC courses and learned some more lessons. By getting a scanner and software that would design the right kind of survey, PTC reduced cycle time for doing JTAs from a high of 8 months to 1.4 months. As they completed JTAs for RD "A" and QM "A" schools, they learned yet more lessons. Eventually, they came up with a JTA report that included most of the analysis information a course designer would need to design a training program.

Those lessons have been captured in this SOP. We' ll go over the steps for doing a JTA and designing the final report later in this chapter.

For right now, count on about 1.4 to 2 months for a JTA effort. From lessons learned, moving the OA function to TRACEN Yorktown and software acquisitions, the Coast Guard may have accelerated its JTA efforts even more. If you are asked to do a JTA, you can see if it is possible to shave off even more from its cycle time.

What Will I Get Out of It?

Quite a lot, actually. Do you remember that we said the final product for a JTA is a report? It is the first piece you' re going to need to finish up analysis tasks and start design work on a course. Let' s go through what you gain from a JTA report.

The product you get from doing a JTA is a final report made up of a task list sorted into train or don' t train, job aid or train on-the-job. You can see how important that product is to you as a course designer. How else could you be sure what tasks should go in your course?

What Will I Get Out of It?
(continued)

But, there' s still more. The new way of doing a final JTA report provides additional data that you' ll find very helpful. Let' s take that MK "A" example again. That JTA report tells you which tasks people are or are not performing at various duty stations throughout the Coast Guard. If nobody is performing a task, that information tells the program and rating manager to examine that issue. Maybe people should be performing the task, and the program and rating managers want to find out why they are not. On the other hand, maybe the field doesn' t need to do that task, and we were mistaken in thinking that they should. In any case, once the issue is all sorted out, you won' t need to add tasks to your training that no one is required to do. Or, if it turns out that just a very few MKs are performing a task at a specific unit, structured on-the-job training packages make much more sense for those people than adding the task to resident training.

What other data can you find in the JTA report, and how can you use it? Let' s take the QM "A" JTA final report, as an example. Not only do you get the performer' s perspective, but also the perspective of his or her supervisor. Let' s take that example of "perform/do not perform" again.

Maybe you think the performer should be doing that task, yet the data says he or she is not doing the task. You find yourself wondering what his or her supervisor would say about the issue. JTA final reports give you that information. You can compare what the worker says with what his or her supervisor says. And, it isn't just numbers. The supervisor also tells you why the task isn' t being performed:

- Not required at this unit
- Equipment not available
- Performed by someone of a higher rank or different rate
- Opportunity has not occurred
- Not qualified

What Will I Get Out of It? (continued)

The new JTA report also gives you demographic data so you can see where the surveyed population works--378s, 270s, buoy tenders, small boat stations, etc. When you get to training program design, you can use this information to tailor different scenarios or create more realistic practice exercises and tests for your training program design. You can even consider designing a "core and strand" approach that trains everybody in the core (common) tasks, but develops the "strands"--tasks performed only at specific units--as independent training, tailored to meet the needs of individual students.

Can you wring anymore information out of this new JTA report? The answer is "yes." Its designers figured that if a JTA gives you the foundation task list for designing a course, you might also like to know what kind of delivery system (media selection) would work best for training that task. Thus, they included that data in the report.

For those tasks designated as "train or train with job aid," the report tells you various media you could use to do that EPSS, CBT, or video with workbook, or resident training, etc. That is very useful information when you' re trying to figure out if it makes sense to convert all or some part of your course to an alternative delivery method.

There are other issues you' ll face in course design work, and the JTA report data can get you started there as well. It will tell you which asks should be job-aided, and that data will have a big impact on how you do your course design. It will also tell you how much training you need to do with those job aids--just introductory training or extensive training. That data will have a large impact on your training program design decisions as well.

NOTE: We' ll tell you what a job aid is and show you how to design and develop them in chapters 28 and 35 of this SOP. For right now, the important fact is to know that most training program designs will include some job aids, and that fact affects how you' ll design the training program.

What Will I Get Out of It?
(continued)

The JTA report also has data about which tasks or quals need to be trained on-the-job (OJT). It' s a good idea to talk with the program, rating and training managers about the OJT tasks. The field may be too busy to train them so the decision is to add them to your course. Or, since you' re a course designer, the managers may want you to design and develop a structured OJT package to send to the field units that need it. Or, if there' s money to fund that project, the managers may want to have a contractor develop a structured on-the-job training (OJT) package, and you will be the SME for that project. However it works out, make sure that those OJT tasks don' t fall through the cracks.

We told you that the report has data about media selection. A note of caution, though. These are just recommendations--not a mandate to develop.

Think of media selection as more recommendations that can help you with design. If most of the tasks say CBT or WBT, there' s a good chance your training program is mostly subject-based (i.e., more about knowledge of the subject than about performing a specific set of skills). That makes it a very good candidate for converting to alternative delivery and saving the Coast Guard some money into the bargain. Even if media selection results indicate that only some of the tasks might be converted to CBT or WBT, you can still save money, reach more people, and shorten the course by converting those tasks to alternative delivery. Before you design your training program, visit the PTC and ask for their help.

PTC staff can tell you whether it' s a good idea to do some cost-benefit analysis and develop an Instructional Plan (IP). The training program may cost so little that it makes more sense to keep it as purely resident instruction. And sometimes, there are other good reasons for not converting a course. Your PCs at PTC can help you get the data needed to help managers make that call.

What Will I Get Out of It? (continued)

So, as you see, that JTA report is a storehouse of information that can get you started. What' s in it for you is a list of validated and sorted tasks for your design. That task list is essential for completing the remaining tasks of the ISD analysis phase, and it is your starting point for training program design work.

Why and When Do I Conduct JTAs?

Why:

We conduct JTAs to determine what tasks should be job-aided, trained, job-aided and trained, or trained on the job. The JTA process helps us identify "right" training.

When:

As the flowchart at the beginning of the analysis section shows, program, rating, training managers and TRACENs consider doing a JTA when:

- No JTA (or FEA) results exist.
- They want to identify potential course efficiencies.
- The Coast Guard provides new equipment to its workforce or upgrades old equipment.
- Training is mandated by Congress or DOT (e.g., Human Relations or Sexual Harassment Prevention training).
- A full-blown FEA is not necessary.
- There are no resources to conduct a full-blown FEA.
- Someone starting on training program design work is looking at an " A" School that was designed around a recent quals review, but there is no data regarding which quals to train, job aid, perform OJT or not train at all.
- Your TRACEN has just completed the triage process for all its courses, and several require a JTA.
- The program, rating or training managers want to convert a course or courses to alternative delivery, and they want to be sure the course task list is efficient before that work is undertaken

What Is My Role?

Frequently, the role TRACEN personnel play in JTA efforts is that of SME. As someone very familiar with the job, you may be asked to develop or validate a task list. Or you might be the person who develops an on-site interview plan and who provides the people who actually administer the survey on site. You will probably have input to the survey design and validate the eventual result. Then again, you might be asked to serve on a panel using GroupWare to generate JTA results.

It is also possible that you will have no role.

JTAs are funded by programs. They make the decision to do a JTA in-house, by contractor, or at a later date. Or, the program may have funded an FEA (Harless-method) and that effort produced a task list sorted into "train or no train, job aid with introductory or extensive training." In that case, you have no need to conduct a JTA. Instead, you can use the FEA results to finish your analysis tasks and start your design.

However, even if you are never asked to be part of any JTA efforts, you always have one responsibility that is just yours, and it' s very important: maintaining that audit trail. If you see no evidence of an FEA or a JTA, raise a flag about it. A training program designed without the help of either of those methodologies may have problems. It may not really be fixing a performance problem, and it is likely to be inefficient, even if it is fixing a performance problem.

You can help solve both those problems by raising the issue, through the chain, that an FEA or JTA needs to be done.

What happens if the program decides to fund a JTA? What' s your role likely to be then?

- SME: As an SME, you are likely to help identify the sample population and, for a current course, produce the task list (in Microsoft Word) that the PTC or a contractor needs to design the survey.

What Is My Role? (continued)

- If the JTA is done on-site (or even if it' s not), you may identify where the rating or job is located, and in what numbers.

- You may use that information to create an on-site visit plan.

- For an on-site type JTA, you may do the coordination with units, alerting them that your staff is going to visit and survey folks.

- When the surveys are scanned and the report is produced, you may be one of the people briefed on results.

- You may serve as part of a rating and qualifications review board and use a JTA report as data to help in making decisions.

- You' ll use the JTA report as the starting point for the remaining analysis tasks and for starting your design work.

- If you' re an instructor, you' ll compare the JTA tasks for training and any subsequent documentation to be sure tasks haven' t "crept" back into training. Training staff mean well when they think that the more tasks we train, the better off our folks are. But, learning theory refutes that assumption. It tells us that very few tasks should be trained to memory--it' s very much like cleaning up your files and checking RAM to make sure your computer is operating at top efficiency

The rules of thumb are:

- Only a few tasks are trained to memory.
- Many are job-aided.
- Different intensities of training (or no training at all) are required for those tasks selected to become job aids.

What Is My Role? (continued)

Watch for "task creep!" It' s a killer of efficiency, and it doesn' t help our people perform better. It just adds length to training programs and makes more work for our instructor staff. We can no longer count on justifying more staff just because we' ve added tasks to the training program.

Who Can Help Me?

The recent trend for JTAs is to contract them out or have PTC do them. Usually, this request will come from program or training managers, but if you think you have a situation that requires a JTA, you may want to consult with the PTC staff. With the program' s approval, they can conduct the JTA for you, partner with your school to complete the JTA, or tell you what' s required in contracting one out.

What Is the Process for Getting Started?

JTAs are funded by programs at the Headquarters level. You may become involved in a JTA effort because the program has requested one. Or, at the TRACEN level, your division or branch may raise the need to do a JTA.

As an instructor or course designer, you are tasked with identifying continuous improvements for your training. If you think an existing course or an "A" School could be more efficient if a JTA were conducted, contact your program or rating manager with that recommendation through your chain of command. It may be that the your supervisor knows some information ("big-picture") you don' t know, so it' s always good to go through the chain.

If you' re interested in the sample JTA you see in this SOP, go by and talk with the folks in the PTC. They can show you complete copies of all the JTAs done and what kind of information each has produced. That should give you some good ideas for improvements you could make if you' re ever involved in a JTA. That kind of information can also help your managers decide if it' s a good call to tie up people and funds doing one. Finally, if the decision is made to contract out, you can ensure that the contractor delivers all the information you want and need.

JTA Job Aid

Here are the steps for conducting a JTA:

NOTE: Other TRACENs may take issue with the steps that call for using PTC' s help. We have included PTC for several reasons. It has already gained permission to use the software necessary to design a JTA survey. We learned the hard way that other software would not produce what we needed. We have also conducted several very successful JTAs and the resultant reports contain much more information than any other contractor-produced JTA reports we have seen to date. Finally, we' re highly competitive. Typical costs for contractor-produced JTA efforts were in excess of $40K. In contrast, the PTC' s JTAs have averaged about $7K for on-site survey administration.

There is no mandate to use PTC staff for conducting JTAs. However, all TRACENs and Coast Guard units are encouraged to do so. Our intent is to help, not hinder.

Step 1: Obtain an applicable OA report and task inventory from the OA staff.
Step 2: Obtain a list of most recent qualification factors or job performance requirements from the program and rating manager.
Step 3: Work with the program rating manager and OA staff to identify any other information that could change the current task list (e.g., new equipment brought on-line or a job change).
Step 4: If you are looking at an existing course, obtain a list of tasks currently being trained by the course.
Step 5: Make sure the program or rating managers help you identify any future trends or changes which may soon overcome your task list (e.g., JRR information, new equipment, changed maintenance philosophy, etc.).
Step 6: Make an appointment with PTC staff or your local PC for help with validating your task lists. Are the items on your list really tasks or are they just subjects? Do they have the characteristics of a task statement?

JTA Job Aid (continued)

- Measurable
- Have a clear starting and stopping point
- Consist of an action verb followed by an object (Repair (verb) the MTU engine (object)
- Contain only one action
- At proper level (task vice a step in the task)

Step 7: PTC staff or your local consultant will help you clean up your list, and if you want PTC to design the JTA survey, they' ll tell you to provide an electronic list of tasks in Microsoft Word.

Step 8: PTC or a contractor will do the survey design for you. Unless you' re trained in survey work or in statistical sampling, you probably don' t want to do this part yourself. It calls for an understanding of the relationship between what you ask and the statistical validity of results. Comments can be difficult, for example. You want to capture that information, but you may not know how to convert it into statistically useable information.

Step 9: PTC will coach you through the survey printing, mailing, and distribution, if you decide to go that route. They will also help you work out a plan for on-site survey execution and interviewing, if that' s how you decide to do the JTA.

Step 10: PTC has the scanning equipment to scan results. They' ll also analyze results for you and convert those results into a final report. If you want to do some of that work, they can give you the analyzed data, and show you a format for presenting that data. Your level of involvement is up to you and also dependent on how fast you need the data.

Step 11: PTC can also show you examples of PowerPoint presentations they put together to brief the program and rating managers. You can use them as models for your own briefings. PTC can also provide a PC to help you brief out results. This can be very useful if the customers ask questions about the process, and you don' t feel you can answer them very well. For example, people frequently ask, "What' s this Difficulty, Importance, Frequency (DIF) model all about and how does it work?" PTC has staff who know how to answer those questions.

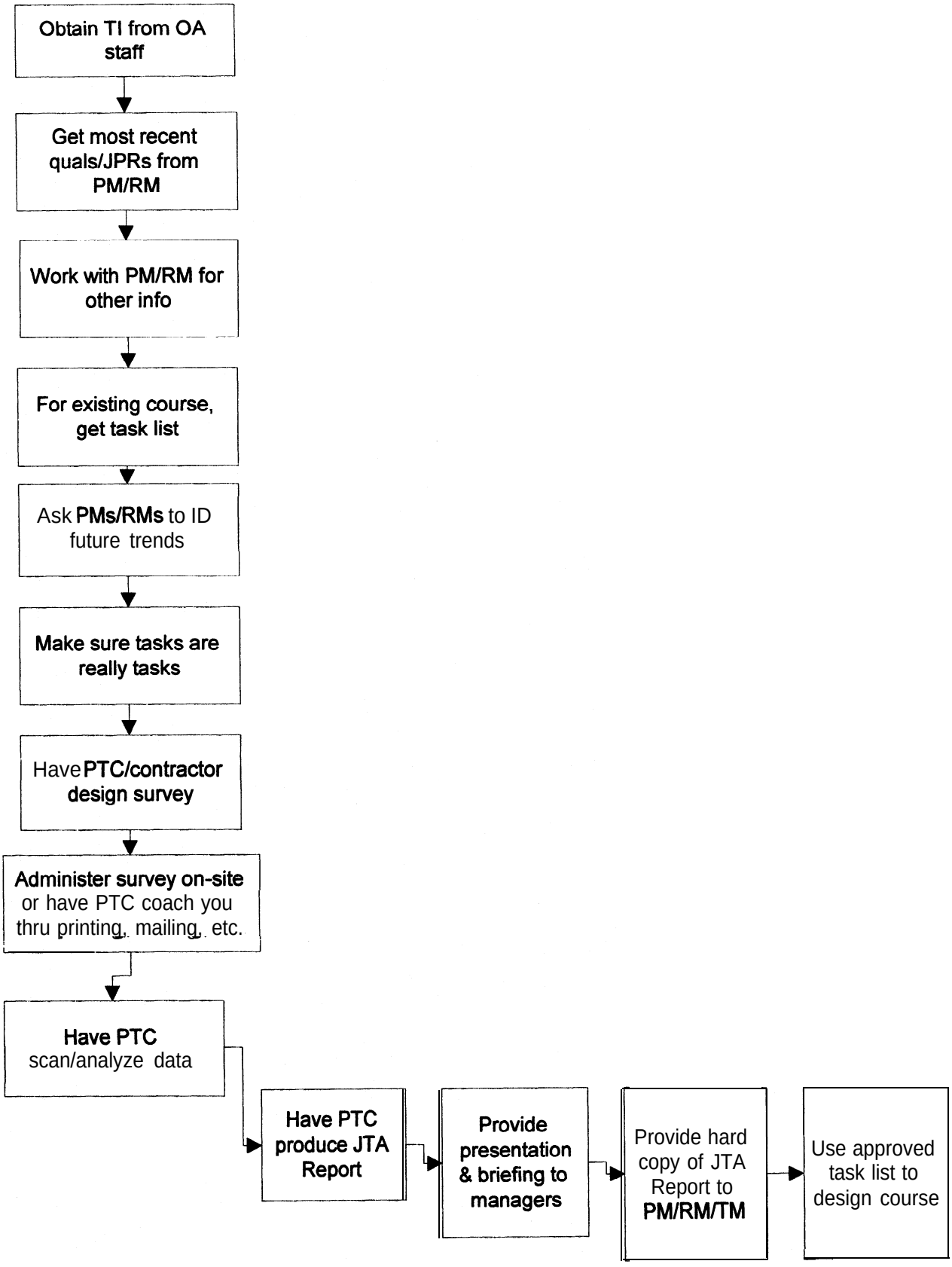
JTA Job Aid (continued)

Step 12: Provide a copy of the report to program and rating managers during the briefing and a hard copy with a cover letter at a later date. Remember that audit trail? Program and rating managers need to keep their records current too.

Step 13: Program, rating and training managers will review results. They may do this during the briefing and give you the go-ahead to use the "train or job aid with training" task list. But there may be other issues as well. The managers and you can negotiate those issues during the briefing meeting or at a later date.

Step 14: Once you receive the go-ahead, you take the approved "train, job aid with training (and maybe OJT) tasks" and use that list to finish analysis tasks and begin your design work.

Conduct a Job Task Analysis (JTA) Job Aid



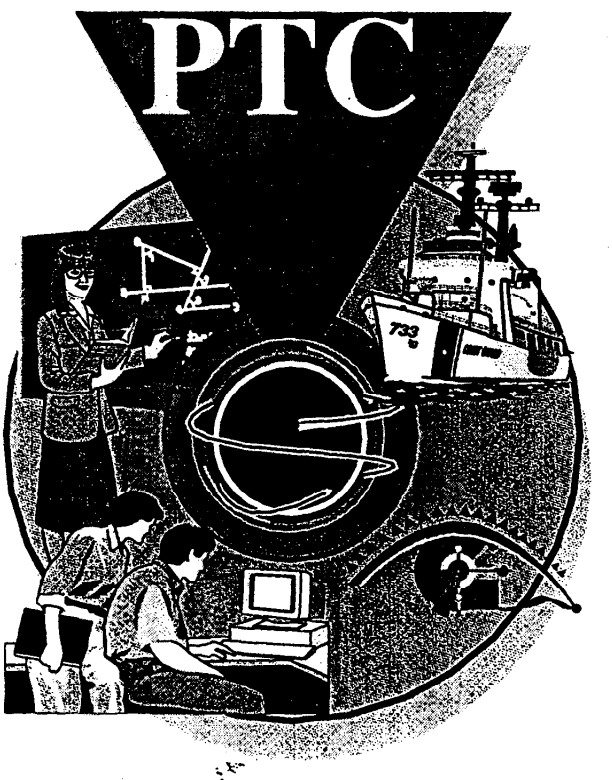
QM-A
Job Task
Analysis
Report

U.S. Dept of
Transportation
Unit&l States
Coast Guard

Quartermaster Third Class

Performance Technology Center

PTC



U.S Coast Guard
Performance Technology Center
Training Center
Yorktown, VA

EXCERPTS FROM QM JOB TASK **ANALSIS** REPORT

QUARTERMASTER THIRD CLASS
JOB TASK ANALYSIS

Table of Contents

QUARTERMASTER THIRD CLASS
Job Task Analysis

Question	Quals	Yes	No	% Yes	Avg Frequency	Avg Importance	Avg Difficulty	Recommend
A	ADMINISTRATION AND TRAINING							
01	Correct and maintain nautical publications.	75	2	0.97	3.38	3.62	1.74	OJT
02	Correct and maintain nautical charts by:							
02a	Electronics	14	63	0.18	2.64	4.14	2.64	JA/T
02b	Pen and ink.	74	3	0.96	3.72	4.47	2.12	T
03	Use Chart No. 1 to identify navigational related information.	76	1	0.99	2.59	3.28	1.47	OJT
04	Compute average daily rate of ship's chronometer.	34	42	0.44	3.73	2.00	1.50	NT
05	Maintain a Timepiece ratebook.	36	41	0.47	3.81	2.00	1.47	NT
06	Extract information contained in each of the following publications to plan a voyage:							
06a	coast pilots.	69	8	0.90	2.64	3.52	1.94	OJT
06b	Sailing directions.	65	12	0.84	2.37	3.54	1.95	OJT
06c	Light lists.	63	14	0.82	2.70	3.40	1.98	OJT
06d	Tide Tables	67	10	0.87	3.10	3.74	2.42	T
06e	Tidal Current Tables	65	12	0.84	3.08	3.80	2.41	T
06f	Fleet guides.	57	20	0.74	2.14	3.11	1.75	OJT
07	Extract information contained in each of the following publications:							
07a	List of Lights	54	23	0.70	2.22	2.83	1.98	NT
07b	Dutton's	61	16	0.79	2.39	3.28	1.98	OJT
07c	Bowditch	71	6	0.92	2.79	3.51	2.18	JA/T
07d	Hobbs	19	58	0.25	2.00	3.05	1.89	OJT
07e	World Port Index	40	37	0.52	1.72	2.21	1.74	NT
07f	Pub 117 Radio Navigation Aids	18	59	0.23	1.67	2.28	2.06	NT
07g	Distances Between Ports	42	35	0.55	1.74	2.41	1.53	NT
07h	Pub 217 Maneuvering Boards	49	28	0.64	2.52	3.24	3.02	JA/T
08	Handle and stow classified and/or accountable material.	60	17	0.78	3.30	4.15	2.47	T
09	Determine nautical chart and publication requirements for a cutter in accordance with Nautical Chart and Publication Allowance for Cutters.	56	21	0.73	2.05	3.27	2.29	JA/T

Attachment I

QUARTERMASTER THIRD CLASS
Job Task Analysis By Percent Yes

Question	Quals	Yes	No	% Yes	Avg Frequency	Avg Importance	Avg Difficulty	Recommend
27	Obtain soundings using an echo sounder (fathometer).	77		1.00	4.35	4.09	1.20	OJT
41	Make bridge preparations for getting the ship underway and entering port.	77		1.00	3.52	3.94	2.30	T
43	Maintain unit logs (CG-4380 series).	77		1.00	4.48	3.95	2.39	T
03	Use Chart No. 1 to identify navigational related information.	76	1	0.99	2.59	3.28	1.47	OJT
31d	Electronic fixes.	76	1	0.99	4.70	4.62	1.92	OJT
01	Correct and maintain nautical publications.	75	2	0.97	3.38	3.62	1.74	OJT
02b	Pen and ink	74	3	0.96	3.72	4.47	2.12	T
31a	Visual fixes.	74	3	0.96	4.05	4.44	2.37	T
31c	Radar fixes.	74	3	0.96	4.30	4.36	2.42	T
31e	Dead reckoning position.	74	3	0.96	4.68	4.32	1.93	OJT
48a	Variation	74	3	0.96	4.43	3.86	2.18	T
48b	Deviation	74	3	0.96	4.42	3.84	2.14	T
48c	Gyro error	74	3	0.96	4.23	3.96	2.31	T
49	Demonstrate a working knowledge of the Navigation Rules (COMDTINST M16672.2B).	74	3	0.96	3.75	4.36	3.07	T
35c	Alidade	73	4	0.95	3.30	3.26	1.36	OJT
35e	Binoculars	73	4	0.95	3.66	3.39	1.21	OJT
28	Enter soundings in appropriate log.	72	5	0.94	4.32	3.69	1.23	OJT
33a	"Time, speed, and distance calculations."	72	5	0.94	4.31	4.01	2.17	T
07c	Bowditch	71	6	0.92	2.79	3.51	2.18	JA/T
44	Maintain a navigational plot in unrestricted waters for a minimum of eight (8) fixes.	71	6	0.92	4.30	4.39	2.58	T
29d	Terrestrial range	70	7	0.91	3.16	3.99	2.12	T
34d	Shoaling	70	7	0.91	3.36	4.35	1.93	OJT
06a	Coast pilots.	69	8	0.90	2.64	3.52	1.94	OJT
23a	Nautical Almanac	69	8	0.90	3.38	3.43	2.58	T
24b	Greenwich Mean Time (GMT)	69	8	0.90	3.38	3.33	2.03	OJT
34f	Turn bearings and ranges	69	8	0.90	3.48	4.28	2.49	T
34a	Tracklines	68	9	0.88	3.53	4.41	2.49	T
34g	Danger bearings and ranges.	68	9	0.88	3.36	4.21	2.50	T
50b	IALA B	68	9	0.88	3.43	3.97	2.26	T
06d	Tide Tables	67	10	0.87	3.10	3.74	2.42	T
24a	Zone time	67	10	0.87	2.94	3.16	2.00	OJT

QUARTERMASTER THIRD CLASS
Job Task Analysis Media Selection Results

Question	Quals	Yes	No	% Yes	Recommend	Media Selection
A	ADMINISTRATION AND TRAINING					
01	Correct and maintain nautical publications.	75	2	0.97	OJT	
02	Correct and maintain nautical charts by:					
02a	Electronics	14	63	0.18	JA/T	Simulation/ICW Video w/ workbook
02b	Pen and ink	74	3	0.96	T	ICWKBT Video w/ workbook
03	Use Chart No. 1 to identify navigational related information.	76	1	0.99	OJT	
04	Compute average daily rate of ship's chronometer.	34	42	0.44	NT	
05	Maintain a Timepiece ratebook.	36	41	0.47	NT	
06	Extract information contained in each of the following publications to plan a voyage:					
06a	Coast pilots.	69	8	0.90	OJT	
06b	Sailing directions.	65	12	0.84	OJT	
06c	Light lists.	63	14	0.82	OJT	
06d	Tide Tables	67	10	0.87	T	ICW/CBT Video w/ workbook
06e	Tidal Current Tables	65	12	0.84	T	ICWKBT Video w/ workbook
06f	Fleet guides.	57	20	0.74	OJT	
07	Extract information contained in each of the following publications:					
07a	List of Lights	54	23	0.70	NT	
07b	Dutton's	61	16	0.79	OJT	
07c	Bowditch	71	6	0.92	JA/T	CBT Correspondence Course
07d	Hobbs	19	58	0.25	OJT	
07e	World Port Index	40	37	0.52	NT	
07f	Pub 117 Radio Navigation Aids	18	59	0.23	NT	
07g	Distances Between Ports	42	35	0.55	NT	
07h	Pub 217 Maneuvering Boards	49	28	0.64	JA/T	CBT
08	Handle and stow classified and/or accountable material.	60	17	0.78	T	ICWKBT Resident Training
09	Determine nautical chart and publication requirements for a cutter in accordance with Nautical Chart and Publication Allowance for Cutters.	56	21	0.73	JA/T	ICWKBT Video w/ workbook
B	COMMUNICATIONS					
10	Identify all visual signal flags in the flag bag for:					
10a	International	64	13	0.83	NT	

Interactive Courseware (ICW), Computer-based Training (CBT)

Attachment 3

QUARTERMASTER THIRD CLASS
Job Task Analysis Student and Supervisor Training Recommendation Comparison

Question	Quals	% Yes	Avg Frequency	Avg Importance	Supv Importance	Avg Difficulty	Student Recommend	Supv Recommend
A	ADMINISTRATION AND TRAINING							
01	Correct and maintain nautical publications.	0.97	3.38	3.62	4.33	1.74	OJT	OJT
02	Correct and maintain nautical charts by:							
02a	Electronics	0.18	2.64	4.14	3.00	2.64	JA/T	NT
02b	Pen and ink	0.96	3.72	4.47	4.62	2.12	T	T
03	Use Chart No. 1 to identify navigational related information.	0.99	2.59	3.28	3.92	1.47	OJT	OJT
04	Compute average daily rate of ship's chronometer.	0.44	3.73	2.00	2.19	1.50	NT	NT
05	Maintain a Timepiece ratebook.	0.47	3.81	2.00	2.22	1.47	NT	NT
06	Extract information contained in each of the following publications to plan a voyage:							
06a	coast pilots.	0.90	2.64	3.52	3.89	1.94	OJT	OJT
06b	Sailing directions.	0.84	2.37	3.54	3.74	1.95	OJT	OJT
06c	Light lists.	0.82	2.70	3.40	3.81	1.98	OJT	OJT
06d	Tide Tables	0.87	3.10	3.74	4.02	2.42	T	T
06e	Tidal Current Tables	0.84	3.08	3.80	4.02	2.41	T	T
6f	Fleet guides.	0.74	2.14	3.11	3.31	1.75	OJT	OJT
07	Extract information contained in each of the following publications:							
07a	List of Lights	0.70	2.22	2.83	3.35	1.98	NT	OJT
07b	Dutton's	0.79	2.39	3.28	3.22	1.98	OJT	OJT
07c	Bowditch	0.92	2.79	3.51	3.45	2.18	JA/T	JA/T
07d	Hobb's	0.25	2.00	3.05	2.67	1.89	OJT	NT
07e	World Port Index	0.52	1.72	2.21	2.40	1.74	NT	NT
07f	Pub 117 Radio Navigation Aids	0.23	1.67	2.28	2.08	2.06	NT	NT
07g	Distances Between Ports	0.55	1.74	2.41	2.33	1.53	NT	NT
07h	Pub 2 17 Maneuvering Boards	0.64	2.52	3.24	3.02	3.02	JA/T	JA/T
08	Handle and stow classified and/or accountable material.	0.78	3.30	4.15	4.00	2.47	T	T

Attachment 7

QUARTERMASTER THIRD CLASS
Job Task Analysis Supervisor and Student Importance

Question	Quals	Supv Importance	Student Importance	Supv % Yes	Yes	No
A	ADMINISTRATION AND TRAINING					
01	Correct and maintain nautical publications.	4.33	3.62	0.98	50	1
02	Correct and maintain nautical charts by:					
02a	Electronics	3.00	4.14	0.18	9	41
02b	Pen and ink	4.62	4.47	0.98	50	
03	Use Chart No. 1 to identify navigational related information.	3.92	3.28	0.96	49	1
04	Compute average daily rate of ship's chronometer.	2.19	2.00	0.41	21	30
05	Maintain a Timepiece ratebook.	2.22	2.00	0.43	22	29
06	Extract information contained in each of the following publications to plan a voyage:					
06a	Coast pilots.	3.89	3.52	0.84	43	8
06b	Sailing directions.	3.74	3.54	0.76	39	12
06c	Light lists.	3.81	3.40	0.86	44	7
06d	Tide Tables	4.02	3.74	0.86	44	7
06e	Tidal Current Tables	4.02	3.80	0.86	44	7
06f	Fleet guides.	3.31	3.11	0.75	38	13
07	Extract information contained in each of the following publications:					
07a	List of Lights	3.35	2.83	0.76	39	12
07b	Dutton's	3.22	3.28	0.92	47	3
07c	Bowditch	3.45	3.51	0.94	48	2
07d	Hobb's	2.67	3.05	0.27	14	36
07e	World Port Index	2.40	2.21	0.55	28	23
07f	Pub 117 Radio Navigation Aids	2.08	2.28	0.57	29	22
07g	Distances Between Ports	2.33	2.41	0.71	36	15
07h	Pub 217 Maneuvering Boards	3.02	3.24	0.88	45	6
08	Handle and stow classified and/or accountable material.	4.00	4.15	0.75	38	13
09	Determine nautical chart and publication requirements for a cutter in accordance with Nautical Chart and Publication Allowance for Cutters.	3.95	3.27	0.67	34	17

QUARTERMASTER THIRD CLASS
Job Task Analysis Supervisor's Unit of Assignment

Question	Total Booklets	Unknown	1	2	3	4	5	7	8	9	10	12	13
1. Unit	51		7	9	1	5		20		5	1	1	2
2. Paygrade	51		a	36	2	5							
3. Under Supv	51	3	2	a	12	26							
4. % of Week Tasks Account For	51			6	15	20	10						
5. Work Hours	51			15	9	15	12						

1. Unit Of Assignment

1 = 378'
2 = 270'
3 = Icebreaker (WAGB)
4 = 210'
5 = 213'
6 = 140' Icebreaker tug (WTGB)
7 = 110' Patrol Boat
a = 82' Patrol Boat
9 = 180' Bouy tender, Seagoing (WLB)
10 = 225' Bouy tender, Seagoing (WLB)
11 = 157' Buoy tender, Coastal (WLM)
12 = 175' Buoy tender, Coastal (WLM)
13 = 133' Buoy tender, Inland (Large)
14 = Construction tender, Inland

2. Supervisor Pay Grad

1 = QMC
2 = QM1
3 = QM2
4 = Other

4. Percent Of Workweek

1 = 0 to 20%
2 = 21% to 40%
3 = 41% to 60%
4 = 61% to 80%
5 = 51% to 100%

3. Time at Unit

1 = Less Than 3 Months
2 = 3 to 6 Months
3 = More than 6 but less than 12 Months
4 = 12 Months or More

5. QM3' Usual Work Week

1 = 0 to 35 hours
2 = 36 to 45 hours
3 = 46 to 50 hours
4 = 51 to 60 hours
5 = 61 or more

QUARTERMASTER THIRD CLASS
Job Task Analysis QM3's Unit of Assignment

Question	Total Booklets	Unknown	1	2	3	4	5	7	8	9	10	12	13
1	77	1	13	13	2	10		25		7	2	1	3
2	77	1	5	8	10	53							
3	77	3	10	8	13	43							
4	77	5	3	13	20	21	15						
5	77	2	4	15	12	20	24						
6	77	1							51	25			

1. Unit Of Assignment

1 = 378'
2 = 270'
3 = Icebreaker (WAGB)
4 = 210'
5 = 213'
6 = 140' Icebreaker tug (WTGB)
7 = 110' Patrol Boat
8 = 82' Patrol Boat
9 = 180' Bouy tender, Seagoing (WLB)
10 = 225' Bouy tender, Seagoing (WLB)
11 = 157' Buoy tender, Coastal (WLM)
12 = 175' Buoy tender, Coastal (WLM)
13 = 133' Buoy tender, Inland (Large)
14 = Construction tender, Inland

2. Time in Rate

1 = Less Than 3 Months
2 = 3 to 6 Months
3 = More than 6 Months
4 = 12 Months or More

4. Percent Of Workweek

1 = 0 to 20%
2 = 21% to 40%
3 = 41% to 60%
4 = 61% to 80%
5 = 51% to 100%

3. Time at Unit

1 = Less Than 3 Months
2 = 3 to 6 Months
3 = More than 6 but less than 12 Months
4 = 12 Months or More

5. QM3's Usual Work Week

1 = 0 to 35 hours
2 = 36 to 45 hours
3 = 46 to 50 hours
4 = 51 to 60 hours
5 = 61 or more

QUARTERMASTER THIRD CLASS
Job Task Analysis Student and Supervisor Training Recommendation Comparison

Question	Quals	% Yes	Avg Frequency	Avg Importance	Supv Importance	Avg Difficulty	Student Recommend	Supv Recommend
A	ADMINISTRATION AND TRAINING							
01	Correct and maintain nautical publications.	0.97	3.38	3.62	4.33	1.74	OJT	OJT
02	Correct and maintain nautical charts by:							
02a	Electronics	0.18	2.64	4.14	3.00	2.64	JA/T	NT
02b	Pen and ink	0.96	3.72	4.47	4.62	2.12	T	T
03	Use Chart No. 1 to identify navigational related information.	0.99	2.59	3.28	3.92	1.47	OJT	OJT
04	Compute average daily rate of ship's chronometer.	0.44	3.73	2.00	2.19	1.50	NT	NT
05	Maintain a Timepiece ratebook.	0.47	3.81	2.00	2.22	1.47	NT	NT
06	Extract information contained in each of the following publications to plan a voyage:							
06a	coast pilots.	0.90	2.64	3.52	3.89	1.94	OJT	OJT
06b	Sailing directions.	0.84	2.37	3.54	3.74	1.95	OJT	OJT
06c	Light lists.	0.82	2.70	3.40	3.81	1.98	OJT	OJT
06d	Tide Tables	0.87	3.10	3.74	4.02	2.42	T	T
06e	Tidal Current Tables	0.84	3.08	3.80	4.02	2.41	T	T
6f	Fleet guides.	0.74	2.14	3.11	3.31	1.75	OJT	OJT
07	Extract information contained in each of the following publications:							
07a	List of Lights	0.70	2.22	2.83	3.35	1.98	NT	OJT
07b	Dutton's	0.79	2.39	3.28	3.22	1.98	OJT	OJT
07c	Bowditch	0.92	2.79	3.51	3.45	2.18	JA/T	JA/T
07d	Hobb's	0.25	2.00	3.05	2.67	1.89	OJT	NT
07e	World Port Index	0.52	1.72	2.21	2.40	1.74	NT	NT
07f	Pub 117 Radio Navigation Aids	0.23	1.67	2.28	2.08	2.06	NT	NT
07g	Distances Between Ports	0.55	1.74	2.41	2.33	1.53	NT	NT
07h	Pub 2 17 Maneuvering Boards	0.64	2.52	3.24	3.02	3.02	JA/T	JA/T
08	Handle and stow classified and/or accountable material.	0.78	3.30	4.15	4.00	2.47	T	T

Attachment 7

QUARTERMASTER THIRD CLASS
Job Task Analysis Supervisor Why Task Not Performed

Question	Qual	Total Booklets	No	1	2	3	4	5
A	ADMINISTRATION AND TRAINING							
1	Correct and maintain nautical publications.	51	1			1		
2	Correct and maintain nautical charts by:							
02a	Electronics	51	40	12	25		2	1
02b	Pen and ink	51				1		
3	Use Chart No. 1 to identify navigational related information.	51	1				1	
4	Compute average daily rate of ship's chronometer.	51	30	17	8	2	2	
5	Maintain a Timepiece ratebook.	51	29	19	6	2	2	
6	Extract information contained in each of the following publications to plan a voyage:							
06a	Coast pilots.	51	8			7	1	
06b	Sailing directions.	51	12	1		7	4	
06c	Light lists.	51	7			5	1	
06d	Tide Tables	51	7	4		3		
06e	Tidal Current Tables	51	7	4		3		
06f	Fleet guides.	51	13	1	1	9	2	
7	Extract information contained in each of the following publications:							
07a	List of Lights	51	12	2	1	3	6	
07b	Dutton's	51	3	2	1			
07c	Bowditch	51	2	2				
07d	Hobb's	51	36	5	27	1	3	
07e	World Port Index	51	23	4		6	12	
07f	Pub 117 Radio Navigation Aids	51	22	7		2	13	
07g	Distances Between Ports	51	15	3	1	5	6	
07h	Pub 217 Maneuvering Boards	51	6			4	4	
8	Handle and stow classified and/or accountable material.	51	13	1		9	1	1
9	Determine nautical chart and publication requirements for a cutter in accordance with Nautical Chart and Publication Allowance for Cutters.	51	17			14	1	1

Chapter 14: Select Appropriate Delivery System(s) (Media Selection)

What Is It?

CAUTION: When reading this chapter, be sure you read Chapter 26, Identify Instructional Methods and Strategies, Chapter 17, Conduct a Cost-Benefit Analysis (CBA), and Chapter 18, Design and Develop an Instructional Plan (IP) at the same time. In this time when the Coast Guard is beginning to move toward alternative deliveries, it is essential that Coast Guard course designers have a full picture of the impact of specific choices. Failure to have that big picture can result in spending much time and money developing a program, only to find out the Coast Guard will not support its maintenance or development.

Selecting a delivery system means figuring out, **BEFORE** you design a training intervention, how you are going to "deliver" that training intervention.

NOTE: A common mistake in the training design business is to confuse delivery systems with instructional methodologies. Delivery systems are the means available to deliver training (e.g., an instructor or facilitator, CBT, video with workbook, correspondence course, and WBT). All of these examples (and others not mentioned) are ways you might decide to "deliver" training. In contrast, instructional methodologies are the strategies the training designer chooses to make sure learning and transfer to the job take place. Examples of instructional methodologies are: case studies, role-plays, small group instruction, lectures, demonstrations, and so forth.

There are many different ways to classify different delivery systems. One classification system you might find helpful follows:

People-dependent deliveries: Is the training people-delivered--that is, dependent on an instructor (or peers) to lead or facilitate activities? Some examples of people-dependent delivery systems are:

- Resident training.
- Some simulations.
- Mobile training teams.

What Is It? (continued)

- Structured on-the-job training (OJT).
- Seminars and conferences.
- Interactive video teletraining (IVT). (This method is a "hybrid"; it depends on both the instructor and videos, computers and even satellites, for its delivery.)
- Peer-learning. ("Peers" train each other by demonstrating, practicing, and coaching activities which is a good delivery system to use when you want to get students practiced in using job aids to perform a task.)

Computer-assisted deliveries: The FT "A" course discussed in this SOP is both people-dependent and computer-assisted in its delivery methods. Instructors lead and facilitate learning, but NIDA trainers and computer software deliver most of the instruction, the tests, reviews and practice exercises. NIDA trainers also perform many "instructor type" tasks: tracking students' performance, maintaining records, and producing administrative and statistical reports. This type of delivery system is often referred to as "computer-assisted" instruction (CAI).

Another type of computer-assisted instruction is IVT. This type of instruction is instructor-led, but the instructor is remote from most of the students. The instructor controls student interactions through manipulation of video teletraining equipment. The instructor also uses a computer to deliver presentations and to communicate with students at remote sites, via features such as chat rooms and e-mail. Using computers at their sites, students taking the course can also communicate with the instructor and with each other, even though they are at locations very remote to the site beaming out the instructional event.

Student-centered, self-paced instruction: This type of delivery depends on the student interacting with print media; audio-visual deliveries; or computer-assisted, self-paced instruction. Some examples of student-centered, self-paced instruction are:

- Videotape and workbook.

What Is It? (continued)

- Print media such as correspondence courses.
- Cassette tape and workbook.
- Job aids and job-related equipment or simulators.
- WBT--self-paced, interactive instruction delivered to students' desktops, via the internet or intranet. This type of instruction is student-centered and self-paced. Students know, at all times, how they are doing and there is considerable branching to allow students to learn in their own way.
- CBT--self-paced, interactive courseware often delivered via the CD drive on a student' s computer. As with WBT, CBT is student-centered and allows the student many possibilities for self-remediation until the student fully grasps the material. Both CBT and WBT, though, generally rely on an organizational intranet for delivery.
- Other examples of student-centered instruction that depend on a computer are various types of electronic performance support systems (EPSSs). Of special note are the Electronic Systems Operating Manual (ESOM), Interactive Electronic Technical Manual (IETM), and Shipboard Operational Regulations Manual (SORM). These hybrid deliveries rely on hyperlinking ("jumping," with the click of a computer' s mouse, to another related subject) for ease of use and often include training features such as virtual ship tours, video clips, drop-down job aids, and so forth.

How Do I Select Delivery System(s)?

There are many media selection models available that can help you select appropriate delivery systems for part or all of your training. Some of the models are found only in paper form; others are electronic.

How Do I Select Delivery System(s)? (continued)

In the best of all worlds, use a team to perform media selection. The key person on the team is the SME who is thoroughly familiar with the subject matter, tasks, and task steps. However, another good member to have is an instructional technologist (IT), instructional system specialist (ISS) or training specialist (TS).

This person should be thoroughly familiar with adult learning theory, all training design issues, various training strategies, and with the various capabilities different media possesses.

However, when you can't get such a team together, don't worry. Using a good media selection model, you can easily perform media selection on your own. If there are any questions, these can be referred to the IT, ISS or TS at another time.

NOTE: Media selection is **NOT** a science. What you get from a media selection is a set of recommendations, not a prescription!

Once you get familiar with several different models, you will quickly see that many of them appear to have a bias. For example, those media selection models developed by companies selling CBT may mysteriously lead you every time to CBT. Such models have a very low confidence level.

We will try to steer you toward models with more credibility. But remember, media selection is just a recommendation. As you'll see when you do an Instructional Plan (IP), just because the model says CBT, you may not end up delivering training that way. An EPSS may be cheaper and provide better help on-the-job...particularly if the JTA said the task should be job-aided. And even that EPSS may not be a good choice if the student population hasn't yet migrated to SWSIII.

How Do I Select Delivery System(s)? (continued)

Media selection is just one piece of data that goes into designing a training intervention.

Some software programs (e.g., Advisor) have a media selection feature. Look at the newest upgrade Advisor demo to see if you like the way it works. However, without the software, you won' t be able to take advantage of its on-line features (calculating, printing, reporting, charting).

The Naval Air Warfare Center--Training Systems Development (NAWC-TSD) in Orlando has developed an excellent media selection model and will give you a copy on request. The model may be on-line now; check their web site. The training technology selection process for this model uses flowcharts to identify training objectives that call for physical or intellectual skills or training attitudes.

DOT' s FAA has developed a very good media selection model that you can request. One feature of the FAA model focuses on the relationship between media and media aids by identifying the critical characteristic for each medium, one which no other medium could satisfy so well as the others (i.e., practice to proficiency, hands-on activity, active interaction, etc.). However, other parts of the model are FAA-specific so you may find it hard to tailor to your situation.

PTC staff has developed a media selection model by taking the best characteristics of the FAA and NAWC-TSD models and adapting them to Coast Guard training needs. One of the best features of this media selection model is that it starts by looking at learning outcomes:

- Is the predominate learning outcome a psychomotor skill--operate, perform, repair?
- Is the predominate learning outcome an intellectual skill, knowledge, etc.--identify, inspect, troubleshoot?
- Does the predominate learning outcome deal with attitudes, feelings and emotions--leadership, diversity training?

How Do I Select Delivery Systems (Media)? (continued)

This sort of model tracks very well with the skills (psychomotor), knowledge (intellectual or cognitive), and attitude (affective mode) any training interventions will predominately be made up of.

The model has been tried out during several JTAs. It has no special biases, and it offers several possible media for each decision you make. PTC uses the model to make initial media recommendations for each task in a JTA effort. That way, media selection results can be incorporated into the JTA report.

You will find a copy of this model at the end of this SOP chapter. It is your job aid for performing media selection. As the model tells you, ITs, ISSs, and TSs are available to help you when you do media selection.

How Long Will It Take?

Not long at all. If there are few tasks, you can accomplish media selection in an hour. If there are many tasks, it may take you a day.

What Will I Get Out of It?

After you perform media selection, you will have media recommendations for each task in your course. If most or all of the tasks are the same type of medium, that fact will indicate you should choose that particular type of medium for training delivery.

If media selection indicates that some tasks should be delivered by one medium, and others by another, you can choose a training design that uses various media for its delivery.

A more typical result of media selection is a "mixed-bag." For example, media selection for MK "A" quals indicated that the "knowledge" portion of the course should be delivered by self-paced, student-centered instruction and, in this case, by CBT. However, the hands-on work with equipment in MK school' s labs will be instructor-led demonstrations and practice in various labs.

What Will I Get Out of It? (continued)

Media selection from a JTA report are included at the end of this chapter. That excerpt shows you the outputs from a media selection effort.

Why and When Do I Do Media Selection?

Why:

You do media selection so you can determine what other types of delivery systems would work for your training.

Why do you want to do that? Because relying solely on resident training for our people has caused some significant problems for the Coast Guard:

- Resident training is very expensive and the cost keeps going up and up.
- Alternative delivery systems can be more effective and efficient than resident training courses.
- Most of today' s training has technological components. Using technology to learn technology facilitates leaning.
- Our TRACENs are not big enough and they don' t have enough instructor staff to train all of the people who need training. That means only some of the people who need this intervention get it.
- In the Coast Guard' s current state, staffing and funding are competitive. That means there is always the threat that instructor and training designer staff may be snatched up for a higher priority. Yet training must go on. Alternative deliveries, with distance learning capabilities, are the only current answer to this dilemma.
- Alternative deliveries can be very expensive to develop, but once they' re developed, their cost goes way down. They represent a better ROI for the Coast Guard.

Why and When Do I Do Media Selection? (continued)

- All organizations have the same problem, so they' re all moving to alternative deliveries and distance learning. The Coast Guard is dependent on the Navy for many of its training needs. It needs to stay current with up-to-date training trends so it can share in what the Navy (and other agencies) develop(s).

NOTE: Many of the current and emerging media you might choose are very expensive to design and develop. Also, some of the emerging technologies may require hardware and software that the Coast Guard has no current plan for procuring. For those reasons, you need to:

- Either learn how to conduct media feasibility studies and cost benefit analysis or get help with this task. This SOP includes procedures for CBA and media feasibility. PTC staff has also provided Headquarters with many feasibility-type studies, CBAs, and evaluations of performance improvement outcomes using different media. They will be glad to share that information with you.

- Make sure you have read and stay current with Coast Guard policy COMDTINST 1554.1, Designing and Developing Interactive Courseware (ICW) and Styles and Standards for Development of ICW and EPSSs. These regulations govern the selection, design, and development of emerging technology media.

- Consult with the PTC staff concerning decisions you make about such media. COMDT (G-WT) has designed PTC as the Coast Guard' s CBT Center of Excellence and, in that capacity, has entrusted the PTC with review and approval of the alternative delivery decisions TRACENs and training providers (TPs) make about media used to deliver instruction

When:

Here are some of the clues that let you know it is time to do media selection:

- As part of an FEA, if it is the type of FEA that produces a task list.

Why and When Do I Do Media Selection? (continued)

- As part of a JTA.
- To validate and add to TRACEN triage results.
- As part of training program design (either a new start or a revision of an old training course).
- As part of a CBA.
- To help with "What If?" planning. If you' re thinking of converting courses to an alternative delivery, you may want to do preliminary media selection work to identify potential deliveries.

What Is My Role?

As an instructor or course designer and developer, you are likely to be the SME performing the media selection.

You may also help someone else with performing media selection.

You may use media selection results someone else produced, when you design a training program.

Who Can Help Me?

The References Section of this SOP lists several publications that can help you in doing media selection and in selecting various delivery systems. PTC staff can help you. You may not need any help. The media selection process is fairly easy and quite a bit of fun.

First, try out the model we' ve given you for a job aid. If you don' t understand something about it, or it doesn' t seem to work, go see the PTC staff. They' ll answer all your questions.

What Is the Process for Getting Started?

You can do media selection any time you think it is a good idea. However, there are the clues we' ve discussed that act as triggers for doing media selection. When you are involved in those types of projects, be sure you include media selection results.

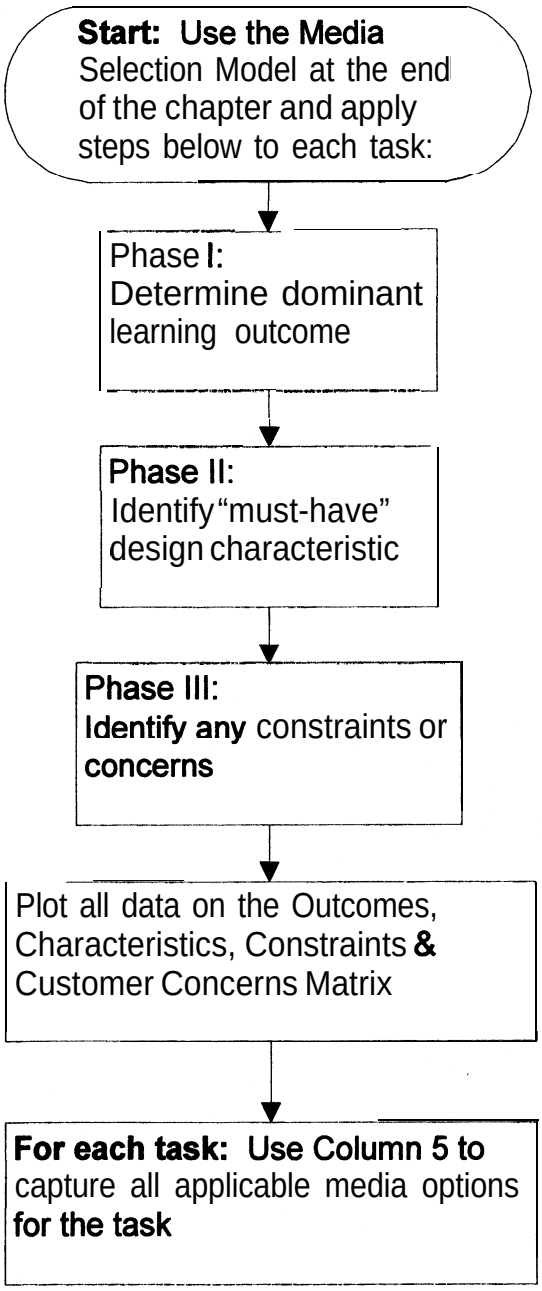
You may also be asked to do media selection for a specific project, either by your supervisor or by the program and training managers.

Delivery System(s) Job Aid

See the attached Media Selection Model (MSM). It is your job aid.

We have also included a tool from the Coast Guard' s CDC course. The **Supporting Media Selection Assistance Chart** helps you match performance objective characteristics to media most likely to support those characteristics. You can find this chart at the end of this chapter.

Select Appropriate Delivery System(s) (Media Selection) Job Aid



Media Selection Model

Performance, Analysis, & Design Branch
Performance Technology Center
Training Center Yorktown

Media Selection:
Outcomes, Characteristics, Constraints, and Customer Concerns

Task: _____

#	**Phase III: CONSTRAINTS** AND CONCERNS. ***Your response to these questions will help identify*** *which media* ***may be more appropriate to use than others.***	Yes	No
13	Are there severe consequences to inadequate performance/safety hazards inherent with improper performance? (i.e., potential safety hazard, potential damage to equipment)		
14	Is equipment required to support training? (i.e., engines, tools, reference materials)		
15	Is the equipment at the job site available for on-the-job training? (i.e., shutting down a system means vessel not able to get underway)		
16	Is it practical to use the actual system/equipment? (i.e., able to support mission with system down)		
17	Can the training be worked into the actual job? (i.e., watch standing)		
18	Is an instructor or experienced journeyman available at the job site?		
19	Is the task particularly difficult to learn or perform on the job? (i.e., physical/ environmental constraints; underway time)		
20	Will the mission be adversely affected by the length of time the student is away from the job?		
21	Is the task more appropriate for individual learning? (i.e., interaction with other people not a necessity)		
22	Does the nature of the job allow the student time to spend on a non-resident course? (i.e., watch standing, underway time)		
23	Is the appropriate facilities/equipment available to support alternative deliveries? (i.e., computers with CD drive for CBT course, downlink available for interactive video tele-training, Internet access)		
24	Is the target population widely dispersed geographically?		
25	Is the class size less than 15 students?		
26	Are the class convenings less than 5 per year?		
27	Is the instruction time for this task less than 4 hours?		
28	Does the information for this task change on an annual basis? (i.e., reference, instruction, procedure)		
29	Is there course content that is redundant with other courses? (i.e., Coast Guard, other agencies, commercial)		

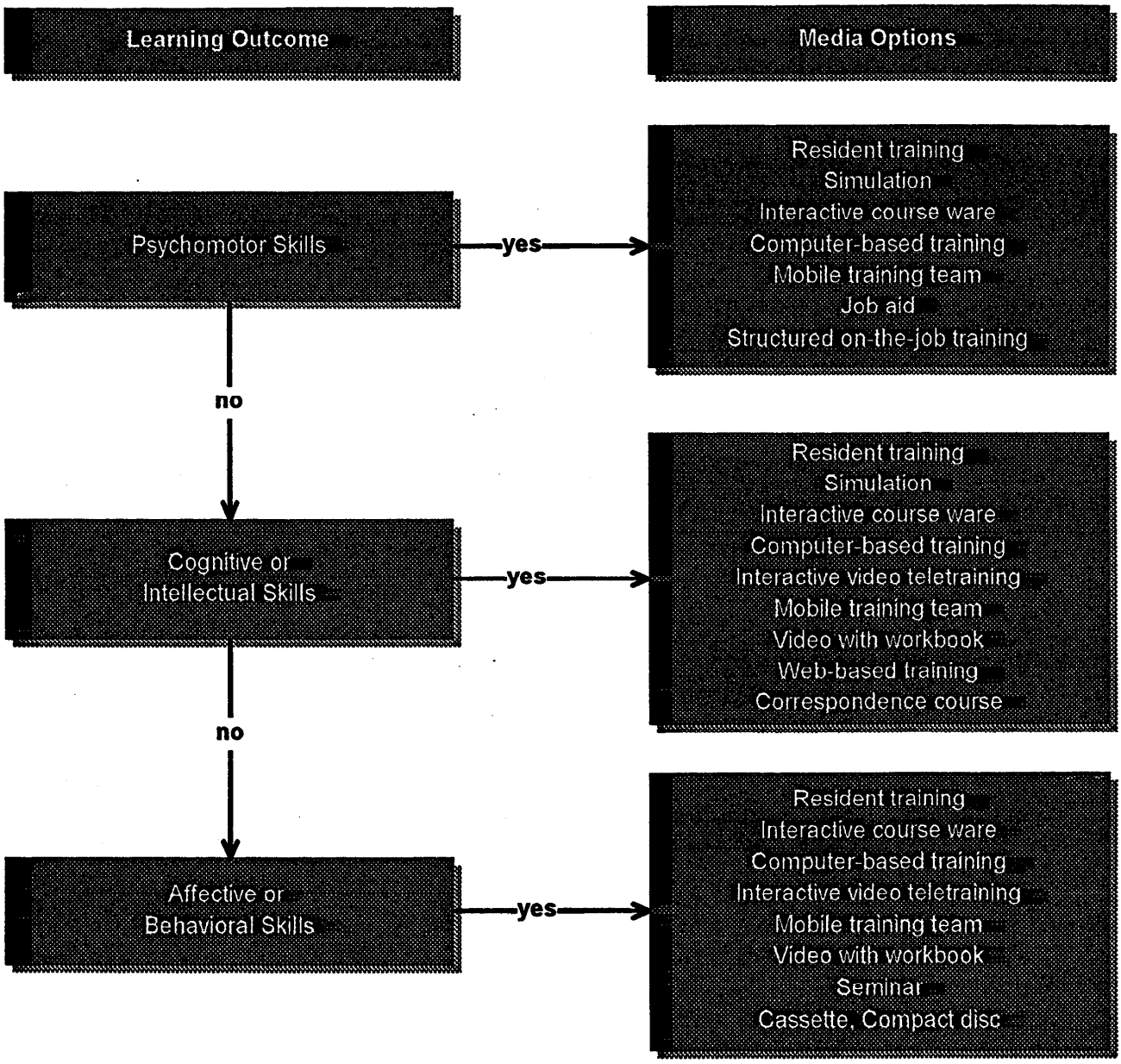
Media Selection:
Outcomes, Characteristics, Constraints, and Customer Concerns

Qual/Task: _____ _____

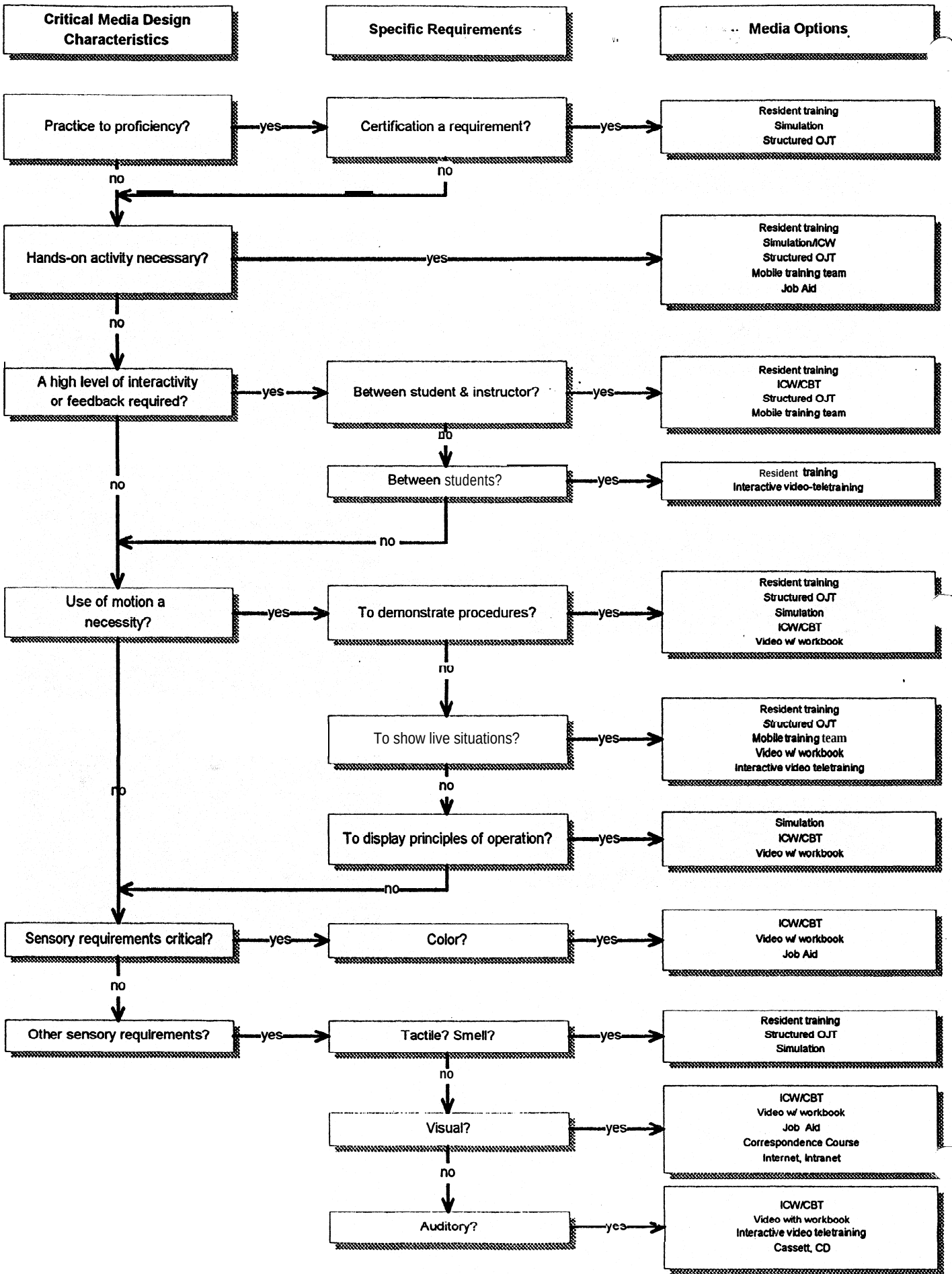
Learning Outcome: _____

1. Using the Media Selection - Phase I Flowchart, place a check, in column 2, by each media selections identified as appropriate for the learning outcome. See questions 1-3 of the Media Selection questionnaire.
2. Using the Media Selection - Phase II Flowchart, place a check, in column 3, by each media selection identified as appropriate for the critical design characteristic(s) identified as necessary for learning to be achieved.
3. Using the Constraints and Concerns matrix, place a check, in column 4, by each media selection identified as appropriate.
4. Place a check, in column 5, by each media selection that has been checked in columns 2, 3, and 4.

Column 1 Media Selections	Column 2 Phase I Learning Outcome	Column 3 Phase II Design Characteristics	Column 4 Phase III Constraints & Concerns	Column 5 Options
1. Resident training (classroom, lab)				
2. Simulation, Virtual reality				
3. Interactive courseware (ICW) 4. Computer-based training (CBT)				
5. Interactive video teletraining (IVT)				
6. Mobile training team (MTT)				
7. Correspondence course				
8. Structured on-the-job training				
9. Video with workbook				
10. Job Aid, EPSS, ESOM, IETM				
11. Seminar				
12. Cassette/Computer Disk				
13. Web-based training				
14.				
15				


Learning Outcome
Media Options
Psychomotor Skills
yes
Resident training
Simulation
Interactive course ware
Computer-based training
Mobile training team
Job aid
Structured on-the-job training
no
Cognitive or Intellectual Skills
yes
Resident training
Simulation
Interactive course ware
Computer-based training
Interactive video teletraining
Mobile training team
Video with workbook
Web-based training
Correspondence course
no
Affective or Behavioral Skills
yes
Resident training
Interactive course ware
Computer-based training
Interactive video teletraining
Mobile training team
Video with workbook
Seminar
Cassette, Compact disc

Media Selection - Phase II



Media Selection - Phase III

If the answer is "yes" to question	then	and	Remarks
13	do not consider structured OJT if task involves using equipment; consider deliveries that include other than actual equipment (i.e., simulator, trainer, mock-up)	consider media options that require instructor interaction if task does not involve using equipment	Resident training is an option; however, conduct cost analysis on media options to identify most appropriate and cost effective.
14	consider deliveries that include equipment or simulation of equipment	if "yes" to #13, consider resident training or alternative deliveries that include other than actual equipment (i.e., simulator, trainer, mock-up)	
15 - 17	consider structured OJT	if 'yes" to #13, consider resident training or alternative deliveries that include other than actual equipment (i.e., simulator, trainer, mock-up)	
18	consider structured OJT	if 'yes" to #13, consider resident training or alternative deliveries that include other than actual equipment (i.e., simulator, trainer, mock-up).	MTT or IVT are options where experience at the-unit is not available.
19	do not consider structured OJT; consider alternative deliveries to resident training if other than actual equipment can be used	if 'yes' to #13, resident training becomes an option	
20	consider IVT if inter-activity is required; consider other alternative deliveries to resident training if individual learning is appropriate.	if 'yes' to #13, resident training becomes an option	Conduct cost analysis on medii options
21	consider ICW, CBT, video with workbook, job aid, correspondence course, web-based training.	if "yes" to #13, resident training becomes an option	Conduct cost analysis on media options
22-24	consider alternative deliveries to resident training	if 'yes' to #13, resident training becomes an option	Conduct cost analysis on media options. If cost is a constraint, select option(s) that arelowincost.
25-27	conduct cost analysis on medii options	select option(s) that are low in cost	ROI for high cost medium will not be realized for years on low throughput
28	conduct cost analysis on medii options	select option(s) that are low in cost	
29	conduct a COTS/GOTS search	conduct cost analysis on media options.	

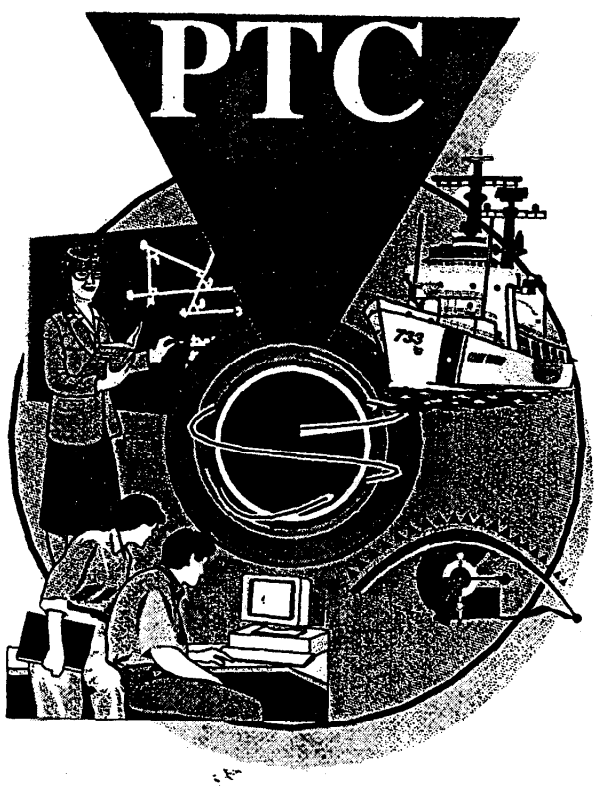
QM-A
Job Task
Analysis
Report

U.S. Dept of
Transportation
**United States
Coast Guard**

Quartermaster Third Class.

Performance Technology Center

PTC



U.S Coast Guard
Performance Technology Center
Training Center
Yorktown, VA

MEDIA'SELECTION RESULTS FROM QM JOB ANALYSIS REPORT

QUARTERMASTER THIRD CLASS
Job Task Analysis Media Selection Results

Question	Quals	Yes	No	% Yes	Recommend	Media Selection
A	ADMINISTRATION AND TRAINING					
01	Correct and maintain nautical publications.	75	2	0.97	OJT	
02	Correct and maintain nautical charts by:					
02a	Electronics	14	63	0.18	JA/T	Simulation/ICW Video w/ workbook
02b	Pen and ink	74	3	0.96	T	ICW/CBT Video w/ workbook
03	Use Chart No. 1 to identify navigational related information.	76	1	0.99	OJT	
04	Compute average daily rate of ship's chronometer.	34	42	0.44	NT	
05	Maintain a Timepiece ratebook.	36	41	0.47	NT	
06	Extract information contained in each of the following publications to plan a voyage:					
06a	Coast pilots.	69	8	0.90	OJT	
06b	Sailing directions.	65	12	0.84	OJT	
06c	Light lists.	63	14	0.82	OJT	
06d	Tide Tables	67	10	0.87	T	ICW/CBT Video w/ workbook
06e	Tidal Current Tables	65	12	0.84	T	ICW/CBT Video w/ workbook
06f	Fleet guides.	57	20	0.74	OJT	
07	Extract information contained in each of the following publications:					
07a	List of Lights	54	23	0.70	NT	
07b	Dutton's	61	16	0.79	OJT	
07c	Bowditch	71	6	0.92	JA/T	CBT Correspondence Course
07d	Hobb's	19	58	0.25	OJT	
07e	World Port Index	40	37	0.52	NT	
07f	Pub 117 Radio Navigation Aids	18	59	0.23	NT	
07g	Distances Between Ports	42	35	0.55	NT	
07h	Pub 217 Maneuvering Boards	49	28	0.64	JA/T	CBT
08	Handle and stow classified and/or accountable material.	60	17	0.78	T	ICW/CBT Resident Training
09	Determine nautical chart and publication requirements for a cutter in accordance with Nautical Chart and Publication Allowance for Cutters.	56	21	0.73	JA/T	ICW/CBT Video w/ workbook
B	COMMUNICATIONS					
10	Identify all visual signal flags in the flag bag for:		4			
10a	International	64	13	0.83	NT	

Interactive Courseware (ICW), Computer-based Training (CBT)

QUARTERMASTER THIRD CLASS
Job Task Analysis Media Selection Results

Question	Quals	Yes	No	% Yes	Recommend	Media Selection
10b	Allied	48	29	0.62	NT	
11	Identify emergency signals for:			0.00		
11a	Aircraft	25	52	0.32	OJT	
11b	Surface ship	47	30	0.61	OJT	
12	Transmit and receive Morse Code characters by:					
12a	Flashing light.	44	33	0.57	NT	
12b	Hand flags (Wig-Wam)	15	62	0.19	NT	
13	Encode and decode international signals in accordance with Pub 102.	41	36	0.53	NT	
14	Transmit and receive international signals from Pub 102 by:					
14a	Flag hoist	38	39	0.49	NT	
14b	Flashing Light	37	40	0.48	NT	
14c	Hand flags	19	58	0.25	NT	
14d	Radio telephone	19	58	0.25	JA/T	ICW/Simulation Resident Training
14e	Sound-producing devices	17	60	0.22	JA/T	ICW/Simulation Resident Training
15	Transmit and receive Allied signals from Allied Communication Pubs by:					
15a	Flag hoist	33	44	0.43	NT	
15b	Flashing light	33	44	0.43	NT	
15c	Semaphore	31	46	0.40	NT	
15d	Radio telephone	10	67	0.13	JA/T	ICW/Simulation Resident Training
15e	Sound-producing devices	4	73	0.05	OJT	
16	"Transmit, receive, and record message traffic via radiotelephone."	44	33	0.57	T	ICW/Simulation Resident Training
17	Transmit and receive semaphore characters.	28	49	0.36	NT	
18	Use prosigns in visual communications as outlined in ACP 129.	28	49	0.36	NT	
19	Use Collective and Commander call signs in visual communications as outlined in ACP 129.	25	52	0.32	NT	
20	Transmit and receive basic visual message traffic using the following formats:					
20a	Plaindress	32	45	0.42	NT	
20b	Abbreviated Plaindress	25	52	0.32	NT	
21	Prepare and service a plaindress visual message for transmission by:					
21a	Flashing light	31	46	0.40	NT	
21b	Semaphore	24	53	0.31	NT	
22	Maintain a visual message log.	27	50	0.35	NT	

QUARTERMASTER THIRD CLASS
Job Task Analysis Media Selection Results

Question	Quals	Yes	No	% Yes	Recommend	Media Selection
C	NAVIGATIONAL SYSTEMS					
23	Compute time of sunrise and sunset using:					
23a	Nautical Almanac	69	8	0.90	T	ICW CBT
23b	Tides Table	26	51	0.34	T	ICW CBT
23c	Air Almanac	11	66	0.14	NT	
23d	Computer-based calculations	50	27	0.65	OJT	
23e	"Media (newspaper, television, etc.)"	12	65	0.16	NT	
24	Solve the following time calculations:					
24a	Zone time	67	10	0.87	OJT	
24b	Greenwich Mean Time (GMT)	69	8	0.90	OJT	
24c	Coordinated Universal Time (UTC)	53	24	0.69	OJT	
24d	Local Mean Time (LMT).	61	16	0.79	JA/T	ICW CBT
25	Compute time of Local Apparent Noon (LAN) using:					
25a	Nautical Almanac.	40	37	0.52	NT	
25b	Computer-based calculations	18	59	0.23	NT	
26	Determine distance using a stadimeter.	24	53	0.31	NT	
27	Obtain soundings using an echo sounder (fathometer).	77		1.00	OJT	
28	Enter soundings in appropriate log.	72	5	0.94	OJT	
29	Compute gyro error by:					
29a	Azimuth of the sun	53	24	0.69	T	ICW/CBT Resident Training
29b	Azimuth of Polaris	22	55	0.29	JA/T	ICW/CBT Resident Training
29c	Amplitude of the sun	46	31	0.60	T	ICW/CBT Resident Training
29d	Terrestrial range	70	7	0.91	T	ICW/CBT Resident Training
29e	Trial and error (Triangulation)	64	13	0.83	T	ICW/CBT Resident Training
30	Determine horizontal sextant angles.	20	57	0.26	NT	
31	Plot the following navigational information:					
31a	Visual fixes.	74	3	0.96	T	Structured OJT ICW/Simulation
31b	Horizontal sextant angles.	16	61	0.21	T	Structured OJT ICW/Simulation
31c	Radar fixes.	74	3	0.96	T	Structured OJT ICW/Simulation
31d	Electronic fixes.	76	1	0.99	OJT	
31e	Dead reckoning position.	74	3	0.96	OJT	
31f	Estimated position.	66	11	0.86	OJT	
31g	Celestial fixes	31	46	0.40	NT	

QUARTERMASTER THIRD CLASS
Job Task Analysis Media Selection Results

Question	Quals	Yes	No	% Yes	Recommend	Media Selection
32	Compute tides and currents using:					
32a	Publications (manually)	63	14	0.82	JA/T	ICW Resident Training
3 2 b	Computer-based calculations	41	36	0.53	OJT	
32c	Media	7	70	0.09	NT	
33	Determine ship's speed of advance and speed over ground using:					
33a	"Time, speed, and distance calculations."	72	5	0.94	T	ICWKBT Resident Training
33b	Electronic calculations.	67	10	0.87	OJT	
34	Prepare a chart for use in restricted waters using:					
34a	Tracklines	68	9	0.88	T	ICWKBT Resident Training
34b	Waypoints	66	11	0.86	T	ICWKBT Resident Training
34c	Gazetteer points	56	21	0.73	T	ICWKBT Resident Training
34d	Shoaling	70	7	0.91	OJT	
34e	Advance and transfer (using ship's tactical data)	60	17	0.78	T	ICW/CBT Resident Training
34f	Turn bearings and ranges	69	8	0.90	T	ICW/CBT Resident Training
C34g	Danger bearings and-ranges.	68	9	0.88	T	ICWKBT Resident Training
D	OPERATIONAL AND PREVENTIVE MAINTENANCE					
35	Clean and properly stow the following equipment:					
35a	Azimuth circle	51	26	0.66	NT	
35b	Bearing circle	47	30	0.61	NT	
35c	Alidade	73	4	0.95	OJT	
35d	Sextant	46	31	0.60	NT	
35e	Binoculars	73	4	0.95	OJT	
35f	Stadimeter	25	52	0.32	NT	
35g	Signal lights	38	39	0.49	OJT	
E	WATCHSTANDING					
36	Render passing honors	53	24	0.69	NT	
37	Recognize naval and merchant flags of principal maritime nations.	49	28	0.64	JA/T	CBT ICW
38 .	Recognize the following personal flags and pennants:					
38a	Coast Guard Flag Officers	66	11	0.86	NT	
38b	Broad and burgee pennants.	24	53	0.31	NT	
39	Perform duties as helmsman:					
39a	At sea	46	31	0.60	T	Structured OJT
39b	In restricted waters	46	31	0.60	T	Structured OJT
39c	During steering casualties	43	34	0.56	T	Structured OJT
39d	During underway replenishment	17	60	0.22	T	Structured OJT

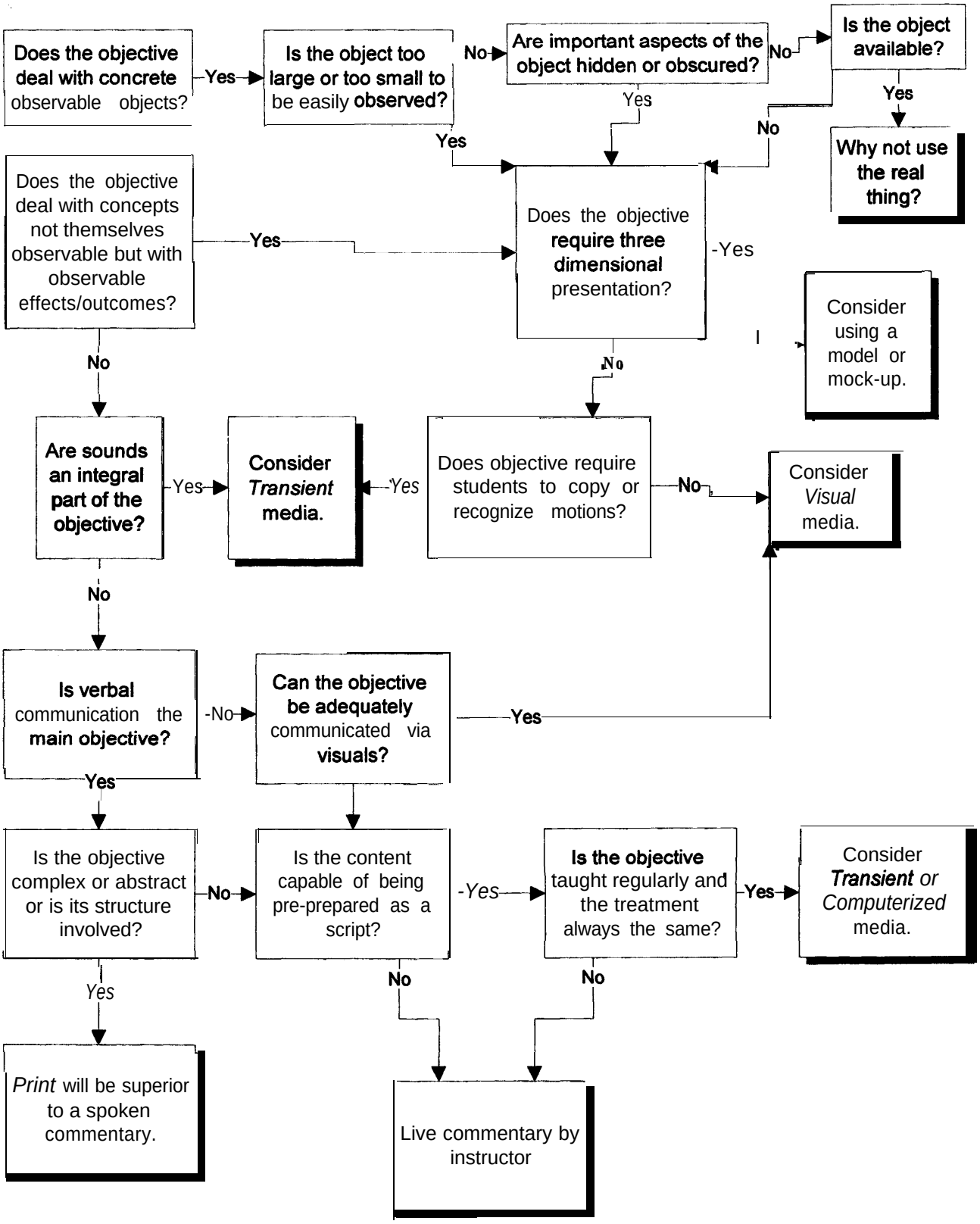
Attachment 3

QUARTERMASTER THIRD CLASS
Job Task Analysis Media Selection Results

Question	Quals	Yes	No	% Yes	Recommend	Media Selection
39e	During flight operations	22	55	0.29	T	Structured OJT
40	Wind and compare chronometers daily at the proper time and make appropriate report.	37	40	0.48	NT	
41	Make bridge preparations for getting the ship underway and entering port.	77		1.00	T	Simulation/ICW Video w/ workbook
42	Solve basic maneuvering board problems for:					
42a	Course and speed	48	29	0.62	JA/T	ICW Resident Training
42b	Time of Closest Point of Approach (CPA)	48	29	0.62	JA/T	ICW Resident Training
42c	Distance of CPA	46	31	0.60	JA/T	ICW Resident Training
42d	Bearing to CPA	44	33	0.57	JA/T	ICW Resident Training
42e	True wind.	65	12	0.84	T	ICW Resident Training
42f	Desired wind	36	41	0.47	T	ICW Resident Training
42g	Intercept and avoidance	38	39	0.49	JA/T	ICW Resident Training
42h	Set and drift calculations	43	34	0.56	T	ICW Resident Training
43	Maintain unit logs (CG-4380 series).	77		1.00	T	ICW/CBT Video w/ workbook
44	Maintain a navigational plot in unrestricted waters for a minimum of eight (8) fixes.	71	6	0.92	T	ICW/CBT Resident Training
45	Perform the following tasks in restricted waters during navigational detail:					
45a	Bearing taker	50	27	0.65	T	ICW/Simulation Resident Training
45b	Recorder	58	19	0.75	T	ICW/Simulation Resident Training
45c	Radar operator	55	22	0.71	T	Structured OJT ICW/Simulation
45d	Plotter	67	10	0.87	T	ICW/CBT Resident Training
45e	Evaluator .	35	42	0.45	T	ICW/Simulation Resident Training
45f	Aft steering	28	49	0.36	T	ICW/Simulation Resident Training
46	Perform a synoptic weather observation and record the data.	42	35	0.55	NT	
47	Prepare a synoptic weather message for transmission.	33	44	0.43	NT	

Question	Quals	Yes	No	% Yes	Recommend	Media Selection
48	Determine compass course and true course by applying the following compass errors:					
48a	Variation	74	3	0.96	T	ICW/CBT Video w/ workbook
48b	Deviation	74	3	0.96	T	ICW/CBT Video w/ workbook
48c	Gyro error	74	3	0.96	T	ICW/CBT Video w/ workbook
49	Demonstrate a working knowledge of the Navigation Rules (COMDTINST M16672.2B).	74	3	0.96	T	ICW/CBT Video w/ workbook
F	AIDS TO NAVIGATION					
50	Demonstrate a working knowledge of the following buoyage systems:					
50a	IALA A	40	37	0.52	JA/T	ICW/CBT Video w/ workbook
50b	IALA B	68	9	0.88	T	ICW/CBT Video w/ workbook
50c	Western Rivers	7	70	0.09	NT	
50d	Uniform State Waterway Marking System (USWMS)	1	76	0.01	NT	
50e	Atlantic Intracoastal Waterway (AICW)	22	55	0.29	JA/T	ICW/CBT Video w/ workbook
51	Compute the distance of visibility of a light by:					
51a	Nominal range	40	37	0.52	NT	
51b	Geographical range	34	43	0.44	NT	
51c	Luminous range	37	40	0.48	NT	
52	Demonstrate a working knowledge of the characteristics of aids to navigation found in the IALA B buoyage system including non-lateral aids.	63	14	0.82	JA/T	ICW/CBT Video w/ workbook

Supporting Media Selection Assistance Chart



Chapter 15: Conduct Job Aid Analysis

What Is It?

On-the-job performance depends on our people being able to access the information they need to do their work accurately and in a timely fashion. One intervention we provide to our people to give them this critical information is training.

However, adult learning theory tells us that much repetition and practice are needed for students to memorize new information or procedures. It also tells us that what our students don' t use, they lose. Thus, if we expect our students to memorize everything new we teach them, we would have to add days and weeks onto our training courses--or monumental amounts of information to our distance learning interventions. Once students returned to the field and didn' t use all the new information right away, learning decay would set in. That would create a need for students to be retrained in refresher courses. You know the Coast Guard can' t afford that approach!

There is another way of ensuring our people have the critical information they need to perform well on the job. We can provide them with job aids (i.e., memory joggers). Fortunately, the HPT FEA processes we use and our JTA results help us determine which of our tasks should be trained and which should be job-aided.

Job aids are a type of performance support. Some of the different types of job aids are:

- Algorithms
- Decision tables
- Maintenance manuals
- Procedure tables
- EPSSs that combine the features of various job aid formats with some training information
- Print (paper-based) job aids
- Electronic job aids such as Microsoft Office Help systems.

What Is It? (continued)

One of the prime influences on how well people perform is the presence--or absence!--of job aids. For example, workers expected to change out an engine--a very complicated task with many steps which they do very seldom--will show very different rates of performance depending on whether they are expected to access the task steps from memory or are given a job aid.

Instead of having our students memorize all the new or complicated information and procedures they need to use, we can decide to store that data in a job aid.

Job aid analysis helps us figure out if we should job aid tasks (as opposed to training them to memory) and if we need introductory or extensive training to support students who are learning how to use those job aids.

Thus, job aid analysis is a two-step process.

Step 1: Determine if the job aid can stand alone (no training) or if the task calls for:

- **Job aid with introductory training** (introduce what the job aid will be used for, demonstrate it, and then let students practice it) or

- **Job aid with extensive training** (same steps as above, but several repeats of the demonstration, and many more review and practice exercises).

Step 2: Use task information gathered during FEA to decide if is appropriate to job aid a particular task.

Step 2 may surprise you. If you' ve conducted an FEA or JTA or are looking at the results of those efforts, don' t you already know that a specific task should be job-aided?

What Is It? (continued)

Yes and no. Yes, because analysis has identified specific tasks as good candidates for job aids. No, because there are some constraints to using job aids. For example, maybe you' re in a very tight and dark space and couldn' t access or see a job aid, even if you had one. You should try to develop "work-arounds" to those types of situations where job aid use is constrained, but sometimes "work-arounds" just won' t do the trick.

In a case such as that, you will decide to train the task to memory rather than converting it to a job aid.

One final thought. The decision whether to convert information to a job aid or to train the task to memory is a very important one.

When we decide to train a task to memory, we have to be aware of this method' s limitations:

- All the information the student receives is NOT stored in long-term memory.
- We must have the student repeat the task over and over if we expect him or her to store it in long term memory.
- Learning decay is always a problem. If the student doesn' t use the information shortly after returning to the field, he or she will lose it.
- In the TRACEN-environment, students tend to retain information only long enough to take a test or to perform the task for the first time under supervision.

Once you think about these facts, you can see that it makes sense to store the majority of task information in job aids. You can also see that the best training program design will depend on job aids for its foundational documents. A training program designed around job aids can use them as training aids for demonstrating and practicing the tasks required to do the job being trained.

What Is It? (continued)

NOTE: We use HPT' s ABCD process as our method for performing job aid analysis. Since the ABCD process is proprietary, we can only give you an overview of the process. You will have to attend ABCD training to receive the job aids required to conduct job aid analysis or ask another member of your TRACEN who has already been trained to do the task for you. You can also learn the same information in HPT' s Job Aid Workshop (JAWS).

How Do I Conduct a Job Aid Analysis?

You use the tools provided in the ABCD process, and you follow its job aids, step-by-step.

NOTE: The tools (job aids) and worksheets used in job aid analysis are part of HPT' s ABCD or JAWS, proprietary systems. You must either take training to obtain your own copies of these materials, or ask someone in training division or PTC who has already had training to help you.

NOTE: If the audit trail shows that an HPT type (Harless) FEA has already been done, there is less work to do. That FEA methodology includes some of the work required for a job aid analysis:

- Using your audit trail information, look at the list of tasks in the FEA report. Do they say "job aid, or job aid with introductory training, or job aid with extensive training, or no training"? If they do, part of the job aid analysis has already been done.

How Long Will It Take?

Not long. If your course only covers a few tasks, job aid analysis may take only an hour. If you have many tasks, it may take longer, but don' t plan on spending much more than half a day or a day on the task.

What Will I Get Out of It?

You will get exactly the information you need to have **BEFORE** you design a course:

- A list of filtered tasks that tells you what parts of the course should be job aids only, which should be training only and which should be job aids with training. You also identify how much training each of these job aids will require ("introductory" or "extensive" training)

- A list of tasks that appeared to be good candidates for job aids, but which, in fact, will not make good job aids.

Why and When Do I Do a Job Aid Analysis?

Why:

You do job aid analysis for four reasons:

- Doing a job aid analysis tells you how much training only, job aids with no training, and job aids with training you' re going to have to do.

- Job aid analysis tells you whether your job aid will require extensive training or only introductory training.

- Putting tasks through the job aid filter "filters out" those tasks which should not be job-aided.

- Putting tasks through the job aid filter lets you brainstorm ways in which job aid constraints might be overcome.

All this information is critical to your design work.

When:

You conduct job aid analysis before you design a training program.

What Is My Role?

You may not have a role. If the job aid analysis has already been done, all you have to do is use its results in your design work.

If no job aid analysis has been done, your role will be to conduct a job aid analysis.

Who Can Help Me?

Job aid analysis is an easy task, but there is always help if you have never received training in how to go about this task, or if there is something you don' t understand.

At TRACEN Yorktown, training division and PTC have several people who have been trained in ABCD and JAWS methodologies. Our other TRACENs also have people trained in these methodologies.

What is the Process for Getting Started?

This task should be done **BEFORE** you design a performance intervention. Triggers for performing job aid analysis are:

- It' s time to do design work and there isno evidence of job aid analysis in the audit trail.
- You' re looking at a JTA that was previously done and you want to determine if those tasks tagged as job aids are really suited to be job aids.
- You are revising a resident course levels 1, 2, and 3 evaluations indicate students need more extensive training on some of the tasks designated as job aids.
- You want to learn more about the ABCD methodology and find out why some job aids get introductory training, others get extensive training, and some no training at all. You want to understand, for yourself, how it all works.

Job Aid Analysis Job Aid

The HPT-owned ABCD and JAWS tools required to do a job aid analysis are proprietary (copy-righted). That means you must do one of two things to use them:

- Obtain ABCD and JAWS training. As part of that training, you will receive your own set of tools for conducting FEAs, designing and developing training programs, and for designing and developing job aids.

- Get help from a PTC or training division consultant. People who have already taken ABCD and JAWS training have these tools and can help you conduct a job aid analysis.

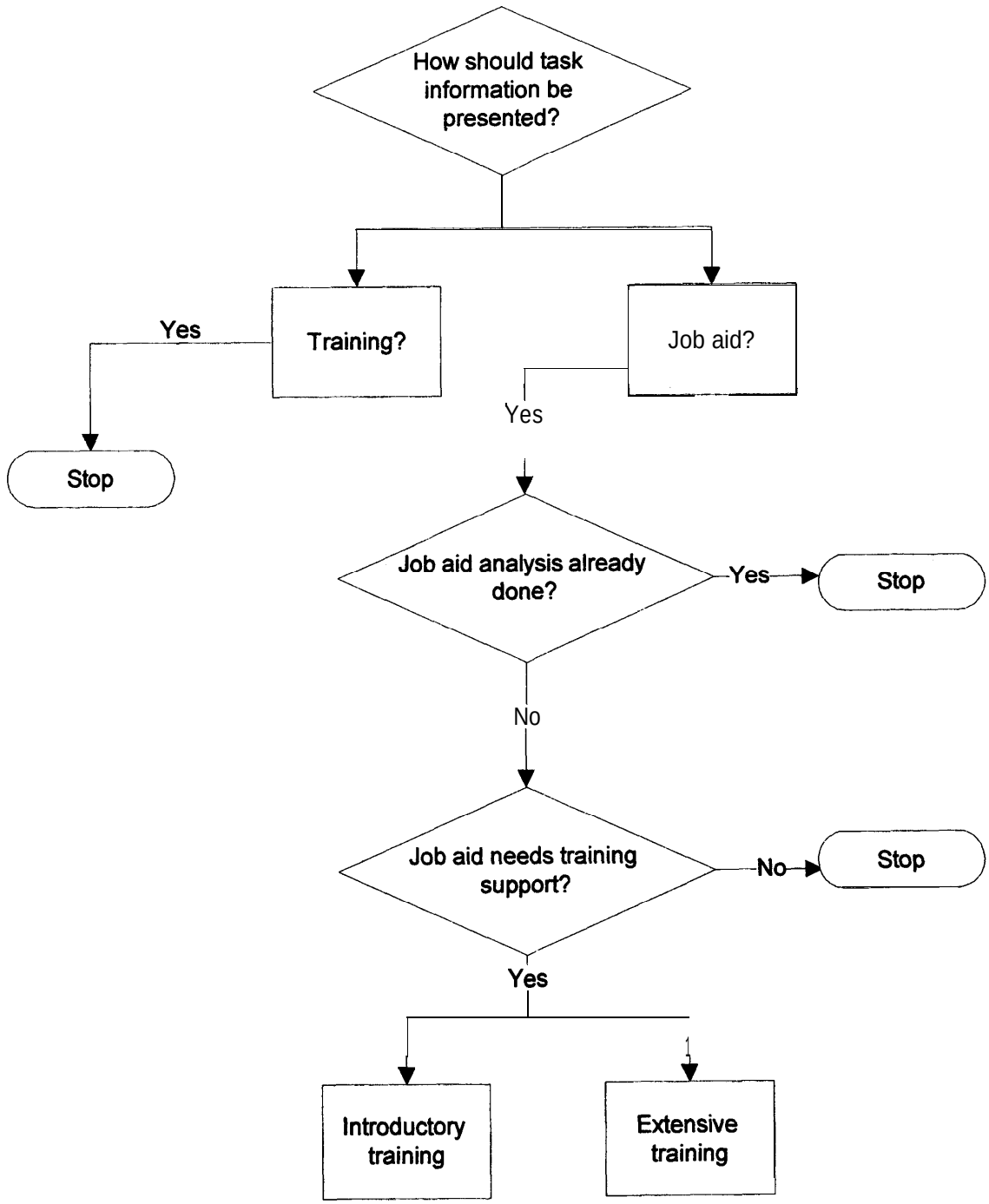
The steps required to conduct a job aid analysis are:

Step 1: Determine if the task should be delivered via training or through a job aid.
Step 2: Check the audit trail to see if job aid analysis has already been done. If there is no evidence of job aid analysis work, proceed to Step 3.

Step 3: Determine any training support the job aid will need (if the job aid can stand alone (no training) or if it requires introductory or extensive training).

NOTE: The terms "introductory" and "extensive" training are explained in the ABCD process.

Conduct Job Aid Analysis Job Aid



MARINE SAFETY BRANCH JOB AID ANALYSIS WORKSHEET FOR _____

Team Leader: _____ **Worksheet Completed By:** _____

Page _____ **of** _____ **Date:** _____

Task #	Task Code			Is Job aid Required by Policy or Reg.?		Speed at which task is performed			Are there physical barriers?		Are there social barriers?		Frequency is a:		Consequences of error:				Is the task likely to change?		DECISION		
	Importance	Difficulty	Frequency	Yes	No	Critical	Important	Not Important	Yes	No	Yes	No	6, 5, 4 High	3, 2, 1 Low	Devastating	High	Moderate	Low	Yes	No	Training Only	Job Aid Only	*Job Aid with Training

*Job Aid with Training

Chapter 16: Conduct Off-the-Shelf (OTS) Search

What Is It?

An off-the-shelf (OTS) search is a critical step you take **before** you design resident courseware or alternative deliveries. The principle is very simple. All you are really doing is researching products that have already been developed. If such products will work for the instruction you plan to design, you don't want to reinvent the wheel by developing the same products yourself. Also, you want to make sure your instruction is as interesting as possible. Adult learning theory tells us that the more senses (sight, hearing, touching, etc.) you engage, the greater the impact your training will have on the learner. Therefore, you want to research what commercially or government produced products are out there so you can take advantage of them.

There are two types of OTS searches:

- **Commercial-off-the-shelf (COTS)--**a search for products developed by private industry. COTS products can be pricey, but don't discard them. Often, businesses will be willing to "cut you a deal" to develop a business relationship with the Coast Guard or to gain users and advertising for their products.

- **Government-off-the-shelf (GOTS)--**a search of products developed by Federal agencies. These products are often "free" to other agency users.

Therefore, an OTS search just means thoroughly researching courseware, static, and interactive media (IM) products that have already been produced to see if they have good application to the training you're developing.

What Is It? (continued)

Part of a good COTS or GOTS search is evaluation. You don't want to buy something that won't work for Coast Guard training, so you'll want to try out these products and evaluate them with an audience similar to the students who will actually use them. If the products work and achieve the desired result, if the cost is right, and if you can fit such products into your larger training design, you will probably have saved yourself some significant money.

How Do I Conduct an OTS Search?

At one time, such research might have been quite difficult to accomplish and might have taken many hours to complete.

Today, thanks to the wonders of technology, an OTS search can be completed relatively easily and quickly.

For the commercial side of the house:

- Use the internet and search for IM training products that cover particular subjects or tasks.
- Look in trade and professional magazines such as "Training" for advertisements from companies who produce training products. You can respond to promising advertisements by e-mailing or calling to see if the companies have anything you can use.

For the government side of the house:

- Use the internet to research the Navy's Shipboard Training Enhancement Program (STEP) catalog.
- Look at the Naval Education and Training Professional Development and Technology Center (NETPDTC) web site.

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For the government side of the house:

- Use the internet to research the Navy' s Shipboard Training Enhancement Program (STEP) catalog.

- Look at the Naval Education and Training Professional Development and Technology Center (NETPDTC) web site.

- Take a look at the products listed on the Defense Automated Visual Information System (DAVIS) and Defense Instructional Technology Information System (DITIS) databases. These systems provide information on the thousands of audio-visual (AV) and interactive multimedia instruction (IMI) products currently available from Department of Defense (DOD). Although primarily developed to support DOD, the DAVIS or DITIS site is open to the general public and other federal agencies. To request copies, you coordinate with the National Audiovisual Center.

How Do I Conduct an OTS Search? (continued)

- Check the DAVIS or DITIS web site for more details on how to order copies of these products. Some of the products may have copyright or security restrictions, limiting who can view or duplicate products. The web site will tell you what restrictions apply.

PTC has created a tool that will help you go through the steps required for an OTS search. This document will also serve as an audit trail to capture the results of your search.

How Long Will It Take?

In one sense, an OTS search, like housework, is never really "done." For best results:

- Spend about a week doing an initial search.
- Start contacting commercial businesses or going through the steps to acquire a GOTS product.
- Coordinate events at which businesses can demonstrate their products or review sample products you' ve obtained. This part of the search can be time-consuming, since you have to coordinate demos and then work the timing for demos into your work schedule.
- Make arrangements with the company to have instructors or students do further evaluation on the products. Evaluation is also a very time-consuming and resource-intensive part of an OTS search.

Jointly with our other TRACENs, PTC has developed an Interactive Courseware (ICW) Standards & Styles Guide. This document is part of COMDTINST 1554.1 for developing ICW for the Coast Guard. Appendix A to this guide is a Commercial-Government ICW "Off-the-Shelf" Source Check. This tool will take you through the steps required to conduct an OTS search.

How Long Will It Take? (continued)

When you' ve finished all of those steps, are you done? You' re done for the time-being, but technology changes very quickly, and our system for getting funding for a large purchase is much slower. So, you will want to do a final, very focused COTS and GOTS search just before you buy products. The price may have gone down, or up! Products that didn' t initially work on Windows NT may now be compatible. Before you spend your money, it' s wise to do one final and focused COTS and GOTS search. At the end of this chapter, a Commercial and Government Off-the-Shelf (COTS/GOTS) MK "A" Product Search Results is provided as an example report.

What Will I Get Out of It?

An excellent example of what you can get out of a COTS and GOTS search is TRACEN Yorktown' s current Fire Technician "A" School. At one time, the Coast Guard sent its FT students to the Navy' s school. That school was extremely long. The Coast Guard gained initial cost savings by moving FT "A" School training to TRACEN Yorktown. By training only CG-specific tasks, the resulting school was shortened by many months.

Still, this "chalk and talk" school was quite difficult. Some students simply didn' t fully grasp electronic theory when it was delivered in a "chalk and talk" mode.

In 1995, the school began to talk to NIDA, a company that sold trainers equipped with computer-assisted instruction. The FT School bought and installed that equipment, and the new, much more effective and efficient FT "A" School was born. NIDA supplied all the hard and software, including tests, and a course and student management program. Since the advent of computer-assisted (NIDA trainer) instruction, few students in the FT "A" School ever face rephasal or disenrollment from the course. Electronics is much easier to learn in a computer-assisted, self-paced mode.

What Will I Get Out of It? (continued)

By examining a commercially produced trainer and associated products, the FT School was able to:

- Take advantage of a one-stop-shop company with cutting edge experience in delivering electronic and electrical training to the military and private sector businesses.
- Avoid in-house or contractor development of costly training.
- Start a trend which has quickly spread to other schools who train electronics & electricity (EMs, GMs).

But, one note of caution for OTS products. Take a look at the "**Other Questions/Issues to Consider**" page of the Commercial-Government ICW "Off-the-Shelf" Source Check. There can be a down side to buying COTS products. When you' re evaluating products, be sure you consider issues such as:

- Compatibility with SWSIII and Windows NT.
- Life-cycle costs and management concerns.
- Whether the product has a course management system component (tracks student performance).
- Whether the course can or cannot be modified.
- Usability issues (how well it matches CG objectives, does it over-train/under-train?).
- Is there an area for students to take notes (bookmarks)?
- Other issues.

Faithfully following all those steps will ensure that the COTS or GOTS products you choose are beneficial to Coast Guard training.

Why and When Do I Conduct an OTS Search?

Why:

If we had the time, it would make sense to do an OTS search for every Coast Guard training program we have. However, since we probably don' t have time to do that, it is most critical to do a search when you are considering converting an expensive resident course to an alternative delivery.

Why and When Do I Conduct an OTS Search? (continued)

You can save a great deal of money, over time, from such a conversion. However, if products already exist, and you can get them free (GOTS products) or fairly cheaply (COTS products), you may find that procuring such programs makes more financial sense than developing a whole new training program.

When:

This is particularly true if you are looking for core training modules for subjects that have wide application in both the military and civilian sectors. For example, suppose you have a need to teach basic hydraulics. Many industries have a need to teach the same material. All of the military services train hydraulics. So rather than developing a Coast Guard-specific IM product, you may find it smarter and cheaper to look for what is already out there.

You can easily see how this would work. If you put together a plan to develop IM training for part of a long "A" School, the cost of developing that training will be high indeed. When you make your proposal for funding, the first question your stakeholders will ask is: "What' s out there already? Could we use any of it?"

You answer those questions, in advance of requesting funding, when you do an OTS search.

Other triggers for doing an OTS search are:

- AV materials are out of date.
- Level 1 evaluations: student critiques say the "class is very boring, and needs to be made more interesting!"
- Going to a trade show or conference and seeing a really interesting company or great and affordable products or technologies.

Conduct Off-the-Shelf (OTS) Search

What Is My Role?

You are the subject matter expert (SME) instructor or course developer.

In those roles, you are likely to:

- Routinely conduct OTS searches.
- Review the results of other OTS searches.
- Conduct a focused OTS search to update former OTS searches.
- Conduct SME (content or familiarity with student needs) evaluation of OTS products.
- Coordinate demos of promising OTS demos.
- Work excellent OTS products into your course designs.
- Be on the lookout for a company like NIDA that sells a one-stop course: design all done, tests and materials all developed, student management and course tracking system already built in.
- Review workable OTS products to see where they need to be updated, upgraded or downgraded or modified.

Who Can Help Me?

Your shipmates who are instructors or course developers may have done an OTS search. They can help you.

PTC, TRACEN Yorktown staff and other TRACEN staffs have done several OTS searches to research products for FEAs, JTAs and design and development work they' re asked to perform. They can help you.

You may not need help. It' s a routine "research-coordinate demos-evaluate" job. The ICW Standards & Styles Guide has everything you need. If you've got a computer with internet access, you can begin an OTS search, right after reading this SOP.

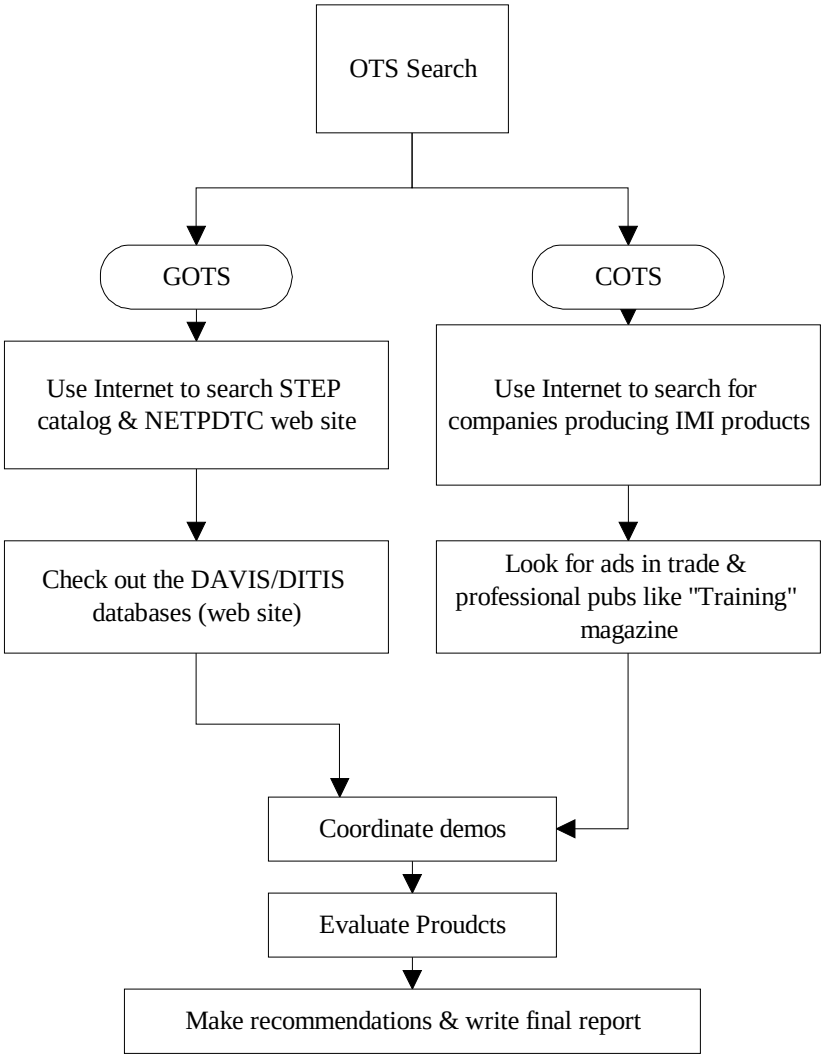
What Is the Process for Getting Started?

You don' t need any special permission or coordination. If you think it needs to be done, add it to the continuing work of course internal evaluation. When you get to the "demo" stage, be sure your supervisor knows. Those demos take away from usual work time, so you want to be sure everybody who might benefit gets invited.

Conduct Off-the-Shelf (OTS) Search

What Is the Process for Getting Started? (continued)	As a courtesy to those who follow you and to help the command, make sure you maintain that audit trail, and pass your findings up the chain. You may just be the one who saves the Coast Guard a significant amount of money!
OTS Job Aid	The steps for an OTS search are outlined in Appendix A of the Coast Guard' s ICW Standards & Style Guide found at the end of this chapter. Also see the OTS Search Flowchart.

Conduct Off-the-Shelf Search



Appendix A

Commercial-Government ICW "Off-the Shelf' Source Check

Overview. Subject matter experts (SMEs) and interactive courseware (ICW) developers will use this checksheet to document ICW product searches. Completed sheets provide evaluators with an overview of the sources and areas examined to try and meet a particular training need. Any supporting documents should be attached.

An an evaluator, your opinions are important! Please comment on any item you feel is important or isn't adequately covered by this questionnaire. Call the Alternative Development and Delivery Branch, Performance Technology Center, Yorktown at (757) 898-2016 if you have questions.

Need Info. What need/course are you trying to fill? _____

_____

_____

_____

Target Audience. Who is your target audience? _____

_____

_____

_____

Source Info. Where did you look and what were the results?
(Some sample sources are shown.)

Source	Contact Info	Results/Recommendations/ Available for trial review?	Cost
STEP Catalog	CD-ROM or www.cnet.navy.mil/netpdtc/step/stepcat.htm		
NETPDTC ICW	CD-ROM or www.cnet.navy.mil/netpdtc/icw.html		
Davis Search			
Ditis Search			

SME Review. Did a subject matter expert review the proposed fill?

Product	SOURCE	SME/ICW	Recommendation

. Detailed Product Review Results (complete for likely fill candidate)

Course Name/Title: _____

Product Type (e.g., CBT/CBI, online course): _____

Interactivity (graphics, animation, fidelity): High, Medium, Low: _____

_____

Min. System Requirements: _____

Predominant Instructional Strategies:

Drill & Practice: _____

Tutorial: _____

Gaming: _____

Simulation: _____

Case study: _____

Problem analysis: _____

Other: _____

SME Review Section: Please answer each of the questions as they relate to the product you are evaluating. Indicate those questions you are unable to answer. Those questions can be addressed by an ICW developer as the checklist is completed.

Course Structure:	**Yes**	**No**	**NIA**
Start-up			
1. The course self-boots.	____	____	____
2. The course includes boot-up instructions.	____	____	____
3. Students register to use the product.	____	____	____
4. Students log on each time they use the course.	____	____	____
5. If #4 is yes then how does the course track student & course data?			
Course ID Number? _____			
Class ID Number? _____			
Trainee Log-on Data (e.g., name, SSN, password)? _____			
Date screen? _____			
Other? _____			
6. First-time students receive a course/navigation overview	____	____	____
7. Course overview is optional for returning students.	____	____	____
8. Students can repeat the overview if desired.	____	____	____
Pretest			
9. The course includes a pretest.	-	-	____
If yes, complete questions 10 - 18			
10. Each lesson/module of the course includes a pretest.	____	-	-
If yes does the student receive the results?	-	-	
11. Students can skip the pretest and move straight to the lesson/module.	-	-	____
12. Pretest results determine a student's track through the lesson/module.	____	-	-
13. A certain score allows the student to bypass the lesson/module.	____	-	-
If yes, what percentage allows bypass?_____			
14. Students only take the pretest once.	____	-	-
15. Pretest scores are stored in a unique student data file.	____	-	-
If yes, are they recoverable and how?_____			
16. Students receive pretest instructions (e.g., #questions, time allowed).	-	-	____
17. Students do not receive remediation or help during the pretest.	-	-	____
18. Students can review missed questions.	-	-	____
Lesson Start.			
19. Lesson start has an automatic (i.e., timed) start.	____	-	-
20. The introductory lesson has a manual (i.e., key press) start.	-	-	____

Course Structure (cont'd):	**Yes**	**No**	**N/A**
Demo&rations			
21. Does lesson provide demonstrations?			
If yes to #21 answer questions 222-26			
22. Demonstrations are optional.			
23. Demonstrations cover small increments of instruction.			
24. Small demonstrations are "linked" together or form logical progressions.			
25. Demonstrations require student interaction.			
26. The student can pause, repeat, or skip demonstrations.			
Simulations			
27. The simulation accurately and realistically mimics the procedure/ equipment(e.g., steps aren't skipped, are realistic, properly timed).			
28. It contains information not included in the technical data (i.e., when/why to perform the procedure).			
29. Simulations are directly tied to the enabling/terminal objectives.			
30. The simulation is a mandatory lesson item.			
31. The simulation enables the student to practice to proficiency.			
32. Auto-prompted simulations are tailored to the student.			
33. Sufficient interim summaries and transitional material is included.			
34. Simulations are used to reinforce other learning activities.			
35. Simulations are stand-alone activities and not tied to other learning activities.			
36. Simulations are used for testing purposes.			
37. The simulation incorporates appropriate feedback and remediation.			
38. Helps, hints, prompts are provided based on student activity/action.			
Practice			
39. Practice provided until the student demonstrates required proficiency.			
40. Simple repetition of the simulation is not used for practice.			
41. Practice is directly tied/relevant to the enabling or terminal objectives.			
42. Practice is timely/appropriate to the student's learning activity.			
43. Practice questions and activities are sequenced from easy to difficult.			
44. The program can branch the student to additional learning activities based on practice results.			

Course Structure (cont'd):	**Yes**	**No**	**N/A**
Progress Tests			
45. Each lesson/module includes at least one progress test.	-	-	-
If yes, are progress tests unlimited?	____	____	____
46. Test/progress check questions are not repeated for the same student.	-	-	-
47. Different test questions/activities are used in the pretest and progress tests.	____	____	____
48. The program provides tailored feedback based on progress test results.	-	-	-
49. Additional training, practice and, if appropriate, outside references/sources are provided to the student as feedback.	____	____	____
50. Results can be correlated to the applicable lesson/module, and answers are stored in a test/student specific file and are recoverable.	____	____	____
5 1. Subject matter hints are not provided during the progress test.	____	____	____
52. Students receive feedback on their answers (correct/incorrect).	____	____	____
53. Students are provided with review/remediation based on test results.	____	____	____
54. Students and administrators can receive hard-copy progress test results.	____	____	____
Post-Test			
55. Each lesson/module has a stand-alone post-test.	____	____	____
56. Test questions, exercises, and simulations are similar in content/ format to earlier learning activities.	____	____	____
57. Test questions, exercises, and simulations are randomly generated.	____	____	____
58. Post-test attempts are limited.	____	____	____
If yes, how many? _____			
59. Scores and student test data are included in recoverable test files.	____	____	____
If yes, what data is included? _____			
60. Students are provided with test performance feedback (e.g., # right/wrong).	____	____	____
61. Students are provided with remediation, lesson repeat, or recommendations for other study/help based on their test results.	____	____	____

Course Structure (cont'd):	**Yes**	**No**	**N/A**
Critique			
62 The course includes a student critique.	____	____	____
63 Students can rate content, design, navigation, and other course elements.	____	____	____
64 Student responses, progress/test data, task data, etc. are available for recovery and analysis.	____	____	____

Course Design

65. The course is designed to run on platforms available to the intended audience.	____	____	____
66. Course is consistent throughout in appearance and operation.	____	____	____
67. The course includes easy to use (based on intended audience/platform) bookmarks and clean entrance/exits.	____	____	____
68. Exit and entry points are **frequently** included.	____	____	____
69. Needless repetition is minimized.	____	____	____
70. The course will bookmark and close out if **left** unattended. If yes, what is the waiting period? _____	____	____	____
7 1 . Students can skip, pause, and/or restart video sequences, animation, or other timed series of stills/motions.	____	____	____
72. Student review is included throughout the lesson.	____	____	____
73. Students can easily navigate throughout the modules after mandatory sections are complete. If no, is there a reason to limit movement? _____	____	____	____
74. Unless part of a core performance objective, students retain control regarding movement between screens.	____	____	____
75. Icons and interaction buttons are always active or change in appearance to indicate inactivity.	____	____	____
76. The course is logically organized and structured.	____	____	____
77. Students are given an overall macro view of the course (i.e., total modules).	____	____	____
78. Students are provided with typical lesson/module completion times (i.e., total modules).	____	____	____
79. Students receive a listing/organizer of each module's lessons.	____	____	____
80. Each module contains a summary screen.	____	____	____
8 1 . Control lockout feedback is provided.	____	____	____
82. Mandatory sections and their sequence are clearly indicated.	____	____	____

Course Structure (cont'd):	**Yes**	**No**	**N/A**
Menus			
83. Menus are concise, logical, and easy to use.	_	_	____
84. Course is menu driven.	____	____	____
85. Menus reflect only those options currently available to the student via color coding, shading or some other readily apparent indicator.	_	_	_
86. Menus provide a means of cleanly exiting the course.	_	_	_
87. Menu options do not function at cross-purposes to same function icons/buttons (i.e., if a move forward icon is locked out, the move forward menu item would also be locked out).	_	_	_
88. Sub-menus permit movement to higher menus.	_	_	_
89. Confirmation and feedback regarding option selections is provided.	____	____	____
90. Titles are used on all menu screens, main and sub.	_	_	____
91. Status symbols/checks are used to show students completed lessons.	____	____	____
92. Symbols/checks are used to show students mandatory/optional lessons.	_	_	____
93. Tags or indicators coupled to feedback are used to indicate recommended paths.	_	_	_
Help			
94. "Tool-Tip" type help is available at the lesson/screen level.	____	____	____
95. "Balloon Help" is available at the lesson/screen level.	____	____	____
96. "Hyperlinked" help is available at the lesson/screen level.	____	_	_
97. Appropriate help lockouts are included during testing sections.	____	____	____
98. Help menus/sections are intuitive, easy to access, and appropriate for the intended audience.	_	_	____
99. Consistent methods for obtaining help are used throughout the module.	_	_	____
100. **Exiting** help returns the students to the exact point in the course where they initiated the request for help.	_	_	____
101. **Help** information is relevant, correct, and complete.	_	_	_
102. **Help** includes links to varying levels of information (e.g., task specific to in-depth background information).	_	_	____
103. **Help** areas can be displayed adjacent to or in conjunction with the lesson screen.	_	_	____
104. **Help** areas are customizable and include bookmarks.	_	_	____
105. **Help** areas includes a search engine for word/phrase/topic searches.	____	_	_

Course Structure (cont'd):	**Yes**	**No**	**N/A**
Motivation Factors			
106. **Course** material is relevant to the stated objectives.	___	___	___
107. **Course** material is relevant to the target audience.	___	___	___
If yes, is it relevant by job/billet, rate, pay-grade, or other descriptors (i.e., age, education)? ___ ___ _____ ___			
108. **Course** modules/lessons are short enough for students to perceive progress (typically 20-30 minutes)., Typical course module length is: _____	___	___	___
109. **Course** modules/lessons are short **enough** for the student to easily exit and return to the same module/lesson.	___	___	___
1 10. **Course** is challenging for target audience, but not overwhelming.	___	___	___
111 Course offers the student **frequent** opportunities for success.	___	___	___
112. **Course** avoids repeating material already known to target audience.	___	___	___
113. **Background** material, suggestions, or directions are available for students who need additional **help/refresher** training.	___	___	___
114. **Varying** touchpoints and interactions are used to engage the student's interest and focus attention. The program avoids **frequent** "touch to to continue" or "next" interactions.	___	___	___
115. **If** used, **humor** is professional and appropriate to the target audience.	___	___	___
Audio			
116. **Sound,** if present, complements the text/visuals.	___	___	___
117. **Visuals** illustrate or reinforce sounds.	___	___	___
118. **Key** words and phrases stand out in the audio string.	___	___	___
119. **Complex** issues are simplified.	___	___	___
120. **Audio** does not include extraneous information, unwanted sounds, or inappropriate pauses.	___	___	___
12 1 . **Volume,** pace, tone, and voice changes are appropriate.	___	___	___
122. **Narration** is attractive, credible, and engaging.	___	___	___
123. **Music** and background do not compete/conflict with narration for the student's attention.	___	___	___
124. **Music,** is used, sets the proper tone for the presentation.	___	___	___
125. **Sound** effects are used (e.g., Push Buttons).	___	___	___
If yes, sound effects are consistent and appropriate.	___	___	___

Testing Conventions	**Yes**	**No**	**N/A**
Testing standards and test construction may vary given the test's measurement goals.			
General Standards			
126. **Response** methods are used consistently throughout any given test.	____	____	____
127. **Students** must answer the questions in order of their presentation.	____	____	____
128. **The** program provides visual feedback to indicate which item the student has selected.	-	-	-
129. **The** student can change an answer before it is scored.	____	____	____
130. **There** are enough questions/itemsper learning objective.. The student is informed as to how many questions will be given, the approximate time needed to complete the test, and if any questions re weighted differently.	-	-	-
13 1 . **The** student is given or has the option to select a sample question for practice prior to starting the test.	____	____	____
132. **The** student is shown the results following each test and provided the opportunity to review missed questions.	-	-	-
133. **All** scores are calculated on a 100 point scale.	____	____	____
Test Construction			
134. **Each** question/problem directly relates to a performance objective.	____	____	____
135. **Questions** are concise and clear with no irrelevant words.	____	____	____
136. **There** is only one question per screen unless it is an exercise or simulation (i.e., matching).	____	____	____
137. **Each** question is independent.	____	____	____
138. **Question** address key points. It's not a trivia test.	____	____	____
139. **Safety** related items are tested one time per type of test.	____	____	____
140. **Information** that is on an "optional" track during the program is not tested.	____	____	____
141 . **Test** questions are sequenced so that more difficult questions are toward the end of the test with the exception of randomly generaged test questions.	____	____	____
142. **For** multiple choice, the correct answer position varies.	____	____	____

Feedback and Remediation

143. **Negative** feedback in the form of abuse or ridicule is not used.	____	____	____
144. **Where** possible, feedback or remediation is specific to the action the student is trying to perform.	____	____	____
145. **"Cute"** feedback is not used.	____	____	____
146. **Level** of feedback or remediation compares to the difficulty of the action or question.	____	____	____
147. **Positive** feedback is not given too frequently or for trival accomplishments.	____	____	____
148. **Feedback** and remediation of safety-related actions is given in terms of consequences.	____	____	____
149. **Students** having considerable difficulty with the material receive immediate remediation.	____	____	____
150. **Remediation** is provided throughout all modules other than test.	____	____	____

Design Conventions	**Yes**	**No**	**N/A**
Personnel conventions			
15 1 . **Military** Personnel comply with service dress and appearance. Uniform combinations are correct and consistent throughout the production.	____	____	____
152. **Actors,** role players, and participants use **safe procedures** and comply with directives and all applicable safety rules and regulations	____	____	____
Language Conventions			
153. **The** program (text or narration) uses active voice.	____	____	____
154. **The** program uses inoffensive non-sexist language.	____	____	____
155. **The** tone is clear, concise, and courteous.	____	____	____
156. **The** program used the imperative mode with the subject understood or **implied** to address the student.	____	____	____
157. **Sentences** are short and to the point.	____	____	____
158. **The** program uses affirmative sentence structure whenever possible.	____	____	____
159. **Abbreviations** and technical jargon, if used, are **common** knowledge to the target audience or they are defined in the lesson.	____	____	____
160. **The** program does not use slang or non-technical jargon.	____	____	____
161 . The student can easily look up abbreviations and technical jargon in a glossary or help section. .	____	____	____
162. **New** terms are defined the first time they appear in a module.	____	____	____
163. **Terms** and **definitions** are consistently used throughout the program.	____	____	____
164. **The** program's language is appropriate for the target audience.	____	____	____
165. **Sentences** do not wrap over multiple screens.	____	____	____

ICW Developer Review Section: This section will generally be reviewed by an ICW developer. In addition to the questions in this section, the ICW developer will also look at those questions the SME was unable to answer.

Design Conventions	**Yes**	**No**	**N/A**
Video and Animation Conventions			
166. **Courseware** that requires outside media (i.e., a video clip from a CD-ROM) has a still frame that identifies the media, file, and any other information the student would need to access the media.	___	___	___
167. **Videos,** stills, animation, and other graphics designed to portray equipment do so accurately.	___	___	___
168. **Titles,** captions, or highlights over motion video, with the exception of learner control prompts, are done with video post-production techniques, not the ICW authoring system.	-	-	-
169. **"Fade** to black" and "up **from** black" are used for the end and beginning of linear video segments.	-	-	-
Navigation and Control Conventions			
170. **The** courseware's navigation system is consistent, intuitive, and conforms to the ICW Standards and Style guide.	___	___	___
If no, why? _____			
17 1 *Navigation/interaction icons, buttons, and switches consistently use color, shading, or other visual cues to indicate position/mode.	-	-	-
172. **Icons** are located at the bottom of the student's screen, are consistently placed, and are consistent in their function.	-	-	-
173 . **Tool** tips, balloon help, or other assistance exists to define icon function.	-	-	-
Switches and Control Conventions			
174. **Switch/control** text matches the real equipment as closely as possible.	___	___	___
175 . **Switch/toggle** names, positions, and identifiers are legible.	___	___	___
. *General Conventions*			
176. **Displays** are lean and not overly complicated.	___	___	___
177. **Where** needed, text is used to emphasize the visuals.	___	___	___
178. **Appropriate** headings are used to clarify displays.	___	___	___
179. **Text** or icons are not (normally) stored on video/video stills.	___	___	___
180. **Where** possible, split-screens are used for comparisons.	___	___	___
18 1 . **Changes** between screens are limited to focus on the changed element.	___	___	___
182. **Screens** are systematic, consistent, and logically organized.	___	___	___
183. **Each** screen presents one main point, idea, concept, step, or action.	___	___	___

Design Conventions (cont'd):	Yes	No	N/A
General Conventions			
184. First and last screens within a lesson/module introduce and reinforce key points.			
185. Transition screens are used to move from wide-angle to close-up view.			
186. Transition screens are used when moving from one physical area to another.			
187. Graphics, text, and other media work together to build a mental image/model.			
188. Screens have sufficient "white space" to avoid overcrowding.			
Text Design Conventions			
189. Text follows normal capitalization standards (i.e., text isn't all caps).			
190. Text overlays are displayed on a contrasting color bar or box.			
191. Borders are used around text bars or boxes.			
192. The program uses consistent text format (e.g., font, spacing, color).			
193. Consistent text and background colors differentiate types of screens.			
194. Text is normally displayed within an area as "left justified."			
195. Text is not underlined except to indicate a special characteristic (i.e., an active hyperlink).			
196. Screens are not crowded with too much text. There should be no more than about 10 lines of text per screen.			
197. Font size supports easy reading by the student.			
198. Text columns are sufficiently wide (40-50 characters wide). Text is not in small "news columns" or in overly large columns (approx. 80 characters wide).			
199. Full text screens, bars, or boxes are not overlaid on other text items unless they are Help overlays.			
200. Pop-up text displays located on top of graphics can be removed.			
Text Location Conventions			
201. Navigation text is located at the bottom of the display window or as a pull-down/pop-up menu.			
202. Technical data notes are located in Help, pop-up windows, or as boxes in the upper right band display area.			
203. Safety and Warning text is displayed in Help, pop-up windows, or as boxes in the upper left hand comer of the display window.			
204. Simulations accurately mimic real information displays.			
205. Information text, test questions, and feedback/remediation are located where best possible for the learner to see them without interfering with graphics, navigation text, warnings, or safety notices. Placement should be consistent.			
206. Test questions and answers are differentiated by color, bullets, and/or location.			

Design Conventions (cont'd):	**Yes**	**No**	**N/A**
Color Display Conventions			
207. **The** program does not use solid white, or bright color backgrounds (e.g., yellow, red).	____	____	____
208. **Information** is displayed as white text on a blue/dark background.	____	____	____
209. **Warnings** and incorrect feedback are in red text.	____	____	____
210. **Warnings** and safety notices are prefaced by "WARNING" or "SAFETY".	____	____	____
2 11 .Safety/Caution notices or information is displayed as yellow text on a black/dark background.	____	____	____
2 12. **If** used, navigation text is should be consistent with navigation icons (e.g., color, placement).	____	____	____
2 13. **Standard** color conventions are used for highlighting.	____	____	____
214. **Highlighting** key words in text, captions, switch names, or switch positions is minimized.	____	____	____
2 1 5. **Flashing** text is only used to accurately portray/simulate equipment displays.	-	-	-
Computer-Generated Graphics			
216. **Learner** can control initiating animation sequences or can repeat them.	-	-	-
217. **Computer** graphics are limited to essential areas.	____	____	____
2 18. **The** program uses only essential ornamentation, patterns, or effects.	-	-	-
2 19. **Graphic** files are cropped and stored with associated media in a library for reuse within the program.	-	-	-
220. **Program/program** graphics are designed for run/display using a 256 color palette.	____	____	____
22 1 . **Selected** formats based on program needs are supportable across the organization. Currently SWS III software will support the following raster formats: **(bmp,** tif, **gif,** pcx, jpeg, tga,) as well as vector formats: **(WMF,** CGM, AI, EPS). [AI and EPS require postscript for output capability.)	-	-	-

Areas under development:

Graphics
Language Conventions **completed?**
General and Specific Screen Design Conventions (text, color, highlights)

- Avoid using complimentary colors together (i.e., yellow text on top of green background or red text on top of blue background)

Testing Conventions **completed?**
Feedback and Remediation
Authoring **should be primarily Authorware**
Modifications
Platform Limitations/Variables

- Will the product run correctly on the SWSIII hardware/software?

Other questions/issues to consider

Lesson remediation (e.g., automatic, variable, # tries)? _____

Lesson branching? _____

Lesson refresher (i.e., trainee elective)? _____

Lesson assignment (i.e., progression based on testing)? _____

Data Recovery (e.g., test data, time on screen)? _____

Testing. Does the course contain testing? _____

Test bank database? _____

Pre-testing? _____

In-lesson test administration? _____

End-of-lesson test administration? _____

Comprehensive multi-lesson testing? _____

Add weights to come up with numerical score? _____

Commercial and Government Off-the-Shelf (COTS/GOTS) MK "A" Product Search Results

Update #7 (final)

Date: 23 September 1997
To: Chief, PAD Branch
From: LCDR Arnold
Copy: Chief, PTC
Chief, ADD Branch
Chief, Engineering and Weapons School

Summary

Completed Review. A complete review of our COTS/COTS product search for Mechanical Skills curriculum matches is included in the Subject Area Matrix. Currently the ITC and Alfa-Lava1 products are the most likely CBT course fills. Detailed comments for those two sources are provided after this summary. One trend has emerged during this project: companies with videos or other products are striving to either protect their current market share or gain new markets by creating CBT/CBI products. So, although this is the "final" COTS/GOTS update we really should conduct follow-on checks for available products *prior* to beginning new module development or allocating any funds, especially from companies with products already under development. I can't emphasize enough the fluid nature of this market! Finally, we are somewhat constrained from beginning broad new reviews/searches for additional project fills due to current personnel shortages and other priorities.

Mechanical Skills COTS/GOTS Search

Videotapes with Workbooks and Industry Trends. The matrix also includes training videos with workbooks. These products are potential fills *if* we include conversion from instructor-led training to the video w/workbook methodology. Of those products, the Coastal Skills Video series shows the most promise. However, significant work is needed to improve their workbooks (e.g., more specifics/comprehensive, non-tailor-able content). Caterpillar also has a range of detailed videos with workbooks/student guides. Most of the companies with videotape and workbook training programs are in the process of creating CBT courseware deliverable via CD-ROM. Like most "vaporware", delivery dates, costs, and functionality for these potential products may vary widely from the sales/marketing staffs' initial estimates. Of the companies converting to CBT, the Coastal Skills and Caterpillar series are potential fills. Coastal's existing CBT is primarily focused on Human Resources topics (i.e., sexual harassment) with engineering applications under development. Caterpillar is aggressively marketing multimedia versions of their 3500 and 3600 series of engines to the U.S. Army and Marine Corps. They're also developing new general multimedia products on subjects like principles of operation for diesel engines. I'm currently working to set up a caterpillar demo in the near future.

Enclosure (3)

Conducting New/Updated Searches. As previously discussed; we've complete&our active search for new products. However, we should caveat any final request for funding via the IP with a plan to conduct a final very *focused* review in the areas the program manager agrees 'to fund. This includes student trials and comparative time analyses of identified products and a final search for new ones *prior* to expending funds on significant course buys or course conversions. This ensures we won't waste money or become terribly embarrassed as we launch development. This is especially true given the potential lag-time between completing the search, requesting funding, and actual allocation/programming of funds. I believe there may be some desire (and I share it) to push development forward if funding is secured. However, given the industry's rapid pace of change we should be loath to start significant design and development without a final very focused COTS/GOTS check. This will include a quick Internet search, queries to already identified vendors, and a final update from the schoolhouse.

Student Trials. Although we've based our initial acceptance of the commercial products on instructor and PTC staff review we need to conduct at least some preliminary trials involving the typical student (MK "A"). I intend to run small groups of students through the modules after the MK "A" gauge prototype is delivered. I don't want to hold up development of an IP but I also want to verify students can truly use the COTS products. We'll test out the Alfa-Laval product first by measuring time to complete the program, ability to learn the content, and student satisfaction. I won't reorder the ITC products unless we're able to secure funding.

Software Copies and Costs. Costs for the same piece of software can vary greatly based on procurement options (e.g., single copy or volume, network or solitary workstation). Buying enough individual software copies for each workstation can become prohibitively expensive, regardless of how the software is delivered (network or individual CD). I do not expect this to change. Also, we must consider the costs for procuring upgrades and revisions over the full life cycle of the planned curriculum. These updates can, over the long run, be far more expensive than the initial software purchase. One method to reduce costs while still fully employing the lab (assuming a lab size to accommodate a full MK "A" class) is to buy no more than 5 – 10 copies of an individual product and set up a flexible curriculum. For example, students will not all be taking the same course at the same time. Small sets-of students can work through each lesson, move to the lab for practical exercises, then return for further training. Specific costs for the various products we've looked at are included in the matrix and the Mechanical Skills section that follows.

Mechanical Skills

Internal Combustion Engines, Inboard/Outboard Engines, Hydraulics

Summary. We found one product (series) from Industrial Training Corporation (ITC) and one product from Alfa Lava1 Industries that met the following rough criteria:

- Not too complex for intended audience
- Rough match to existing curriculum
- Flexible/adaptable
- Includes workbook and resource information.

Enclosure (3)

Industrial Training Corporation (ITC) Active Pro Series. ITC's Active Pro series. includes modules covering several mechanical skills content areas. SME availability and reduced ADD staffing precluded us from running comprehensive student tests prior to recommending the software. However, based on SME and close ADD/PAD staff review the ITC products can meet our basic needs. A key factor behind this evaluation is our ability to add subject screens with graphics, audio, and other media to their product that, in effect, enables ***us*** to ***customize the product without any additional external costs.*** Although we can't remove screens, this capability will enable us to build a product quite rapidly that meets the school's ***exact*** needs -both now and in the future. The following eight ITC lessons are suitable curriculum fills in roughly their current form:

- Mechanical Seals .
- Bearings-Reducing Failure Rate (2 lessons): Failure Analysis/Maintaining Bearings
- Precision Measuring Instruments
- ITC's System Operation and Directional and Flow Control units (2 units) from their Industrial Hydraulic Power series would also make suitable fills provided we conduct some modification to the courseware
- ITC's Lubricants module (2 lessons) maps to the current MK "A" Unit 5 Internal Combustion Engine, "Lube oil Characteristics." CDR Hood reviewed this product and has recommended it for use in the "A" school curriculum with some specific caveats—:
    1. The ITC ICW covers Greases where the MK **"A"** does not.
    2. ITC ICW does not cover Navy oil symbols or Saybolt Seconds.
    3. We suggest that we develop a CBT module on laboratory and shipboard oil 'analysis and job aids for oil samples and performing shipboard tests using the Visguage and Gerin Oil Test Kit.

An updated ITC cost quote that outlines their pricing options is attached. In summary, we can outfit a 30 workstation lab with 8 networked lessons per workstation for a total charge of $70,340.00 ($293.00 /lesson). Scaling down to 10 workstations with 8 lessons per workstation will cost $33,220.00 ($415.00/lesson). Both of these options include the. cost for their ActivePro™ network software and a robust CMI system that tracks student performance, collects test data, and performs other administrative functions. A straight purchase of 8 individual lessons for one workstation is $5,400.0 ($675.00/lesson). However, procuring enough lesson copies to support simultaneous instruction on only 10 computers would cost over $50K.

Which procurement option should we select, or at least recommend? I considered at least four main factors: number of workstation/students planned for the lab (accommodate max capacity), curriculum flexibility (ability to integrate lecture, lab, and CBT lessons given students will move at different rates through the CBT lessons), budget constraints, and lab architecture (network availability and limitations). I've assumed approx. 30 students and a flexible curriculum that enables students to quickly shift between class, hands-on labs, and the computer lab. The $70K option saves money for all but the smallest implementation plans. It offers us the best opportunity to manage a flexible curriculum tailorable to students with different skills.

Enclosure (3)

Alfa Laval Separation, Inc. One of the few very good commercial fills we could find that met our criteria. The software cost is relatively low and we can negotiate price reductions for multiple copies/networked stations. The base price of $440.00/copy is not unreasonable given the finished product's quality. MKC Wood, tew reps, and I reviewed the finished release version. The course includes more material than what the typical "A" school student would need. However, I envision using selected modules from the CBT program coupled with locally developed question/problem sheets and a short lab demo. The course would be a good tool for enabling students at the "A" or "C" school level to gain a more thorough understanding of the system's operating principles and foundational knowledge. Bottom line: complete this course and you will thoroughly understand how the fuel/lube oil separator works. In the words of the reviewing SME:

> '"This should be required viewing for anyone going to a ship with purifiers or clarifiers. After completing the sections and passing the tests I was confident I could walk up to that unit (the Alfa Lava1 system), light it off, and make clean lube/fuel oil".

Specific comments are:

- The course thoroughly and completely covers the Alfa Lava1 separator used by the Coast Guard. There are numerous graphic simulations and text that coincide with the "A" school curriculum. However, it covers far more material than the typical "A" school student would need or probably want. A suitable work around could include providing the student with a workbook, note sheets, or similar system to pinpoint needed information. However, the additional material it is not so complex that it would preclude "A" school student use. We cannot currently delete or add screens to the program without significant additional cost (unlike the ITC series)..
- The program would be an excellent fill for a "C" type course.
- The program contains over 30 "bugs" in its initial release version. None are showstoppers and we've passed our review results on to the Alfa-Laval rep. I anticipate they'll take corrective action soon.
- The program includes an initial aptitude test that is used to tailor training to the respondent's level--a nice feature. Students must interact to keep progressing.
- The program contains 4 modules that take approx. 45 minutes each (3 hours) for experienced personnel to take. Overall program completion time is approx. 6 hours for less experienced personnel. Of that "A" school could use less than one hour and "C" school about three. Each module contains a percent completion bar ---a handy indicator of how far along you are in the module. The indicator helps students from getting discouraged or hurrying along.
- Each module includes well-placed learning activities, quizzes, and.a final exam. The final exam includes several questions that are not adequately covered in the learning sequences (may be a function of the pre-test). You can fail all of the quizzes but must pass the final test. After ten final test tries the program dumps and must be reloaded. The large program completiontime delta (3 -- 6 hours) is largely a function of the detailed testing and number of attempts needed to pass the tests.

Enclosure (3)

- Media is very professional. Audio, graphics, and animation files significantly add to and support instruction.
- The program includes a Course, Management System to track student performance. We have not yet conducted trials linking it to our Authorware Models based CMS system but it should work

Enclosure (3)

Subject **Area Matrix**

Subject **Matter Area:** Lube & Fuel Oil Purifiers

COTS or DoD/Fed Source/Status	MK Comments	ADD Comments/Level of Interactivity	Cost	Potential Training Reduction	Recommendations
Activ™ Learning- ***Fundamentals of Lubrication*** POC: Edwin Winder, 800.638.3757	**ITC's Lubricants module (two lessons) maps to the current MK "A" Unit 5 Internal Combustion Engine, "Lube oil Characteristics."** CDR Hood	Level II Interactivity; good production values, **CMI.** Needs some mod.	**$675.00/lesson**	TBD. CBT course **(both** lube lessons) is **4-8 hours**	**Procure. Conduct student trials for finished data prior to expending funds. Initial trials with ADD & tew staff indicate this product can meet our needs. Modify as needed.**
Activ™ Learning- ***Lubrication Maintenance*** POC: Edwin Winder, 800.638.3757	**ITC's Lubricants module (two lessons) maps to the current MK "A" Unit 5** Internal Combustion Engine, "Lube oil Characteristics." CDR Hood	Level II Interactivity; good production values, CMI. Needs some mod.	$675 .00/lesson	TBD. CBT **course** (both lube lessons) is 4-8 hours	Procure. Conduct student trials for finished data prior to expending funds. Initial trials with ADD **&** tew **staff** indicate this product can meet our needs. Modify **as** needed.
Alfa Laval CBT Module POC: Scott Seifert 215.443.4000	Fill. More material than needed but covers "A" and **"C"** school needs. You complete this you'll know the **Alfa** Lava1 system.	Level II Interactivity; Covers Principles of Separation; includes testing and CMI; Currently testing with students and instructors.	**$440/copy** (one workstation)	Current course is 12.2 hours. CBT course length is approx. 3-6 hours. Student trials pend.	Procure. Conduct student trials for finished data prior to expending funds. MKC Wood currently conducting trials in conjunction with the **MK** "A" Module testing. Initial trials with ADD **&** tew staff indicate this product can meet our needs.

Subject Matter Area: Mechanical Skills

COTS or DoD/Fed Source/Status	MK Comments	ADD Comments	Cost	Potential Training Reduction	Recommendations and Further Action
Activ™ Learning- ***Precision Measuring Instruments*** POC: Edwin Winder, 800.638.3757	"Closely mirrors current curriculum"	Level II Interactivity; good production values, CMI; Maps well to Master Lesson Plan- *Measuring Tools and Instruments*	$675 per lesson (one workstation)	Current course is 2 hours CBT course is 2-4 hours.	Recommended "fill" for knowledge based tasks with some modification. Set up and coordinate student trials with schoolhouse, prior to purchase.
Activ™ Learning ICW: ***Mechanical Seals*** POC: Edwin Winder, 800.638.3757	"Covers most topics in curriculum; too complex in some areas"	Level II Interactivity; good production values, CMI. Needs some mod.	$675 per lesson (one workstation)	Current course is 1 hour. CBT course is 2-4 hours	Recommended "fill" for knowledge based tasks with some modification. Set up and coordinate student trials with schoolhouse, prior to purchase.
Activ™ Learning ICW: ***Bearings: Failure Analysis*** POC: Edwin Winder, 800.638.3757	Covers content with exception of "shipboard testing"	Level II Interactivity; good production values, CMI. Needs some mod.	$675 per lesson (one workstation)	Current course is 1 hour. CBT course for both lessons is 4-8 hours	Recommended "till" for knowledge based tasks provided product modified. Set up and coordinate student trials with schoolhouse, prior to purchase.
Activ™ Learning ICW: ***Bearings: Maintaining Bearings*** POC: Edwin Winder, 800.638.3757	Covers content with exception of "shipboard testing"	Level II Interactivity; good production values, CMI. Needs some mod.	$675 per lesson (one workstation)	Current course is 1 hour. CBT course for both lessons is 4-8 hours	Recommended "fill" for knowledne based tasks provided product modified. Set up and coordinate student trials with schoolhouse, prior to purchase.

Subject Matter **Area:** Clutches & Gears

COTS **or DoD/Fed Source/Status**	MK **Comments**	**ADD Comments**	**Cost**	**Potential Training Reduction**	**Recommendations and Further Action**
Tel-A-Train: *Maintaining & Troubleshooting Gear Reducers;* Videotape with computer-based testing and tracking system	TBD	Although not direct CBT, the product may be suitable for the project with improved workbook	$465/copy	TBD	Confirming if unit cost includes multiple test packages (pends) Not a **first** tier **fill** but has potent

Subject Matter Area Inboard Outboard Engines

COTS or DoD/Fed Source/Status	MK Comments	ADD Comments	cost	Potential Training Reduction	Recommendations and Further Action
OMC	N/A	OMC does not use CBT nor do they anticipate developing any CBT. They have tentativtly granted approval for us to use their graphics and media images in our products at no cost.	-0-	N/A	Check with Outboard School to see w is constructed in-house. Similar result manufacturers (i.e., Evinrude)

Subject Matter Area Internal Combustion Engines

COTS or DoD/Fed Source/Status	MK Comments	ADD Comments	Cost	Potential Training Reduction	Recommendations and Further Action
Caterpillar H.J. Freliche 309.578.6219 Videotape rendering of 3600 series engine training manual. Also being investigated by WLB/WLM project.	• Not reviewed to date. Will order if approach appears viable	• Videotape series includes student workbooks/guides that match up with the training videos. Students have background materials and problems to solve in a self-paced &stem. Company is moving to a CD-ROM delivery and is aggressively moving to market the materials to the Army and Marine Corps. • Five tapes that cover development & design of 3600 series engine. Includes lubricating, intake & exhaust, cooling, turbocharger, and combined/ separate circuit systems. Also includes cylinder head design, serviceability, removal, and inspection, removal of piston and liner assemblies, removal and replacement of a main bearing, and a video rendered slide show of the Woodward governor. • Four tapes that cover the operation & maintenance of the 3600 engine. Features general overview of system components and systems, control and protection systems, start up and shutdown procedures, oil change, and daily, 100,250, 1K, 2K, and 7.5K hour maintenance/service procedures. • Tape series runs from approx. 21 to 37 minutes each.	• Development & design tapes cost $60.00 • Operation & maintenance tapes cost $50.00	N/A	Order and review' one set videotape delivery of curriculum becomes viabl Continue to monitor development of CD-ROM based versions and new materials. Working to set up demo a RTC of CBT version.
Patterson Instruments/Cobalt- ***The Marine Diesel Engine***	• Valid content; too in-depth for "A" school • Might be useful as part of integrated "set" of ICW modules	• Powerful free-play simulations enable learner to input and react to different equipment states, settings, failures, and conditions • Developer may be able to cost-effectively eliminate extraneous information Interactivity Level: II	• First Suite-$2600 • 49 Add'l ficences-$4900 • Review of their modification proposal is on-going	N/A	May be applicable to upp level training ("C", Academy) or Healy Project Need to remove upper level material and comple systemsprior to using in MK "A" internal combustion engine modu

Subject Matter Area Valves

COTS or DoD/Fed Source/Status	MK Comments	ADD Comments	Cost	Potential Training Reduction	Recommendations and Further Action
Tel-A-Train: ***Maintaining Valves;*** Videotape with computer-based testing and tracking system	TBD	Although not direct CBT, the product may be **suitable** for the project with improved workbook	$675/copy T B D		Confirming if unit cost includes multiple test packages Not a first tier fill but has potential
Coastal Skills Training (Videotape w/Workbook)-*Valve Basics (Series of 3, $1,350)*	Good product based on cursory review. Requires in-depth review prior to accepting	Coastal skills tapes are in use with EM school. Initial MK review of entire series indicates that the tapes, if Coastal Skills prepares a good student guide/workbook would be **good** fills.	-0-	TBD	Not a **first** tier fill but has potential

Subject Area Air Conditioning & Refrigeration

COTS or DoD/Fed Source/Status	MK Comments	ADD Comments	Cost	Potential Training Reduction	Recommendations and Further Action
Tel-A-Train: *Handling & Transporting* ***Hazardous*** *Materials/DOT HM 126F-* ***General*** *Awareness Training;-* Videotape with computer-based testing and tracking system	TBD	Although not direct CBT, the product may be suitable for the project with improved workbook	$495/copy	TBD	TBD
Tel-A-Train: ***Handling & Transporting Hazardous Materials/DOT HM 126F-Saftey Training;*** Videotape with Computer-based testing and tracking system	TBD	Needs review; completion date TBD	$495/copy	TBD	TBD
Tel-A-Train: ***Introduction to Air Conditioning and Refrigeration;*** Videotape with Computer-based testing and tracking system	TBD	Although not direct CBT, the product may be suitable for the project with improved workbook	$495/copy	TBD	TBD

Subject Area Hydraulics

COTS or DoD/Fed Source/Status	MK Comments	ADD Comments	Cost	Potential Training Reduction	Recommendations and Further Action
Activ™ Learning ICW: *Industrial Hydraulic Power: Hydraulic Systems Operation*	Not as complete as MK "A" School material; Covers most material	Suitable for use with local modification. Relatively simple to add needed information due to ITC's internal modification capability	$675/copy	Current course is 2 days class & 1 lab day. CBT course est. at 4-8 hours based on using 2 of 5 ITC hydraulic units (pro-rated 10-20 hours).	Could be used with some adaptation. Recommend procurement provided resources can be assigned to add needed information and merge with lab exercises.
Activ™ Learning ICW: *Industrial Hydraulic Power: Directional and Flow Control*	Requires some modification	Suitable for use with local modification. Relatively simple to add needed information due to ITC's internal modification capability	$675/copy	Current course is 3 days. (see above)	Could be used with some adaptation. Recommend procurement provided resources can be assigned to add needed information and merge with lab exercises.
Elizabeth City: *Course under development (currently on hold) by the CBT design and development team at ATC Elizabeth City*	Will review Alpha copy after completion TBD	Will schedule review with SME after initial check. Course not yet delivered from E-City.	$0	TBD	Check current class for course length and pick up current LPO/Curriculum guide for comparative task analysis
Tel-A-Train: *Industrial Hydraulic Technology/ Hydraulic Transmission of Force and Energy;* Videotape with computer-based testing and tracking system	TBD	Although not direct CBT, the product may be suitable for the project. Based on FAA experience the course may become too difficult to manage if we mix too many delivery methodologies	$495	TBD	Check current class for course length and pick up current LPO/Curriculum guide for comparative task analysis

Chapter 17: Conduct a Cost-Benefit Analysis (CBA)

What Is It?

A CBA is simply a comparison of the cost of developing and maintaining a performance intervention (for example, a training program) compared with the benefits that result from establishing that performance intervention.

The terms "cost-benefit analysis" and "cost-effectiveness analysis" are often used interchangeably, but, in fact, they are two different things. You will use the results of CBA and work them into a cost-effectiveness formula--ROI--when you consider several possible designs for your performance intervention. But, that' s at a later date--when it' s time for you to develop an Instructional Plan (IP), the last step in the analysis phase. CBA is a tool used earlier in the analysis phase.

If possible, CBA should be part of the FEA process so that decision-makers can decide if it makes good financial sense to continue on with solving a problem. For example, if a performance problem is costing the Coast Guard $20,000 annually, we would not want to develop a solution that costs $60,000 annually. That kind of solution would mean a net loss of $40,000 annually for the Coast Guard--not a solution at all!

Think of CBA as a data collection process and a tool. As an example, you can use CBA when your program managers ask for help in determining which of several performance improvement options to fund. The results of a good CBA can also be invaluable in determining that:

- A particular performance intervention (i.e., resident training course, hybrid, web-based training, EPSS) represents a real solution to a significant performance problem. The benefits of funding this program far outweigh its initial development costs.

Or,

- There are steep up-front and life-cycle costs associated with developing this performance intervention, and analysis shows that the proportion of potential benefits to the costs associated with the project make it a poor investment. Additionally, it is not yet clear how this project ties in with the Coast Guard' s and TRACEN' s business goals.

What Is It? (continued)

There are many methods for doing a CBA, and you can use CBA to compare the costs and benefits of different kinds of performance improvement interventions. However, since you are working at a TRACEN, most of the CBA work you do will involve interventions to close gaps in skill and knowledge.

Keep one other thought in mind. Although there are many different ways to do a CBA, any method you select should produce results that allow managers to answer these questions:

- How does this project stack up with other competing training priorities?
- Will this performance intervention or training program provide real benefits (worth) to the organization? Do those benefits outweigh the cost of developing and implementing the intervention?
- Is the cost so high that it doesn't matter how many performance problems it solves?
- Will this solution really eliminate performance deficiencies?
- How does the project tie into Coast Guard business goals and family of plans?

How Do I Conduct a CBA?

It takes three steps to perform a CBA:

Step 1: Calculate costs
Step 2: Calculate benefits
Step 3: Compare the results

Advisor software, a product developed in 1995-96 by BNH Expert Software, Inc., and periodically upgraded, contains helpful, on-line tools for considering training cost analysis and feasibility issues. This software is not part of the suite currently found on the Coast Guard's SWSIII common operating environment, but if the tool proves useful enough to the Coast Guard, it might be in the future. For right now, you can look at Advisor's demo disks at PTC and see if Advisor meets your needs.

How Do I Conduct a CBA? (continued)

Another helpful resource when you have to do a CBA are products the American Society for Training and Development (ASTD) sells called "Info-Lines." These tools consist of short (16-page, etc.) pamphlets on various subjects, and one of those is "How to Conduct a Cost-Benefit Analysis." You can order this product from ASTD.

The Coast Guard's Research & Development Center (R & DC) developed an electronic cost-benefit model as part of the WSC-3 CBT program.

Although you may not have discovered it yet, here at TRACEN Yorktown, that model is loaded on your desktop in the Excel application. Pull it up, and you'll see it is all ready to use.

Comptroller division is a wonderful resource to use when you're doing a CBA. They can provide standard personnel costs (SPCs) and other tools to your desktop, and they are a gold mine of helpful information when you're trying to perform a CBA. Be sure you have them check the results of your CBA. Nobody has a better understanding of the issues and results that are likely to be meaningful to Coast Guard resource directors.

Finally, we've provided a job aid at the end of this SOP chapter.

How Long Will It Take?

In the real world, a CBA usually has to be done very quickly, in response to a program tasker. Often, it isn't a matter of how long it takes, but rather that you must produce the answer in a week. That's why it is good to know in advance how to do one and where to get help with doing a CBA. That way, you won't be forced to do a less than desirable job because of time constraints.

How Long Will It Take? (continued)

You can shorten the time it takes to do a CBA by:

- Making sure your branch or division has all the information it needs on the desktop. You don' t want to waste time trying to figure out salary and travel costs when you have only a week to do that CBA!

- Exploring ways to do CBA now, in advance of needing to do one. That way, you can play with different formulas and determine which works best for your situation.

- Setting up a working group to determine the benefits of different types of delivery systems for your program' s training needs. There are real "benefits" to figuring out benefits now. You will find yourself using them again and again, as justifications for projects you want to take on.

What Will I Get Out of It?

You can probably best see the benefit CBA has for you from hearing some "sea stories" about how the Coast Guard training community has used CBA to make decisions for training programs.

In 1997, COMDT (G-S) decided it needed a quick turnaround CBA. The issue was this. The Coast Guard was sending its engineering officers to the Navy in Newport, Rhode Island, to obtain damage control and fire fighting training. There were several benefits to this arrangement:

- The Coast Guard didn' t have to pay to develop, staff, and maintain the course.
- Coast Guard junior officers received indoctrination into the way the Navy does business. This is very useful since the Coast Guard falls under the Navy in time of war.
- The Navy base had state-of-the art simulation and trainer facilities.

The downside of the equation was that the Navy had a long-term agreement with a local motel to provide lodging for students.

What Will I Get Out of It? (continued)

As the Navy faced its own cost cuts, it started housing its students in BAQs, but Coast Guard and other agency officers had to stay in the motel, so the commitment could be honored. Believe it or not, that lodging bill was using up over half of the program's annual training budget!

Faced with this dilemma, the program asked PTC to do a quick CBA so it could determine if it made more sense to continue to use Navy training or to develop training in-house.

From the results of the CBA, the program decided to stay with the status quo for the time being. That' s what CBA does: helps decision-makers make decisions.

Another example of how you can use CBA results is when you have to develop an Instructional Plan (IP).

For example, there' s the story of the Machinery Technician "A" School revision project. Once its JTA effort helped the MK school figure out what to train in their "A" School, they also realized that they could probably reduce the course' s length even more by converting delivery of knowledge quals to an alternative method.

NOTE: Course reduction is almost always a good idea. It reduces costs. And, with our minimally manned ships, it helps the field by getting people back to the job quicker.

Using CBA helped the school determine if it made more sense to buy OTS products, or to develop CBT in-house or to hire a contractor. CBA tools will give you the same kind of help, when you' re considering alternative deliveries for your training programs.

Why and When Do I Conduct a CBA?

Why:

Different triggers may cause you to conduct a CBA. Some of those are:

- Need to develop an alternative delivery for a training program.
- Tasker from a program manager requesting that you conduct a CBA.
- As part of an FEA project you' re working on.
- As an internal management decision.
- To help you decide if it makes sense to buy an OTS product.
- To help you determine if you should take on a new training program.

When:

You do a CBA because it makes good financial sense to determine the costs and benefits of a project **BEFORE** you commit resources to it.

What Is My Role?

- You may be the person doing a CBA.
- You may give SME input to a CBA.
- You may be part of a working group, determining benefits of different deliveries or distance learning for your training programs.
- You may use a CBA someone else has developed as part of a larger report or project.

Who Can Help Me?

Comptroller division can help you with determining current costs. PTC can help you with samples of CBA conducted for various training issues. Your program manager can help you in determining benefits. Your desktop can help you in calculating costs and in putting all the data together in a report.

What Is The Process for Getting Started?

If you receive a request to do a CBA, that tasker will start the process. Other cues that might indicate you should start a CBA have been discussed in other parts of this SOP chapter. Consider requesting a CBA, doing one, or modifying a pre-existing CBA:

- As part of any FEA effort.
- As part of any Instructional Plan (IP) you develop.
- Before you take on a new start.
- As part of your considerations about converting any courseware to an alternative delivery.

CBA Job Aid

Here are the steps for doing a CBA:

Step 1: Calculate costs. Use a CBA model to make sure you capture all costs.

NOTE: The hardest part of a CBA is figuring out which costs to include. Most CBA models consider the following costs:

- Personnel costs
- Training materials
- Delivery costs
- Travel costs

Step 2: Total all costs.

Step 3: Identify measurable benefits (any gain directly resulting from the performance intervention you are analyzing) such as savings for:

- Time
- Materials
- Equipment
- Reduction of personnel turnover
- Solving personnel problems such as accidents

CBA Job Aid (continued)

Step 4: Identify benefits that are more difficult to quantify (can' t be described by a dollar amount or other measurement) such as:

- Improved productivity
- Decreased costs (i.e., turnover)

Step 5: Analyze results of steps 1-4:

- Compare costs to benefits
- Your results should provide a sufficient level of data to show why picking one option over others makes managerial sense

Step 6: Capture results in a written report or a presentation. Make sure it includes some evidence of your calculations (i.e., spreadsheets), and a narrative or interactive presentation that captures recommendations. Be sure to discuss:

- Existing performance problem
- Benefits of different performance interventions that could solve the problem
- Result

What do you do if the CBA says the costs outweigh the benefits? CBA is a good tool for internal management as well. Once you have the results, you can decide:

- Not to go forward with the project.
- To change to another performance intervention that has more benefits.
- To emphasize that the "up-side" (the benefits) will really accomplish business goals and therefore ought to be considered--despite the project' s high cost--in other words, it' s the right thing to do.

Chapter 18: Design & Develop an Instructional Plan (IP)

What Is It?

Design and develop an IP is a pre-decisional process. The outputs of the IP process are a report ("Instructional Plan") and a presentation of process results to decision-makers. The "process" consists of selecting three or more possible performance improvements delivery options and determining costs and benefits for each option. That data is then captured in a "document or report" called an Instructional Plan (IP).

NOTE: For those of you have taken or attended the Coast Guard' s Course Designer Course (CDC), you may be a little puzzled by what seems like a new definition for IP. In the past, the Coast Guard defined IPs as the paperwork that documented the work of the design phase of ISD: objectives, test items, the strategy for the instructional delivery, etc. With the changes our Training System is experiencing from an influx of new technologies, the Coast Guard now refers to IPs as the pre-decisional process and documents produced to obtain program approval of one (of three or more) training program design options. This process is necessary so that the Coast Guard does not waste TRACEN staff' s time producing a training program that the organization can' t afford or does not desire to have developed. What was formerly referred to as an "Instructional Plan (IP)" will be called a Learner Plan (LP) or Course Map (CM) in this SOP. The LP or CM will be captured, for program purposes, in either a curriculum outline (or a newly designed document that may replace the old curriculum outline). This method will save rework and enable TRACEN staff to document training program design just once. In contrast to the older meaning for Instructional Plan, the IP we will discuss in this chapter of the SOP is the pre-decisional process and documentation you go through, in the analysis phase of ISD, **BEFORE** you design actual instruction.

An IP is **"pre" (before)-decisional** because it gives program, rating, training and TRACEN managers:

- The data they need to choose the best delivery system for a new or revised performance improvement option.

What Is It? (continued)

- They are presented with this data **BEFORE** the performance improvement option is designed.

You may have some questions about this term, "performance improvement." As instructors and course designers at a Coast Guard TRACEN, aren' t you only concerned with designing or conducting training?

The answer to that question is, primarily "yes," but sometimes, "no." EPSSs may have training features, but they are not primarily training. Instead, they are just what their name implies--supporters of performance. So, when you design an EPSS, you are designing a tool that will help people find their way around in a technical manual or adding some features, such as a glossary of terms, which can help people on the job, when they have to use the manual.

That' s the HPT change we were talking about in the beginning of this SOP manual. The HPT approach looks at ALL the influences that affect performance. As an instructor or training program designer, you are also an HPT practitioner. As such, you will find yourself sometimes working with performance issues that don't have to do with just training.

The IP process is one of those times. You may decide to develop an option that is really more a supporter of performance rather than pure training--and determine the costs of benefits of that option--along with the other training options you select.

Once the Coast Guard has completed FEA, JTA, and selecting delivery systems (media selection) work, you have the outputs you need to start thinking about "macro" design issues. At this point, you are probably already thinking about ways you might deliver the course you eventually design--maybe CBT or knowledge-based exercises supported by an EPSS or part WBT and part hands-on lab work.

What Is It? (continued)

However, you know the Coast Guard has limited dollars to spend on new training starts. There are other issues as well. Will the target audience have migrated to SWSIII by the time your training program is on-line? Will some of your design ideas call for software that isn' t currently part of the Coast Guard' s common operating environment? If the software you want does not meet the test, will you be able to convince TISCOM that this new software should be added to the standard suite? As much as you may want to try out some of the new technologies, you know that the start-up costs of delivering new technology training may be quite high. With "new start" dollars so hard to come by, there' s a good chance the program and rating managers won' t think it' s worth the effort to go through a long fight to get alternative delivery dollars.

In addition, you also have to consider all the aspects of the new technologies issue. Some don' t have a proven track record yet. They look and sound good, but can you be sure they will be cost-effective in the long run? You could always just design the course for delivery at a TRACEN and say, "Well, that' s a tried and true method, and now I don' t have to think about it anymore." But, the trend today, both for private industry and military services, is away from resident training and toward alternative deliveries. If the Coast Guard is going to stay current and take advantage of what is already developed (OTS searches), it has to increasingly consider alternative deliveries. With such weighty issues to consider, the Coast Guard no longer wants its TRACENs to make quick or independent decisions about training program design.

Given our current climate, the Coast Guard wants its course designers to use some sort of process to help everyone concerned make "right" decisions about the best way to deliver training. That process is designing and developing an IP.

How Do I Design & Develop an IP?

The Coast Guard's Training Infrastructure Study Group (1994-1995) recognized course designers would be faced with these issues, so they came up with a process that helps everybody make the "right" decision:

- Use the outputs of FEA or JTA and media selection to choose three or more possible performance improvement or training design options.

- Conduct an OTS search for any tasks or quals you plan to convert to an alternative delivery.

NOTE: You may be asking why you have to do an OTS search as part of the IP process. Decision-makers will expect you to answer "What's out there?" questions as part of this process.

Conduct a CBA to identify cost-benefits and cost-effectiveness (ROI) data for each of these options.

- If you have identified an untried technology, include pilot evaluation information so that programs can weigh learning effectiveness and learning transfer data for each delivery system demonstrated.

NOTE: To conduct the CBA, use one of the following:

- R & DC's CBA tool, found in Excel files on your SWSIII
- PTC's CBA model
- Use or modify a model found in Info-lines or another source.

NOTE: Be sure to have the Comptroller Division check out your CBA results. They will know if you have covered the right points for an effective IP presentation.

- Capture that data in a document (the IP).
- Present the IP to decision-makers.
- If asked, develop a resource change proposal (RCP), a document the Coast Guard uses to request funds for a project.

How Do I Design & Develop an IP? (continued)

NOTE: This SOP does not tell you how to develop an RCP. Coast Guard Headquarters has a publication that tells you how to do that. The comptroller or PTC can provide you with copies of this procedural guide. Comptroller division and the resource director for your program can also help you develop an RCP. We' ve included extracts from the RCP developed for the MK "A" CBT project so you can get an idea of what an RCP looks like.

- Do **NOT** waste time on any design work until program, rating, training and TRACEN managers have selected an option and identified funding for that project.

How Long Will It Take?

The first Coast Guard efforts in developing an IP took a long time. That was because they were "prototype" efforts --that is, efforts done for the first time. No one had a pre-set plan to follow or a job aid that listed the steps for the process. Everything had to be researched and done from scratch, and that kind of process takes a long time.

The first producers of what the Training Infrastructure Study meant by an IP were staff at TRACEN ATTC, Elizabeth City. As a result of the Aviation Workforce Structure Study, they had to redesign their training courses to train three instead of five ratings. To meet this challenge, they designed several possible options for delivering training, determined costs and benefits of each option and presented this data to training, program, rating and TRACEN managers. Based on the option decision-makers chose, they then began a massive effort to redesign training.

The second designers to produce an IP were staff at the PTC at TRACEN Yorktown. In a spirit of cooperation, TRACEN ATTC had invited PTC staff members to their IP presentation. Armed with lessons learned from that experience, and tasked by G-WTT to find efficiencies in the new MK "A" School, PTC turned to results from the JTA for MK "A" E-4 quals.

How Long Will It Take? (continued)

Since the MK rating is the largest in the Coast Guard, and the MK "A" course the most expensive TRACEN Yorktown owns, PTC staff immediately began work to produce an IP for a new and more cost-effective training program design. The resultant IP captured three possible options:

- Reduce MK "A" School by a few days through the addition of OTS products for some of the "knowledge" quals.

- Reduce MK "A" School by almost a week through in-house conversion of 59 hours of knowledge to CBT.

- Reduce MK "A" School by almost a week through contractor development of 59 hours of knowledge quals to CBT.

All of the design options called for a computer lab. Each design option was researched and thoroughly "costed out." Those involved in the IP effort also conducted CBA so that benefits of each option and return-on-investment (ROI) information could be added to the report.

Once the IP was briefed to G-WT, G-WTT, program, rating, TRACEN, and school managers, PTC also offered to draft an RCP that Coast Guard Headquarters could use for obtaining funding for the project.

Based on IP data, G-WTT subsequently decided to fund contractor development of CBT for the MK "A" course, and both PTC and the MK "A" School knew exactly what direction their design efforts should take.

Each of these prototype-efforts took several months and many staff members to complete.

However, since two TRACENs have already undergone prototype IP efforts, lessons learned have much reduced the time required for the process.

How Long Will It Take? (continued)

This SOP chapter captures those lessons learned, and gives you all the information you need to produce an IP. It also includes a sample IP you can review so you know what the final output will look like.

With that background in mind, plan on about a month to do your IP. It may not take that long, but a month will give you extra time to gather and format your data. You also will need some lead time to make sure decision-makers are available for your presentation.

What Will I Get Out of It?

You get several benefits from developing an IP:

- You avoid the frustration of designing a course only to find out that the program won' t fund it.
- When you finally do design a training program, you and all concerned stakeholders are sure it' s the right intervention to solve the field' s performance problems.
- You don' t waste any TRACEN resources on the "wrong" intervention.
- You get to try out a new technology, but you know it is one the Coast Guard will support.
- You have a very good idea, up-front, what your design effort is going to cost.
- Many design phase issues have already been decided by this process (Do I use a contractor or develop in-house? How much can I spend? Do I have people who know how to do this?).
- You get a very valuable addition to your audit trail. If, for some reason, plans change, you can always find out what options were considered and why some were discarded, while others were kept. This can be very valuable information, especially if you have just reported to Yorktown and don' t know why certain decisions were made or what you think about them.

Why and When Do I Design & Develop an IP?

Why:

You develop an IP so that decision-makers have **ALL** the data they need to make the best decisions. You may remember a slogan that had much popularity a few years ago--"right training (performance intervention) for the right people at the right place at the right time for the right cost." That slogan sounds like a good idea for the Coast Guard or any other agency. But at the time the slogan was used, we didn' t really know how to figure out those five "rights." With the fleshing out of the IP process, the Coast Guard now has a process and tools to help us do just that.

When:

Designers should always follow the IP process for any "new start." It is also appropriate to follow the IP process whenever you have completed an FEA or JTA (even if someone else did the FEA or JTA). The IP process is also a good one to use when you are considering revising an old course--especially if you plan to convert resident training to an alternative delivery method. It is also a good idea to use the IP process anytime you recognize that different delivery methods need to be considered and that there may be widely varying costs for different training program design options.

NOTE: If you are responsible for an "A" School, you may find it very useful to develop an IP for alternative deliveries. Generally speaking, "A" Schools are the most lengthy (and therefore, the most expensive) courses the Coast Guard delivers.

One way to find efficiencies for your "A" School is to use the IP process.

There is one more important point to make about developing IPs:

Why and When Do I Design & Develop an IP? (continued)

Do **NOT** develop an IP for a performance intervention that has never received an FEA or JTA. Why not? If you do develop an IP for a course or performance intervention that hasn' t been properly analyzed, you may find yourself developing a very expensive intervention, but you won' t be able to convince programs that it will "fix" the performance problem. Always make sure an FEA or JTA has been done first.

What Is My Role?

You may be a player in several IP roles during your assignment as a course designer or instructor at a Coast Guard TRACEN:

- Leader for the whole IP process.
- SME, researching CBA data for each option.
- SME, researching or evaluating OTS options.
- Course designer identifying three or more options.
- Drafter and formatter for the IP document and presentation.
- Coordinator who arranges the time, place and players to attend the IP presentation.
- General helper and researcher for someone else developing an IP.

Who Can Help Me?

Since the PTC did prototype IP work for the redesigned MK "A" course, their staff knows how this process works. They can help if you have any questions about how to do an IP.

Other TRACENs may be able to help you as well. You are taking advantage of "best practices" when you check in, now and again, with our fellow TRACENs to see if they have any new ideas and processes to share.

What Is the Process for Getting Started?

Now that decision-makers (program, rating, training and TRACEN managers) know what an IP is and how it works, you may be directed to do one. If that happens, the process will start from the moment you receive the IP tasker.

What Is the Process for Getting Started? (continued)

But, if your program doesn' t really know that much about the process or has not thought about asking you to do it, here are some ways to get an IP process started:

- Discuss the issue with appropriate managers. Ask if they would like an IP to help them decide if it' s financially worthwhile to convert a performance intervention to an alternative delivery.

- Discuss the issue with your first-line supervisor. Ask if he or she thinks it is a good idea to take the time it requires to put an IP together.

- Talk about the possibility with some of the other schools. Have they done an IP? Do they plan to? Are there any common areas you both can use to save each of you doing redundant work.

NOTE: First things first, though. If you discover that the performance problem you' re looking at or the course you want to change has never had an FEA, ask for that first. You never want to develop any intervention until you' re sure it will help in "fixing" the performance problem.

Design & Develop an IP Job Aid

When you decide to develop an IP, here are the steps you need to follow:

Step 1: Use the outputs of FEA or JTA and media selection to choose three or more possible performance improvement/training design options.

Step 2: Conduct an OTS search and cost-out or evaluation for any tasks or quals you plan to convert to an alternative delivery.

Step 3: Identify cost-benefit and cost-effectiveness (ROI) data for each of these options.

Step 4: Capture that data in a document (the IP).

Design & Develop an IP Job Aid (continued)

Step 5: Present the IP to decision-makers.

Step 6: If asked, develop a Resource Change Proposal (RCP), a document the Coast Guard uses to request funds for a project. Do NOT waste time on any design work until program, rating, training and TRACEN Managers have selected an option and identified funding for that project

Chapter 19: Introduction to Design

Introduction

If you are familiar with Coast Guard training, you may notice some changes to how we do business in the design phase of ISD. The terminology and tasks with which we were familiar have been altered by a greater emphasis on performance and emerging technologies. Some of the changes you will see in this SOP chapter are:

- Learning objectives have become performance objectives--terminal performance objectives (TPOs)
- Designing how you will test people is now called designing level 2 evaluations (tests)
- Instructional strategies have been expanded
- Two chapters have been added for designing alternative deliveries (EPSSs and CBT and WBT)

NOTE 1: In private sector businesses, course design and course development work can be performed by different people. In the Coast Guard, course designers and developers are usually the same person. That fact means there is potential for speeding up our ISD work.

NOTE 2: Contractors will typically design and develop the Coast Guard' s alternative delivery products. Does that mean we are off the hook? No. To ensure we get our money' s worth, we will need to know the course designer and developer jobs so we can be sure the products we accept from vendors meet Coast Guard standards for learning transfer to performance on the job.

Definition

Instructional design is a systematic process for working the principles of learning and instruction into plans for instructional events.

Design is the second phase of ISD (A**D**DIE). Analogies for the design phase are:

- A preliminary sketch
- An outline
- A map
- A training program blueprint

Definition (continued)

The outputs of the design phase are the plans you hand off to the training developer. Therefore, design outputs should contain sufficient instructions and guidance for the developer to know precisely what needs to be fleshed out to complete training program development.

Those of us who instruct or facilitate know how important entertainment and enlightenment techniques are for positive student motivation. However, in the design phase, our prime concern is to **ensure the training we design leads to better job performance.** That concern means design phase work is mostly about:

- Finding and identifying just those instructional methods, strategies, activities and training aids that have the greatest potential for ensuring transfer of the training program' s skills and knowledge to on-the-job performance.

- Sketching, outlining, mapping, and blueprinting the instructor/faciltator' s or computer/student' s use of those methods, strategies, activities, and training aids to promote optimum transfer of skills and knowledges to on-the-job performance.

SOP Design Tasks

During ISD' s design phase, you will:

- Design Performance-Based Training
- Identify Target Audience
- Conduct Task Analysis
- Conduct Content Analysis
- Write Performance Objectives
- Design Level 2 Evaluations (Tests)
- Identify Instructional Methods and Strategies
- Group and Sequence Objectives
- Design Job Aids
- Design and Develop Electronic Performance Support Systems (EPSSs)

SOP Design Tasks (continued)

- Design Interactive Courseware (ICW)--CBT, WBT, IVT
- Design and Develop Level 1 Evaluations (Student Critiques)
- Complete Design Tasks and Draft Learner Plan (LP)

Training Design Components

A map is made up of various components: topographical features, map key, map scale, and so forth. Instructional designs are also made up of components:

- **Course.** A planned and organized series of learning experiences related to a particular job or group of tasks (e.g., MK "A" School, Prospective Commanding Officer and Prospective Executive Officer (PCO/PXO), Boarding Officer, etc). Courses can also be made up of planned and organized series of learning experiences related to a topic (e.g., Ethics in Leadership, Sexual Harassment Prevention, Human Relations, etc.).

- **Unit.** A major task or task group to be learned within the course (e.g., Troubleshooting the MTU Engine, Investigating X Class of Vessels). Units can also be made up of a major topic or topic group (e.g., Unlawful Discrimination Laws and Executive Orders).

- **Module.** A unit, especially one that can stand alone, that will be learned independent of other units (e.g., Coast Guard Policy Statement on Sexual Harassment).

- **Lesson Plan.** A detailed plan describing the learning activities and experiences that learners will do and use. (i.e., a lesson plan for how to conduct a JTA).

- **Learner Plan (LP).** Called an Instructional Plan in the Coast Guard' s Course Designer Course, this new term, a learner plan, is the **final output** of Coast Guard design work: a course map or blueprint--a detailed plan of learning activities and experiences that describes what learners will do and use (e.g., a course map, blueprint or outline for Marine Safety Petty Officer Course).

Recent Instructional Design Trends

To avoid confusion for users, this SOP sticks to one philosophy in its design chapters. However, you should be aware that there is more than one approach to training program design. Some of the newer instructional design trends you may hear or read about are:

- **Competency-based approach.** This approach focuses on the student and learner and gives heavy emphasis to individual learning plans. The student and the trainer plan individual instruction for each competency (i.e., knowledge, skill, and ability (KSAs). The main measure of the competency-based approach' s success is integration of KSAs back on the job.

- **Functional-context learning.** This approach says design should simulate actual job conditions to ensure students can really perform tasks and jobs when they return to the field (e.g., make Incident Command System (ICS) training environment chaotic and highly stressful, just as it will be in the field; use computers in training environment the same way they' ll be used in the field).

- **Technology.** Tasks that course designers once performed manually or cognitively are increasingly being converted to software applications (e.g., Authorware provides endless branching opportunities for self-paced learning, Advisor helps make media decisions, Designer' s Edge simulates ISD tasks and archives a project' s ISD outputs in a database).

Checklist for Getting Started with Instructional Design

Questions	Yes √	No √	Why Important?
1. Does the audit trail show evidence that an FEA or JTA has been done?			Coast Guard Headquarters (G-WTT) will not approve training programs that lack a recent FEA. **NOTE:** Check with your G-WTT training manager if there is evidence of a recent JTA. A recent JTA may be sufficient analysis to begin designing the training program (e.g., MK "A" JTA).
2. Have all stakeholders accepted or approved FEA or JTA results?			The task listing from which the training program will be designed must be approved by program, rating and training managers BEFORE you begin design work (i.e., include tasks identified as OJT? Include some knowledge-based quals, even though they were deleted as "no train" by JTA?).
3. Has an Instructional Plan (IP) been presented and one option selected and funded by the program manager?			Absent evidence of IP approval, your training program: • Will **NOT** receive non-recurring (start-up) funding. • Will **NOT** compete successfully for recurring AFC-56 funding. • Will receive **NO** support for life cycle maintenance. • **May not** be compatible with SWS common operating environment and bandwidth constraints. You will **not** know which training program design option you should pursue.

4. Is an IP required for an "old" course revision?		√	**Exceptions:** • Unless there is more than one training program design you' re considering. • Unless revisions mean a change in staffing or resourcing. **NOTE:** Check with your G-WTT training manager. They may task you with doing some analysis and cost-benefit analysis to see if it makes good business sense to continue the course at the schoolhouse. They may also ask you to explore an alternative delivery such as IVT or an EPSS.
5. Has training program initial and recurring funding been approved and a date for funding delivery been established?			• Even if one option has been chosen from an IP presentation, funding may not yet have been approved. • You may be waiting for another budget cycle to get funding (i.e. RCP), or the program may be trying to identify other sources for funding. • Do **NOT** engage in design work for an alternative delivery until funding has been approved and a date for its delivery has been established. It is a waste of TRACEN resources to spend time designing an option that may never be funded. • Large alternative deliveries will most often be developed by contractors. No contract work can start until funding is identified. • You may design and develop a training program only to find out it has delivery requirements the Coast Guard can' t meet (e.g., too much video in initial WLM/WLB CBT to run on CG' s SWS).

6. Have job aids been developed for those tasks an FEA or JTA said should be job-aided?			• Job aids are the foundational documents for your training design or alternative delivery. • Since job aids make up your training program design' s foundation, you can' t begin design work until the job aids you need to design the program are developed.

A checkmark in the "Yes" column for all of the questions (with the exception of question number four) means you are ready to begin design work. The next chapters of this SOP will help you perform the various tasks that make up the design phase of ISD.

Chapter 20: Design Performance-Based Training

What Is It?

NOTE: This chapter of the SOP uses a different format from the FAQs you will see in its other chapters. There is much confusion in the training world about what performance-based training means. We have included this section to help clear up that confusion.

What is **performance-based training**? The answer to that question is a training program designed to be as much like what the person will have to do on the job as possible.

Designing performance-based training means creating a training program that will ask the student to learn, do, and practice levels of performance similar to what he or she will have to do on the job. It also means designing training that simulates real-life job scenarios and conditions to the greatest extent possible – given the delivery system the training program uses. (Obviously, in a classroom setting, the course designer cannot provide an exact match with the environment the student will encounter on a vessel or in a helicopter).

To illustrate what we mean, if the Coast Guard wants to train all its workers to use the Incident Command System (ICS) to respond to "all risks/all hazards", then the design of an ICS training program should simulate real-life conditions. That means that the same stress level, the same chaotic conditions, the same presence of the press should all be built into the training program – to the extent possible under training conditions.

Why Is It Critical To Design Performance-Based Training?

The **education model** is subject- or topic-based. Its prime purpose is to teach people about subject matter so they will know how to think about such subjects. For example, an education course might teach people about the principles and concepts of sociology so that they better understand the interactions among different societies. However, that course will not necessarily teach students the procedures a social worker must know to be successful at social work.

Why Is It Critical To Design Performance-Based Training? (continued)

In contrast, the **training model** is performance-based. Its prime purpose is to teach people how to "do." To be successful, a training program must enable graduates to transfer what they have learned to on the job performance. If the program does not achieve that transfer for its students, it is not a successful program.

Performance-Based Training Myths

Since most of us have spent the greater part of our lives learning within the education model, it is not surprising that we tend to transfer that model to our course designs. That fact is at the bottom of why trainers have many misconceptions about what performance-based training really means.

Some of the myths about performance-based training you may hear while working at a TRACEN are:

- Performance-based training means you can' t teach any knowledge
- Performance-based training means designing very little training – just enough to teach a "monkey" how to turn a wrench – you can' t teach him why he or she is turning the wrench
- Performance-based training means you have to have expensive, large training aids at the school house

None of these myths is true.

Performance-Based Training Realities

In contrast, performance-based realities are:

- The performance-based training model expects you to teach any knowledges the student must have as a pre-requisite to being able to **do** something – unless the student already knows those pre-requisite knowledges
- Performance-based training doesn' t mean very little or very much training. Instead, it means just enough training to match what the person needs to perform on-the-job and to transfer learning back to the job

Performance-Based Training Realities (continued)

- Performance-based training does NOT have to depend on large real-life training aids. It can be just as effective (and often, much safer!) if it uses simulations and simulators. Pilot training is a good example of simulator-delivered, performance-based training.

Recap

The purpose of the training model is to design a program that allows the student to transfer the skills and knowledges he or she learned in the classroom or lab to the actual job and equipment found in the field.

Designing performance-based training means creating a training program that matches what people learn in training to the skills, knowledges, conditions and standards they will use, encounter and have to meet on the job.

We also performance-base training because of safety concerns. If it is too dangerous to let a novice practice a new skill in the field (i.e., flying a helicopter), we can performance-base training (i.e., use flight simulators) to give the student the experience and practice he or she needs minus the dangers of real-life performance.

Chapter 21: Identify Target Audience

What Is It?

Identifying the "target audience" (or student composition) for training programs means determining who should (and who should not) attend or receive the training. Remember that phrase about the "five rights" of training: "right intervention to the right people at the right time at the right location and for the right cost"? Identifying the target audience is the design phase task that lets you pick the "right people." When you complete this task, you have made sure the "right" students will get training.

How Do I Identify the Target Audience?

To identify the "right" audience or student composition for a training program, you first coordinate and get the program manager's input. You will also want to talk with field units to get their input. You could even use a panel of experts for this task.

The areas you want to consider are:

- OA data.
- Relevant FEA data.
- Type of unit assigned/billet to be filled.
- Rating and rank.
- Work experience or position.
- Other education or training received.
- On-the-job training received.
- Reading/math levels.
- Levels 1-3 evaluations. Level 1 (student critiques) level 2 (tests), and level 3 (external evaluations) may all be showing the same trend: the "wrong" people are attending the training program or receiving the training.
- Prerequisite skills and knowledges the student needs.

Along with the information items listed above, ask yourself the following questions:

- Who are the people attending this training program?
- Where are they stationed?

How Do I Identify the Target Audience? (continued)

- How were they selected and assigned to their billets? How does that affect the training you're going to design?
- Why are they attending training?
- How much education do they have? How much time in the field?
- What's likely to be on their minds?
- How are they likely to view technology? What tools do they favor?

TRACEN Yorktown' s Marine Safety School developed a technique for identifying target population that you may find useful. They thought the student description provided by the program and rating managers was often sketchy, so they developed a process and worksheet for expanding and refining that initial data.

The Marine Safety Branch staff uses its own experience to flesh out the target audience description. It captures that information on **The Marine Safety Branch Target Student Population Description** (the worksheet) which covers:

- Physical characteristics (e.g., ages, physical capacity to meet physical requirements of job, etc.)
- Professional experience (e.g., past training, assignments, exposure to terminology, etc.)
- Academic experience (e.g., nature and range of educational background, math and reading ability, etc.)
- Attitudes (e.g., reasons for attending, attitudes about the training program, biases, motivations, etc.)
- Interests (e.g., professional and recreational interests, etc.)

You will find a copy of this worksheet at the end of this chapter. Use it to help capture target audience data.

How Long Will It Take?

Not long. The program manager may have all you need.

If there are complicated issues, such as students attending the training program straight out of boot camp or a need to provide joint training to all other military services, then you may want to convene a panel to properly identify the target audience.

What Will I Get Out of It?

You get several benefits from identifying your target audience **BEFORE** you design the training program--or, from redefining your target audience if evaluations indicate the wrong people are receiving training. You:

- Make sure the "right" people will attend or receive the training program.
- Know what training prerequisites students need to enroll in the training program.
- Spend less time remediating your students because they have the prerequisite skills and knowledges.
- Do NOT design a training program that trains students in what they already know. Instead, you can concentrate on designing training that gives students what the Coast Guard needs them to know.
- Design a training program that is much more efficient because it is targeted toward a particular group of people.
- Design a training program that has a better chance of transferring and converting skills and knowledges learned into field performance.
- Can build relevance (What' s in it for me? – motivation & incentives) into your training program design because you know your target audience' s needs.

What Will I Get Out of It? (continued)

- Receive few or no "dings" from bad evaluations.
- Increase the "match" between students and training courseware.

Why and When Do I Identify the Target Audience?

Why:

Defining the target audience helps to ensure that:

- Students aren't taught what they already know.
- Training reduces the gap between what they know or do and what the Coast Guard needs them to know or do.
- You remember to set criteria for students entering training (you have to be sure they already know how to use hand tools or have the prerequisite math skills, if they're taking Class "C" training!).

When:

You define your target audience **BEFORE** you design courseware to:

- Establish required entry level skills and knowledges for the people receiving the training.
- Define any prerequisites for taking the training program.

What Is My Role?

Typically, if you are a course designer and developer, you will be the person doing target audience identification. The program manager will have "stats" and information about what the target audience should look like.

What Is My Role? (continued)

But, since program managers are very busy, they probably won' t have time to actually expand and refine on that initial information. That will be up to you.

If you' re an instructor, target audience identification may be even more important. Much too much of your time will be taken up with difficult rephasal and disenrollment issues, if the wrong people are attending the training program.

And, you may have to establish practices you don' t like, such as nightly study hall and homework assignments, to try to help those students who lack the proper prerequisites.

Whichever role you have, you' ll find that establishing the right target audience during the design phase is very important. When the right people take training, your job is much easier and training is much more efficient.

What if you had nothing to do with a current course' s target audience identification? One thing you can do right now is to examine level 1, 2, and 3 evaluations:

- Are level 1 evaluations (student critiques) saying training is too easy or boring? That may be a tip-off that the wrong people are attending the training program, or that the training program needs to be deleted.

- If your school uses pre-tests, do those pre-tests consistently show that a large number of students arrive already knowing the material? This is a tip-off that the wrong target audience is attending or receiving the course.

- What do level 3 evaluations say? Do supervisors think their workers demonstrate improved performance after training? Once the students return to the field, if they' re not allowed to perform the job that training taught them, they were probably the wrong target audience

Who Can Help Me?

The program (rating) manager can help you. Your fellow instructors can help. Your TRACEN ITs or ISSs can help.

If you discover a trend of "wrong people" attending or receiving training, we suggest you talk to your training and program managers to resolve the issue. That kind of information can be a tip-off that training was not the correct intervention to improve performance.

What Is the Process for Getting Started?

The usual cues for defining target population are:

- A new curriculum.
- Students showing up at a training program without prerequisites.
- Level 3 evaluation results indicating students aren' t performing the tasks the course trained when they return to the field.

Identifying the Target Audience Job Aid

Here are the steps for identifying target populations:

Step1: Coordinate with program or rating managers to capture their input to target audience.

Step 2: Consult with applicable field units.

Step 3: If necessary, convene a panel of experts.

Step 4: Look at:

- OA data.
- FEA data.
- Type unit assigned or billet to be filled.
- Rating and rank.
- Work experience or position.
- Other education or training received.
- Types of OJT completed.
- Reading and math levels.
- Prerequisite skills and knowledge the training program requires.
- Other related data.

Identifying the Target Audience Job Aid (continued)

Step 5: Write description of target audience.

Step 6: Save target audience documentation for later inclusion in Learner Plan (LP) and curriculum outline.

Chapter 22: Conduct Task Analysis (TA)

What Is It?

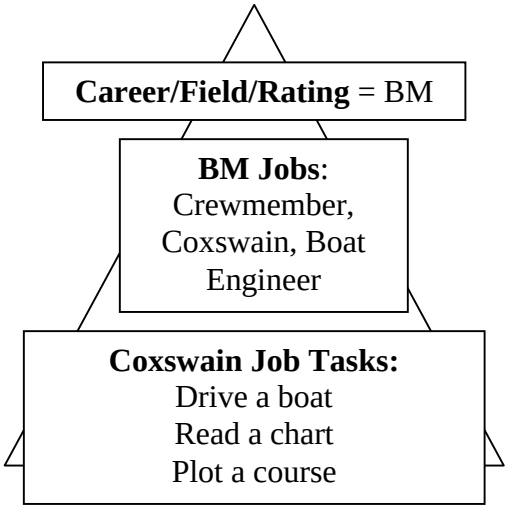
Before we explain what the TA process means and show you how to do one, there are some terms you need to know to understand the process. Let' s review those terms now:

First, what is a task, and how is it different from a job or a task step?

- A **task** is a stand-alone, self-contained activity that is distinct from all other tasks. It has a discernable beginning and end. It should result in an output that is job-related. It should be observable and measurable. Task examples are:

- Maintain Evaporators
- Drive a Boat
- Update Supply Records

You can also gain a better understanding of what a task is by looking at a hierarchical model that shows how a task is related to but different from a rating and a job within that rating:



At the top of the pyramid is a career/field/rating – Boatswain' s Mate (BM). Under rating, there are BM jobs (i.e., crewmember, coxswain, boat engineer). Under the coxswain job, there are **tasks** that make up that job:

What Is It? (continued)

- Drive a boat
- Read a chart
- Plot a course

Under one of those tasks, Drive a boat, there are **task steps:**

Drive a boat:

- Perform pre-check
- Start the boat
- Cast off

Taken together, the steps of the task make up that task. So, when you analyze tasks, you go through the process of breaking the task down into its component and related sets of actions (task steps) until you have listed every action required to complete the task objective.

For the purposes of this SOP, TA means identifying all steps and sub-steps that are required to complete a task. TA also means identifying the pre-requisite skills and knowledge required to perform the task (i.e., knowledge of hand tools). To complete TA, the analyst must also list;

- The tools and equipment required to perform the task
- The conditions under which the task must be performed (i.e., night ops)
- The standards to which it must be performed (i.e., nut must be torqued to tolerances listed in the Engineering Manual).

You probably have a couple of questions already. One might be:

- Why isn' t TA part of the analysis phase of ISD?

What Is It? (continued)

That' s a good question, and the answer is that it could be. Some models include TA with ISD' s analysis phase. However, the people who conduct FEA and JTA are often PCs, not SMEs. An SME (someone really familiar with actually doing the task) is essential to good TA. Also, there is seldom time to do analysis to the task level during FEA or JTA. For those reasons, we' ve chosen to include TA -- as many models do -- in ISD' s design phase.

Your second question might be:

- With all the analysis work we' ve done so far, why do we have to tear tasks down to the step level too?

There are several answers to this equally good question. In the fourth chapter of the design section, you will learn how to write performance objectives. The task statement, Tear Down an Engine, becomes your Terminal Performance Objective (TPO) and the task' s steps (or groups of similar steps) become your Enabling Objectives. So, you can see it would be hard to write performance objectives if you didn' t have TA results to help you out.

A second reason is that you can' t go very far with designing a performance-based training program without good TA. TA defines pre-requisite skills and knowledges. Thus, the course designer does not include that information in the course design because students will already know it. Since the task statements become the TPOs, the course designer is constantly reminded not to fall into the age-old trap of developing subject-based training that is about topics rather than performance.

Yet another reason is that TA work can capture the task steps an accomplished performer (AP) uses to complete the task. Using an accomplished performer to do TA allows the course designer to capture and design the AP' s "tricks of the trade" into the training program, thus ensuring better performance from the program' s graduates.

What Is It? (continued)

But today there is one more reason that may be the most critical of all. Contractors who develop the Coast Guard' s alternative delivery training are usually not SMEs. To avoid the steep cost of sending SMEs to In-Progress Reviews (IPRs) to check for faulty content, the Coast Guard can avoid some mistakes by handing off completed TAs to the vendor.

Good TA requires reliable methods for gathering, analyzing, verifying, measuring and reporting data. There are many methods you can use for conducting TA, but the Coast Guard is most familiar with a method called a **task listing**. This method uses TRACEN SMEs with much experience in how the task is performed in the field. They list all the steps required to perform the task in the order those steps are performed on-the-job. The task listing method also captures all skills and knowledges required to perform each step of the task (i.e. use a multimeter, understand the principles of operation for a specific engine) and also captures other information relevant to on-the-job task performance (i.e., references and tools required, etc.).

To start TA, the analyst takes the results (a task listing) from an FEA or JTA and begins the work of analyzing each task on that list.

How Do You Conduct Task Analysis?

There are several ways to conduct TA. Although the fairly simple method of a task listing works for most tasks, it would be better to use a method such as algorithms (see the "Type a Memo" example of algorithm TA on page 22-13) or stimulus-response for more complicated tasks, requiring many decision points.

This SOP chapter will mention those other methods, but we will only concentrate on the procedures for the task listing method. If you want to try another method, please look at the materials on TA listed in the References Section.

How Do You Conduct Task Analysis? (continued)

NOTE: Those you who have been ABCD-trained know that the ABCD TA process uses stimulus-response (SR) tables. If you received training in this method and have the job aids, you may want to use the SR approach rather than task listing.

As we' ve said, there are various ways to conduct TA. For example, you might go to the field, directly observe how people are performing a task, ask questions about what you see, and record the results. Or, for large tasks involving decision making, you might use a flowcharting process such as developing algorithms that show how you arrive at correct decisions ("yes" or "no"). If it is important for a task to show subordinate-superior relationships, you might turn to the work breakdown structure approach. You could also use interviews with people who perform the task (the Coast Guard preferred method) or research technical manuals and other print materials or send questionnaires to people who perform the work at their jobs.

As you can see from the examples we' ve mentioned, it' s not a question of the "right" or "wrong" method. Rather, it' s a question of which approach works best for the types of tasks you have to analyze.

Regardless of what methodology you use, all TAs have the following procedures in common:

- Identify the major or critical outputs of the job. (The ABCD method calls these outputs "major accomplishments.")
- Collect the data necessary to record principle tasks (i.e., direct observation, interviews, relevant printed materials, questionnaires, and surveys or a combination of these) required to complete these major accomplishments
- Ensure that each task has a discernable, measurable output. If it doesn' t, it is probably a task step – not a task

How Do You Conduct Task Analysis? (continued)

- Break the task down into steps. Stop the breakdown when you have identified all the subtasks that make up the task
- Validate data. For example, information derived from interviews can be validated by direct observation
- Submit the tasks for preliminary concurrence (i.e., send the task list to a group of experts who know what the task should consist of and ask them to validate/comment on results)
- Design a suitable format for presenting TA results (task listing, table, flowcharts, narrative descriptions or combinations of those formats)

That gives you some background on how task analysis works and what kinds of approaches are available for different kinds of tasks.

Now comes the important part. How does the Coast Guard conduct TA? As we' ve said, the Coast Guard prefers its SMEs to conduct TA using the **task listing method.**

The steps for that method are:

- List each step necessary to accomplish the task
- Examine each step for possible sub-steps the student would need to accomplish
- Look at entire list of steps to see if any steps can best be grouped together
- List the pre-requisite skills and knowledge required to perform the task
- List all tools and references required to perform the task
- List the conditions under which the task must be performed
- List the standards to which the task must be performed for successful completion

How Do You Conduct Task Analysis? (continued)

NOTE: At the end of this chapter, you will find tools to help you conduct task analysis:

- A **Task Analysis Work Sheet** you can reproduce to help document the results of a task listing analysis
- A **Sample Task Step List** for the tasks "Conduct Container Weight Test" and "Conduct Truck and Trailer Inspection." This example will help you in breaking down a task into its component steps
- A **Table for Deriving Task Steps' Skills and Knowledges** that will help you in identifying the prerequisite skills and knowledges required to perform a task

Occasionally, you will find yourself conducting TA for what are really knowledge quals. In that case, the task listing method will not work.

For that kind of situation, we' ve developed a**Knowledge Qualifications Task Analysis Worksheet** (found at the end of this chapter).

Let' s look at how analysis of a knowledge-type qual works. Suppose you have to analyze the steps involved in the principles of operation for an air conditioning and refrigeration system. You start by answering the following questions:

- What is it? (and what is it not?)
- Who uses it?
- Why is it used?
- What are its components?
  - Rules
  - Systems
  - Parts
- Where is it used?
- How is it used?
  - Start
  - Run
  - Secure

How Do You Conduct Task Analysis? (continued)

One final thought on how to conduct TA: be sure your analysis documents any special aptitudes or abilities required for successful completion of the task. For example:

- Tasks that an On-Scene Coordinator performs take place during a stressful, emergency situation
- Boarding Officer tasks require a balance between a courteous, civil demeanor and an official, regulatory posture
- A supervisor' s tasks call for time, meeting and communication management

As part of your TA, try to capture the special characteristics required for successful task performance. Some examples of how that documentation might look are:

- Maintaining poise during a press interview in the midst of an emergency situation, (i.e., states facts only and correctly, does not argue, voice remains at conversational level, etc.)
- Being courteous while enforcing an unpopular regulation, (i.e., smiles, says "thank you")
- Discussing marginal performance with a subordinate without angering or offending the person, (i.e., states a target behavior, discusses only behaviors, does not combine counseling with praise, does not argue, etc.)

To recap what we' ve said so far, you now know:

- There are several methods available for analyzing tasks
- The Coast Guard prefers the task listing method
- There is a method for breaking down a "knowledge qual" into its component parts

How Long Will It Take?

TA is intensive and time-consuming work. Even if you use TRACEN SMEs, you can expect to spend a considerable amount of time on this task.

How long it takes will obviously depend on how many tasks you have to analyze, how well your SME (or panel) knows the tasks, and the methodology you use for collecting and analyzing data.

What Will I Get Out Of It?

We have already mentioned some of the many benefits of TA. Some that bear repeating and that have particular application to TRACEN instructors and course designers/developers are:

- TA forms the basis for all course design work; without it, you can' t design a job aid or design instruction very well
- Task statements and task steps become the training program' s objectives. Those objectives will only be as good as the results of TA allow them to be
- We are an organization that does not have formal doctrine. That means we have little to give contractors who will develop alternative deliveries. Good task analysis can go a long way in helping solve that problem. It is also a very efficient alternative to sending our SMEs on-site to help with contractor development
- Good TA prevents "nice-to-know" task creep. TA answers the course designer' s question of how much material to include

Why And When Do I Conduct Task Analysis?

Why:

Another reason to do a TA is when an existing course is identified for an alternative delivery. Nothing is more useful to course designers than a good TA.

Why And When Do I Conduct Task Analysis? (continued)	**When:** TA can begin right after an FEA or JTA has been conducted. The IP will decide which design (and delivery system) Programs want to fund, but regardless of that decision, TA will have to be done. In short, once you' ve received the green light for the "train" and "job aid with training" decision, you need to start TA since it will form the basis for any training program design you ultimately develop (resident instruction or an alternative delivery).
What Is My Role In Conducting Task Analysis Likely To Be?	As a TRACEN SME, you are likely to be the one conducting a TA. As the person who knows the task' s content, you will be a key person in any effort to analyze the steps the task consists of.
Who Can Help Me?	This SOP can help you. Reading further information about how to conduct TA can help you. You can also depend on your TRACEN IT or ISS staff to guide you in initial efforts or to help you figure out a hybrid methodology for accomplishing what you need to accomplish. However, you may not need any help. You know the task. You can best analyze it. We suggest you stick to the task listing method, or if you are ABCD-trained, follow the job aids for S-R TA
What Is The Process For Getting Task Analysis Started?	There is no formal process for getting this task started. It should be the next step for TRACEN SMEs once a task list is identified and approved as a result of a JTA or an FEA. In the past, TRACENs have seldom been asked to undertake a TA by Coast Guard Headquarters, but that situation may be changing. Good TA results are a critical part of the government furnished materials (GFM) we hand off to contractors.

What Is The Process For Getting Task Analysis Started? (continued)

Another trigger for starting a TA effort is an existing training program. If no TA has ever been done, conducting a TA is one good way to improve the program.

Conducting A Task Analysis Job Aid

Assuming that an FEA or JTA has already been conducted and you are starting with a validated task list (i.e., tasks identified as "train" or "job aid with training"), the steps of a task listing TA are:

- List each step necessary to accomplish the task.
- Examine each step for possible sub-steps the student may need to accomplish.
- Look at the entire list of steps to see if any steps can best be grouped together.
- List the pre-requisite skills and knowledges required to perform the task.
- List the tools and references required to perform the task.
- List the conditions under which the task must be performed.
- List the standards to which the task must be performed for successful completion.

Chapter 23: Conduct Content Analysis

What Is It?

In Chapter 21, "Conduct Task Analysis", we said the task statement – for example, Tear Down an Engine – becomes the terminal performance objective (TPO), and that task steps (or groupings of task steps) become Enabling Objectives (EOs). The procedure for determining task content and thus, how to write task statements at the appropriate level of performance, is **content analysis**.

Content analysis means classifying each task statement and step in a task (or groupings of steps in a task) by:

- **Content type**

And

- **Job performance level**

Task statements and task steps can be classified as one of five **content types**:

- Fact
- Concept
- Procedure
- Process
- Principle

Task statements and task steps can also be classified as one of two types of **job performance**:

- Remember (Do you expect the student to store this information in long-term memory?)
- Use (Do you expect the student to apply this information?)

RULE 1: Students can remember/recall all five content types: facts, concepts, procedures, processes or principles. But, they can only apply or use concepts, procedures, processes or principles. They cannot apply or use facts.

What Is It? (continued)

For example, a student can remember or recall a definition for leadership. But, he or she cannot apply that definition by itself. Instead, the student would have to use the leadership definition in conjunction with a leadership concept, procedure, process or principle.

RULE 2: Content analysis is used to distinguish between the information it is necessary for students to commit to long term memory and the information they must use or apply:

- Remember occurs when students are asked to recall or recognize any of the five types of content
- Use occurs when students are asked to apply any of four content types

How Do I Conduct Content Analysis?

As soon as you finish a task analysis worksheet:

- Classify each task statement and task steps (or groupings of steps) as one of the content types (see **Content Analysis Chart One: How to Determine Content**, at the end of this chapter):
    - Fact
    - Concept
    - Procedure
    - Process
    - Principle
- Classify each task statement and task steps (or groupings of steps) according to its job performance level (see **Content Analysis Chart Two: Writing Task Statements at the Appropriate Level of Performance**, at the end of this chapter):
    - Remember
    - Use

How Long Will It Take?

Time to conduct content analysis will depend on the number of tasks you must analyze, and their relative complexity. If you have a great many tasks, content analysis will obviously take longer. If there are few tasks, the job will only require a few minutes of your time.

What Will I Get Out Of Conducting Content Analysis?

There are several reasons for conducting content analysis:

It will help you write performance objectives, the task you will learn in the next chapter of this SOP. Remember we said that you always want to try to train to a level equal to what the student will have to do on the job. The way you do that is to write objectives for the instructor that are as close as possible to the performance level required by the job. So, when you write performance objectives, it is critical to know task content type (i.e., fact, concept, procedure, process, principle) and job performance level (remember or use).

Content analysis will help you design tests and performance assessments. For example, it would be appropriate to design a simple recall test to evaluate the student' s ability to remember Ohm' s Law. However, if the student needs to know how to use a multimeter to troubleshoot an electrical problem, you will design an "application" test – i.e., have him or her use a multimeter to troubleshoot a simulated electrical problem.

Content analysis also helps the course designer determine how much practice and repetition are required to be built into the course design. If students need to recall something (i.e. commit it to long-term memory), you will have to design lots of repetition and interaction. On the other hand, if you want students to apply or use something, you will design your course around job aids (or an EPSS), instructor demonstrations using the job aid or EPSS, and practice for the students to try out the task using job aids or an EPSS.

See the **Example of Content Analysis Applied** at the end of this chapter.

Why And When Do We Conduct Content Analysis?

Why:

You conduct content analysis because it helps you:

- Write performance objectives
- Design training that will transfer to the job and improve workforce performance
- Design performance-based tests and learning assessments

When:

You usually conduct content analysis after TA. However, if you have the time, it could be conducted as part of TA.

What Is My Role In Conducting Content Analysis Likely To Be?

Your role in conducting content analysis is SME. You are the person most likely to know task steps, type content, and level of performance required on the job.

For this reason, content analysis should never be conducted without an SME. He or she is **CRITICAL** to doing this task correctly.

Who Can Help Me?

Reading this SOP and using the charts at the end of the chapter should mean you won' t need any help.

However, if you run into a problem or have a question, the IT or ISS staff at your TRACEN can help you.

What Is The Process For Starting A Content Analysis?

Content analysis is a logical follow-on step after TA. It can also be done as part of TA. Make sure you add the results of content analysis to your audit trail.

What Is The Process For Starting A Content Analysis? (continued)

If you are reviewing old curricula with the goal of making improvements or possibly converting that curricula to an alternative delivery, you should:

- Check the audit trail for evidence of a TA and content analysis. If there is evidence that this work has been done recently, you can safely use those products for your course design work
- If there is evidence that TA or content analysis has been done, but not very recently, use the old product and update/validate it with new data
- If there is **NO** evidence that task or content analysis has ever been done, start that effort now as your first priority. No alternative delivery should be pursued until a recent, up-to-date task and content analysis has been conducted by an SME

Content Analysis Job Aid

To conduct content analysis, follow these steps:

- Use **Content Analysis Chart 1, How To Determine Content**, to classify each task (and task steps or grouped task steps) as a specific content type:
  - Fact
  - Concept
  - Procedure
  - Process
  - Principles
- Use **Content Analysis Chart 2, Writing Task Statements at the Appropriate Level of Performance**, to determine whether each task (and task steps or grouped task steps) should be:
  - Remembered/recalled
  - Applied/used

NOTE: The two charts are located at the end of this chapter.

Chapter 24: Write Performance Objectives

What Is It?

When you complete task and content analyses, you should have:

- A list of steps necessary to accomplish the task--in the order they are performed.
- Content type and performance level identified for each task and its steps.

The next step is to convert that data to performance objectives.

Converting task statements to an action word (verb) that captures how you will test student performance in the classroom (or by another delivery method) can be quite difficult. It helps to know if you are dealing with facts, concepts, procedures, processes, or principles. It also helps to know if you want the student to remember or recall a performance, or use or apply it. That' s why we went through the process for conducting content analysis before explaining the procedures for writing performance objectives.

NOTE 1: When you write a performance objective, you are simultaneously selecting a method for testing student performance. This fact means that writing a performance objective is much more than a writing exercise.

NOTE 2: Since there is so much material to cover in designing level 2 evaluations (tests), we have placed that information in Chapter 25. For now, be aware that you write performance objectives AND do some of the design level 2 evaluations work at the same time.

You need to write two types of performance objectives:

- Terminal Performance Objectives (TPOs)
- Enabling Objectives (EOs)

TPOs are based on the task statements from an FEA or JTA and describe what the student will be able to do upon completion of instruction. The word "terminal" is used as a descriptor because a TPO describes the terminal or "end" performance the student should have mastered upon completion of instruction.

What Is It? (continued)

EOs are written at the task step (or groups of task steps) level and support the TPO. The word "enabling" is used as a descriptor because mastering an EO brings the student closer to mastery of the TPO. When a student has completed all EOs satisfactorily, the student should:

- Have mastered the TPO, or –
- Be ready to demonstrate the ability to perform the TPO

Similar to the task "Conduct content analysis," the task "Write performance objectives," is also related to designing performance-based training.

You start the task "Write performance objectives," with task and content analysis outputs: task statement, task steps, conditions, standards, task and step content type, and level of performance (use or recall). Your job in writing performance objectives is to convert that data into performance objectives. As you design these objectives, you will make sure they describe and test **actual job performance**. By capturing actual job performance in your objectives, you are ensuring that the resulting training program will be performance-based.

NOTE: Sometimes the constraints imposed by classroom or alternative delivery mean you have to deviate some from actual job performance. However, any of these deviations should always be as close as possible to on-the-job performance.

Writing performance objectives is NOT an easy task. It takes creativity and innovation to make performance objectives match actual job conditions, standards, and performance.

Let' s examine how you write performance objectives.

Every TPO has three parts:

1. **Performance** (task statement--what the student is expected to do).
2. **Condition(s)** (limits/conditions within which the student is expected to perform).

What Is It? (continued)

3. **Standards** or criteria (how well the student is expected to perform).

RULE 1: Every EO has the same three parts.

RULE 2: Some EOs are written only as performance statements because their conditions and standards are the same as for the TPO. However, if an EO' s conditions and standards **are different** from those of its TPO, then it will require its own conditions and standards. This is why we say an EO has the same three parts as a TPO.

Look at the **Example of Enabling Objective That Requires Its Own Conditions and Standards** at the end of this SOP chapter. It will help you visualize the scenario below.

Task Statement: Conduct freight vessel exam

The course designer knows there won' t be an actual freight vessel in the classroom, so the designer converts the task statement to:

TPO: Given a freight exam scenario, regulations, references, and boarding forms/checklists, DETERMINE regulatory compliance by completing the appropriate boarding forms noting 80% of the possible facility discrepancies.

Now, suppose a task step for "Conduct freight vessel exam" asks the student to commit to memory some important terms involved in determining regulatory compliance.

Obviously, for that type of EO, students will not be given a freight vessel exam scenario, regulations, references, and boarding forms/checklists. Also the standard for that type of recall exercise will very likely be 100%.

In a case such as that, the designer will need to develop separate conditions and standards for that particular EO.

How Do I Write Performance Objectives?

The characteristics of a TPO are:

- Describes what the student will be able to do upon completion of instruction.
- TPOs are derived from task statements or performance qualifications ("quals") and/or job performance requirements (JPRs).
- Corresponds to a task that was selected for training during the analysis phase.
- Describes the conditions, standards, and performance required in the training environment.
- Should be as close as possible to actual performance in the field.

When a course designer puts all three parts of a TPO together, the resulting product looks like the examples below:

- Given incoming and outgoing correspondence, PROCESS the correspondence by completing an "in-out" box exercise. To successfully complete the exercise, address the required action, the priority, and the response deadline for each piece of correspondence.
- Given appropriate navigational data, COMPUTE gyro error by azimuth of the sun in accordance with Dutton' s and Pub 229.
- Given appropriate navigational data, IDENTIFY the procedures for computing gyro error by azimuth of the sun in accordance with Dutton' s and Pub 229.

Now you know what performance objectives look like, but let' s examine each of their component parts more closely so you can learn how to write them.

How Do I Write Performance Objectives? (continued)

The Performance Statement component:

Ideally, the performance statement should be the same as the task statement from an FEA or JTA. However, what can be achieved in the field with real equipment and real-life situations is sometimes a bit different from what students can be asked to achieve in a classroom, lab, or alternative delivery. For that reason, you will sometimes have to modify task statements for your training program.

To write this part of the TPO:

- Define the observable performance you want the student to do.
- (Ideally), use the same task statement that came from FEA or JTA work.
- If you can' t use that statement because of varying constraints, define a statement that is as close as possible to the performance desired in the field.

For example, if the task FEA or JTA identified is:

- Conduct freight vessel exams.

But, you have to train that task in a classroom setting where you won' t have the equipment or time to actually conduct freight vessel exams, convert the task statement to:

- Determine regulatory compliance by completing a boarding form.

From the examples you have seen so far, you can see that all performance statements must include an action word (verb) plus an object (a noun).

Examples: Conduct (action word--verb) + freight vessel exams (object--noun) or

Determine (action word--verb) + regulatory compliance (object--noun)

How Do I Write Performance Objectives? (continued)

One of the hardest parts of writing objectives is choosing the "right" action word for a classroom or alternative delivery situation. At the end of this chapter, you will find a tool, **Decision Table for Selecting Action Verbs**. Use this tool when you write performance objectives.

The following helpful hints will also help in determining the "right" action word for the performance statement:

- Base the performance (action word) on the task or task step and keep it precise.
- An instructor or students should be able to read the performance statement and know exactly what they need to train or do.
- Avoid vague terms that are not clearly observable ("understand, demonstrate a knowledge of, show an understanding of, know the principle of, be familiar with…").
- Use only one action word. If you use more, then you have captured more than one task, and you need more than one test or assessment.
- Don't add words such as "The student will be able to …"
- Think about how you are going to test the trainee. Avoid terms such as "fully," "completely," and "really."
- Avoid words relating to positive behavior such as "good," "right," "well," or "correct manner."

The Conditions component:

The conditions statement describes the givens, situations or scenarios, and restrictions under which the task will be performed. Just as with the performance statement, you won't always be able to match training conditions to conditions in the field. However, you want to make conditions as similar to the field as possible.

How Do I Write Performance Objectives? (continued)

Otherwise, you won' t know if the student who has completed training can really perform satisfactorily under field conditions.
To write this part of the TPO:

- Consider the actual performance of the task as it is done in the field.

- Replicate those conditions (including tools and equipment) as closely as possible.

- Add any conditions that match how the task will be done in a classroom, lab, or alternative delivery setting (e.g., "darkened lab to simulate night operations").

As an example of how this works, let' s consider the task, "Determine regulatory compliance by completing a boarding form."

- In the field: you have access to an actual vessel that needs to be inspected, regulations, Commandant Instructions, the Marine Safety Manuals, and boarding forms/checklists.

- In the classroom: you probably do not have an actual vessel that needs to be inspected--instead, you have a scenario that provides vessel information. You do have regulations, Commandant Instructions, boarding forms/checklists.

So the TPO conditions statement for training in the classroom would read:

"*Given a freight vessel exam scenario, regulations, references and boarding forms/checklists."*

Don't forget to add a job aid to the conditions statement, if people performing the task in the field use a job aid.

Use these hints when preparing conditions statements:

- **Avoid a long list of specific tools and equipment.**

How Do I Write Performance Objectives? (continued)

- **Don't include obvious situations: "given a test and a pencil."**
- **Avoid talking about how the trainee will learn the task, "Given a lecture … "**

- **Avoid making the conditions too specific: "Given two pieces of polymer 4 inches by 4 inches" might be too specific--better would be, "Given two pieces of polymer."**

- **The conditions statement should describe, as closely as possible, field conditions under which the trainee will work. If the person must perform the job in poorly lighted, small spaces, then the conditions specified in the testing situation should mirror those conditions as closely as possible.**

The Standards component:

The standards statement describes the minimum acceptable level of trainee performance. Standards are written in terms of quantity, quality, accuracy, and limits.

To write this part of the TPO:

- Determine the level of competence to which you want the student to perform. Base that level of competency on the level required for the field.

NOTE: Getting standards "just right" can be a tricky call. For a task that involves safety or that must be performed to total proficiency, standards of 100% are appropriate. Generally speaking, though, the job of training is to get students to entry-level proficiency. To become highly proficient, a student must practice over and over again. Usually, the time allowed for a resident course is not long enough to achieve that level of proficiency. Proficiency issues are one good reason to consider developing alternative deliveries. Self-paced instruction, delivered on the job, allows the student to practice again and again until total proficiency is attained.

Course designers have long used certain measures to identify competency or proficiency levels:

How Do I Write Performance Objectives? (continued)

- **Limits:** examples: Within 5 minutes, [type] 40 words per minute, within 3 attempts.

- **Quantity:** example: Enter at least three violation reports within an hour.

- **Accuracy:** examples: Without error, answer at least three out of four correctly, answer must be within 2 degrees.

- **Quality** (specific level of acceptability for error; describes absence or presence of error): examples: Surface must be smooth with no cracks, steps must be performed in proper sequence, measurement must be within specified tolerance, note 80% of the possible discrepancies.

CAUTION: Be sure your standards match those in the field. If speed is not important there, it should not be a standard in your objective. If your objective says that a 20% error rate is all right, that rate should be acceptable in field performance.

Standards should also match the requirements of a field or rating. Those standards that work well for engineers or quartermasters may not work well for a marine safety investigator.

Course designers sometimes use references as a standard. For example, a standards statement might read, " …in accordance with M9000 Engineering Manual." That is an acceptable way to write a standards statement, with one caveat:

- Make sure the actual reference tells the student the standards (accuracy, limits, time, quality, etc.).

For example, it is acceptable to reference a technical manual for the standards if the student can find the task in the manual and:

- **Read the quality:** surface must be smooth with no cracks

How Do I Write Performance Objectives? (continued)

- **Find limits:** solvent must be applied for only 5 minutes
- **Find accuracy:** Nut must be torqued to + or – 2

If the technical manual talks about the task, but does **NOT** set standards to which that task must be performed, do **NOT** use the reference in the standards statement.

NOTE: The reference can, and probably should, be part of the conditions statement, since technical manuals and regulations are standard tools for people in the field.

Refer to the following helpful hints when developing standards statements:

- If speed is particularly important on the job, include a reasonable time limit in the standards statement.

- Do not make the standards dealing with speed quite as high as would be required for an experienced worker performing the task on the job. The main factor that distinguishes your graduates from experienced workers is that graduates have had less practice.

- Avoid vague standards such as "to industry standards," or "correctly."

- Avoid relating standards to instruction. Do not use a phrase such as "according to the instructions in the handout." Specifications can and do change; standards do not.

- Make sure that your standard statements are all inclusive. Use many standards, if necessary, to cover all criteria.

- The minimum acceptable standard for a task should be the same for each trainee in the training program.

As you write each TPO, consider appropriate methods for assessing performance. At the end of this chapter, we' ve included a tool, **Table of Assessment Methods by Category**, that will help you determine the appropriate test for each type of TPO. When you use the table:

How Do I Write Performance Objectives? (continued)

- Prioritize test options based on how well they match on-the-job performance.
- Eliminate methods that are not feasible or practical to administer.
- If there are several choices, select the preferred method listed in the chart.

After you have written a performance statement, conditions and standards for each task, the only work left is to put those items all together into one performance objective.

The Coast Guard prefers to use objectives that are similar to Mager objectives:

- Start with conditions
- Next, add the performance statement
- End with the standards statement

NOTE: For audit trail and review and documentation purposes, you may want to keep a record of the work you accomplished in writing performance objectives.

Now that you know how to write a TPO, what about EOs?

You write EOs for each task step, or for a group of task steps, that can logically and practically be tested at the same time.

EOs are written in the same way as TPOs.

Those EO characteristics that make it different from a TPO are:

- It captures a step (or steps) required to complete the TPO
- EOs train and test steps

How Do I Write Performance Objectives? (continued)

Example EOs are:

- Given date, ZT, And ZD, COMPUTE Greenwich Mean Time (GMT) in accordance with Dutton' s.
- Given a corrected GHA and DR longitude, COMPUTE the local hour angle in accordance with Dutton' s.
- Given exact ZN and gyro compass bearing, COMPUTE gyro error in accordance with Dutton' s.

How Long Will It Take?

Writing performance objectives won't take long at all, particularly once you get some practice.

Of course, how long it takes depends on how many tasks and task steps you have to convert to TPOs and EOs. For a long training program that trains many tasks, and for tasks with many steps, it may take as much as a week of dedicated time to write performance objectives.

For a shorter training program, or tasks with fewer steps, it will probably take a few days instead of a week.

Remember, you are rarely starting from scratch. Even if this is a "new start" training program, you always have old curriculum outlines to draw on.

What Will I Get Out of It?

Performance objectives--TPOs and EOs--become the foundation of the training program. They help convert real world job performance into useful and transferable training--both for the instructor and for the student.

You gain several benefits from writing performance objectives:

- They direct subsequent training program development.
- They direct how you train your students.

What Will I Get Out of It? (continued)

- They tell both you and the students how they are going to be tested and evaluated. Knowing this information before students are tested or evaluated will help them focus their study time and therefore reduce the amount of time you need to spend with remediation.

- Performance objectives form the basis of your design; they also make up a large part of the Coast Guard' s curriculum outline.

Why and When Do I Write Performance Objectives?

Why:

You write performance objectives to:

- Change real work job performance into training language.
- Tell students what they need to know and do (under what conditions and to what standard) when training is completed.
- Complete a critical part of the Coast Guard' s curriculum outline.
- Direct and guide the course developer in developing instructional materials for the training program.
- Serve as the framework or blueprint for instruction.

When:

You write performance objectives:

- Once you complete or receive task analysis worksheets and content analysis results.
- When you need to develop or revise a curriculum outline.
- When you are doing design work for traditional or alternative delivery instruction.

What Is My Role?

As an instructor or course designer, you are the key person writing performance objectives. You are always the SME regarding content. Sometimes, you may rely on an IT, ISS, or a TS to help write performance objectives. But, with the help of this SOP and some practice, you should find you can write them on your own.

You are also the prime user of performance objectives:

- As an instructor, they tell you what to train, and they tell your students how they will be tested.
- As a course designer, they give you the framework from which to build your training program.

Learning how to write performance objectives also helps you with internal evaluation work. A good starting point for determining if instruction or alternative delivery programs are still current and accurate is to review performance objectives.

Who Can Help Me?

Your workplace has IT, ISS, or TS staff who are experts in course design work.

What Is the Process for Getting Started?

There are several triggers for writing performance objectives:

- "New start" training programs
- Need to do a curriculum outline
- Need to revise a curriculum outline
- Need to make internal changes to a training program
- Internal evaluation work
- Training program design work

Write Performance Objectives Job Aid

The steps for writing performance objectives are:

Step 1: Draft performance statement. Either use task statement or modify to meet constraints of training program.

Write Performance Objectives Job Aid (continued)

Step 2: Consider how you will test student performance.

Step 3: Draft conditions statement. Try to match conditions in field.

Step 4: Draft standards statement. Try to match standards for field performance.

Step 5: Modify objective parts, if necessary, to ensure the performance objective and the way you plan to test match.

Step 6: Put all three statements together in the format suggested in this chapter.

Step 7: Use the tool, **Objective Evaluation Checklist (OEC)**, at the end of this chapter to check your work.

Chapter 25: Design Level 2 Evaluations (Tests)

What Is It?

Commandant' s Instruction 1550.23, Training Evaluation Policy, has promulgated a new process for training evaluation.

First, we evaluate student reaction to our training programs. This evaluation is referred to as Level 1 evaluation (**reaction**).

NOTE: We discuss Level 1 ("reaction" – student critiques) evaluations in Chapter 31 of this SOP. TRACEN Yorktown has made a decision to develop one level 1 evaluation (scannable form) that will be used by all TRACEN schools.

Why does the Coast Guard' s new training evaluation policy ask us to start with level 1 (reaction) evaluations?

We start with level 1 evaluations of our training programs because negative reactions to training are very likely to have a high correlation with little learning being accomplished. For example, if students tell us in level 1 (reaction) evaluations that the instructor does not know how to train, the visuals are so poor that they convey nothing to the learner, or the handouts are illegible, those students are not likely to learn much from the course.

The next level of evaluation the Coast Guard' s new training evaluation policy mandates is level 2 (**learning**) evaluation. The intent of level 2 evaluations is to measure **student learning**. By measuring student learning, we mean determining the extent to which the trainee was able to change his/her attitudes, improve knowledge, or increase skills.

Level 2 evaluations (tests) are used by Training Providers (TPs)/TRACENs to ensure a trainee gains the desired information by the end of training. The purpose of level 2 evaluations (tests) is to find out:

- What knowledges students learned
- What skills students developed or improved
- What attitudes that students brought to the training experience were changed

What Is It? (continued)

To accomplish level 2 evaluations – that is, find out if our students learn, we test them. For Coast Guard TRACENs, level 2 evaluations include end of course tests, performance tests, and simulations.

Why is testing students to find out if they have learned so important?

- Mastering course objectives is important since no change in trainee behavior can be expected if learning has not taken place. (i.e., no change in behavior (transfer of skills and knowledge to unit performance – level 3) can take place unless learning has occurred)
- If you skip to level 3 (behavior) evaluation and find that the student can' t perform on-the-job, you might conclude that learning hasn' t taken place. Yet, the student' s lack of performance might be caused by a supervisor who prevents or discourages the person from performing or, the student may find the field does not yet have the tools he or she needs to perform the task. Unless you first measure learning, you can' t accurately determine why the student isn' t performing well on-the-job. In other words, valid level 3 evaluation results depend upon having first obtained valid level 2 evaluation results

NOTE: Aside from the obvious importance and benefits of level 2 evaluations (tests), they are also a way for the TRACEN to contribute valuable data to the Coast Guard, regarding the performance of its workers. TRACEN course designers, developers and instructors have control over learning. Regardless of the delivery system – in a resident course or with an alternative delivery method – designers, developers and instructors can take steps to ensure learning takes place. In contrast, they don' t have control over what happens at units. Other influences on performance – assignment and selection, lack of tools and equipment, environmental factors, etc. – come into play there. By providing level 2 test data that "proves" learning has taken place, TRACENs can help the Coast Guard in properly assessing all the influences that positively and negatively impact performance. Level 2 data can also help the Coast Guard in determining what influences, other than training, need to be "fixed" in order for workforce performance to improve.

What Is It? (continued)

Let' s take a moment to look at two real-life situations to see how level 2 evaluations (testing) works. Suppose the Coast Guard decides to attack two performance problems with training:

- MKs need training in troubleshooting the MTU engine
- All Coast Guard people need training so they can adopt a more positive attitude toward diversity issues

The course designer for the MTU troubleshooting training program will need to design evaluation instruments that indicate whether the student can or cannot properly troubleshoot a deficient MTU engine. Troubleshooting mechanical failure is a skill -- to be successful in on-the-job performance, the troubleshooter must be able to properly diagnose the problems causing engine malfunction and then "fix" those problems. The best kind of evaluation for a skill is a performance test – either on real equipment, into which faults have been inserted, or using a simulation that is as much like a real-life problem with a faulty MTU engine as possible. For this situation, the course designer will design a level 2 evaluation that uses:

- An actual MTU engine, if that is practical, or
- A simulator (an automated model of the MTU engine), if that technology is available and practical, or
- A simulation (an exercise which simulates the behaviors and skills required in troubleshooting the MTU engine)

Given the availability of equipment, safety issues, costs, and so forth, the course designer will have to make choices. However, there are certain constants he or she will observe:

- The level 2 evaluation design will be performance-based (a skill)
- The evaluation will be as close to real-life, on-the-job conditions, performance and standards as possible

What Is It? (continued)

In contrast, the course designer' s decisions for a level 2 evaluation of a student' s grasp of diversity issues will be quite different. In this situation, the goal is for the student to have changed his or her attitudes toward diversity issues. The course designer' s challenge will be to determine if those attitudes have changed to reflect the attitudes the organization both expects and wants to nurture.

The same constants as applied to the MTU engine hold true for this situation as well:

- The level 2 evaluation will be as performance-based as possible
- The evaluation will be as close to real-life, on-the-job conditions, performance, and standards as possible

The big difference between assessing ability to properly troubleshoot (a skill) and assessing a student' s ability to change attitudes (affective mode) is the course designer' s choice of test methods. In this case, he or she will probably choose to design a test that uses:

- Simulated or real-life Coast Guard case studies (e.g., video with scenarios – each scenario followed by a written test)
- Role-play, followed up with test evaluation questions
- Scenarios delivered by various methods, followed up by a written test
- Pre- and posttest attitude survey

Note that the course designer does not choose to evaluate changed attitude performance by "recall of information" methods (multiple choice, short answer, fill-in-the-blank, matching, true/false questions) **alone.** Recall of information evaluation would mean that the student had heard and could recall the information, but not that he or she understood how this information should be applied in the work place (changed attitudes).

What Is It? (continued)

There are some other considerations a Coast Guard course designer needs to know about when he or she is designing Level 2 evaluations (tests):

- Design **criterion-referenced** tests (i.e., measure against a standard as opposed to comparing students to each other)

Coast Guard level 2 evaluations (tests) should always be **criterion-referenced**. That means the test should determine whether or not a student can meet a job-related standard with no regard to the performance of the other students. For example, let' s say a student' s job will require him or her to complete personnel documentation with no greater than a 5% error factor. To receive a GO on a level 2 evaluation for this requirement, all students would have to correctly complete a structured test on personnel documentation that had 20 items the student could get right or wrong. To pass the test, students must get 20 or 19 personnel documentation items right. Anything less would receive a NO GO.

Why? Because the job standard is 5%, and students must meet that criterion in order to be successful on the job. If out of 20 calculations, any student only missed one item, he or she would have completed the objective, and we would be confident that they could perform successfully on the job.

Let' s take a moment out to talk about criterion-referenced testing. It is an important subject, and there are many myths about what it really means.

The same multiple-choice test can be either criterion-referenced or norm-referenced. The terms refer primarily to the way in which each type of test establishes standards. In criterion-referenced tests, the performance of all the students in the group is compared to the number of subordinate skills or objectives passed. For example, if the performance objective standard (criterion) states that 80% of the questions must be answered correctly, then each student is compared to that standard. Those under 80% receive a NO GO, and those at 80% or higher receive a GO.

What Is It? (continued)

Norm-referenced tests establish their standards differently. They compare the performance of one student with the performance of the other students who took the test. Thus, the student' s rank or position in the group is the reference point for determining the quality of performance rather than a specified proportion of the objectives passed (i.e., PO Jenkins got a 99; therefore her performance was better in relation to PO Smith who only got a 79).

Criterion-referenced tests are tests based on the performance objective. The Coast Guard and other military services have adopted criterion-referenced testing because we need people who can perform on the job as soon as they complete training. Criterion-referenced testing gives us confidence our graduate students can perform on the job.

In contrast, norm-referenced testing (tests designed to compare one person' s level of achievement against a population' s -- A, B, C, D student, for example) does not give us the same level of confidence.

What do criterion-referenced tests look like?

PERFORMANCE OBJECTIVE: Given circuit diagrams of transistor amplifiers containing faults, LOCATE all faults in the diagrams.

CRITERION-REFERENCED TEST: Handout B contains two circuit diagrams of transistor amplifiers. These diagrams contain faults that consist of components that are either missing, extra, or connected in the wrong places. LOCATE each fault in the diagrams. All faults must be correctly located to receive a GO on this objective.

The test is criterion-referenced because it:

- Tests the same performance as the objective asked the student to perform: LOCATE faults in transistor amplifiers

What Is It? (continued)

- Asks the student to perform the test under the same conditions as exist in the field (student encounters situation with faulty transistor amplifiers, student has circuit diagrams of transistor amplifiers at his/her disposal)
- The test is to the same standard as expected in the field: student locates ALL faults

Other examples of criterion-referenced tests could be:

- Writing out decisions after reading or experiencing a scenario or case study
- Writing down an answer after determining an estimated time of arrival
- Labeling the parts of a diagram

When designing a criterion-referenced test, you should be sure that:

- The performance statement in the objective matches the performance called for by the test item. (i.e., If the performance statement is to Develop a Contingency Plan, the test should also call for the student to develop a contingency plan)
- The conditions under which the test item will be performed match the conditions stated or implied in the objective. (i.e., If the performance always takes place as a night ops, then the test should also be performed at night or under conditions which simulate night ops)
- The standards as stated or implied by the objective are the same standards used to evaluate the student' s final performance (e.g. If the performance' s standards state that a 5% error is acceptable in the field, the test should reflect that same error rate – no more, no less)

Another issue course designers have to consider concerns what types of tests you can use in your training program design. Are short answer tests all right? Can you use essay questions? How about true and false?

What Is It? (continued)

You can use different types of tests. It is appropriate, for example, to test knowledges with short answer (fill in the blanks, matching) or multiple choice tests. True and false tests are not reliable instruments since the student has a 50% chance of guessing the right answer. Essay questions are very subjective; therefore it is better not to use them.

The intent of the Coast Guard' s training evaluation policy is to ensure that:

- Short answer tests (i.e., multiple choice) are NOT used as the primary evaluation instruments for predicting successful performance in the field. Such tests rarely relate directly to job performance…how often are you faced with 4 "right" choices in job performance situations?
- All tests are based on the objectives (criterion-referenced)
- Instructors understand the intent of testing is to have a student demonstrate his or her ability to perform successfully in the field – NOT to rank order students according to how they performed in comparison to each other

Since the majority of Coast Guard level 2 evaluations (tests) are performance-based, often students will have no need to write down answers. Instead, they will simply perform the task. The instructor observes their performance, and based on the standards, decides if they pass or fail. The instructor' s evaluation is based solely on whether the student performed the task according to the standards stated in the objective.

Here are some final considerations for Coast Guard course designers designing level 2 evaluations (tests):

- The majority of Coast Guard level 2 evaluations should be performance-based. That means level 2 evaluations should come as close as possible to evaluating the student' s ability to perform the task as he or she will have to perform on the job (i.e., same conditions, same standards, same equipment, etc.)
- Test all training; if the training program is not being tested, it is not being evaluated

How Do I Design Level 2 Evaluations (Tests)?

In Chapter 24, we told you how to write performance objectives. Part of that task was determining how to evaluate (test) student performance on the objective (i.e., match, state in writing, etc.).

In this chapter, Design Level 2 Evaluations (Tests), you capture, flesh out and document your initial thoughts on how student performance should be evaluated.

The steps required to design level 2 evaluations are:

Step 1: Prepare a **Performance Objective Assessment Specification Worksheet** for each TPO. (A sample Performance Objective Assessment Specification Worksheet is found at the end of this chapter). This worksheet is the blueprint that guides the course developer or instructor in completing tests for the training program. The worksheet should include all the information a course developer or instructor needs to complete development of level 2 evaluations (tests).

Step 2: Record on the Performance Objective Assessment Specification Worksheet any thoughts you have on:

- How long (roughly) the level 2 evaluation (test) will take – per student and per class
- What equipment and resources will be required for the evaluation
- When, in the training program, the level 2 evaluation should be scheduled
- Instructions for the instructor/evaluator, including how much and what type of assistance instructors may provide to students during this test
- Evaluation data (i.e., answer key, checklist against which the TPO standard will be evaluated, feedback sheet)

Step 3: Fill in remaining information on the Performance Objective Assessment Specification Worksheet:

- Performance and conditions in plain language
- Recommended number of test items (i.e., questions, scenarios, etc.)

How Do I Design Level 2 Evaluations (Tests)? (continued)

Step 4: Complete one sample test item that can be used as a "boilerplate" for what the other test items should look like.

Step 5: Design the sample test item directly on the Performance Objective Assessment Specification Worksheet, or if there is not enough room, draft it on a separate sheet and attach to the Performance Objective Assessment Specification Worksheet.

Step 6: Archive Performance Objective Assessment Specification Worksheets as part of the audit trail.

How Long Will It Take?

Designing level 2 evaluations can take a fairly long time. Designing and developing checklists and answer keys, or providing sample test items, or developing appropriate case studies and scenarios can obviously take time. This is not one of the steps in course design that can be rushed.

However, since TRACEN course designers and developers (even instructors) are often the same person, you will save time by moving from design to development seamlessly (no handoffs or reviews required) and by combining the work of design and development into one task.

What Will I Get Out Of Designing Level 2 Evaluations (Tests)?

Level 2 evaluations offer many benefits to TRACEN staff and management:

- They provide valid data for assuring the Coast Guard that people have indeed learned the skills, knowledges and attitudes they need to do their jobs
- They provide feedback to instructors on how well they are doing their job
- They set the stage for the TRACEN' s part in level 3 evaluations (behavior – external evaluation). No transfer of skills and knowledge to job performance in the field can take place if learning has not occurred

What Will I Get Out Of Designing Level 2 Evaluations (Tests)? (continued)

- They provide TRACEN staffs with a wealth of data. Using the results of level 2 evaluations, instructors can improve the training program, instruction, and learning. They can also target areas that require remediation

Why And When Do I Design Level 2 Evaluations (Tests)?

Why:

You conduct level 2 evaluations to determine if students learned from the training provided. Although students can appear to have grasped skills and knowledge, level 2 evaluation (test) results tell the real story. Similar to formative evaluation, level 2 evaluation results are often the best means to target areas of the training program or instruction that need immediate improvement.

When:

The most obvious time for designing level 2 assessments/tests is when you are designing a "new start."

However, in real-life, you may spend more time with existing courses than designing new ones. As you work through this SOP, or attend professional development sessions, you may realize that the level 2 evaluations in the courses for which you have responsibility are very poor or that they don' t match objectives. From the results of that internal evaluation work, you may decide you need to redesign level 2 instruments so you can obtain more valid data from them and have better assurance that students did, indeed, learn from the training they received.

There is yet another real-life scenario which will probably continue to become more and more common: the examination of existing courses for their potential to deliver cost savings from a conversion to various forms of alternative delivery. Designing or redesigning better level 2 evaluations is one way to keep costs of conversion down and to ensure the resulting product is at least as good and perhaps better than resident instruction.

What Is My Role In Designing Level 2 Evaluations (Tests)?

As that part of the TRACEN staff asked to design and develop courses, you have a prime role in designing assessments/tests or level 2 evaluations.

Once you have gotten the hang of designing a few level 2 assessments, you will probably not require actual assistance to perform this job. However, you may want to work with your course designer or instructor colleagues or with IT, ISS, and TS staff, just to get some other thoughts on what should go in scenarios, how to make a first-class case study, or what a really good role play script and level 2 evaluation (test) looks like.

Who Can Help Me?

There are several avenues you can pursue for help:

- Check the References Section of this SOP. Dr. Kirkpatrick' s Evaluating Training Programs – the Four Levels and COMDTINST 1550.23 are particularly good references for help with this task
- Ask your IT, ISS, and TS staff for help. They can provide good ideas, points of reference, samples for you to look at, and good feedback. It will often turn out that this is all you need to get off to a very promising start
- Examine your own school' s audit trail. Revitalize and revamp some of the level 2 evaluation (test) ideas you find in old curriculum outlines or file cabinets. You' ll save yourself significant time and meet the standard for faster, better, cheaper, if you reuse good work that' s been done in the past. In the interest of this thought, keep those audit trails maintained, and be sure your replacement understands the real value of a good audit trail
- Examine tests produced for the new alternative delivery products the Coast Guard is beginning to use. If you can, reuse what has already been developed
- Examine the tests produced for non-resident materials. You may have to work on performance-basing some of them, but there are reams of test materials there that won' t require any rework at all. Don' t reinvent the wheel if you don' t have to

Who Can Help Me? (continued)

- Look at the NIDA-assisted course tests. Perhaps you can reuse some of them or adapt those tests to your own level 2 evaluations

What Is The Process For Getting Started?

The process for getting started with designing assessments/tests (level 2 evaluations) is as follows:

When you are designing a new course – whether for resident or alternative delivery --

- Design your level 2 evaluation (test) at the same time you write performance objectives

There are other times, too, when it is a good idea to redesign level 2 evaluations (tests). Let' s say level 1 (Reaction Evaluations) show a trend in students having trouble with particular test items. Or let' s say that your internal evaluation work shows you that the training program' s objectives and tests don' t match. When internal evaluation work indicates that the training program' s tests are a problem, you will want to revisit and rework those level 2 evaluations.

Or maybe you have been tasked with providing government furnished material (GFM) for a new start, and you have enough material to design objectives and Level 2 evaluations. Providing such materials will considerably lower the costs associated with a course design/development project. Such a practice will also mean more control over TRACEN assets – instructors and course designers won' t be pulled away from TRACEN work by a need to help contractors at a distant site.

Design Level 2 Evaluations (Tests) Job Aid

You will find a job aid for this task at the end of the chapter. The steps for designing level 2 evaluations (tests) are:

Step 1: Prepare a Performance Objective Assessment Specification Worksheet for each TPO.

Design Level 2 Evaluations (Tests) Job Aid (continued)

Step 2: Record on the Performance Objective Assessment Specification Worksheet any thoughts you have on:

- How long (roughly) the level 2 evaluation (test) will take – per student and per class
- What equipment and resources will be required for the evaluation
- When, in the training program, the level 2 evaluation should be scheduled
- Instructions for the instructor/evaluator, including how much and what type of assistance instructors may provide to students during this test
- Evaluation data (i.e., answer key, checklist against which the TPO standard will be evaluated, feedback sheet)

Step 3: Fill in remaining information on the Performance Objective Assessment Specification Worksheet:

- Performance and conditions in plain language
- Recommended number of test items (i.e., questions, scenarios, etc.)

Step 4: Complete one same test item that can be used as a "boilerplate" for what other test items should look like.

Step 5: Design the sample test item directly on the Performance Objective Assessment Specification Worksheet, or if there is not enough room, draft it on a separate sheet and attach to the Performance Objective Assessment Specification Worksheet.

Step 6: Archive Performance Objective Assessment Specification Worksheets as part of the audit trail.

Chapter 26: Identify Instructional Methods and Strategies

What Is It?

One of the most important tasks in ISD' s design phase is identifying instructional methods and strategies. In fact, you could say that all the tasks you' ve performed so far--identifying the target audience, conducting content and tasks anlaysis, writing performance objectives and designing level 2 evaluations--were just leading up to this most important task. When you identify instructional methods and strategies, you:

- Apply what you know about **adult learning theory** to the instructional design.
- **Group and sequence objectives** to achieve maximum learning.
- Select appropriate **methods** for the kind of learning you want to take place (i.e., lecture, demonstration, case study, etc.).
- Use **strategies** (i.e., the nine instructional events, advance organizer, reinforcement, feedback, etc.) to help your students learn and retain information.

NOTE 1: We' ll tell you what you need to know about applying adult learning theory, selecting appropriate methods, and using strategies in this chapter. We will cover the group and sequence objectives (design a course map) task in the next section, Chapter 27.

NOTE 2: If you are a graduate of HPT' s ABCD course design training, use that method and the job aids that came with the training for this task. Reading through this SOP chapter, though, may give you some further ideas for identifying instructional methods and strategies.

What do we mean by adult learning theory? A considerable number of studies have been done of the adult learner, so the good news is that we know quite a bit about what adults like and don' t like in training experiences, and what helps (and does not help) them learn. The body of knowledge about the methods and strategies that work (and don' t work) when training adults is referred to as adult learning theory (ADL). This chapter will tell you some of the highlights of adult learning theory.

What Is It? (continued)

ADL is also part of the Coast Guard' s Instructor Development and Course Designer Course curricula. If the subject interests you and you want to know more about it, you can find more information in the References Section of this SOP.

When you group and sequence objectives, you are creating a **course map** that helps students navigate through the training experience in a way that promotes their learning. For example, if you are teaching motor skills (i.e., a mechanical task), you will want to train using hand tools before you train maintaining a specific component.

Positioning tasks in the "right" location to maximize learning is the "**sequence**" part of this task. Clustering tasks into a **learning hierarchy** to promote learning (i.e., training the steps involved in troubleshooting capacitors in general, followed by going through the steps involved in troubleshooting a specific capacitor) is a "**grouping objectives**" activity. We will tell you how to group and sequence objectives (design a course map) in Chapter 27 of this SOP.

Identifying the "right" **method** or methods for your training program design has to do with selecting the best method for imparting the type of information you want students to learn. As you' ll learn from the results of adult learning studies, adults have pronounced likes and dislikes. Knowing what works for adults will help you in selecting the right method for what you are trying to train. Also, we know that certain kinds of methods work well for specific types of learning and other do not work as well. For example, if you are training appropriate interactions under certain conditions (e.g., a boarding), role plays or case studies work well. Lecture does not work as well.

What Is It? (continued)

The methods we' ll cover in this chapter of the SOP are the same ones you learn in the Coast Guard' s Course Designer Course (CDC):

- Lecture
- Discussion
- Tutorial
- Independent study
- Demonstration
- Simulation
- Role play
- Structured on the job

Identifying **strategies** means choosing those activities that are known to help students learn and retain the type of information you are training (i.e., intellectual or verbal skills, cognitive skills, motor skills).

One strategy we will tell you about in this SOP is using **Gagne's nine instructional events** to design and conduct instruction. This is the method the Coast Guard Instructor Development Course (IDC) uses to train new instructors in what they need to do to successfully conduct instruction. The nine instructional events are also trained in CDC. The nine instructional events are:

1. Gain attention
2. Inform learners of the objective
3. Stimulate recall of prior learning
4. Present the content
5. Provide learning guidance
6. Elicit performance
7. Provide feedback
8. Assess performance
9. Enhance retention and transfer

NOTE: We' ll reinforce using Gagne' s nine instructional events by covering them again in Chapter 37, Develop Lesson Plans, and Chapter 45, Conduct Instruction.

What Is It? (continued)

Some of the other strategies we' ll tell you about in this chapter are:

- Advance organizer
- Cognitive modeling
- Elaboration

How Do I Identify Instructional Methods and Strategies?

First, you need to know something about adult learning theory--what adults like and do not like, respond to and do not respond to in a training experience:

- **Make sure the training experience is problem-centered.** Adults tend to prefer single-concept, single-theory training programs that focus on applying a concept to real-life work problems.

- **Do some assessment of your students before you start design**. Make sure your training program design takes into account the entry level knowledge, understanding, and probable stands students are likely to take on critical issues before you develop the program.

- Remember to **design a program that promotes the integration of information.** Our job is to help students integrate the information they need to perform their jobs in a meaningful way. To remember and use new information, adults need to be able to integrate it with what they already know. Be aware that if the new information you want students to learn asks them **to unlearn what they already know**, they will acquire that new information more slowly and with more resistance.

- **Adults want a structure** to help them keep track of details and facts and their relation to one another. (**NOTE:** That' s why tools we' ll tell you about--such as an **advance organizer**--are such a help.)

- **Storytelling** with adult learners is a good thing--when adults hear a story about new information, it sticks to what they already know, and that makes it is much easier for them to retain.

How Do I Identify Instructional Methods and Strategies? (continued)

- **Present only one idea at a time** to help learners organize and integrate information.
- **Summarize frequently** to facilitate recall and retention.
- **Pace training** so that learners can master one element before moving on to the next.
- Be sure the practice exercises and case studies you design have **fidelity**. In short, make sure practice exercises, case studies, and pictures come from real-life Coast Guard events.
- Also, recognize that **adults prefer active (to passive) learning**, and therefore like games, cases, exercises, and simulations. However, make sure such exercises contain a reflective element if learning (or change) is to occur.
- **Plan for both feedback and recognition**. Learners need to know what they are trying to accomplish and how they are doing. Therefore, design in time for feedback.
- Be aware that **adults tend to take errors personally**. That means their self-esteem suffers a negative impact from mistakes. Therefore, they won' t want to take many risks and will prefer tried and true solutions. You can minimize these constraints by choosing appropriate methods and strategies.
- Curriculum design should, **where possible, account for learning style differences**. Adults do have significant learning style differences (i.e., visual, auditory, tactile, etc.). Your design should accommodate those differences by being as **multisense** (audio, visual, tactile, etc.) as possible. Some IT practitioners also believe individual personality types (introvert versus extrovert, sensor versus intuiter, etc.) have an impact on learning and should therefore be accommodated in course design work

How Do I Identify Instructional Methods and Strategies? (continued)

- Most adults **prefer straightforward, "how-to" content.**

- **Accommodate adult's continued growth and changing values.**

- **Work transfer strategies** into your training program design. (Examples of transfer strategies are pre- and post-training activities, discussions during training that focus on using new knowledge or skills back on the job, self-assessments and discussions with supervisors that define expectations, pre-work such as reading or data-gathering, refresher training, and support group meetings for graduates).

- Create a **safe, comfortable environment** for training.

- **Facilitation** is more effective than lecture, for certain kinds of experiences (i.e., setting up objectives, tapping into learners' experience and opinions to create parts of the content, reaching student consensus).

- **Activity promotes understanding and retention.**

Adult learners are also quite capable of learning all on their own, without the benefit of an instructor or a facilitator. The only time they cannot accomplish self-directed learning is when they know nothing at all about the content or have no basic level of experience with the skills.

Adults also like **self-directed learning**, when it is convenient and appropriate for them (the "teachable" moment).

You will see the terms, "**student-centered,**" "**learner-centered,**" "**self-directed**" many times in this SOP. All of these terms mean students doing the learning on their own--with some help from training program designers in the form of structured exercises, handouts, books, videos, print materials, computer-based or computer-assisted exercises, and with some help from instructors in answering questions.

How Do I Identify Instructional Methods and Strategies? (continued)

Some final thoughts on what adults prefer:

- Trust
- Respect
- Involvement
- Collaboration

Those key, "we' re-all-adults-here" concepts are ones you need to keep in mind when you design training programs.

That gives you some background on what adult learners prefer in their training experiences.

NOTE: The strategy, group and sequence objectives (design a course map), is covered in Chapter 27, the next chapter of this SOP.

Now let' s go onto the next step. How do you know when to make your training program design **student-centered**, or if **didactic** is the preferred approach for imparting a new piece of information or skill? Once you decide to **student-center** your design or include **experiential or discovery activities**, how do you decide whether lecture or demonstration is the best method to choose?

Next, we' ll cover selecting the right method for the information you are training.

If you want students to experience learning, undergo their own discovery, take an active role and bear responsibility for their own learning, you will want to build the following characteristics into your training program design:

- **Experiential**
- **Active**
- **Discovery**
- **Student-centered**

The methods that promote those characteristics are role plays, discussion, and hands-on practice that help students discover what works for good job performance.

How Do I Identify Instructional Methods and Strategies? (continued)

On the other hand, the **didactic** approach (tell them how to do it--lecture) can work better for tasks that are:

- Dangerous.
- The Coast Guard wants people to do these tasks just one way.
- About to be performed by people with no prior knowledge of or skill in doing these tasks.

Generally speaking, identifying appropriate methods is not about choosing the one "right" method. It is much more a case of selecting a method that is known to work very well for the type of information you want to impart or the training program you are designing.

Identifying the appropriate method to use is also a bit of an art. You know that adults prefer active to passive learning, and that active learning tends to stay longer in short- and long-term memory. But you can't always choose active methods such as discovery, experiential, and so forth. Sometimes, there is only one right way to safely perform a task, so you don't waste the students' time with a dangerous discovery exercise. You just choose lecture.

NOTE: We have taken the following information about methods from the Coast Guard's CDC.

Lecture: The lecture method is a speaker talking to an audience on a particular topic. Lecture is a good method when students know nothing at all about the information or skills that make up the training program. It is also a good method for presenting general information and for "telling" students the one right or acceptable way to do something. However, lecture is a **didactic** method that is made up of one-way communication, with little interaction. As is the case with all "one-way" communication techniques, the lecture method may result in miscommunications that are not fully realized until the instructor sees the results of level 2 evaluations (tests).

How Do I Identify Instructional Methods and Strategies? (continued)

Pros:

- Time saving (can be developed very quickly – lack of interaction allows instructor to control class time better).
- Inexpensive to develop.
- Good for delivery of general information.
- Can be used with any size group.

Cons:

- Instructor-dependent.
- Quality or content often varies; not a standardized method for delivery.
- May be boring to students.
- Leads to passive learning (lower retention).
- Lack of feedback for instructor and students.
- May be "canned" and unresponsive to student needs (not flexible).

Discussion: Discussion is the exchange of ideas about a given topic between the instructor and students. This method usually works best in small groups. Disruptive or overly shy students can sabotage small group discussions. There is also a high probability discussion will veer from the content of the training program. Discussion is a very effective method for presenting and developing analytical skills. It can also be easily adapted to **experiential** and **discovery learning strategies** since the instructor can lead a discussion so students "discover for themselves" what they need to know.

Pros:

- Involves everyone.
- Reduced peer pressure.
- Exchange of ideas and shared experiences (prime concept of adult learning theory is letting adults share their experiences).

Cons:

- Depends on voluntary participation.
- Limited effect in large groups.
- Some students may be uncomfortable or unfamiliar with the process.
- Time-consuming.
- Great potential for losing focus on topic.

How Do I Identify Instructional Methods and Strategies? (continued)

Tutorial: Tutorials are a **student-centered** method. They can also be easily tailored to include **experiential** or **discovery** exercises. Since tutorials are matched to individual students, they can be used for the full range of student ability--from slowest to fastest. The tutor or instructor' s role is to provide students with learning materials and activities, and then let them "learn" from those materials at their own pace. The tutor "facilitates" instruction by leading informal discussions and by answering questions students raise about the materials or activities.

Pros:

- Individual attention.
- Customized instruction.
- Good for remedial training.
- Can be adapted to full range of student abilities.
- Close student monitoring and immediate feedback.

Cons:

- No interaction with others who have similar learning requirements.
- Labor-intensive.
- Time-consuming.
- Expensive.

Independent Study. This method is flexible, **student-centered** and **self-paced** (i.e., completed by the student within the student' s timeframes). It can also be tailored to include a full range of **experiential** or **discovery** activities. Prime responsibility for learning is transferred from the instructor to the student. Students bring their own unique experiences, learning styles, and coping strategies to independent study, but the facilitator or instructor still helps them self-pace their progression through learning activities. Lack of interaction may be a problem for some students, but an upside of independent study is that the student can practice to proficiency without having the pressure of keeping pace with a group. The Coast Guard correspondence course program is a good example of independent study.

How Do I Identify Instructional Methods and Strategies? (continued)

Pros:
- Student-paced.
- Immediate feedback.
- On-demand training potential.
- Well suited for distance training.

Cons:
- No interaction with others.
- Repetitive in nature, leading to possible student fatigue.
- Time-consuming to develop.
- High development costs.

Demonstration: This is a two-way method that allows the instructor to show the correct way to do something while allowing students the chance to practice that performance and receive feedback. Often used in combination with other methods (i.e., lecture, discussion or tutorials), demonstrations are best conducted with small groups. Demonstration is an excellent method for instruction of step-by-step procedures or training with job aids. Demonstration uses both **didactic** and **student-centered** approaches. The instructor shows and tells the "right" or organizationally acceptable way of doing something (didactic) followed by students (student-centered) practicing what they' ve just seen. Demonstration is also a method that can be adapted to **peer-learning** exercises. A down side of demonstrations is their cost: real-life training aids, mistakes made on equipment, costs of maintaining large training aids.

Pros:
- Two-way training.
- Allows for hands-on experience.
- Provides opportunity to practice new performances.
- Immediate feedback.

Cons:
- Mistakes can be costly and dangerous.
- Time-consuming.
- Labor-intensive.
- Ineffective with large groups.

How Do I Identify Instructional Methods and Strategies? (continued)

Simulation: Simulations are a good method for instructing both procedural (step-by-step) and problem-solving skills. This method includes models and mock-ups, **case studies**, "in basket" exercises, or simulated games. Case studies allow students to seek solutions to oral or written accounts of a conflict situation. In-basket exercises give students an opportunity to practice managing and establishing priorities for solving problems, completing projects and other organizational concerns. Simulations are a very effective method for training the skills of delegation, scheduling, and planning how to carry out task or project management. Simulation games are like case studies but they add the element of competition with other small groups who are dealing with the same problem.

It is relatively easy to build **student-centered, experiential, and discovery activities** into simulations.

Pros:

- Practice provided in safe environment.
- Can be used to train both procedures and problem-solving skills.
- Perceived by students as fun and challenging.
- Can be used to develop teams and to enhance team work skills.

Cons:

- Needs extremely careful planning to achieve objectives.
- Time-consuming to administer and design.
- Can be expensive.
- May be perceived as artificial.

Role Play: Role playing is a good method for giving students an opportunity to incorporate new behaviors. It is also a very effective method for helping people recognize that there is seldom one best way to solve a problem or conflict. However, role plays are time-consuming, students may feel uncomfortable getting up and expressing emotions in front of other people, and they can be perceived as artificial.

How Do I Identify Instructional Methods and Strategies? (continued)

It is an excellent method, though, for instructing interpersonal and practice skills used in counseling, management, and so forth. Role plays can be **student-centered, experiential, and exercises in discovery**. If a role play is staged for students, it can be more **didactic**, but students who are uncomfortable with playing roles may find this method more comfortable than performing role plays themselves.

Pros:

- Opportunity to practice new behaviors.
- Opportunity to reverse roles and see problems from other perspectives.
- Good for training interpersonal skills.

Cons:

- Time-consuming to administer and design.
- Ineffective in large groups.
- Students must be comfortable with expressing emotions in public.

Structured on the job: "Structured" on the job means providing training at the job site and structuring that training experience through lesson plans, workbooks, tests and turn-key training packages that answer the field' s need to provide this type of training in a standardized manner.

This method is an excellent one for letting students learn how to do assigned tasks without leaving their jobs. There is little wasted time with structured on the job, it is immediately relevant to the individual' s job requirements, and the immediate application of new skills diminishes the chance for learning decay to set in. It is also an inexpensive method since there is practically no advance preparation or administrative cost. It can vary in quality and is highly dependent on the time, availability and communication skills of the people providing structured on-the-job training. In today' s Coast Guard, staffing for optimally crewed ships may mean there is less opportunity for structured on the job training.

How Do I Identify Instructional Methods and Strategies? (continued)

Well-designed structured on-the-job training is **student-centered** and **experiential**. It may also have elements of **discovery** built into the training program design.

Pros:

- Responsive to on-demand training (faster, more responsive).
- Students learn only what is needed (efficient).
- Students remain at job site (efficient and cheaper).
- Low administrative costs and preparation effort.

Cons:

- Optimally manned crews may not have the people or the time to administer OJT.
- Less effective for initial instruction of knowledge and skills.
- Depends on ability and willingness of experienced personnel to train.
- Instructional quality may vary.
- Training may be secondary to work schedule and Op Tempo demands.

Your job as a designer is to choose the method or methods that work best to promote the most learning. The pros and cons we' ve listed for each method will help you do that, but to make life easier, we have included two tools to help with this task at the end of this chapter:

- **Method Selection Assistance Chart**
- **Method Selection vs. Certain Variables Chart**

These two tools will help you choose the right method(s) for your training program quickly and easily.

Next, we will examine strategies you can choose to help your students learn. First, we' ll give you more information on incorporating Gagne' s nine instructional events into your training program design:

How Do I Identify Instructional Methods and Strategies? (continued)

Event 1: Gain Attention: Gain learner attention by introducing appeals to different senses:

- Gesture.
- Change voice volume.
- Provide visual or auditory stimuli (overhead transparency, PowerPoint slide, videotape).
- Put on a classroom skit (e.g., sexual harassment training).
- If possible, match the content of the attention gaining device with the content you want students to learn.
- Show students a "relevant" but frustrating example (e.g., poor survey in a class on designing good surveys).

Event 2: Inform Learners of the Objective:

- Start off with saying (and showing) "at the end of this lesson you will be able to…" so the students gets a clearer picture of what they will have learned by the end of the training session.
- Demonstrate the desired performance.
- Establish an **enterprise schema** that helps the learner remember and retain lesson information. For example, by telling the student the entire purpose of what is being learned--maintaining an engine--(the **enterprise**), the learner can better remember a particular lesson--checking the manifold--under the larger enterprise schema, maintaining an engine.

Event 3: Stimulate Recall of Prior Learning:

- Help students learn new material by integrating it with something they already know.

How Do I Identify Instructional Methods and Strategies? (continued)

Event 4: Present the Content:

- Intellectual skills: explain and demonstrate the skill with many examples from a variety of contexts.
- For concepts, emphasize distinctive features and emphasize critical aspects of rule application.
- Cognitive strategies: explain when and how to employ the strategy and demonstrate with examples.
- Verbal information: deliver verbal information visually or auditorially, and organize it in ways that are meaningful to the learners.
- Motor skills: demonstrate motor skills.
- Attitude learning: make the situation requiring a choice of action very clear, and demonstrate the behavior the organization desires by using a respected human example to model that behavior.

Event 5: Provide Learning Guidance:

This event supports the internal processes the learner has to go through to remember new information or skills. Your goal in this event is to make content as meaningful as possible.

- Use concrete examples of abstract terms and ideas.
- Elaborate each idea by relating it to others students already know.
- Use strategies with a proven track record: (**shaping** strategies for training a particularly complex or difficult skill; **backward chaining** for training a difficult procedure (rule), **advance organizer** for training a new mechanical procedure which is somewhat like other mechanical procedures the trainee has already learned.

How Do I Identify Instructional Methods and Strategies? (continued)

Event 6: Elicit Performance: Allow time for the learner to demonstrate the new skills or knowledge. (Event 6 is often called **practice**.)

- Verbal information. Have the learner state the information.
- Intellectual skill. Have the learner demonstrate or apply the skill.
- Cognitive strategy. Have the learner solve an unfamiliar problem that uses the same skills just trained.
- Motor skills. Have the learner practice doing the task.
- Attitude change. Have learner pick correct choices from a scenario.

Event 7: Provide Feedback:

- Tell students how well they are doing.
- The student may know their performance is incorrect, but not know how to correct it. Be sure you give corrective or **formative feedback**. Formative feedback (also called **constructive criticism**) should be related to how students are performing and give them advice about how to improve.

Event 8: Assess Performance:

Use this event to be sure students have really learned new skills or information.

- **The student should be able to perform without assistance and to a preset standard of quality or quantity.**
- **The test must match the objective (i.e., the test requires the exact same performance stated in the objective--for verbal information, the learner should state the answer and for motor skills, the learner should actually do the task).**

How Do I Identify Instructional Methods and Strategies? (continued)

- **You do not need to formally test students--you can use an informal test or peer assessment instead.**

Event 9: Enhance Retention and Transfer: **Retention** is the student' s ability to still perform the new task after a period of time has gone by since the student last performed the task. **Transfer** is the student' s ability to use the new skill or knowledge in a slightly different or greatly different situation from the one in which the student learned the task.

- **Give your students additional practice.**
- **Give your students opportunities for repeated practice.**
- **Provide varied types of practice exercises.**

We may have mentioned some strategies that are new to you. Now we'll cover strategies you can use in each of the nine events to help promote learning.

NOTE: There are many, many instructional strategies available. We are just including a few in this SOP. If you want to know more about instructional strategies, go to the References Section of this SOP.

- **Shaping**--a strategy that makes practice easier by providing many cues--either through a printed job aid or coaching.

- **Fading**--a type of shaping that provides many cues--then gradually reduces those cues, and finally withdraws them.

- **Specialized practice**--a strategy that uses a "recognize, edit, produce" sequence of events. For example, students are given examples of poorly and well-written performance objectives. First, they recognize which is which. Next, they edit the bad ones to make them better. Finally, they produce good performance objectives themselves.

How Do I Identify Instructional Methods and Strategies? (continued)

- **Backward chaining--**a strategy that lets students practice the steps for a procedure in backward order. The advantage of backward chaining is that the student gets to see the result of the previous step, which is the stimulus or input for the step being practiced.

- **Advance organizer--**a strategy that helps students put new information into a broader framework ("advance organizer") that they already know (e.g., training students in general techniques for using CFRs, then training them in the use of a specific CFR).

- **Cognitive modeling--**a strategy that uses experts to talk about what they are thinking while demonstrating a new skill or procedure.

- **Learning hierarchy**--a strategy that that uses a pyramid to explain complex relationships.

  NOTE: This SOP has an example of a learning hierarchy in Chapter 22, Conduct Task Analysis. The learning hierarchy strategy is used to illustrate the relationships among a rating, jobs in the rating, tasks within the job, and steps within tasks.

- **Paired associate learning** (mediating links)--a strategy that asks the students to associate new labels with previously learned ideas or events.

- **Clustering--**a strategy that presents terms that are unfamiliar to the students in categories that help them learn. For example, capacitor components, manifold components, and so forth.

- **Elaboration--**a strategy that trains the students to put unfamiliar terms in a sentence or other mnemonic device (i.e., "**t**he **q**uick **m**ouse" to better remember the term, **T**otal **Q**uality **M**anagement).

  NOTE: This SOP uses elaboration strategy in Chapter 29, Design and Develop an Electronic Performance Support System (EPSS).

How Do I Identify Instructional Methods and Strategies? (continued)

- **Part skills--**a strategy for breaking down a complex motor skill (i.e., tear down the engine) into "part skills" (i.e., remove the manifold) that are easier for the student to learn and remember.

- **Mental practice--**a strategy for having the student mentally practice a skill (i.e., visualize the steps).

- **Overlearning--**a strategy that deliberately uses practice beyond the point of proficiency to help students store a task in their memories.

- **Cognitive dissonance--**a strategy sometimes used in a training program designed to change attitudes. The theory is that a student cannot believe two inconsistent things at one time ("cognitive dissonance"). To avoid discomfort, the student will try to reduce dissonance or downplay its importance. One possible result of cognitive dissonance is changed behavior.

As we said, the strategies listed are just some of the many available to instructors and course designers. You can find many more by researching **learning theories**.

NOTE: There is one method we did **NOT** include in this chapter, and that is selecting supporting media to be used with the selected methods. We have included material on this subject in Chapter 36, Develop Instructional Materials and Training Aids.

How Long Will It Take?

The charts this chapter of the SOP provides will help you chose methods and strategies fairly quickly. However, thinking about how you will design exercises that capture certain strategies is both a skill and an art.

Identifying instructional methods and strategies is a task that can and should involve creativity. For that reason, it is difficult to establish specific timelines for this task. Given the realities of designing a new training program, the timeline will probably be a given.

How Long Will It Take? (continued)

In that case, the designer will have to work within the constraints of that timeframe. We suggest using a group or team to identify instructional methods and strategies. This activity usually benefits from the synergies to be gained from many heads, as opposed to one.

What Will I Get Out of It?

You will gain several benefits from identifying instructional methods and strategies, a critical step in training program design:

- Instruction that lets students learn, retain, and apply what they have learned.
- Instruction that transfers to job performance.
- Well-designed instruction (i.e., learning objects) that can be reused in other courses and training--thereby increasing TRACEN and Coast Guard ROI.
- The "right" intervention for the "right" people at the "right" time and place and for the "right" cost.

Why and When Do I Identify Instructional Methods and Strategies?

Why:

You need to identify instructional methods and strategies to ensure:

- Students learn (can remember or apply).
- That students can transfer what they have learned to on-the-job performance.

When:

For classic design work, as soon as you have produced the components of a course--task analysis results, identification of target audience, performance objectives, and level 2 evaluations (tests)--you will want to begin identifying instructional methods and strategies.

Why and When Do I Identify Instructional Methods and Strategies? (continued)

You might also have a need to identify instructional methods and strategies when you have an existing training program that isn' t succeeding very well. Maybe it doesn' t cost very much and doesn' t have a large student population, so you have no great incentive to convert it to an alternative delivery. On the other hand, maybe your internal evaluation work suggests that the course might really be improved as a resident course by a superior course design. That kind of "trigger" would also signal you to identify instructional methods and strategies.

What Is My Role?

As a TRACEN designer, you will have a key role in identifying instructional methods and strategies. You are the SME, so you know training program content best. By applying the principles and procedures you' ve learned in this SOP, you can be assured of producing a credible training program design the first time around. However, as with all work of this complexity, it is always a good idea to ask for help from an experienced IT, ISS, or TS. If resources are sufficient, training program design is best performed in a team.

Who Can Help Me?

TRACENs have many resources you can draw on. The various training division branches have specialized personnel in curriculum sections who can help you and even lead such efforts. PTC staff can help you. There are also many books, publications and articles on this subject.

Consider an internet search to flush out some new ideas.

What Is the Process for Getting Started?

We' ve mentioned some of the "triggers" for starting this task.

If you are involved in designing and developing a "new start," identifying instructional methods and strategies is a natural step in the design process.

If a contractor is designing and developing course materials, you may want to use this chapter of the SOP as a kind of checklist to use when reviewing design documentation that the contractor provides.

What Is the Process for Getting Started? (continued)

Your internal evaluation work may also trigger starting this task.

Finally, you may be tasked by your supervisor to carry out this task, either for a new start or for an existing training program.

Identify Instructional Methods and Strategies Job Aid

The steps for Identify Instructional Methods and Strategies are:

Step 1: Read through and consider ADL findings when designing your training program.

Step 2: Group and sequence objectives and design a course map that tells the instructor and students how they should progress through the instructional events.

Step 3: Select method(s) that are appropriate for the information and skills you want students to learn. Use the **two charts** listed at the end of this chapter to help you select appropriate methods.

Step 4: Choose appropriate strategies for training the tasks (or task steps) that make up your training program:

- Ensure you work each of the nine instructional events (i.e., gain attention, etc.) into the training program design.

- Choose appropriate strategies for training different kinds of knowledge (i.e., verbal, cognitive) and motor skills information (i.e., advance organizer, part skills, fading, etc.).

Step 5: Check your design' s activities, exercises, methods and strategies to be sure you have fully considered ADL findings.

Step 6: Document results.

Identify Instructional Methods and Strategies Job Aid (continued)

Step 7: Keep and maintain results of identify instructional methods and strategies and group and sequence objectives (design a course map) in your audit trail.

Step 8: Use these results when you complete design tasks and draft a learner plan (LP), (Chapter 32).

The two charts you need to perform **Step 3** of this job aid are located at the end of this chapter. Their titles are:

- **Method Selection Assistance Chart**
- **Method Selection vs. Certain Variables Chart**

Chapter 27: Group and Sequence Objectives (Design a Course Map)

What Is It?

The task of grouping and sequencing objectives is part of identifying instructional methods and strategies. Webster's dictionary defines "strategy" as a careful plan or method. When you group and sequence objectives you are designing a plan or method (strategy) for presenting the instruction.

NOTE: Since grouping and sequencing objectives is part of the larger task, identifying instructional methods and strategies, we could have included this material in Chapter 26. However, we thought you would find this SOP easier to use if we broke that large task down into two more manageable chapters.

What "**grouping objectives**" means to TRACEN course designers is to group objectives into course units or lessons and then to determine the proper sequence for those units and lessons that will promote optimum student learning. What "**sequencing objectives**" means to TRACEN course designers is figuring out the proper course, unit and lesson order or flow for training objectives that will result in optimum learning for students.

While those definitions are helpful, you probably still feel a little hazy about what this task is. We have provided some more information and some examples we think will be helpful in clearing up any confusion you may have at this point.

During the analysis phase of ISD, you probably noticed various relationships among job tasks. Even if you weren't involved in analysis, as you look at the approved task list for the course, you can see relationships among those tasks. Identifying and documenting such relationships (real and more artificial) is what we mean when we say you need to group and sequence instruction.

Grouping objectives (the logical structure for the course) and sequencing objectives (the "first, next, last" order the course uses) are very closely related. Grouping (structure) refers to the **relationship among objectives** while sequencing is the **order in which objectives** will be trained.

What Is It? (continued)

Let' s talk about the**grouping objectives** (structure) part of the task first. Your job as a designer is to identify the relationships among objectives so you can easily convert those objectives into learning units or modules.

Some of the more obvious ways to group objectives--or structure a course--are:

- **Task-centered structure:** This type of structure groups objectives based on their relationships to job tasks. This structure can be particularly helpful when there is a specific order in which tasks must be done on the job. Designing training that reflects the same order used on the job tends to reinforce that order in the student' s mind.

- **Topic-centered structure:** This structure groups objectives by topic. Main topics become the course' s units. This is a useful grouping strategy when trainees are required to learn much information. Such a framework makes it easier for students to learn and retain related information.

- **Problem-centered structure:** This type of structure is helpful for training students to problem-solve. Structuring a course around problems students will face on the job helps them focus on finding solutions. For example, for a course training a mechanic to diagnose equipment problems, you might structure the course around symptoms of equipment failure. The instructional emphasis would be on diagnostics.

NOTE: Since there is so much related information in this SOP, we used a topic (i.e., analysis, design, etc.) structure to group objectives. Another strategy we used was to sequence tasks under those topics in the usual order they are performed (i.e., conduct task and content analysis followed by write performance objectives, and so forth).

There is something else you need to think about that has an impact on how you group instruction.

What Is It? (continued)

Using the methodologies we commonly use today, many of the objectives you are dealing with in the design phase will be converted to job aids. One of the issues you face in grouping and sequencing instruction is how to best deploy and train your job aids.

NOTE 1: Those TRACENs who have gotten staff trained in HPT' s ABCD process may want to use that methodology for grouping and sequencing instruction. The job aids in the ABCD design textbook will help you carry out this task.

NOTE 2: In this SOP, we decided to deploy job aids at the end of each chapter. Our logic was that first you learn how to do the task by reading the SOP chapter and then you practice the task using the job aid.

Now that you have a better idea about how "grouping objectives" works, let' s look at **sequencing objectives** (order). When you "sequence" objectives, you are rank-ordering them in the progression those objectives should be trained:

- Some objectives are subordinate to others (i.e., you need to accomplish objective A (a less important task) **BEFORE** you can accomplish objective B (a more important task): (e.g., (task A) obtain position descriptions for all personnel in a division BEFORE you can (task B) assign right people to right jobs).

- Some objectives are equal in importance but must be performed in a particular sequence (e.g., within ISD, both conducting an FEA and designing and developing an IP are equally important. However, you have to conduct an FEA before you can design and develop an IP).

- Some objectives have a logical sequence but can be performed in any order (e.g., we have placed conduct COTS/GOTS searches in the analysis phase of the ISD, but this task can and should be performed on a continuous basis--within any phase of the ISD or even unrelated to the ISD process).

What Is It? (continued)

- Some objectives are unrelated to others (e.g., considered "off-normal" tasks that sometimes occur within a job and must be done, but are not part of the normal sequence of tasks and steps within a job)

Another way to look at the task of grouping and sequencing objectives is that it helps you determine your course' s architecture. As a course designer, somehow and some way, you' ve got to progress from writing performance objectives to designing a course map. That map must display the units and lessons that make up the course and establish a logical flow for how the student should progress through training. The work you do in grouping and sequencing objectives will determine your course architecture. Once you complete your grouping and sequencing objectives work, you will know:

- The optimal progression for students moving through the course.
- Where the course starts.
- Where the course ends.
- Those parts (if any) of the program that are optional.
- Those parts (if any) that students can take out of sequence.

Let' s back up for a minute and think about the components that make up a course. All courses consist of:

- A course.
- Units of instruction that make up that course.
- Lessons or modules that make up the units of the course.

When you group and sequence objectives, you are organizing the TPOs and EOs that make up the course into more manageable components:

- Units.
- Lessons.
- A smaller piece of instruction (i.e., skill within a lesson).

What Is It? (continued)

For a mechanical course, for example, you may group and sequence TPOs into four units:

- Component Identification
- Operation
- Maintenance
- Troubleshooting

Next, you will probably group and sequence objectives (lessons) within each unit. You might use one of the following ways to sequence those lessons:

- Step-by-step in job performance order.
- In order of priority or frequency of performance.
- By moving from:
  - Simple to complex
  - Overview (big picture) to details
  - Specific to general
  - Known to unknown
  - Concrete to more abstract
  - Present to future
  - Observation to reasoning

We can give you a better picture of how this works by giving you some examples of TRACEN real-life grouping and sequencing objectives work. Our TRACEN schools have favored ways to accomplish this task. For example, Marine Safety School favors an "as job tasks are completed" approach:

- The Fishing Vessel Examiner Course groups certain EOs and some skills and knowledges from other EOs together to reflect the order in which these tasks are completed on the job:
  - Bridge items lesson
  - Engine room items lesson
  - Lifesaving items (located elsewhere on the vessel) lesson

What Is It? (continued)

- The Marine Safety Petty Officer Course (MSPOC) groups MSIS EOs to reflect the order in which they are completed on the job:
  - Enter Facility Scheduler
  - Draft Facility Activity/Discrepancy & Violation Reports

Other schools favor different approaches:

- Topics arranged in a logical order (i.e., component identification, operation of the piece of equipment, troubleshooting of the piece of equipment).
- Build on prerequisite material.
- Ease of learning (macro to micro or micro to macro, etc.).

The last step in the grouping and sequencing objectives task is creating a graphic representation of the decisions you' ve made. This graphic is called a course map. It should be formatted as a graphic so that course developers can easily understand it.

A course map shows the sequence of units, relationship of TPOs to each other, and the relationship of EOs to TPOs within the overall course.

It will serve as a blueprint for course developers or instructors who are developing different pieces of the course. It will also tell the instructor how to sequence instruction. Or, if you are designing interactive courseware (ICW), it will indicate how the student needs to navigate through the course.

How Do I Group and Sequence Objectives (Design a Course Map)?

The steps you follow to group and sequence objectives are:

Step 1: Group objectives into units and lessons (modules) within units.

Step 2: Select the most appropriate method for sequencing those units and lessons to promote optimal learning and transfer to on-the-job performance.

How Do I Group and Sequence Objectives (Design a Course Map)? (continued)

Step 3: Use the results of steps 1 and 2 to determine course architecture:

- Overall course.
- Units and their sequence within the course.
- Lessons (modules) and their sequence within the course.
- Smaller pieces (i.e., tests, practice exercises, labs, etc.) and their sequence within the lessons (modules).

Step 4: Graphically depict course architecture in a course map.

NOTE: There is a tool at the end of this SOP chapter called **Grouping and Sequencing Procedure Table.** Use this job aid when you have to group and sequence objectives and design a course map.

Since designing a course map may be a new task for you, we have included more detailed instructions in this section about how to make a course map.

You have a certain amount of discretion in how you put your course map together, but you will want to observe certain accepted conventions:

- Depict flow by lines with directional arrows.
- Provide an explanation of any symbols used.
- Ensure placement of symbols reflects required and optional sequences.
- Represent all layers (units, TPOs, lessons (modules), and or EOs).

Your end product--a course map--should communicate the logic of the course to developers. A good course map will:

- Show the students how course lessons relate and build upon one another.
- Effectively introduce to the student and instructor where they are going and what they are going to learn.
- Help summarize and show students and instructors what they have learned and where they have been.

How Do I Group and Sequence Objectives (Design a Course Map)? (continued)

When you are putting a course map together, be aware that the most common types of maps used are:

- Course
- Lesson
- Topic

Each of these maps serves the same purpose. They provide instructors, students and course developers with a visual presentation of the design process. Course maps also provide an overview of an entire course. They usually display a listing of the units (and TPOs) for the course and the sequence in which they will be presented.

Lesson maps represent a smaller unit of instruction--typically a single lesson that is offered in a single session. Lesson maps commonly display one or more TPOs as well as supporting EOs.

Topic maps are often limited to one concept or principle and provide more in-depth detail to the structure of an instructional unit. For example, a topic map might be used to represent the steps necessary to perform a single, job-aided task such as starting an engine.

Maps drawn for ISD projects usually use a bottom-up format with the lowest level depicting the first objective. In other words, the student must go through the instruction listed on the bottom of the map before he can progress to the higher level of instruction (depicted higher up on the map). The course map will also clearly indicate mandated and optional progressions.

For example, students may have to progress from Lesson A to B to C, but it may be optional when they take Lessons, D, F, and Z.

NOTE: To see how course maps look, turn to the end of this chapter and look at the **Example Maps From The Marine Safety Petty Officer Course**. You are not required to follow the exact formats you see there, but the examples will give you some idea of how course maps should be put together.

How Long Does It Take?

The actual grouping and sequencing will not take very long at all. By the time you reach this stage, you will already have a fairly good idea of how you want to group and sequence objectives to obtain the best course design.

However, the course map part of this task may take a little more time. If you include a graphic display, you will have to use software such as ABC Flowcharter. If you don' t know how to use that software, you will need a little time to learn how to manipulate the program.

What Will I Get Out of It?

This task is critical to developing the "right" instruction. The outputs you will receive from performing this task are:

- Appropriate course structure (e.g., topical, task-centered, problem-solving, etc.).
- Properly sequenced objectives (i.e., the order in which objectives will be trained enhances and promotes learning and the transfer of learning).
- Course map that shows instructors and students how the student needs to proceed through the course.
- Course map that shows relationship of each objective of the course to course components (i.e., units, lessons, etc.).

Why and When Do I Group and Sequence Objectives (Design a Course Map)?

Why:

Sequencing is important because it impacts whether learning does or does not take place, and because learners cannot process and learn new information or skills unless they have previously learned the prerequisite knowledges, skills, and abilities (KSAs) upon which the new KSAs depend.

Structure is important because it provides a framework for learning: structured information helps you learn more quickly and allows you to remember what you have learned more efficiently.

Why and When Do We Group and Sequence Objectives (Design a Course Map)? (continued)

You spend most of the design phase designing the different components that make up a course:

- Performance objectives
- Test (level 2 evaluations)
- Instructional methods and strategies

During the grouping and sequencing objectives task, you take the obvious next step. You put all of the components together into a logical design that instructors and students can easily follow and that the developer can use as blueprint for developing course materials and instruction (lesson plans).

The analogies we' ve used for this work--blueprint, course map, etc.--help you understand exactly why this step is so important.

When:

When you finish designing course components , it is time to group and sequence objectives (design a course map).

What Is My Role?

If you are the course designer, your role will be to group and sequence instruction.

If you are the course developer, you will use the blueprint (learning plan or course map) to help you complete the work of developing required course materials and lesson plans.

If you are the SME assisting a contractor with developing an alternative delivery product or reviewing contractor-produced products, you will use the course map, blueprint, or learning plan to be sure the contractor has captured all pertinent information and strategies in the final products.

Who Can Help Me?

This SOP gives you a good start for grouping and sequencing objectives.

Who Can Help Me? (continued)

If you still feel unsure about the task, after reading the SOP, ask your TRACEN IT, ISS, or TS staff to give you some help in getting started.

You can read more about grouping and sequencing objectives and course maps in the References Section of this SOP. You can also get in touch with staff at other TRACENs to see what they' re doing with this task.

What Is the Process for Getting Started?

As soon as you design all the components that go into a course design, you should group and sequence objectives and complete your course map.

Other times for completing this task might be:

- You want to convert a current resident course to an alternative delivery and need to redesign the course to take advantage of the benefits (and meet the constraints) of that delivery system.

- You realize the current course design is not working (level 2 evaluations indicate students aren' t learning; level 1 evaluation results indicate students are dissatisfied with how the course teaches) so you need to redesign it into a more workable format.

Group and Sequence Objectives (Design a Course Map) Job Aid

There is a job aid at the end of this chapter. The steps you follow to group and sequence objectives are:

Step 1: Group objectives into units and lessons (modules) within units.

Step 2: Select the most appropriate method for sequencing those units and lessons to promote optimal learning and transfer to on-the-job performance.

Group and Sequence Objectives (Design a Course Map) Job Aid (continued)

Step 3: Use the results of steps 1 and 2 to determine course architecture:

- Overall course.
- Units and their sequence within the course.
- Lessons (modules) and their sequence within the course.
- Smaller pieces (i.e., tests, practice exercises, labs, etc.) and their sequence within the lessons (modules).

Step 4: Graphically depict course architecture in a course map.

Chapter 28: Design Job Aids

What Is It?

We' ve already introduced you to job aids, but they are such a valuable tool that it' s worth going over again the relationship that job aids have to improving human performance.

Job Aids:

- Prompt and guide you in performing a task
- Act as a memory-jogger, so you don' t have to commit all the steps of a complicated task to memory
- Are placed at the job site ("right place")
- Are available on-demand, when you need them ("right time")
- Help you remember important safety precautions and warnings that you might otherwise forget

When you train and educate the workforce, you are making an investment in developing the workforce' s memory and capacity for future efforts. When you design job aids, you are giving the performance supports that pay immediate dividends when a person has a specific task to perform.

Another major strength of job aids is their ability to summarize and crystallize large amounts of information.

Job aids can take many forms:

- A picture
- Singe-page checklist
- Entire book
- Daily "To Do" list
- A recipe
- Note card prompters for a speech
- Templates, boilerplates, macros and wizards
- Content outline
- Algorithms
- Decision-tables

What Is It? (continued)

But, while we' re discussing what job aids are, let' s be clear about what they are not. In and of themselves, they are not training, and they can' t substitute for training, in all situations. Rather, they fill an important gap in education and training.

When people use machines or procedures infrequently, they often forget how to use the machine or do the procedure. Even though people may have been trained in the procedures and safety precautions for a very complicated and possibly dangerous task, learning decay means they are likely to forget the exact sequence of task steps, as well as the safety precautions associated with performing the task. Sometimes, people become so familiar with a task that they also become somewhat careless in performing that task.

Job aids -- found right on or next to or embedded in the tools people use to do their jobs – can remind our workforce of the "right" and safe way to do a particular job or task.

REMINDER: Chapter 15, "Conduct Job Aid Analysis," in the analysis section tells you the situations for which job aids are **NOT** appropriate.

Up until recently, people thought of job aids as cookbooks, print media technical manuals, laminated pieces of paper that fit into a coat or shirt pocket or instructions found right on the piece of equipment. However, as emerging technologies have matured, more and more of the workforce are now using electronic performance supports – the electronic form of job aids. The Help desk, drop-down job aids, and wizards found in Microsoft Office products and other software are a good example of this kind of performance support.

So, what is this task? What do you do when you design a job aid?

What Is It? (continued)

Designing a job aid is another way of saying you are going to plan what should go in the job aid as well as determine what kind of format it should have (i.e., cookbook, algorithm, checklist, and so forth). Designing job aids means considering all the factors you need to think about to ensure the resulting product is:

- User-friendly
- Ergonomically "correct"
- Accurate
- Supportive of performance on the job

You may be involved in a project that calls for producing a series of job aids – a task we' ve called designing a **"family of job aids"** (i.e., a series of job aids to support position-specific performance when an Incident Command System is stood up). In that case, your job aid design work will produce a blueprint that will work for all job aids in the series – that way, your family of job aids will all have the same look and feel so the student/worker will find them easy to use.

Designing job aids means asking the following questions:

1. What does the person doing this work need and want to make the task easier?
2. Do I need to think about cultural diversity or literacy levels?
3. How will I manage the differences between apprentice level and master levels?
4. Where, when, and how will the job aid be used?
5. Do I need to include safety cautions and warnings?
6. How will I get the user' s attention?
7. What factors will affect job aid accessibility?
8. What information do workers need to perform the task?
9. What do effective workers (APs) know and do?
10. Are there any existing job aids I can adapt?
11. What illustrations should I include in the job aid?
12. Where should I highlight, use white space or bullets?
13. How will I simplify the task?

What Is It? (continued)

14. How do I make my job aid design complement how it will be used (design matches function)?

When you design a job aid or a family of job aids, you will ask and research the answers to those questions. From what you learn, you will than design a blueprint for what the job aid should look like when it is developed.

How Do I Design Job Aids?

When you need to design a job aid, follow these steps:

Step 1: Find answers to those fourteen questions we just mentioned.
Step 2: Determine the type of job aid format best suited for the task (i.e., cookbook, checklist, etc.).
Step 3: Do the task yourself (if you are an SME or skilled in the task) or observe an AP do the task.
Step 4: Write down everything you see the AP do.
Step 5: Ask questions about any step, process, procedure you don' t understand.
Step 6: Write down all amplifying information.
Step 7: Note those points in task performance when safety is an issue.
Step 8: Find clear, simple illustrations that help the job aid user perform the task.
Step 9: Rewrite a few of the task steps (Rewrite steps using short, simple sentences – you do not have to rewrite all task steps now. That can be done when you develop the job aid).
Step 10: Design job aid layout (i.e., substitute visuals for words where possible, make sure steps are in proper order; determine where warnings and cautions should go, and so forth)

When you design a family of plans, follow the same steps, but when you get to step ten, continue by:

- Fully developing one job aid
- Developing a family of job aids blueprint that shows when and where each job aid should be positioned once it is developed

How Do I Design Job Aids? (continued)

- Ensuring all of the job aids in the family have the same look and feel

Here are some tips for designing job aids:

- Use action verb plus an object for task steps
- Highlight important information
- Explain what happens before or after the step
- Give examples
- Number the steps
- Avoid crowding too many items on the page
- Use call-outs
- Position warning BEFORE the step it applies to
- Design job aids in small "bites"
- Design job aids in sufficient detail so that the person can perform the task without trial or error
- Include only information that is directly relevant to the task
- Use short words and short sentences
- Call attention to especially important information with arrows or boxes
- Use all caps and boldface to call attention to important information
- Use line art drawing instead of photos
- Use only one option for a step that can be done more than one way
- Edit, try-out and revise the job aid once it is fully developed

How Long Will It Take?

Designing a job aid can take a great deal of time if:

- It is a complicated job or task
- You haven' t had much experience with designing job aids
- You are very unfamiliar with the task/job content)

How Long Will It Take? (continued)

On the other hand, if you reverse one or more of those variables (uncomplicated task, you have much experience in designing job aids and you are very familiar with task/job content), it can take very little time.

One hint for reducing time is to use an AP to design them. This method will both shorten design time and also capture and disseminate "best practices" throughout the organization.

Another hint is to attend an **HPT Job Aids Workshop (JAWS)** training session. This training is invaluable to anyone who is trying to quickly come up to speed on job aid design and development.

There are also differing times associated with in-house or contractor development. If we can provide the contractor with excellent GFM (i.e., easy to use-and-read technical and field manuals or course handouts or excellent task analysis results), then we can count on fairly quick job aid production, since the contractor is very familiar with job aid design techniques.

Another method for reducing time is to designate job aid designers/developers in each school. This method allows a few individuals the chance to become quite proficient (and thus, quicker) at producing results. As school staff, they already possess job/task content expertise.

What Will I Get Out of Designing Job Aids?

There are several benefits to be gained from designing job aids:

- Effective, performance-improving foundational documents for course design
- Job aids that work (help student learn task, refresh student in doing task, allow student to practice task on-the-job until proficient)
- Job aids you design can be used to demonstrate performance, train student in performance and practice user in performance of the task

What Will I Get Out of Designing Job Aids? (continued)

- User-friendly job aids
- A "family of job aids" with the same look and feel
- Ergonomically designed job aids (i.e., small laminated "attach-to-equipment, glow-in-the-dark" job aid for a task that must be performed in a narrow, confined and dark space)
- De-bugged job aids (developed job aids will have to be piloted with other SMEs to find and eliminate any "bugs" or problems – you can include the same step in your job design work)
- The better part of your course will be designed when you finish designing job aids
- Students can take well-designed job aids back to the field to serve as performance support
- Well-designed job aids increase the chance that students will perform as expected back in the field. Transfer of learning is much more likely to occur, if job aids are part of training
- If-well designed job aids are inputted to a database, they can function as **learning objects** for many other types of performance support

NOTE: See Chapter 34, "Utilize Existing Instructional Modules (Learning Objects)", to find out more about learning objects.

Well-designed job aids capture the results of task analysis in a much more usable and permanent way than does task analysis.

- Well-designed job aids can bring instructors up to speed for cross-training issues
- Well-designed job aids can be used by anybody – from experts to beginners

Why And When Do I Design Job Aids?

Why:

We design job aids for the same reason we design anything. Without a blueprint, the resulting performance support tool is likely to be deficient.

Why And When Do I Design Job Aids? (continued)

When:

We design job aids during the design phase of the ISD model. Since a TRACEN' s course design model is performance-based, job aids will be a large part of any training program' s course materials.

We need to design job aids – foundational documents/tools for the training program – **BEFORE** we design the overall training program or course.

What Is My Role In Designing Job Aids?

As a course designer/developer or an instructor, your role is likely to be the person designing the job aid. You might also function as part of a team, designing a "family of job aids." Or you might be an SME reviewing a job aid.

You are a person experienced in performing field tasks and jobs. If the design won' t work for you, it won' t work well for people in the field. Therefore, your design work, input to a team' s design work, or review of a contractor' s design work are absolutely critical to producing a job aid that genuinely improves human workforce performance.

Who Can Help Me?

This SOP can help you. The References Section at the end of the SOP is very helpful. We have included several books and articles that discuss job aid design and development. They are all "how-to" books, written in "cookbook" style. Job aid designers usually refer to them many, many times in the course of a job aid design project.

Your TRACEN IT, ISS, and TS staff can help. PTC staff can help you. Several of their people have experience with designing job aids. Training Division' s Nonresident staff is also extremely skilled in job aid production. So are several of our instructor and course designer staff.

What Is The Process For Getting Started?

The following triggers indicate that it' s time to start designing job aids:

- You receive official tasking to convert a course or task or group of tasks to job aids
- Task analysis (for those tasks designated as train, job aid, or job aid with training) has been completed

Design Job Aids Job Aid

The job aid for designing job aids is at the end of this chapter of the SOP.

When you need to design a job aid, follow these steps:

Step 1: Find the answers to the fourteen questions listed on pages 3 and 4.
Step 2: Determine the type of job aid format best suited for the task (i.e., cookbook, checklist, etc.)
Step 3: Do the task yourself (if you are an SME or skilled in the task) or observe an AP do the task.
Step 4: Write down everything you see the AP do.
Step 5: Ask questions about any step, process or procedure you don' t understand.
Step 6: Write down all amplifying information.
Step 7: Note those points in task performance when safety is an issue.
Step 8: Find clear, simple illustrations that help the job aid user perform the task.
Step 9: Rewrite a few of the task steps (Rewrite steps using short, simple sentences – you do not have to rewrite all task steps now. That can be done when you develop the job aid).
Step 10: Design job aid layout (i.e. substitute visuals for words, where possible, make sure steps are in proper order, determine where warnings and cautions should go, and so forth).

Chapter 29: Design And Develop Electronic Performance Support Systems (EPSSs)

What Is It?

NOTE: Since there is only one job aid for creating an EPSS, we are including both the design and develop tasks in this chapter and treating them as one task.

An EPSS is often *closely* related to a job aid. It can, in its most limited form, simply serve as a hyperlinked tool to work through a series of task specific steps. In that case indeed it *is* a job aid, although an electronic one.

However, robust EPSS applications more closely resemble computerized self-paced learning systems. Although they incorporate the typical task-specific steps found in a job aid (see Chapter 28, Design a Job Aid), they also include other related information, media, data, and documents associated with the job.

These more robust EPSS applications typically serve as **self-directed learning systems** (SDL) and performance support systems that can:

- Provide needed performance support to large numbers of field personnel.
- Be distributed across organizational boundaries.
- Help users respond to a wide variety of needs including maintenance, operations, troubleshooting, and general knowledge.
- Be efficiently tied to a training component for use as interactive courseware.

EPSS tools are created for a wide variety of applications. They are used to:

- Document and link large amounts of material, data, and associated media (e.g., audio, video, stills, animations).
- Provide detailed steps and performance information associated with specific tasks and duties.
- Serve as a training and doctrine support tool.
- Embed or link other knowledge and learning objects and external training applications (e.g., CBT module, self-paced study guide, videotape learning system).

What Is It? (continued)

By itself, an EPSS usually does not replace a training program. However, it can efficiently serve as a training aid when used by resident instructors and coupled to study guides, discovery learning systems, or other training tools.

EPSSs are more normally used as refresher tools to retain or build upon existing knowledge and skills. Like job aids, they can cover specific procedures and tasks associated with a job. They also can provide an effective way to convert large volumes or masses of material into coherent and easily available "kernels" of information (i.e., learning objects).

EPSSs allow a user to randomly locate and access generic information or detailed performance support steps. This combination of specific task support and free-play access sets apart the typical EPSS from the typical job aid. More robust EPSS applications can also include intelligent branching systems, guided task and related systems information.

How Do I Design and Develop EPSSs?

NOTE: We have included a **design and develop an EPSS job aid** at the end of this chapter. You should follow the steps and practices outlined in this job aid for *task-specific* steps associated with jobs or duties you want to include in the EPSS. Also use PTC' s**EPSS Standards and Styles Guide** as your "bible" for how the EPSS should be designed and developed. You can obtain a copy of this publication from the PTC.

Right now, we' re going to discuss the fundamental steps required to create a generic, relatively simple EPSS.

You can use the following ten step--"COAST GUARD" generic plan when creating an EPSS.

NOTE: Remember though, if the EPSS you are designing and developing is primarily a set of task specific steps, it is a job aid, although an electronic one.

How Do I Design and Develop EPSSs? (continued)

That means you should use the **Design And Develop An EPSS Job Aid** and PTC' s**EPSS Standards and Style Guide** to create your performance support. The job aid is found at the end of this chapter. You can obtain a copy of the **EPSS Standards and Styles Guide** from the PTC.

The steps for a generic, simple EPSS are:

Step 1: <u>(C)</u> *Confirm* the EPSS will correct the performance gap. Does your analysis and media selection indicate an EPSS, or an EPSS coupled with another tool (e.g., a CBT module) will correct the problem? If yes, proceed to step 2.

Step 2: <u>(O)</u> *Organize* the related knowledge and identify the basic functional areas. What content should be included in the EPSS and what is its logical structure? For example, an EPSS created to support an Area or MLC SOP would closely follow the structure of the source publication, while an EPSS created to support a set of jobs or duties would more closely resemble the job hierarchy and sequence.

Step 3: <u>(A)</u> *Assign* key EPSS functions to the EPSS. What kinds of functional tools do you need in the EPSS? These can include bookmarking, annotation, word and phrase search, indexing, intelligent branching, and other navigational and structural components that you wish to assign to the system.

Step 4: <u>(S)</u> *Select* the specific content and information. Cull out the required information and content that need to be included in the EPSS. This is the specific information needed for the job, role, or function.

Step 5: <u>(T)</u> *Treatment* of the topic. Storyboard the EPSS including how the topic matter will be laid out and displayed, create a media shot list, and note where other document/application links will be included.

Step 6: <u>(G)</u> *Gather* media and content. Collect all media related documents and references and other applications. Secure any needed copyright clearances and permissions.

How Do I Design and Develop EPSSs? (continued)

Step 7: (U) *Uniform* production standards. Use a PTC Yorktown-developed EPSS as a model template for your production effort. Also use the PTC **EPSS Standards and Styles Guide**, tutorial or other PTC production tools to ensure a basic level of product usability and uniformity.

Step 8: (A) Author the EPSS. Produce and test the EPSS draft version. For large EPSS applications, you should author and conduct a formative evaluation (test) of a prototype section prior to ramping up to wide-scale production. The formative test ensures that the basic navigation, content distribution, and authoring approach is sound.

Step 9: (R) *Review* and test the complete draft. This step builds on the smaller prototype testing conducted after the initial production phase. Summative evaluation (testing) examines the finished product' s ability to correct the performance gap identified prior to beginning the project.

Step 10: (D) *Distribute* the finished product. Distribution is usually conducted via the Coast Guard intranet after draft revisions are complete and the EPSS is ready for release. However, other products may be distributed via floppy disc, CD-ROM, internet, or other mass media distribution channels.

NOTE: The first letter of each step spells Coast Guard. This **elaboration** strategy will help you to remember the steps involved in designing and developing an EPSS.

How Long Will It Take?

EPSS applications of medium to high fidelity to their source materials typically take from 1 to 3 months, although production time can vary widely. Like most multimedia tasks, the time needed to create an EPSS is directly related to several factors. They include:

- Project staff' s experience with EPSS design and production software.

How Long Will It Take? (continued)

- Volume and suitability of content. Clearly laid out and organized content in usable digital format is more readily inserted into an EPSS than material from poorly written, paper-only products.

- Amount and type of supporting media. Custom created media, especially two- and three-dimensional renderings and animations can add significant production time and cost to an EPSS development project.

- Availability of APs and SMEs. Ready access to seasoned experts is key if the design and development team does not include sufficient expertise to properly review and modify source materials.

- Programming complexity. Inserting other necessary applications, objects, and programs into the EPSS or creating custom coding can also drive up costs and time needed to successfully integrate the products. Ideally, these secondary applications should be compatible with the SWS III image to ensure timely and effective release to field units.

Contracting EPSS design and development can reduce the time required but users should note that a significant amount of time is still required of participating SMEs.

Why and When Do I Design An EPSS?

Why:

When the Coast Guard needs its people to perform at an expert level, but does not have the time or funding to make them experts, it creates a tool to help them perform at an expert level--an EPSS. An EPSS is also produced when the performance solutions requires a combination of job aids, source documentation, rich media, training objects, and other materials embedded into a hyperlinked electronic structure. An EPSS can also be the performance solution of choice when the user needs to access large amounts of material that is best retrieved via electronic means (i.e., EPSSs are used to organize large amounts of material with supporting information and navigation structures).

Why and When Do I Design An EPSS? (continued)

When:

An EPSS can be created at any point in a program or system' s life cycle. However, the key times for creating EPSSs are:

- Acquisition of new equipment (e.g., embedded performance support).
- Inception of a new program so that changed policy, doctrine, or process can be included in the EPSS.

What Is My Role?

For self-help projects, PTC can provide you with the coaching and staff assistance needed to complete the EPSS on your own. At a minimum, you will probably be called upon to fulfill the SME or AP role.

Who Can Help Me?

Workload permitting, PTC can provide you with staff assistance and coaching, development tools, and sample project and templates needed to complete a relatively robust EPSS. They can also provide your contractor with key materials and templates to ensure your project's look and feel is consistent with other Coast Guard related EPSS applications.

What Is the Process for Getting Started?

Before starting an EPSS project, you need to ensure that:

- All source materials are available in digital format.
- SMEs are available for the design and development effort.
- Project developers can provide concrete examples of "best practices/processes."
- Program or sponsor support, including distribution and life-cycle maintenance cost estimation, is ensured.

Design and Develop an EPSS Job Aid

In an effort to standardize EPSS development and provide direction and support, the Coast Guard has predominately targeted the Microsoft Help Engine for its EPSS development platform. Initially, this utilized the Microsoft Windows 3.1 operating system' s Winhelp.exe using BlueSky Software, Inc., RoboHELP Classic exclusively.

Design and Develop an EPSS Job Aid (continued)

The Coast Guard has since migrated to the Microsoft Windows NT operating system. Subsequently, the new Microsoft Help Engine utilizes the hypertext markup language (html) format geared toward the internet. BlueSky Software, Inc., RoboHELP HTML software has also made the transition to this internet-friendly format.

In this new development environment, the skill level required to build an EPSS is slightly more sophisticated, requiring some knowledge of HTML programming.

Also, RoboHELP HTML is not part of the Coast Guard' s common operating environment (i.e., software not part of the standard applications suite). For those reasons, PTC recommends following these steps to develop an EPSS:

Step 1: Coordinate on-site visit to PTC.

Step 2: Performance Consultant (PC) will help you access RoboHELP HTML software on one of PTC' s development computers.

Step 3: The PC will help you get started with RoboHELP HTML' s "Quick Tour" tutorial.

Step 4: After you have worked through the tutorial enough to feel comfortable with the software, the PC will help you begin working with your project. (**NOTE:** This may entail some initial planning before you get started. Each project is unique and has its own considerations.)

Step 5: You can make arrangements to complete your project at PTC, taking advantage of their software opportunities and PC help, or you can get enough help to get started and complete the project at another site.

NOTE: We' ve included some screen prints from the RoboHELP HTML tutorial. These illustrations will give you a feel for what working with the software is like. Contact a PTC PC for more information on what is required to complete an EPSS project.

Design and Develop an EPSS Job Aid (continued)

List of RoboHELP HTML screens:

- New Project
- Quick Tour
- Getting Started
- Creating a New HTML Help Project
- Creating Style Sheets
- Distributing Complied HTML Help
- What’ s Next?

Chapter 30: Design Interactive Courseware (ICW) -- CBT, WBT, IVT

What Is It?

This SOP chapter will tell you about the method we suggest you use to design ICW training and performance support programs. That method is scripting and storyboarding.

Let' s go over why we design ICW in the first place--certainly because ICW is cheaper, can reach more people, and is what the "Nintendo Age" expects. We also design ICW for the same reason we design any other product. Without a blueprint or map, we can' t be sure if the final product will do what we need it to do. However, one of the best reasons to design ICW is its effectiveness in promoting learning. Do you remember we said people learn best when many of their senses (i.e., **multisenses**) are engaged? Multimedia ICW training and performance support programs do just that--engage all (or most) of the students senses simultaneously. That is one reason why students who use such programs learn better and retain more from them. The computer has the capability of simultaneously engaging all (or most) of the student' s senses through multimedia.

Well-designed ICW also has other capabilities that enhance learning. It can simulate Coast Guard real-life situations and job content to a very high degree. It also has the capability for a high level of interactivity between the student and the training program.

The design team needs methods and tools for harnessing ICW' s capabilities and converting those capabilities into meaningful activities for students. Scripting and storyboarding (an ICW process and tools) are one way the design team does just that.

Pioneered by Disney and long recognized as the premier method for designing multimedia projects, scripts and storyboards enable the design team to translate analysis recommendations (i.e., build a CBT, EPSS, or video) into a logical and coherent **pre-production plan.** The pre-production plan is then handed off to the development team who use it to author the training program or electronic performance support.

What Is It? (continued)

Think of scripts and storyboards as a sort of blueprint for multimedia production. They are also very useful tools for conducting project **in-progress reviews (IPRs)** with clients, program managers and sponsors, stakeholders, contractors and SMEs. Scripts and storyboards are effective tools for translating a design vision into a recognizable plan that clients' , SMEs, and stakeholders can agree on, alter, or modify without having to make costly modifications to actual finished software.

Script and storyboard level of detail varies among applications (i.e., Designer' s Edge, RoboHelp, etc.) and the needs of the design and development team. More detailed scripts and storyboards are typically required for:

- Large design teams
- Teams located in various geographic areas
- A highly complex or wide-in-scope end project

Script and storyboard elements include:

- Content and subject matter per screen or frame.
- Media requirements for the screen or frame.
- Dialogue or general descriptions that will help the development team author the product.
- Navigation and user controls, buttons, and icons.

WARNING: Novice developers often jump straight from analysis into authoring. This is a major mistake and is a frequent cause of project failure.

How Do I Design ICW?

To design an alternative delivery system, you first design a script and storyboard.

Many designers simply use a series of "post-it" notes, paperboard displays, or other paper-based products. However, electronic production makes it easier for design and development team members to share storyboard elements between offices and over different time periods.

How Do I Design ICW? (continued)

The electronic tools for scripting and storyboarding are automated flowchart and database programs used to lay out and store storyboard data objects. Content, test, and other storyboard elements are often represented by flow chart symbols or other designators. Electronic storyboards typically contain links to associated material with a detailed description. For example, a storyboard frame might list a picture. An associated file might contain a detailed description of the picture and where it is archived.

PTC, the Coast Guard' s Center of Excellence for CBT, recommends using **Designer's Edge** software for much of the initial scripting and storyboarding of CBT and other technology-intensive performance support products.

NOTE: PTC' s**Interactive Courseware (ICW) Standards and Styles Guide** contains information and guidance related to the design, development, and production of computer-based training and ICW products. Novice developers are encouraged to use the guide when preparing a multimedia storyboard.

When you use design alternative deliveries, follow these key steps:

Step 1: Arrange objectives and tasks into a logical flow (assign a logical hierarchy and flow path from objective to objective. Independent objectives can be clustered or retained as separate elements as required to support the overall training program objective).

Step 2: Determine needed element branching and structure.

Step 3: Determine screen and script design elements for all major screens and display types, including navigation and control interfaces and icons (i.e., lay out a standard screen or template for each major type of screen and frame needed for the production. The basic screen should contain navigation and user control layouts).

How Do I Design ICW? (continued)

Step 4: Insert content and media elements (usually one major concept or topic point) per screen. Detail required links and media with the content.

NOTE: *The usual practice is to design CBT/ICW screens that provide about 60 seconds worth of activity per screen for the average user.*

Step 5: Review each major lesson and section with team and stakeholders.

Step 6: Author content from storyboard.

Step 7: Archive.

Step 8: Arrange storyboards into appropriate order and review periodically with key project members and stakeholders.

NOTE: The process and tools for video production are similar but they are oriented around creating and arranging short video sequences or scenes.

How Long Will It Take?

The time needed to create a script/storyboard is directly related to several factors. They include:

- Project complexity:
  - Amount of branching required.
  - Number of media elements, control options, and testing protocols required.
- End-product size.
- Design and development team size and experience.
- Available tools and team experience with the tools (i.e., Designer' s Edge or ABC Flowcharter).

Scripting and storyboarding usually takes anywhere from 10-25% of the time allotted to a given multimedia project. That figure translates from days to months depending on the factors noted above.

What Will I Get Out of It?

The script and storyboard fulfills four key purposes related to initial production, post-production, and efficient contracting:

1. Of primary importance, it provides the development team with an agreed upon foundation for sound production.

2. It serves as an easily understood project archiving system that supports life-cycle maintenance by helping post-production developers identify and locate elements that require alteration or replacement during the product' s service life.

3. The script and storyboard establishes a clear framework for contractor performance and execution.

4. Stakeholders, sponsors, and users can approve or alter design and development plans before far more expensive authoring and media collection efforts get underway.

Why and When I Design ICW?

Why:

Well-crafted performance support projects are based on a sound determination of the performance problem or delta the project is expected to correct. Even promotional videos are typically designed to support a specific objective or set of objectives. Thus, the script and storyboard serve to expand on the instructional strategies and goals tied to a specific project.

An ICW script/storyboard serves as an effective blueprint and planning tool to prevent cost and time overruns. It also helps the design and development team stay focused on key programmatic objectives and tasks.

NOTE: Detailed storyboards and scripts are key for successfully completing major multimedia projects that involve multiple designers, developers, media specialists, and production personnel.

Why and When I Design ICW? (continued)

When:

Scripts and storyboards should be created **AFTER** the analysis phase of the ISD process.

What is My Role?

Multimedia designers and developers often lack the specific content expertise needed to accurately assign content to all of the screens. An SME can help the designer place the correct material in the right sequence, identify what the typical user will respond to, and suggest changes. Therefore, the usual role for instructors and SMEs is to provide key information, content, and existing media or visual aid samples. They are also key members of the storyboard production and review cycles.

However, your role may be that of ICW course designer. Course designers can also help the team determine the appropriate level of branching, content descriptions, and other programmatic facets that are usually laid out in a script and storyboard.

Who Can Help Me?

TRACEN graphics and video production personnel are often familiar with script and storyboard processes and procedures.

Staff members of the PTC can also provide you with tips and suggestions. They produce and maintain the Coast Guard **Standards and Styles Guide for Interactive Courseware (ICW)**. Although not specifically designed for storyboarding, it does lay out many of the key elements related to screen design and format that you will need to complete a successful storyboard.

You can also contact the PTC for guidance and recommendations related to key software tools used to lay out scripts and storyboards. The best ones integrate all required elements into one coherent package. PTC recommends using **Designer's Edge** software from Allen Communications. Contact the PTC for additional details.

What is the Process for Getting Started?

Once the analysis phase of a project is over and initial design work (i.e., task and content analysis, writing performance objectives, designing level 2 evaluations (tests) is completed), the analyzed tasks and objectives that result from the analysis phase serve as the entering data points of the storyboard.

In the initial ICW design phase, the design team selects appropriate instructional methods and strategies needed to meet the instructional goal and objective.

The strategies and their associated learning tasks are then detailed in the storyboard with the other media elements and supporting materials outlined in previous sections of this SOP chapter.

Design ICW Job Aid

The job aid for design ICW is found at the end of this chapter. The steps for this task are:

Step 1: Arrange objectives and tasks into a logical flow (Assign a logical hierarchy and flow path from objective to objective. Independent objectives can be clustered or retained as separate elements as required to support the overall program objective).

Step 2: Determine needed element branching and structure.

Step 3: Determine screen and script design elements for all major screens and display types, including navigation and control interfaces and icons (i.e., lay out a standard screen or template for each major type of screen and frame needed for the production. The basic screen should contain navigation and user control layouts).

Step 4: Insert content and media elements (usually one major concept and topic point) per screen. Detail required links and media with the content.

NOTE: *The usual practice is to design CBT/ICW screens that provide about 60 seconds worth of activity per screen for the average user.*

Design ICW Job Aid (continued)

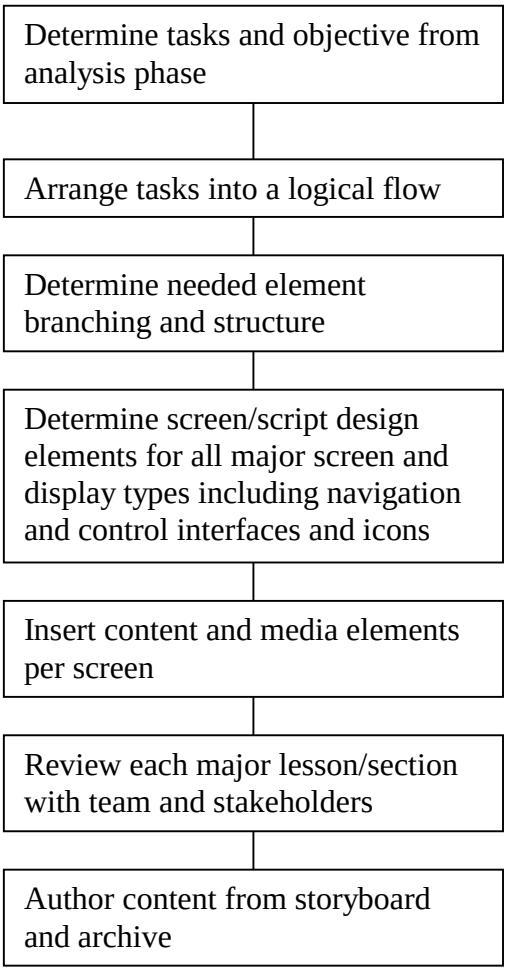
Step 5: Review each major lesson and section with team and stakeholders.

Step 6: Author content from storyboard.

Step 7: Archive.

Step 8: Arrange storyboards into appropriate order and review periodically with key project members and stakeholders.

Design ICW Job Aid



Arrange storyboards into appropriate order and review periodically with key project members/sponsors.

Chapter 31: Design and Develop Level 1 Evaluations (Reactions – Student Critiques

NOTE

TRACEN Yorktown will conduct level 1 evaluations (student critiques) by means of one, standardized form used by all schools. Working in partnership with Training Division staff, PTC designed a scannable form. Instructions for how to implement and conduct level 1 evaluations are contained in the Evaluation Section, Chapter 51, "Conduct Level 1 Evaluations (Student Critiques)."

A copy of the scannable form TRACEN Yorktown will use for its level 1 evaluations is found at the end of Chapter 51.

Chapter 32: Complete Design Tasks & Draft Learner Plan (LP)

What Is It?

Complete design tasks refers to the last tasks you need to do to complete the design phase of the ISD. It also refers to capturing data you might not have gathered up to this point.

Those tasks are:

- Complete lesson plan worksheets.
- Complete assessment (test) specifications.
- Provide sample student practice exercise designs.
- Provide sample feedback for student practices (e.g., class discussion, school response, correct answer, feedback sheet, etc.).
- Estimate number of instructors required for planned activities.
- Estimate instructional time.
- Identify media required (e.g., video, PowerPoint slide presentation, etc.).
- Identify equipment required (e.g., VCR, slide projector, personal protective equipment, computers, etc.).
- Identify number of references required (e.g., CFRs, M9000s, etc.).
- Estimate classroom space (approximate size) or other facilities required (e.g., the local oil facility, AMOCO, etc.).
- Gather all design results together to draft LP.

Draft an LP is the last step in the design phase, but it calls for some discussion.

During the analysis phase of a project, when you read Chapter 18, "Design and Develop an Instructional Plan," we explained the difference between an instructional plan and a learner plan. We want to go over that difference again--now that we' ve reached the point where you need to draft an LP.

The Coast Guard' s Course Designer Course (CDC) defines an Instructional Plan (IP) as follows:

What Is It? (continued)

- Having designed the objectives, test items, and the strategy for the instructional delivery, this design must be documented. The instrument used for this documentation is referred to as the IP.

CDC also states that each IP should contain the following information:

- **Content**
  - Objectives.
  - Testing procedures for each objective.
  - Performance level required of the student.

- **Strategy**
  - Instructional activities (stimulus & feedback).
  - Student activities (response & practice).
  - Time estimates for each activity.
  - Media provisions.
  - Hardware provisions.
  - Expected group size.

In short, if a course designer provides all the items listed above (the outputs of the design phase), an instructor or course developer should be able to construct lesson plans.

That used to be accurate, but based on the findings of the Training Infrastructure Study Group (TISG), the Coast Guard has changed its view on what an IP is. Recognizing that **ALL** course deliveries--resident or an alternative delivery--are very expensive, Coast Guard program and training managers want the option, early on, of reviewing multiple delivery options (three or more)--each of which has undergone cost-benefits analysis (CBA). Based on that information, managers can then make up-front decisions regarding the option they want to fund, and the option they want training providers to expend staff time designing and developing.

For that reason, an IP is designed and developed during the analysis phase of the ISD.

What Is It? (continued)

However, Course Designer Course (CDC) is absolutely accurate in pointing out that the outputs and results of the design phase need to be documented. Since the term, IP, is already in use, we' ve chosen to call documentation for the outputs and results of the design phase an **LP.** We have also added some additional items to the LP documentation.

Whenever an organization changes something that its people have been used to doing, it' s easy to become confused. To avoid that type of confusion, let' s go over this once more:

- This SOP says an IP is documentation and a presentation of that documentation that occurs early on in the ISD process. The reason for this is that program and training managers need to know potential course options as soon as possible so that one option can be chosen and funded. In keeping with the findings of the TISG, we have referred to that earlier work and documentation as an IP.

- To avoid obvious confusion, we have renamed the last step of the ISD' s design phase--gathering all design results and documenting them--"**Drafting a learner plan (LP)**.

- We are suggesting that Coast Guard course designers add more information to the LP documentation.

How Do I Complete Design Tasks and Draft a Learner Plan (LP)?

Let' s address completing design tasks.

Step 1: Complete the assessment specifications to include at least one sample test item, and a potential design for feedback or answer key.

Step 2: Draft lesson plan worksheets. For each lesson you plan to deliver, you should complete a Lesson Plan Worksheet that contains the following information:

- Lesson TPO(s) and Eos.
- Methods/Strategies used to promote learning.
- Appropriate delivery methods.

How Do I Complete Design Tasks and Draft a Learner Plan (LP)? (continued)

- Sample student practice (brief narrative).
- Sample student assessment (test) item.
- Feedback (answer key) sheets, if appropriate.
- Estimated number of instructors.
- Estimated instructional time.
- Media required.
- Equipment required.
- References required.
- Approximate classroom space (or other facilities) required.

Step 3: Draft an LP. [You have already drafted a course map when you grouped and sequenced objectives.]

To draft the LP, collect the following documents:

- Course Map (CM) which displays grouped and sequenced objectives.
- Lesson Plan Worksheets.
- Assessment Specification Worksheets.

Organize the information, ensuring that it:

- Is consistent.
- Ties together.
- Answers the major needs of the developers.

Step 4: Hand off the LP to developers (Coast Guard instructors or developers or contractors). It should contain all they need to finish up the job of developing or procuring:

- Individual lesson plans.
- Course materials and handouts.
- PowerPoint slide presentations and audiovisuals.
- Tests and student assessments.
- Feedback sheets and answer keys.
- Mock-ups, role plays, and case studies.
- ICW or another alternative delivery mode.

How Long Will It Take?

Not long. To finish up assessment (test) specifications, all you have to do is write one sample test item and provide a very short narrative on whether feedback or answer keys should be used and what they should look like. To complete lesson plan worksheets, you just gather up and put together information you' ve already drafted:

- Training program objectives, grouped and sequenced in a course map.
- Testing procedures for each objective.
- Performance level expected of students.
- Sketch of what instructional activities will be used (strategies).

You will have to take some time to estimate time and instructors required for the course, and you will have to identify media, hardware, equipment, and references needed. However, other similar course documentation should make this a relatively quick and easy task to complete.

There is no specific format for a LP. CDC has a sample IP format that you can adapt to use for the LP. So long as you include all the pieces, organize them so they are easy to use and access, and make sure that the developer has everything the developer needs to complete course/ICW development, your LP can be individualized in any way that best captures the material.

What Will I Get Out of It?

Even if you are performing the work of both course designer and developer, completing design tasks and drafting an LP will ensure that you:

- Document the critical results of design work.
- Maintain the training program' s audit trail.

If you are the course designer, but another instructor(s) will actually develop the course, completing design tasks and drafting an LP mean that the developer will have your blueprint when developing the course. Therefore, your excellent design decisions and creative products will not be lost.

What Will I Get Out of It? (continued)

If you are completing design tasks and drafting an LP for a contractor, your work will ensure that contract costs are kept to a minimum and the Coast Guard fleet receives a product it can use.

Why and When Do I Complete Design Tasks and Draft a Learner Plan (LP)?

Why:

You complete design tasks and draft an LP for three reasons:

- To document the results of design work.
- To maintain a course audit trail.
- To provide the developer with a blueprint for developing a usable training product.

When:

The time for doing this work is at the end of the design phase. It would be impossible to do it before that since you need to write performance objectives, design assessments, and so forth, before you can complete the design and document it in an LP.

However, the field always has a need for the formal training system to speed up its work. Many design tasks can be performed concurrently (objective and test writing, for example). Also, if you get in the habit of keeping all design work in one place, and if you start filling in your LP as you go along, you can considerably speed up the process.

What Is My Role?

If you are performing as the course designer, these are the last steps of the design process.

If you are part of a design team, the team leader will assign your specific role.

If you have been tasked with providing such documentation to a contractor, you may be compiling work other people have done, finishing it up or getting them to finish it up, and handing off the final result--the LP--to a contractor.

Who Can Help Me?

This SOP chapter explains what items you need to complete and what items need to go in an LP. CDC has a template for what an IP could look like. You can adapt this template for your own version of an LP.

Ask your TRACEN ITs, ISSs, TSs, or PTC staff if you want a PC' s perspective on what to do to accomplish this task, or what the final LP should look like.

You can also consult with other Coast Guard TRACENs to see what their LPs look like (don' t be surprised if they' re still calling it an IP, though). If you like their formats, you can adapt your LP to look more like theirs.

What Is the Process for Getting Started?

There are no specific triggers for doing this work. You may never be asked to provide an LP to Coast Guard Headquarters or a vendor, and then again, you may be asked to do just that.

The major driver for this task is the date your course (revised or new) is due to convene for the first time, or the date a contractor is supposed to deliver an ICW product. You want to complete design tasks and draft an LP well in advance of those dates, so that developers are using a valid blueprint for developing courses or ICW.

Complete Design Tasks and Draft a Learner Plan (LP) Job Aid

A job aid is found at the end of this chapter.

Steps for Complete Design Tasks and Draft an LP are:

Step 1: Complete Assessment (test) Specifications.

Step 2: Draft Lesson Plan Worksheets.

Step 3: Draft an LP.

Step 4: Hand off LP to course developers.

Chapter 33: Introduction to Development

Introduction

When you attend the Coast Guard' s Course Designer Course (CDC), you learn to do many of the ISD' s development phase tasks. CDC trains you in development procedures for many kinds of courseware:

- Visual Aids [overhead transparencies, slides, and mock-ups (actual equipment)].
- Role-plays.
- Case studies.
- Printed materials.
- Specifications [input to a Statement of Work (SOW)] if courseware will be developed by a contractor.

We have included much of that same material in this chapter of the SOP, but we' ve tried to add to it as well. More and more often, Coast Guard course designers and developers are busily converting transparencies and slides to more interactive courseware (ICW) such as PowerPoint presentations. Others are designing visuals and instructional methods for ICW such as WBT, CBT, EPSSs or IVT, or incorporating ICW OTS products into existing courseware.

Since technology will continue to overcome current methods and offer exciting possibilities to course developers, we have tried to craft this chapter so it will provide the essentials you need today, but also position you to take advantage of tomorrow' s development methodology.

As the Coast Guard increasingly explores and uses emerging instructional and performance support technologies, the roles of course designer and developer will often be performed by contractors--people skilled and experienced in their trade, but unfamiliar with Coast Guard content, culture, roles, responsibilities, and procedures.

Introduction (continued)

Does an increasing reliance on contractor design and development mean the Coast Guard roles of instructor and course designer and developer will go away? No. Since we understand the culture and course content best, Coast Guard SMEs, instructors, and course designer and developers will always be needed to "interpret" how to convert tasks to the Coast Guard's way of doing business. In fact, the more we rely on contractors, the more important it is for Coast Guard people to understand the procedures for doing course design and development work. Only a thorough knowledge of the procedures for doing this work can ensure that the products we procure from contractors are the best possible products.

It is also important for cost-efficiency purposes. In many cases, we will contract out what we lack sufficient staff to develop, but we'll keep in-house those parts of the course we can develop ourselves. For these reasons, we want to keep our people's course designer and developer skill sets honed, and give them plenty of practice in applying those skills.

Definition

What is the development phase of ISD all about?

The third phase in the ISD model (AD**D**IE), development, takes the blueprint, the course designer puts together and fleshes it out into products: training aids, course materials, and lesson plans.

NOTE: Remember, though, the work of course design and development is often performed as one task.

During this phase, a developer:

- Authors instruction, if the final product is a computer-based program.
- Prepares or buys printed materials, fleshes out instructional methods (i.e., role-plays and case studies), and develops lesson plans, if the final product is resident instruction or team-delivered exportable training.

Definition (continued)

- Develops some parts while monitoring and reviewing those parts a contractor is developing, if the training program is a hybrid.
- Converts a current training program to materials and instruction suited to remote-site delivery, if the program is IVT.
- Converts current manuals, visuals, and information into a performance support format, if the product is an EPSS.

Typical Development Phase Work

Tasks that a course developer will perform are:

- Draft or procure manuals and materials and have these materials reviewed by SMEs and course designers for accuracy.
- Prepare or procure nonprint media such as audio, video, and computer-based programs and have those materials reviewed by SMEs.
- Draft or procure print media (handouts) and have that media reviewed for accuracy and relevancy.
- Plan and conduct **formative evaluations** of the training program. Formative evaluations can be done by one of several methods:
    - By a group of SMEs who note problems as you develop courseware ("rapid prototyping").
    - By a sample population of SMEs who take and "try out" the course)--the "murder board" approach.
    - By a developer who evaluates the first several convenings ("pilot") of the training program.
- Try out OTS materials for incorporation into the program

Typical Development Phase Work (continued)

NOTE: OTS materials should already have been reviewed for their applicability to the program and for cost-benefits issues. At this point, the course developer is coming to grips with how (and how much of) the actual OTS program will be incorporated into instruction.

- Draft instructional guides (lesson plans and learning plans that contain introductory material, bridges that lead from one instructional activity to another, and integrators that tie course activities together and link them to student' s prior learning).

- Prepare administrative aids that may be needed (student rosters, maps, materials, equipment, and supplies, checklists, name tags, and student name cards ("name tents").

  NOTE: Obviously, if the course is delivered via WBT or CBT, some of these items may not be needed; however, for those kinds of media, the course developer may have to develop student tracking plans, etc.

- Complete level 2 evaluations. At this point in ISD, the course developer has a blueprint and Performance Objective Assessment Specification Worksheets that documents what the tests should look like. However, the development phase is the point at which all tests must be fully developed (i.e., checklists for performance tests, etc.).

- Prepare or purchase adequate numbers of student materials (references, either in print media or on CD-ROM/floppy disc, textbooks, handouts, workbooks, and job aids).

- Prepare activity aids such as checklists, role play scripts, case studies, and lab exercises.

Typical Development Phase Work (continued)

- Make sure all required instructor support equipment and materials are on hand (paper, videotapes, and VCRs, adequate number of computers and access to any software required, films and projectors, laptops and projectors, charts and pointers, turn charts and markers, and spare parts).

SOP Development Tasks

To try to capture the full range of technology options the Coast Guard is currently using, we' ve expanded the development phase of ISD to include the following tasks:

- Utilize Existing Instructional Modules (Learning Objects)
- Develop Job Aids
- Develop Instructional Materials and Training Aids (Handouts, PowerPoint Presentations, Audio-Visuals)
- Develop Lesson Plans
- Develop Interactive Courseware (ICW)--CBT, WBT, IVT
- Complete Development of Level 2 Evaluations (Tests)
- Conduct Formative Evaluations and Conduct a Pilot Evaluation
- Develop Training Program Documentation (Curriculum Outline)

The Coast Guard' s Curriculum Outline

You may be surprised to find the task, Develop Training Program Documentation (Curriculum Outline), in ISD' s development phase. There is a logical reason for placing this task here.

The Coast Guard is now using the IP documentation and presentation to make decisions about which design option TRACENs or other TPs should develop. That task, design and develop an IP, occurs during the analysis phase. At that time, however, not enough detailed design work [i.e., task analysis, write performance objectives, design level 2 evaluations (tests)] has been done to fully "document" the option selected.

The Coast Guard' s Curriculum Outline (continued)

But, Coast Guard managers need the archival data a curriculum outline provides. We also need curriculum outlines to make sure our Coast Guard training programs receive ACE accreditation--a very important factor in recruiting and retaining highly motivated performers.

The curriculum outline process we use today takes quite a bit of time to develop, so we' ve moved it where it properly belongs--the development phase of ISD. You would not want to document the training program (grouping and sequencing of objectives) and the resources it requires (people, equipment, infrastructure) until you have those factors completely worked out. That won't happen until the development (sometimes even the evaluation) phase of ISD.

Coast Guard training policy developers (i.e., COMDT G-WT) are working the issue of curriculum outlines. In the future, we may be able to input curriculum outline information to a database. That capability would allow customers to access curriculum outline data on demand. It would also provide cross-program training and performance support searches to avoid redundancies and to help with using a "core and strand approach" to the fullest extent possible.

Once the development phase of ISD is over, instructors have everything they need to conduct instruction. Or, if the training program or performance support is delivered via computer, the courseware or performance support is now ready to roll out for student use.

The Coast Guard' s Curriculum Outline (continued)

Completion of the development phase means you are ready to do what a TRACEN does best--train. At this point, you are ready to move to the implementation phase of ISD--conduct and manage instruction or implement and integrate performance support.

Chapter 34: Utilizing Existing Instructional Modules (Learning Objects)

What Is It?

The potential merger of object oriented programming (OOP) and authoring software seems to have great promise for training and life-long learning organizations. The point is, though, that this technology is not fully developed, so we' re going to have to modify our SOP format somewhat to tell you about this concept.

We want you to be aware of this topic, so you can consider potential integration of its power into your design and development work. We also want you to start watching the learning object track record. There are many gurus in the training business who believe this technology will do for training what moveable type did for printing. Some think that by the year 2000, everyone doing online training will use some form of learning objects.

Why is OOP technology not yet fully usable? What the training world is waiting for is OOP to converge with **authoring software** (i.e., software that contains a complete system and a set of tools that allows average educators and trainers to build CBT programs--Quest, IconAuthor, Authorware, Director, Toolbook, CBT Express, and so forth). The idea behind OOP is to make programming something the average user can do so that everyone can use their computers to assemble programs on demand. Once OOP technology converges with authoring software, average users will have the tool they need to easily create learning objects.

Why do trainers think learning objects and OOP are so promising? The hope is that these technologies will eventually enable students to assemble their own just-in-time, tailored-to-their-needs, on-demand training from a learning objects database.

First, keep in mind that learning objects are not a separate medium, such as CBT, WBT, IVT, or EPSSs. Instead, they are simply **smaller parts** of other larger CBT, ICW, EPSS, WBT and IVT programs.

What Is It? (continued)

That brings up the concept of "**reusable**" learning objects. One of the reasons people are so excited about this technology is that reusable learning objects are cheaper to maintain, deploy, and replace than full-blown CBT, WBT, IVT, EPSS programs.

Another reason people are excited is that many of the online-tool companies already use learning objects. Generation21, Asymetrix and Macromedia are all using learning object technologies now. In fact, Asymetrix and Macromedia--the two largest authoring tool vendors--have a learning object approach in their training management systems (Librarian and Pathware). Database companies Oracle and Sybase are creating new training tools for storing and disseminating learning objects. Innovative Knowledge Products (IKP) has put out a product called KnowDev (you can download a demo for this tool from IKP's website - www.ikp.net) that uses "push" technology to prompt users, at regular intervals, to take a "learning break." This tool (KnowDev) enables the user to access very short, little bits of information about various subjects. Although each of these learning breaks is very short, they do provide continuous, just-in-time professional development to workers via the desktop. When the minutes workers use to access these learning breaks start adding up to hours, you can see why trainers are so excited.

Of course, providing people with information or making worker access to information easier and easier is **NOT** the same thing as training. Nevertheless, the OOP technology appears to have great potential for impacting and changing the way trainers do business. That's why we want you to know about this technology and consider its potential in any on-line training projects in which you may become involved.

What Is It? (continued)

What are **learning objects**? Technology gurus define the term in different ways, but for the training world, learning objects are training programs, arranged in brief modules, that a learner can access in random order. For example, if you wanted to know how to use the tables tool in Microsoft Office's Word application, you could access a very short module (learning object) telling you how to do just that, without having to work through the whole beginner, intermediate, or advanced Word training program. Additionally, you could do this as you worked, on demand, at your desktop. So the great appeal of OOP and learning object technology is that it gives new meaning to the terms "just-in-time" and "on-demand" training or performance support.

To reach its full potential, the technology has to make learning objects **reusable.** For example, several military organizations today train their people in similar skills (e.g., using knowledge of the principles of hydraulics to troubleshoot hydraulic systems in different kinds of equipment). To become reusable, a learning object on hydraulics principles would have to be digitized and organized ("chunked") into 10- to 30- minute modules. Those modules would then be linked together in different ways to allow users from different services or users troubleshooting different kinds of equipment to create their own customized paths through a library of hydraulics and systems content.

That is the concept of "reusability." **Chunks** could be connected to other chunks in a variety of combinations and **reused** to create any number of "courses" that might combine elements found under headings such as leadership, decision-making, and collaboration.

Once the technology is fully mature, a learner could access a 10-minute module for simple performance support or call up a longer training program made up of many chunks linked together. The reusable chunks could come from a variety of sources--the Coast Guard' s training system, DOD, or OTS products.

What Is It? (continued)

Of course, one of the prime selling points of this technology is that content would be designed, developed, or procured only once, but reused over and over again in different customized formats.

What trainers hope from a fully matured OOP is the capability of offering the trainees personalized training and learning--a course that covers just what trainees need and takes into account each user' s own personal style of learning--all for an affordable price.

But, the technology is not quite there yet. It needs to develop:

- Tools for creating learning objects.
- Standards for storing and delivering objects.
- Content in the form of learning objects instead of full courses (or libraries).

The other piece is that organizations have to be willing to pay for learning objects. At least in their beginning, they will be expensive.

There is one other potential shortfall with the whole concept of reusable learning objects. Accessing information and training are two different things. Accessing bits of information, without a sound background and context into which to place those bits of information, could result in information deluge with no real learning taking place.

From the design chapters you've read so far, we hope you now realize just how important good, up-front design work is to the ultimate training product. Essentially, a designer is integrating bits of information in a meaningful way and taking advantage of good, sound learning theory and instructional strategies to be sure the student learns--not just accesses information randomly.

What Is It? (continued)

One of the current perils gurus see with this technology is that it may end up just providing information to, but not "training" the individual. Training is about taking raw information, integrating it, and then helping the student develop a mental model for integrating it. In contrast, learning object technology could result in a "shallow" acquisition of many facts, without the proper contexts for synthesizing those facts into meaningful application. What trainers hope is that the OOP technology and instructional technology will grow and mature together.

How Does the Coast Guard Develop Learning Objects?

You can begin utilizing existing instructional modules (learning objects) by rethinking some of the design work you do. If you viewed training program and performance support content as reusable chunks, you would probably design training programs differently from the way you do now.

For example, you could:

- Collaborate with other TRACENs and TPs to design and develop reusable chunks. Those chunks could be delivered to a myriad of users at many places, but the chunks users accessed would be standardized across the Coast Guard (e.g., electronics, electrical, mechanical concepts, and processes/procedures training, equipment-specific training).

- Reduce and convert current large content courses and modules to much smaller chunks of instruction (i.e., learning objects).

- Perform more focused OTS analysis by searching for affordable chunks that could augment or supplement or replace current training and performance support modules.

How Long Will It Take?

If we looked at converting most of what we currently do to this technology, it would probably take a very long time. However, time requirements vary greatly, depending on the size and scope of the project.

How Long Will It Take? (continued)

For example, the time required to produce a small learning object is typically less than the time required to author a specific course.

You can get a pretty good idea of how much time it takes to create learning objects by checking other SOP chapters for the production times associated with specific technologies.

NOTE: If we decided to create a Coast Guard learning object database, we would have to map out time for the creation, implementation, and life-cycle maintenance of a system-wide learning object storage and distribution system. Since that would be an intensely time-consuming and expensive project, it is more likely that we will participate in an existing system, such as the Navy's, to significantly reduce the time and expense required to stand up such a system.

What Will We Get Out of It?

Creating electronic training and performance support systems with reusable learning objects could provide several benefits to the Coast Guard. Some of those benefits are:

- Courseware design, development, and life-cycle support costs would be reduced since development teams would not have to build all lessons "from scratch."
- Data driven objects could be readily shared between services and organizations.
- Smaller objects could be effectively archived and stored in object oriented databases.

Why and When Do We Use Learning Objects?

Why:

- Course designers could use this technology to create small flexible courseware that can be efficiently delivered via the internet and Coast Guard intranet--training and performance support would be more readily available to the people who need it the most.

Why and When Do We Use Learning Objects? (continued)

- Training programs using object oriented technology could incorporate digital video clips of APs completing difficult, infrequent but critical tasks (i.e., a radar wave guide replacement).

- Courseware could be updated without taking the entire group of lessons down or out of service.

- Creating data driven reusable objects would also provide a unique opportunity for resident instructor staff to use learning objects as classroom teaching aids and as part of exercise materials.

When:

As we' ve said, this technology is not fully mature, and even if it were, the Coast Guard is not likely to buy its own object oriented database. We are more likely to use the Navy' s. Therefore, the "when" depends on future coordination with the Navy as they develop their own object oriented database. As that partnership matures, the Coast Guard may find itself rethinking training program design. That' s why we added this chapter to the SOP.

What Is My Role?

Once this technology is mature and easily affordable, you can use reusable learning objects as building blocks to create larger courses.

Using sound analysis and course design principles, you will determine appropriate content to include, and given the system' s archiving and distribution capabilities, students will then choose the modules they need to complete performance objectives. Since students and users determine the "size" and "scope" of their courseware by selecting topics and content that correspond to a particular reusable learning object, this technology offers both the course designer and the student a smorgasbord/buffet table approach to learning.

Since we currently don' t have a system for providing reusable learning object training to Coast Guard workers, it would be a good idea to look at the training you currently have and consider how it might be broken down and redesigned into reusable learning objects.

What Is My Role? (continued)

That process could add new life and potential to your current course designs.
There is another role you can fill in this arena. As a course designer or instructor, you can select and use reusable learning object components (COTS/GOTS products) as multimedia support tools for your classrooms and labs. You can also start to develop or contract out development of reusable learning objects for future use in classrooms or for dissemination via a Coast Guard distance learning system.

However, we do want to add one very important note of caution:

CAUTION: Coast Guard course designers and developers need to create and use common standards, preferably standards adopted by industry and government. PTC Yorktown is currently working with various industry and government groups to identify key standards for future courseware efforts. Once those standards are identified, you will be able to access them for any type of development project you (or a contractor) undertake.

Who Can Help Me?

PTC' s staff works closely with TISCOM, OSC Martinsburg, G-WTT, and IRM to identify and buy needed software and hardware systems. Periodically check with them to see what the Coast Guard is in the process of acquiring, as regards training and performance support software and hardware.

In the meantime, even though the Coast Guard is not currently engaged in creating an automated distance learning network, be sure your design and development teams are following the consistent courseware design and development methods listed in the Coast Guard' s**ICW Styles and Standardization Guide.** Following this guide closely means your efforts won' t be lost if we do create an automated distance learning environment.

Who Can Help Me? (continued)

NOTE:, PTC is currently working with G-WTT to identify appropriate database applications for performance and training support. Some of the tools being considered for Coast Guard adoption are OnCourse and Pathware (courseware management systems) and PeopleSoft (data driven HR system).

What Is the Process for Getting Started?

Conduct the necessary analysis and media selection as outlined in earlier chapters of this SOP. If courseware, video, or other electronic solutions are desirable, then create courseware composed of a series of small modules/lessons instead of one large course.

Stay in contact with PTC's Design and Development Branch for detailed guidance and current information on the "reusable learning objects" issue.

Learning Objects Job Aid

NOTE: There is no job aid for this task since learning object storage and retrieval are emerging and evolving technologies. However, we want you to be aware of its existence, and we want to encourage you to break down existing instruction into learning objects that can be reused.

Chapter 35: Develop Job Aids

What Is It?

Develop job aids means to flesh out the plans you identified when you designed job aids. When you finish developing job aids, the results of your work will be: completed job aids.

To help you gain a better picture of how ISD works, we divided the jobs of designing and developing job aids into two chapters--design and develop. In real life, you will probably perform the two tasks at the same time.

The development process for performing these two tasks is:

- Match task content with the appropriate job aid format.
- Design how the job aid will look, using the SOP and the indicated references.
- Develop finished products.

NOTE: To design and develop EPSSs, use the job aid located at the end of Chapter 29, Design and Develop Electronic Performance Support Systems (EPSSs).

How Do I Develop Job Aids?

Developing job aids can be quite difficult for the novice course designer or instructor for one simple reason: SMEs know a great deal about their job content and therefore have a tendency to say too much. The task of developing job aids is all about simplifying tasks--making tasks **much less difficult,** rather than more **complex**.

The raw materials (inputs) for this task are the results of task and content analysis and any job aid design work that has been completed. However, before you begin the task, there are seven areas of consideration you need to keep in mind. Those are:

One: Do not assume the user has prerequisite skills or knowledge:

How Do I Develop Job Aids? (continued)

- Make sure the job aid' s instructions do**NOT** assume skills the user may not have.

Two: Ensure that the job aid introduction and title set the context for the user:

- Indicate when the job aid is to be used.
- Specify who the user is assumed to be.
- Specify the knowledge or tools the user will need in order to use the job aid.

Three: Draft a clear, easily understood job aid:

- Ensure instructions are free of unneeded details.
- Ensure instructions are clearly and correctly sequenced.
- Use examples when appropriate.
- Avoid new or confusing terms/jargon.
- Use highlighting (italics, **bold type**, ALL CAPS) for critical words such as NOT, ALL, ALWAYS, DANGER, CAUTION.
- Use the fewest words possible to retain meaning.
- Keep words and sentences as short as possible.
- Explain reasons for any choices the user will have to make.
- Make sure that visuals and their instructions appear together (in same place).

Four: Ensure visuals are used correctly in the job aid:

- Ensure visuals are clearly drawn and of high contrast (you can use photographs, but they won' t reproduce as well as line-art drawings).
- Ensure that visuals contain necessary detail, but make sure they contain no unnecessary (and possibly distracting) details.
- Ensure visuals are as simple and uncluttered as possible.
- Show motion and direction with appropriate arrows.
- Make sure the job aid has plenty of white space.

How Do I Develop Job Aids? (continued)

Five: Make sure the job aid' s design is easy to use by trying it out with novice performers:

- Check to see if the user would find the job aid easy to use while performing the task.
- Simplify the job aid if try outs indicate any problems encountered during performing the task.
- Check to see if the user can do any one step or element of the task without consulting the job aid more than once.
- If the job aid has to be consulted more than once for steps or elements, break those steps or elements down into smaller steps/substeps/elements.
- Try out the revised job aid again to be sure all steps and elements can be performed without having to consult the job more than once.
- If the job aid is lengthy, check to see if you' ve broken it down into different sections that can be easily located from a table of contents or tabs.
- If the job aid' s sections cannot be easily found, add a table of contents, index, or tabs.

Six: Make sure the job aid is durable, reusable, and "ergonomically correct" (i.e., well-matched to its use in the workplace):

NOTE: The bullets below are examples--not prescriptions!

- As an example, laminate paper job aids to ensure they are durable, reusable, and will not be hurt by water, stains, etc.
- Use special "glow-in-the-dark" ink for job aids that must be used in dark places.
- Where practical, deploy job aids as part of an EPSS so they can be printed out when needed and easily accessed, using the Help and Find features. By printing what is needed, when it is needed, workers are more likely to use doctrinally correct procedures to perform a task.

How Do I Develop Job Aids? (continued)

- If job aids have not been embedded in a piece of equipment at the time of its acquisition, consider applying job aids to equipment by printing on contact-like paper.

Seven: Ensure the job aid is user-friendly:

- Does it say what it is?
- Does it appear easy to use?
- Is its importance easily evident to the user?

The steps for producing a first-draft job aid are quite simple:

Step 1: Prepare a rough draft:

- Use the results of task analysis and design work for the job aid to determine the job aid' s format.
- Use task analysis steps and substeps to diagram and write instructions for each step in the task.
- Identify visuals that reduce the need for words and improve user-friendliness of the job aid.
- Determine best placement of visuals and, if necessary, accompanying directions.

Step 2: Test the rough draft:

- Identify unclear instructions/directions/visuals/steps with an AP.

NOTE 1: Use an AP so that this test identifies any inaccuracies, discrepancies, or deletions in the draft job aid. The AP is also very familiar with the task, and can therefore help you simplify the job aid, without sacrificing its accuracy.

How Do I Develop Job Aids? (continued)

NOTE 2: Also test out the product with a beginning performer to flush out problems with unclear instructions, directions or steps, illustrations that are not clear to the user, or gaps that need to be filled in for someone unfamiliar with the task. Using both kinds of performer--accomplished and beginner--will help you catch any and all deficiencies the draft job aid may have.

Step 3: Revise the rough draft, based on results of trials.

Step 4: Retest the revised draft, using different accomplished and beginning performers.

Step 5: Make any final revisions indicated to the draft job aid.

How Long Will It Take?

As we' ve said, the hardest part of developing a job aid is simplifying and stripping down the task to its essentials. Your first time around, you will probably add too much detail, and have trouble with proper placement of visuals and their accompanying directions.

However, once you have developed one or two job aids, you will find that your work really speeds up--particularly if you are developing a "family of job aids"--all with the same format, look and feel.

To speed up your work, we suggest the following process:

- Follow the steps we' ve given you for developing a rough draft job aid for each of the formats the course design work indicates you should use (i.e., checklist, worksheet, cookbook, decision table, etc.).
- Try out each of those rough drafts with an accomplished and beginning performer.
- From lessons learned in the first two steps, develop the remainder of job aids required.
- Test all job aids you' ve developed with a different accomplished and beginning performer.
- Revise job aid drafts as necessary.

What Will I Get Out of It?

You will gain the same benefits from developing job aids that you did from designing a job aid:

- Effective, performance-improving, foundational products for course development.
- Job aids that work (help student learn task, refresh student in doing task, allow student to practice task on-the-job until proficient).
- Job aids you develop can be used to demonstrate performance, train students in performance, and provide practice for users in task performance.
- User-friendly job aids.
- A "family of job aids" with the same look and feel.
- Ergonomically developed job aids (i.e., small, laminated "attach-to-equipment," glow-in-the-dark job aids for a task that must be performed in a narrow-confined dark space).
- De-bugged job aids (i.e., job aids that have been piloted with other SMEs to find and eliminate any "bugs" or problems).
- A large part of your course will be developed once you finish developing job aids.

NOTE: When you develop an EPSS, it may eliminate the need for a course by providing sufficient performance support to the end user.

- Students can take job aids back to the field to serve as performance support.
- Job aids increase the chance that students will perform as expected in the field. Transfer of learning is much more likely to occur if job aids are part of training.
- Well-developed job aids, inputted to a database, can serve as learning objects for many other types of performance support.
- Well-developed job aids capture the results of task analysis in a much more useable, transferable, and permanent way than do task analysis worksheets.

What Will I Get Out of It? (continued)

- Well-developed job aids can serve as an aid in bringing instructors up to speed for cross-training issues.
- Well-developed job aids can be used by anybody--from experts to beginners--in performing tasks.

Why and When Do I Develop Job Aids?

Why:

We answered the "why" you develop job aids when we told you the benefits you gain from these products.

When:

We develop job aids during the development phase of ISD. Since a TRACEN' s course design model is performance-based, job aids will be a large part of any training program' s course materials. We need to develop job aids--foundational documents and performance supports for the training program--**BEFORE** we develop the overall training program or course. We do this because completed job aids will become one of the most critical components of our completed training program.

NOTE: TRACEN staff who are trained in the ABCD model know that completed job aids are the pivotal documents around which a training program is designed.

What Is My Role?

As a course designer, developer or an instructor, you are the person who is likely to develop job aids. You also might function as part of a team, developing a "family of job aids" (i.e., APs developing job aids for the specific positions required by the standup of an Incident Command System (ICS)). Or, you might be an SME reviewer of a draft job aid.

What Is My Role? (continued)

You are a person experienced in performing this task or job in the field. If the products don' t work for you, they won' t work for the people in the field. Therefore, your development work, input to a team' s development work, and review of a contractor' s products are absolutely critical to producing job aids that genuinely improve workforce performance.

Who Can Help Me?

This SOP can help you. The References Section of this SOP lists materials that discuss job aid development. Coast Guard TRACEN IT, ISS, TS, instructor, nonresident, and course designer staff can help; they have considerable experience in developing job aids.

If you need to develop job aids quickly, consider using a contractor.

Developing job aids is another project that benefits greatly from cross-TRACEN sharing. TRACENs Petaluma, ATTC, Cape May, and ATC have personnel especially skilled in job aid development.

What Is the Process for Getting Started?

Developing job aids is a natural follow-up and outcome of designing job aids. The triggers to developing job aids are:

- Design of job aids is finished and you move naturally into job aid development or provide your design work to a contractor for development.

- You receive official tasking to convert a course or task or group of tasks/jobs to job aids (e.g., tasking to Marine Safety APs to attend Job Aids Workshop (JAWS) training and develop ICS "position-specific job aids").

Develop Job Aids Job Aid

NOTE: The job aid for developing EPSSs is found at the end of the Chapter 29, Design and Develop Electronic Performance Support Systems (EPSSs). Use that job aid to develop an EPSS.

The job aid for developing job aids is also found at the end of this chapter. The steps for this task are:

Step 1: Prepare a rough draft.

Step 2: Test the rough draft.

Step 3: Revise the rough draft.

Step 4: Retest the revised draft.

Step 5: Make any final revisions indicated.

Chapter 36: Develop Instructional Materials and Training Aids

What Is It?

At this point in the ISD process, the course developer (or contractor) takes the training program design (i.e., those blueprints, decisions, and maps for what the training program or performance support will look like) and converts them into actual products: **instructional materials** and **training aids** that support instruction or performance**.**

This SOP chapter provides general guidelines for the production of instructional materials and training aids commonly developed by TRACEN personnel: handouts, role-plays, case studies, audiovisual aids, and PowerPoint presentations. If you want to know more about the production of any of these materials and aids, we suggest the References Section of this SOP as a starting point.

How Do I Develop Instructional Materials and Training Aids?

Developing an array of instructional materials and training aids involves using different techniques and considering varied factors. This SOP chapter recreates CDC guidelines for those instructional materials and training aids TRACEN personnel are most likely to develop. It also provides checklists that can be used to review contractor or vendor-produced products.

Keep two "rules" in mind as you go through this chapter:

Rule 1: Make instruction as **multisense** as possible. Pictures are, indeed, worth a thousand words. An even better technique is to:

- Use pictures, illustrations, animations for visual learning.
- Include sound for auditory learning.
- Provide materials that can be touched for tactile learning …and so forth.

In other words, engage as many of your students' senses as possible in the products you develop.

How Do I Develop Instructional Materials and Training Aids? (continued)

Rule 2: Remember that media can be used to convey a message, but sometimes media ***is*** the message. Therefore, you want to pay just as much attention to the media you select, develop, or buy as you do to what you say in instructor-led training.

We' ll start with:

Print Media

Print media (reference guides, self-instructional text, practice exercises of various types, tables, charts, etc.) is the most commonly used medium for instruction, probably because it costs relatively little to produce, duplicate, and distribute. It does not take much expertise to develop, and it is very easy to use. Since print media is relatively static, you can increase its dynamism by combining its use with a high level of interactivity with students using the medium.

Steps:

Step 1: Draft text and thumbnail illustrations.
Step 2: Select/design a layout grid and text specifications.
Step 3: Create a dummy.
Step 4: Evaluate/edit/revise.
Step 5: Create camera-ready-copy (ready to be professionally printed).
Step 6: Duplicate/print the text.

Guidelines:

- Keep sentences short, simple, and concrete.
- Make pronoun references direct and clear (e.g., "The 9mm wrench can be used to disconnect the frame. It can then be set aside." Does "it" refer to the wrench or the frame?).
- Use active voice.
- Include the word "you" to aim messages directly at the students.
- Use personal names and personal pronouns when possible.

How Do I Develop Instructional Materials and Training Aids? (continued)

- Use an attention-getting device such as underlining, boldface type, or italics when you introduce a new term.
- Use a different technique for words you want to emphasize.
- Use headings to break up the text into sections and to chunk related text.
- Use transition words when appropriate (e.g., *then, now, next, first, second, and finally*).
- Check reading grade level of text (Microsoft Office Word does that automatically).
- Make sure instruction is free from gender bias.

Illustrations:

- Use appropriate level of detail.
- Include familiar objects to enhance comprehensibility.
- Use as many frames or individual pictures as there are main steps in a procedure.
- Use separate illustrations to show right or wrong, before or after.
- Use lines to indicate relationships between groups or sequenced illustrations.
- Put illustrations as close as possible to the text to which they refer--even if you have to repeat graphics on several pages.
- Explicitly relate illustrations to text by using **captions, call outs,** and references in the text.
- Clearly label illustrations. Label key elements by using arrows or lines connecting the label to the element being described.
- Use focus devices where needed to get reader' s attention and clarify complex materials (i.e., color, exploded drawings, arrows).

Layout:

Layout means the way in which printed matter appears on the page. The six layout concerns of most interest to Coast Guard course designers are:

How Do I Develop Instructional Materials and Training Aids? (continued)

- Format
- Size
- Colors
- White space
- Typeface
- Grammar, spelling

Overall format guidelines are:

- Choose one consistent format for all instructional materials; this "rule" is similar to guidance for making the "look and feel" of all CBT frames the same. You do this to make it easy for the student to locate topics in different materials and to learn how to navigate around in new materials during first time use.

Size:

- Use common paper size (8-1/2 x 11) for handout and materials unless you are dealing with an unusual situation.
- Tables and charts need a larger size paper. Make sure you have a method for folding the paper that works with our military binders.

Color:

- Use color to highlight important reference sheets, to separate different sections, and to provide feedback for practice exercises. Color print can be expensive, so do **NOT** overuse.

White Space: White space means any part of the paper not occupied by text or graphics. Use white space to:

- Focus reader' s attention on the text by isolating it from its environment.
- Establish the relationship between one text or graphic element or another.
- Increase the overall ease of reading the text.

How Do I Develop Instructional Materials and Training Aids? (continued)

Typeface (types, style, and size):

- Microsoft Office Word includes an incredible array; choose only those that are easy to read.
- **Types--**Select a type that adds visual character to the letters and helps guide the reader' s eye movement from letter to letter.
- **Style--**Use bold, italics, and underlining. Do not overuse CAPs. They can be distracting to the reader and are not easy to read.
- **Size--**Size of type is also used to emphasize and separate text. Make it large enough to read easily but not waste space on the page. Labels and headings should be larger to show emphasis or to chunk text. General guidelines for type size are:
  - Use 12 point Times New Roman for normal body of text
  - Use 12 point Arial for labels
  - Use 14 point Arial bold for headings.

Grammar and Spelling: Mistakes in grammar and spelling cause the reader to receive the wrong signals. Microsoft Office Word gives you tools for eliminating these problems (grammar and spell check, reading grade level, thesaurus). Use them.

NOTE: To help you develop print media, we suggest you attend an Information Mapping (IM) workshop. Its materials are proprietary so we will not list any of their methodologies in this SOP.

Tools:

- See the **New Structured Writing Template** found at the end of this chapter.
- See the steps for **Transferring Old Documents to the New Template** (part of the structured writing tools) at the end of this chapter.
- See the **Printed Material Checklist** found at the end of this chapter.

How Do I Develop Instructional Materials and Training Aids? (continued)

Role-play

A role-play can be used either as an opportunity for students to practice skills and knowledge they have just learned, or as an evaluation tool to measure how much proficiency students have gained. Most role-plays will have three participants: the instructor, role-players, and the observers. Role-plays can also be presented in two different modes:

- **Open role-play** where all information about the issue and role description is known by all participants (e.g., student attending MLE school who is about to "mock-board" a vessel and has been told by the instructor that there won't be any problems from the boat's captain). Open role-plays make good practice vehicles.

- **Covert role-play** where information about each role is held in reserve and may be released during the course of the exercise (e.g., petty officer attending Leadership and Management School (LAMS) who must role-play resolving a situation with a consistently late subordinate but has no information from the instructor). Covert role-plays are harder to develop and implement and may be threatening to students.

Situation:

Focus your role-play situation on **conflict** (e.g., conflict arises because of different perceptions of the same issue). The situation should be tightly-structured and follow these steps:

Step 1: Define the issue or matter that must be settled (e.g., board a vessel suspected of drug smuggling; deliver performance marks to a subordinate).
Step 2: Define the setting (i.e., where the role-play occurs and the "why" of the conflict--because of a particular set of circumstances).
Step 3: Define the roles (i.e., parts that reveal those conflicting perceptions).
Step 4: Write the role-play.

How Do I Develop Instructional Materials and Training Aids? (continued)

Setting:

The setting describes the context that gave rise to the issue. Cover all of these areas when writing the setting:

- What events led up to the existence of the issue.
- Critical facts that affect the resolution.
- The nature of the conflict over the issue.
- Information about the personalities involved.
- Physical environment, if important.

Steps:

Using the information you' ve gathered so far:

Step 1: Write the narrative problem statement describing the issue and setting.
Step 2: Write role descriptions.
Step 3: Write the dramatic statement.

The **dramatic statement** sets the scene for what is to occur, and should be similar to the cliff-hanger ending of a movie.

Tool:

- See the **Role-play Development Checklist** found at the end of this chapter

Case Studies

Case studies are used for the same purposes as role-plays, but they focus on skills and knowledge requirements for individual decision-making, management practices, and technical skill applications. Case studies can be either ***instructor-led*** or ***self-paced***. However, self-paced case studies usually test knowledge only, by requiring the student to use cognitive skills (i.e., analysis, evaluation, etc.).

Self-paced case studies differ from instructor-led formats in several ways:

- You must also develop a feedback sheet, telling the most correct or most effective way to handle the problem.

How Do I Develop Instructional Materials and Training Aids? (continued)

- They can be supported by video, slides, etc., and they can be embedded in WBT, CBT, or an EPSS, but their primary medium is print text.
- They tend to be knowledge-based as opposed to performance-based.

Case studies can be based on actual or imaginary experiences. In either case, they must include all relevant facts, opinions, and prejudices required to make a decision. The key to a course designer developing a good case study is realizing that it works best ***to work backwards into the case***. The course designer must first decide what the achievement should be; then create a situation that will enable the student to reach that achievement.

Steps:

Step 1: Select the delivery method (this selection has already been made from the IP presentation).
Step 2: Outline the solution (the outline makes sure that participants demonstrated or became aware of all the options or alternatives for solving the problem and recognized the consequences of improper action in response to the problem).
Step 3: Identify what issues and information need to be included in case content (problem statement, background content, and current specific content).
Step 4: Write a **problem statement** (i.e., states the theme or central issue of the case. It should reveal the problem to be solved and should reflect a particular skill or knowledge).
Step 5: Write the case background (i.e., information about people, the problem, the Coast Guard--keep it short and simple).
Step 6: Write the current specifics.
Step 7: Write the cutoff point.

How Do I Develop Instructional Materials and Training Aids? (continued)

Tool:

- See the **Case Study Development Checklist** found at the end of this chapter.

Audio-Visual (AV) Aids

Most visual aids are developed to support verbal information. Make sure they don' t conflict with the verbal messages. If they are the message, make sure they function as stand-alone communication. They are also expensive and time consuming to develop. For those reasons, don' t use them for trivial purposes. As we turn more and more to the power of Microsoft Office to help us develop visuals, be sure a lack of AV experience does not result in producing impressive artistic techniques that distract students more than they help them learn.

Guidelines:

- Make visuals aids as multisense as possible. Learning research indicates that people learn best when all or most of the senses are involved. The one sense people learn from most is visual; highest learning occurs when both the auditory and visual senses are involved at one time. Fortunately, new technology allows us to involve more than one sense in a presentation.
- Make your visuals legible and clear and be sure they demonstrate brightness of image.
- Present visuals as early in the lesson as possible to relate unfamiliar objectives to familiar ones and to establish perspective relative to size and shape (e.g., what does boom look like? What are skimmers and what do they do?).
- Make your visuals simple, clean, and effective.
- Limit visuals to 5-6 lines and 3-4 words a line, if at all possible (no more than 15-20 words on a graphic).
- Make your graphics bold and simple.
- Drawings should contain only key elements.
- Break complex visuals down into a series of smaller ones.

How Do I Develop Instructional Materials and Training Aids? (continued)

- Give each visual only one focal point.
- Be careful about the messages you use, especially humor. Be sure they don' t contain material of a morally/ethically questionable nature.
- Visuals should be realistic (represent or actually show real-life, on-the-job situations).
- Make sure any policies, rules, regulations, practices, or equipment you show are up to date.
- Use horizontal formatting: position the largest dimension of the visual in the horizontal position (i.e., our students are preconditioned to expect that and the human eye collects visual information more efficiently from a horizontal format).
- Use the same formatting for visuals that deal with the same lesson, module, course, etc. If you have to break the consistency for some reason, return to it as soon as possible.
- Use color, ALL CAPS, bold and italics to cue trainee' s attention to a specific topic or area of discussion. But be careful as italics, underlining, and ALL CAPS are hard to read. Overemphasis can cause lessons to be ineffective.

Mock-Up/Actual Equipment

The use of mock-ups and real equipment is very effective in training psychomotor skills. We use such devices in Coast Guard training when it is critical for trainees to depart training able to perform a task at a high level of competency (e.g., MLE boardings, mechanical, electrical and electronic, gunnery, and damage control situations).

Use or not use?

- Will students and instructors who use the equipment be safe?
- Does every student need the mock-up or equipment, or can they share?
- What is the student-to-instructor ratio? (It needs to be low when using real equipment.)
- What is the expected life cycle of the equipment?

How Do I Develop Instructional Materials and Training Aids? (continued)

- What will it take to maintain the equipment in running order?
- Will mock-ups simulate the real world closely enough to justify their use and expense?

NOTE: The CDC course materials provide information on developing specifications for a vendor to produce a mock-up or for issues involved with installing real equipment.

Tool:

- See the **Mock-Up/Actual Equipment Development Checklist** at the end of this chapter

PowerPoint Slide Show

NOTE: With the advent of SWSIII, PowerPoint slide shows are increasingly being used instead of the older overhead transparency technology. For this reason, we' ve included information about PowerPoint slide development in this chapter--but not overhead transparency development.

Why use PowerPoint? It provides quick and easy high impact visuals, incorporates graphs, charts, and data displays, has the power to assemble other Microsoft Office outputs, can cheaply build multimedia presentations, and allows you to tailor its many formats, colors and logos so you can unify your school, branch, unit displays. Best of all, it manages your presentation for you. All you have to do is hit the arrow button, or click the mouse once.

First, some terms you need to know to use PowerPoint:

- **Click--A** left or right mouse click
- **Slide--**"Page" of presentation visuals
- **Presentation window**--Slide viewing area

How Do I Develop Instructional Materials and Training Aids? (continued)

- **View--**A specific way to look at slides:
  - Slide View
  - Outline
  - Slide Sorter
  - Notes Pages
- **Wizards--**A Help series that automatically takes you through the steps of a task

Let' s discuss**Views** for a minute:

- **Slide--**Shows an individual slide
- **Outline--**Displays only presentation' s text
- **Slide sorter--**Shows all slides in one window
- **Slide show--**Runs your presentation

What is a **wizard**? It is a specific Help system that can walk you through a process or set of steps. Some of the problems it can help you with are:

- Answer
- Auto Content
- Chart
- Find Set Up
- Pack and Go
- Presentation Conference
- Text Import
- Word' s Tip

There are **Shortcuts and Commands** that can help you easily navigate through PowerPoint. They are:

- CTRL + Underlined letter
- Arrows
- Selecting text or objects
- Delete and Copy
- Working in outline

How Do I Develop Instructional Materials and Training Aids? (continued)

- Icon Shortcuts (Quick Procedures)
  - Open a presentation
  - Create a new slide
  - Change layout
  - Change views
  - Change Master Slide (Be careful! This changes every slide in the presentation)
  - New template
  - Add a picture, graph, table

PowerPoint has a very nice collection of **toolbars** to help you create presentations.

Toolbars:

- Standard
- Formatting
- Slide sorter
- Graph' s standard
- Drawing
- Autoshapes
- Animation effects

When you want **to build** your own show, you can:

- Use Autocontent wizard
- Overwrite an older file
- Build from scratch:
  - Use Autolayouts to pick slide types
  - Custom design colors and backgrounds
  - Add objects, displays and art

Building from scratch offers you many options. You can:

- Select a design template or create your own by customizing colors and backgrounds.
- Insert or change slides as you move forward.
- Enter and edit text.

How Do I Develop Instructional Materials and Training Aids? (continued)

- Insert objects, displays, clipart and drill-downs (click on icon and slide "drills down" to other slides with subset information).
- Use transitions, builds, dims and animations to make slides more interesting and to link the presentation' s parts together.

You also have more than one option for **saving** a PowerPoint presentation. You can save it on the computer' s hard-drive or put it on a floppy disc. You can also package it up for a "road-trip," using the package wizard. Include the viewer if your host doesn' t have PowerPoint. They must also have Windows NT or 95.

When you **run** a slide show, you also have lots of options. For example, you can build in drill-downs for layers of detail, and as you run the show, you can also decide to hide slides for easy customization.

Presentation Conference is a particularly powerful tool for:

- Team building
- Cooperative learning
- Distance learning

Slide development guidelines:

Color

- Use color to communicate messages (e.g., to separate key elements) or to introduce breaks and transitions.
- Do **NOT** use color just because it' s there.
- Use darker backgrounds for electronic displays.
- Use color to accent moods (green or blue = restful, red or orange = stress, excitement, danger).
- Use color to underscore seasonal looks (autumn, summer, etc.).
- Always show hierarchy, both by color and font size.

How Do I Develop Instructional Materials and Training Aids? (continued)

- Use text contrast.
- Do **NOT** use light pastel colors for serious materials.
- Use warning colors with care!

Design Tips

- **Font size--**Use different size pitch to separate levels. Do not use a wide variety among slides of the same type. Two to three different varieties are more than enough. Do not get any smaller than 18 point.
- **Complexity--** Keep it simple. Use transitions, builds and dims consistently. However, do **NOT** use a wide variety of these features.
- Focus on the **message--**not the medium!
- Use graphics, pictures, or other media when they help cement a point.
- Do **NOT** use graphics simply because they' re there.
- Use a data chart or display as opposed to lecturing about large volume numbers or data.
- Do **NOT** make charts or graphs too small.

How Long Will It Take?

The answer to this question very much depends on the magnitude of the project. However, we have some hints to reduce time in producing instructional materials and training aids:

- **Use PowerPoint slides.** They are relatively quick to develop, and the power of Microsoft Office makes even a novice' s products look very professional.
- **Use** the **media specialists** at your TRACEN for complex jobs. They are trained and experienced in this work and can produce what you want in the most efficient way.
- **Read** some of the materials listed in the References Section at the end of this SOP before you develop or use specific types of instructional materials and media. There is much to learn for both developing and using any instructional material or training aid.

How Long Will It Take? (continued)

- **Use the materials Nonresident Branch has already developed** for correspondence courses as your handouts, or if that won' t work, use their courses as models for what you need to develop.
- Attend an IM workshop and learn their techniques for developing handouts. Remember that IM is **NOT** (as many people think) a formatting technique. The power of IM lies in the fact that adult learning theory and strategies are embedded in their processes.
- Consider contracting out difficult and complex training aid development projects (e.g., video production). The **Electronic Media Development Detachment (EMDDET)** (Atlanta, GA) has now been stood up and can help you go through what you need to do to develop a video. See the PTC (EMDDET belongs to the PTC) about any video production projects you have in mind.
- Look at the guidance contained in the **ICW Standards and Style Guide**. It has evaluation checklists that can help you improve your own work as well as help you review vendor-produced products.

When you need to estimate the time for completing instructional materials and training aids, **industry standards** can help you out. PTC has that information for many kinds of instructional materials and media development. However, be aware that you need to add time to those estimates if you plan to develop in-house and if your staff (or you) is inexperienced and will need to learn as they develop.

What Will I Get Out of Them?

We generally think in terms of instructional materials and training aids supporting instructor-led training. When you' re in that mode, these devices offer you**multisense** support for the training messages you are trying to convey. However, as we increasingly turn to alternative methods of delivery, instructional materials and supporting training aids and media ***become*** the instruction.

What Will I Get Out of Them? (continued)

When conducting instructor-led training, these items support your messages, and give you the capability of delivering multi-sense instruction. When they stand-alone, they use multi-sense messages to convey instruction. In either case, they are vital to successful training.

Why and When Do I Develop Instructional Materials and Training Aids?

Why:

We have already covered why you develop instructional materials and training aids.

When:

Traditionally, such materials are developed during the development phase of ISD. However, as you' ve discovered in reading through this SOP, times are changing, and as they change, the way we do business changes as well. More and more, the pressure for speed is upon us. More and more frequently, we' ll probably see large and complex projects (e.g., WLM/WLB CBT) developed by contractors. With speed and expense such factors, we aren' t surprised to find out that the ISD phases are more and more merging and melding. Once analysis defines what we want to do and how much it can cost, we' ll probably continue to find that design and development happen in one "rapid-prototyping" event--as we attempt to produce what the field and crews need in as fast, responsive, and inexpensive mode as possible.

What Is My Role?

Traditionally, if you are the course designer or the instructor, you will probably be the person tasked with developing such materials or coordinating their development by someone else (i.e., vendor, contractor, or PTC).

You may fill the role of reviewing products other people produce, so you can make sure the content is accurate and the product will succeed with your students.

Who Can Help Me?

Your TRACEN instructor and course designer and developer staff can help you. Audiovisual support staff at your TRACEN can help you.

PTC can also help you. They have audio-visual staff, highly trained in producing complex audio-visual products. As the designated Coast Guard Center of Excellence for the production of CBT, one of PTC' s roles is helping with the development of ICW and reviewing those products. They can also provide professional advice and consulting about your own development of instructional materials and training aids.

What Is the Process for Getting Started?

When you have completed task analysis and sorted out performance objectives, tests, grouping and sequencing, and instructional strategy issues, it will be time to develop instructional materials and training aids.

There is no one, set standardized process for getting started. It will depend on the project. As with much of the work we do at a TRACEN, you can save time and avoid inevitable mistakes by going to the experts. Nonresident Branch is expert in developing print media course materials. PTC has expertise in alternative delivery methods and proper incorporation of instructional methods and strategies.

Develop Instructional Materials and Training Aids Job Aid

There is no job aid for this chapter. The logic for this part of the SOP is to provide general guidance for developing different types of instructional materials and training aids. We suggest you read through the chapter to see what options are available and to learn techniques for developing these support materials.

You can also turn to a specific part of the chapter (e.g., PowerPoint slide development) if you want to find out general guidelines for developing a specific instructional material or training aid.

Develop Instructional Materials and Training Aids Job Aid

However, please note that the checklists at the end of this chapter can serve as job aids for specific types of instructional material and training aid development:

- **Printed Material Checklist**
- **Role-play Development Checklist**
- **Case Study Checklist**
- **Mock-up and Actual Equipment Checklist**

NOTE: There are also structured writing templates at the end of this chapter as well. These templates will help you prepare professional print materials.

Chapter 37: Develop Lesson Plans

What Is It?

The Coast Guard' s Instructor Development Course (IDC) and Course Designer Course (CDC) both address the task--develop lesson plans. This chapter will explain their approach to this task. It will also provide a sample lesson plan to use as a model.

First, what is a **lesson plan**? As CDC defines it, a lesson plan is a written document describing how a training session will be conducted.

NOTE: For alternative delivery development, lesson plans are part of the GFM handed off to contractors to serve as lesson specifications for CBT, EPSSs, IVT, WBT, etc.

All Coast Guard instructors, even experienced veterans, should use a lesson plan to ensure that:

- Coast Guard training is as standardized as possible (all people receive the same quality of training).
- Training events allow students to learn, retain and transfer job information and skills.
- Different convenings of the lesson proceed in the right and same directions, covering all that needs to be covered for each student.

NOTE: To ensure standardization and that learning, retention, and transfer have taken place, the Coast Guard asks its instructors and course designers/developers to develop lesson plans around Robert M. Gagne' s nine events of instruction. Although lesson plans do not need to be standardized in format, every Coast Guard lesson plan should satisfy the nine instructional events to ensure it presents effective instruction.

IDC and CDC teach Coast Guard instructors and course designers and developers to break every lesson plan down into three sections. We will follow that same approach in this chapter:

What Is It? (continued)

- **Opening actions**--Those actions that get the lesson up and running:

1. Gain attention
2. State the objectives
3. Recall necessary prerequisites

- **Instruction Actions--**Those activities that provide the necessary information to master the objectives:

4. Present the information
5. Provide learning guidance
6. Elicit a response (student practice)
7. Provide feedback
8. Enhance retention and transfer

- **Closing actions--**Those activities designed to finalize one lesson and prepare students for the next:

9. Assess performance

How Do I Develop Lesson Plans?

Let' s examine**opening** actions first:

1. **Gain attention.** This event is designed to focus the students' attention and motivate them so they are ready and willing to learn the information or skill that the lesson plan will teach. Build attention "getters" into your lesson plan by:

- Explaining the importance of the lesson' s skills and knowledge to the job students are learning to perform.
- Explaining how this lesson interrelates with other lessons they have previously covered or will cover in the future.
- Asking thought-provoking questions that cause the student to think about the lesson' s topic.
- Explaining the value of the course--that' s in it for the participants? Break the student' s preoccupations with other matters by focusing their attention on the skills and knowledge that are going to be trained.

How Do I Develop Lesson Plans? (continued)

- Telling related anecdotes (e.g., Remember the Quillayute disaster? Let' s go through the events that happened there and see how they relate to what we' re about to learn.)
  - Using shock value (e.g., show a short video clip on what happens when safety standards aren' t observed). Be careful with this one; it should be used very sparingly and only when appropriate.
  - Presenting multi-sense stimulus material (e.g., pictures, graphs, and videos containing both visual and auditory stimuli; diagrams, charts, and graphs using color and motion assists to trace hydraulic flow, etc.).

2. **State the objective(s).** Every lesson plan should require instructors to explain the purpose and intent of the objectives at the beginning of every lesson. Stating objectives at the very beginning of the lesson sets up expectancies for the student. Since adults are self-directed, they now know what they need to do and are able to assess their progress toward that goal. Later in the lesson, the instructor can confirm student expectations by feedback. Different ways to state objectives are:

- Tell the participants what they will be required to do (the performance), under what conditions, and how well they will be required to perform (the standard).
- Use clear, concise terms that let the trainee know exactly what the expected outcomes are.
- Communicate objectives in words the trainee can understand--elaborate on or explain the meaning of jargon-filled, technical objectives (e.g., "Write *criterion-referenced* tests".).
- Demonstrate what the performance looks like, or what the results of such a performance are for objectives involving learning of a technical skill (e.g., showing a properly welded joint and comparing it with a poorly welded joint).
- Relate objectives to tasks or functions the trainee will perform on the job.
- Stress advantages trainees will gain by obtaining full knowledge and new and improved skills for job performance.

How Do I Develop Lesson Plans? (continued)

- Explain reasons for training this objective (i.e., motivates students).

3. **Recall prerequisites.** In this opening event, you are helping students recall previous learning and/or personal experience. New training builds on previously learned capabilities. The trainees must recall certain information and rules in order to process (**encode**) new material. Prerequisite knowledge should be retrieved from memory **BEFORE** the new material is presented. Ways to recall prerequisites are:

- Include activities for verifying that each student possesses the prerequisites before being able to continue with the lesson (i.e., pre-test).
- Ask suitable questions to cue retrieval of necessary material.
- Present a variety of cues to stimulate recall by all trainees in the class.
- Help students see that previous learning may also support new learning by providing a meaningful context for the new learning (e.g., **advance organizer**, comparing the MTU engine with the Caterpillar engine).

Next, let' s examine**Instruction Actions**. It is during this part of the lesson that the information needed to accomplish the performance objectives is presented to the students. These instructional events are of great importance to trainee' s successfully learning (encoding) information and skills. During instruction actions, how the instructor asks questions, how frequently the instructor summarizes information and what kinds of summaries are used, what kinds of multi-sense aids the instructor provides--all of these actions either contribute to or work against the trainee successfully encoding information and skills.

How Do I Develop Lesson Plans? (continued)

4. **Present the information.** The lesson plan should guide the instructor through a series of activities that are based on the content of the lesson. You can enhance presenting the information by:

- Using a multi-sense (visual, auditory, tactile) presentation to provide the learning points.
- Providing definitions of new words and concepts.
- Demonstrating new skills.
- Providing new rules and principles.
- Using handouts to show different processes.
- Giving "big picture" first, and then gradually providing details, when appropriate.
- Starting with a simple, concrete example of a rule or principles and gradually working toward a more detailed, general understanding of its application, when appropriate.

5. **Provide learning guidance.** The learning guidance you have selected for the lesson helps the student process the new information. Make sure your lesson plan lists the activities designed to do just that. Examples of learning guidance are:

- Providing a framework (**advance organizer**) and practical examples to aid the participants.
- Using **mnemonics** or other memory-aiding tools for items that must be encoded in long-term memory.
- Giving a series of examples and non-examples for a concept after defining that concept.
- Having students explain the steps of a procedure as you demonstrate it a second time (or consider **backward chaining**).
- Using a **fading** technique by coaching student through a skill, and gradually reducing your help until the student can perform independently for a psychomotor skill.

How Do I Develop Lesson Plans? (continued)

- Using visual aids to show students how a process works instead of just letting them read or hear about the process.

6. **Elicit a response** (student practice). Every lesson plan should include the activities needed for the instructor to facilitate practice sessions during the lesson. During this instructional event, you are giving trainees the opportunity to convince themselves and the instructor that they have achieved the objective(s). Mastery of any skill objective requires much practice (i.e., drills, practice sessions):

- Ensure the lesson plan allows participants the chance to practice the objective until they reach a level of ability required for success.
- When appropriate (verbal learning), use **questioning** as a practice technique (i.e., ask questions after presentation of important points of the lesson; use questioning as an aid to recall--assist trainees in retrieving learned material from storage; use questioning to enhance learning transfer--ask questions that require application of learned material to a totally new situation).
- Provide ample and appropriate-to-learning practice sessions--in labs or on simulators for motor skills--through carefully constructed and sequenced review exercises for rules, principles or problem-solving.

7. **Provide feedback**. This event goes hand-in-hand with the event, elicit a response. After every response to a practice, students need quick and effective feedback on their performance. The lesson plan should include activities for every practice. Feedback on correct performance reinforces the learning underlying that performance and motivates the trainee to further performance. Feedback on incorrect performance is also necessary to ensure the trainee learns the correct performance:

How Do I Develop Lesson Plans? (continued)

- Provide feedback as soon after the task has been performed as possible.
- Feedback is usually verbalized, but can be given by a computer, feedback sheet, or peers in a peer training situation--if you use peers, ensure they have been trained in how to give feedback constructively.
- Provide the students with motivational and developmental feedback (the instructor has a responsibility to correct incorrect performance, but that correction can be given by pointing out to the trainee the degree to which his or her performance approached the objective and focusing on just those behaviors the student needs to improve to master the objective).
- Be cautious regarding body language feedback. A smile, nod or simply going on to the next point can cue a trainee to recognize that he or she has mastered the objective. A frown or look of exasperation, however, can be very de-motivating to the student.

8. **Enhance retention and transfer.** This instructional event is completed periodically throughout the lesson. It is designed to help the student transfer what was learned in class back to the job. If any one of the nine events can be said to be more important than any other event, this is that event. Your lesson plan should include "enhance retention & transfer" activities throughout the instructional actions section to help achieve retention and transfer:

- Provide frequent reviews or summaries about the information being presented.
- Provide practices to help retention and transfer.
- Lead class discussions about actual on-the-job application of what the class has learned under differing circumstances.
- Use effective ways to initially present information (i.e., organizing materials into categories or in the form of charts, graphs and tables can help people retain and later retrieve information).

How Do I Develop Lesson Plans? (continued)

- Use pictures to help people retain and transfer what they' ve learned.
- Remember that "spaced reviews" help with retention--can you provide follow-up activities for your students that will help them periodically review what they' ve learned?
- Provide for the use of a concept or skill being trained in a variety of settings (i.e., aids transfer).
- Have students draft an action plan, detailing how they plan to transfer what they' ve learned to on-the-job performance. Offer to follow-up by "coaching" the trainee in achieving those goals.
- Look for ways to reinforce what has been learned through self-study exercises and on-the-job training. Coordinate such events with students wherever possible.
- Consider closing with a return to why this training is valuable to the student and some kind of tasking to apply the new learning.

Finally, let' s looks at what your lesson plan needs to capture for **closing actions**:

9. **Assess student performance.** All Coast Guard training must be tested, so the lesson plan must include those activities and instructions needed to satisfy this last instructional event. The lesson plan should also include "back-up" plans in the event any students fail the final test:

- Use methods such as quizzes, observation, and questioning to "test" what students have learned as you go through the events of instruction.
- Test the students' abilities to perform the stated objective(s).
- Critique performance as soon after the test as possible.

How Do I Develop Lesson Plans? (continued)

NOTE: Optional information included at the closing of a lesson might include:

- Activities for completing a final summary or review.
- Suggested reading lists.
- Reference or research notes.

Use the nine events of instruction as your guide when you develop a lesson plan. At the end of this chapter, we have included a sample lesson plan that uses the nine instructional events. You can use it as a model for developing other lesson plans.

How Long Will It Take?

If the course designer has provided you with a Learner Plan (LP) that includes lesson plan worksheets, and you use the sample lesson plan at the end of this chapter, not long at all.

Without those materials, it may take longer.

Be sure your lesson plan is built around the nine instructional events. If you don' t pay attention to that important point, the lesson may not be effective in promoting student learning, retention, and transfer.

What Will I Get Out of It?

Even if you are an expert instructor, you will find it hard to instruct without a lesson plan. Students tend to drift away from where you are trying to lead them, discussions go on too long, the objectives aren' t covered, and then students fail the test.

What Will I Get Out of It? (continued)

Even more important, the lesson plan is your assurance that the activities you are using with students are ones that really aid retention and transfer of learning. Without a lesson plan to guide your efforts, you can' t be sure the activities you are instructing will achieve what you need them to achieve.

Finally, if you develop the lesson plan yourself, you will be well prepared to instruct the lesson. If you have to use someone else' s lesson plan, it may be a more difficult job to instruct students. For this reason, we strongly urge you to develop your own lesson plans, even if ones already exist. Personalizing lesson plans is one very good way to make the training program' s content your own. Also, the nine events of instruction offer endless opportunity for creativity. You will enjoy working up activities that satisfy each of the nine events.

Why and When Do I Develop Lesson Plans?

Why:

You already know why you develop lesson plans. A lesson plan is an instructor' s most important tool in ensuring learning, retention, and transfer occur for any Coast Guard training event.

When:

Developing lesson plans is one of the first steps in the development phase of ISD (i.e., developing instructional materials).

If you are developing a new course, you can develop lesson plans as soon as performance objectives, assessment specification sheets, and instructional strategies have been developed. If you are both course designer and developer, you can develop lesson plans concurrently with the events mentioned above.

Why and When Do I Develop Lesson Plans? (continued)	You may also find yourself revising lesson plans that already exist so that improved lesson plans can be provided to a contractor who is producing Coast Guard training. Or you might be using pre-existing lesson plans from a DOD course and need to adapt them to Coast Guard situations and equipment.
What Is My Role?	We' ve described some of the various roles you might play in answering the "Why and " question.
Who Can Help Me?	You first receive help with developing lesson plans when you attend IDC and/or CDC. The more experienced instructors in your school (and other schools, other TRACENs) are a rich resource for help with developing lesson plans. You can also look at the References Section found at the end of this SOP. TRACEN staff involved in instructor and course design professional development will be glad to help you with lesson plan development. TRACEN Petaluma IDC and CDC staff are a ready, rich resource for providing consulting on development of lesson plans.
What Is the Process for Getting Started?	We have already answered this FAQ when we answered the "Why and When" question.
Develop Lesson Plans Job Aid	At the end of this chapter, you will find a sample lesson plan for training students in writing performance objectives. Use that lesson plan as a template and job aid for developing your own lesson plans.

Writing Performance Objectives Lesson Plan

Events & Instructor' s Notes	Activities and LP Body
Gain Attention: Use questioning techniques and student participation/experience to set the stage for defining performance objectives. In case no one has boarding officer experience, be prepared with other Coast Guard job-related examples. Capture definitions provided by students on flipchart. Follow up by showing visuals (Powerpoint slides) with definition and examples/nonexamples of performance objective Discuss/resolve any differences between what student(s) said and what visuals say Help transfer and retention by merging boarding officer violation example and performance objectives: Just as the boarding officer needs to know what a violation is, as a CG instructor or course designer, you need to know what a performance objective is.	Anyone have boarding officer experience? Tell us, in general terms, what the elements of a violation are. Just as violations have parts, so do performance objectives. Can someone give me a loose definition of what a performance objective is? Just as the boarding office needs to know what a violation is, you, as a CG instructor/course designer, need to know what a performance objective is to write lesson plans and to provide instruction.

State the objective(s) Convert the objectives to the student' s own words – discuss why "performance" instead of "learning" objective Show slide with all 4 objectives and have a different student read each one for further reinforcement and motivation	By the end of this lesson, you will be able to – 1) State the purpose of a performance objective 2) State at least two benefits of performance objectives 3) State the 3 elements of a performance objective 4) Develop a 3-part performance objective based on a task you perform on-the-job PO Sim, how about reading the first objective for us? Chief Holland, would you please read the second objective….
Recall Prerequisites: Get students to recall what happened when they gave a presentation….	Everyone has given some kind of presentation. What were the two most important things you felt or discovered when you gave a presentation? (felt anxiety and discovered preparation is very necessary) **Use their own words for these concepts.** Once you' ve elicited the responses you want, point out: This lesson will help you correct both!
Have students define what an *objective* means. Capture student definitions on flipchart. Provide slide with definition of objective as reinforcement. Discuss/resolve any differences between student definitions and definition on slide	What does *objective* mean, anyway? Can anyone give me a definition of what an objective is?
Ask students to recall if they have ever seen or heard about objectives in any training they' ve received…	Have you ever seen or heard of objectives in other training you' ve attended?

Capture student perception of what objectives accomplished on flipcharts (if appropriate)	(If some respond "yes) Did those objectives help you as a student in any way you can recall?
Present the information: State purpose of objectives: Elicit benefits of objectives (use their own words to capture benefits on flipcharts): Objectives help the instructor: • Select instructional methods • Know what to train • Know the expected outcome(s) • Know when to stop Objectives help students: • Organize materials • Ensure they can meet goal(s) Show PP examples and non-examples of 3 part performance objectives. Examples should clearly show and label each of the 3 parts of a performance objective. (advance organizer) Next, show PP slides that define conditions and give examples and non-examples of conditions. Follow that with slides that define performance statement and standards and give examples and non-examples of each. Next, show trainees the Mager-preferred order of the 3 parts: conditions, performance statement, standards. To help them remember this order, explain that it follows order in the alphabet: c (conditions) first, etc.	 Purpose: • To describe the intended result of instruction • It' s the destination on a road map What do you think the benefits of objectives are? First, we' re going to look at what a performance objective looks like and what it' s 3 parts are. Next, we' re going to look at each of the three parts of a performance objective: • Performance statement • Conditions • Standards Robert Mager uses a certain order for the 3 parts. You can remember this order if you recall your ABCs: • C = conditions first • P = performance statement second • S = standards last

Using partially filled in information on a flipchart, have students help you develop a rule:	All performance objectives should have ___ parts. • _____that state under what conditions the performance will take place • _____ that states what the performance is • _____that states what standards people must meet when performing the task.
Provide Learning Guidance: • ABCs order to remember order for different parts of objective • Use the acronym/mnemonic "PCS" to help students remember the 3 parts of a performance objective.	Remembering a new meaning for the acronym, "PCS", will help you remember the 3 parts of a performance objective: • (P)erformance statement • (C)onditions • (S)tandards
Elicit a Response: Have students play a game. Divide students up into 4 groups. Give each group many related performance objective elements (conditions, standards, performance statement), but be sure each group has exactly the same amount of elements. The group that finishes these two things first wins: • Sort all the puzzle pieces into 3 categories: performance statements, conditions, standards • Put the puzzle pieces together into performance objectives that make sense	Now, let' s practice what you' ve learned so far by playing a game. First, let' s divide up into 4 groups (Count off 1, 2, 3, 4 until everyone is in one of the groups). I' m going to distribute some puzzle pieces to each group. The group that finishes two activities first wins. The prize for winning is this exceptionally beautiful group certificate for having successfully learned what the 3 parts of an objective are and how to put them together. We' ll make sure the winning team has their names printed on the certificate.

Provide feedback: Borrow 4 instructors to circulate through each of the 4 groups while they are playing the objective game. Instantly praise and encourage performance that is close to the mark. Leave correction of any mistakes until after the game. Once the game is over, have the group do an "after-action" report. They should pick a leader who reports out on how they' ve done and shows how they categorized elements and put them together	Provide encouraging remarks to each of the groups, but do not coach at this time (it' s a game – you want to be fair to each group). The point is to encourage and reinforce "right" performance. Use the "after-action" report as a tool to have teams and peers self-correct. If there are any "wrong" answers that nobody noticed, point out how to correct those answers constructively
Enhance retention and transfer: Have students put together a group action plan for using the information they' ve learned on-the-job. Use the same four groups from the game exercise. Each group leader should report out at the end of the exercise so all can share in different ideas for promoting retention and transfer	OK, folks, we need to use those same groups again. I need each group to work up an action plan for how you' ve going to use what you' ve learned when you get back to your jobs. You' ve got 15 minutes for this exercise. Use the easels/flipcharts to capture your ideas, and prepare your leader to report out at the end of the exercise.
Assess student performance: Hand out assessment sheet. Each test asks the student to do the following things: Part 1: • Briefly state in writing the purpose of performance objectives. • State in writing **two** benefits of using performance objectives.	All right, folks, now it' s time to see if you' ve mastered those objectives

Part 2: • Write a very short narrative, describing a task you do often on-the-job. • List the conditions under which you perform that task. • List the standards you are expected to meet in performing that task. • Convert the task into a performance statement Part 3: Using the performance statement you' ve created and the conditions and standards you' ve described, WRITE a 3 part performance objective that contains all 3 elements and that lists the 3 elements in the proper order:	

Chapter 38: Develop Interactive Courseware (ICW) - CBT, WBT, IVT

What Is It?

Unlike more traditional methods such as paper-based publications, resident instruction, and watch qualification programs, ICW allows the Coast Guard to deliver training and performance support to many people at one time and to remote sites.

The term ICW encompasses a wide variety of delivery methods, based for the most part on new and improved technologies. Although more of these technologies are emerging every day, the ICW the Coast Guard is most likely to use or develop has the following characteristics:

- Includes a rich level of multimedia (i.e., "a picture is worth a thousand words.").
- Adequately simulates Coast Guard real-life situations and job content.
- Can be reused in other applications and projects (i.e., ICW costs a lot to develop. For this reason, we want to be sure we develop only one ICW for hydraulics--not several hydraulics modules for ships, aircraft, etc.)
- Contains as much interactivity as possible.

ICW applications that have those characteristics are:

- **Computer-based training (CBT)** systems (discussed in Chapter 30, Design Interactive Courseware (ICW)--CBT, WBT, IVT)
- **Web-based training (WBT)** systems (discussed in Chapter 30, Design Interactive Courseware (ICW)--CBT, WBT, IVT)
- **Interactive video teletraining (IVT)** systems (discussed in Chapter 30, Design Interactive Courseware (ICW)--CBT, WBT, IVT)
- **Electronic Performance Support Systems (EPSSs)** and tools (discussed in Chapter 29, Design and Develop Electronic Performance Support Systems (EPSSs)
- **Hybrid** systems involving two or more of the applications (i.e., EPSS and CBT, etc.)

What Is It? (continued)

ICW projects should begin from the results of a sound analysis **BEFORE** starting production of a product. In Chapters 29 and 30, Design and Develop Electronic Performance Support Systems (EPSSs) and Design Interactive Courseware (ICW)--CBT, WBT, IVT, we cautioned you to be sure your ICW project started with a performance analysis or an FEA. We also told you to be sure the product you are developing is the result of program and training managers having reviewed an IP and selected this option.

Having cleared the analysis hurdles of FEA and IP presentation before you design an ICW, you should now have a green light to proceed ahead with production (i.e., development).

NOTE 1: As we' ve said before, you will seldom design a training program or performance support and hand it off to a developer. The more likely scenario is that you will do both jobs at the same time.

NOTE 2: With the exception of IVT, ICW products are usually time-consuming and expensive to develop. ICW production usually involves developers using proprietary authoring systems (e.g., Authorware, RoboHelp, etc.) with relatively steep learning curves. For these reasons, most Coast Guard major development projects will be contracted out. Even for that scenario, you still need to know how the development process works so you can be sure the Coast Guard gets the "right" product.

NOTE 3: PTC and other Coast Guard organizations do develop prototype ICW products for evaluation and assessment. If time and resource constraints permit and the product would make a good Coast Guard prototype, they may be able to help you develop an ICW.

How Do I Develop ICW?

You already know that ICW production projects are usually team efforts. You also know that the "design" and "develop" ICW tasks are not really separate activities.

How Do I Develop ICW? (continued)

Since you (or a contractor) most often do these tasks together, let' s review what you learned in Chapters 29 and 30 by going over the steps the ICW production team takes to design an ICW:

- Design the "look and feel" of the ICW:

  Step 1: Brainstorm.
  Step 2: Flowchart.
  Step 3: Model the end user.
  Step 4: Report on the destination site.
  Step 5: Develop product specification.

- Design content:

  Step 1: Storyboard.
  Step 2: Design the people-computer interface.
  Step 3: Define the content (i.e., write scripts and captions).
  Step 4: Research assets, copyright clearance, and acquisition.
  Step 6: Input text.
  Step 7: Convert files and perform file management.

- Design supporting materials and packaging.

That takes us through the design process.

Once those tasks are completed, the ICW team is ready to move into the production phase.

The steps you need to know for producing ICW (i.e., develop an ICW) are found in the Coast Guard-specific job aid, **"The ICW Development Process,"** found at the end of this chapter. Since that is a four-page process, we' ve given you a simplified and generic version below--just so you can see the typical process followed in developing ICW:

How Do I Develop ICW? (continued)

- **Rapid prototype** the product as you develop.

NOTE: We tell you more about rapid prototyping in Chapter 40, Conduct Pilot (Formative Evaluation). Rapid prototyping means to develop a working portion of the final product and immediately implement that portion with a group of learners or experts. Their input is then used to revise the prototype.

- Develop graphics.
- Find or develop video clips.
- Use authoring software (e.g., Authorware or RoboHelp) to author the program. Use programming code, if required.
- Develop support materials and packaging.
- Integrate the whole program.
- Master the program in accordance with project or contract specifications or agreed upon method (e.g., floppy disk, Coast Guard intranet delivery via Shockwave, CD-ROM, etc.)

That gives you some idea of how the generic process for developing ICW works.

Next, we' ll go into a little more depth about each of the types of ICW the Coast Guard uses and develops--CBT, WBT, and IVT.

NOTE: As the Coast Guard' s CBT Center of Excellence, PTC Yorktown typically takes the lead for ICW projects and product development.

CBT. The Coast Guard' s**Interactive Courseware (ICW) Standards and Styles Guide** contains information and guidance related to the design, development, and production of CBT and related products. Novice developers are encouraged to use the guide when designing or developing CBT.

How Do I Develop ICW? (continued)

COMDTINST 1554.1 provides detailed guidance related to the production and delivery of interactive courseware, including CBT. The Coast Guard' s ICW Standards and Styles Guide is an attachment to that COMDTINST. PTC manages changes to the ICW Standards and Styles Guide and keeps copies for those who want them.

WBT. Web-based systems are often repurposed CBT modules that are repackaged for streaming or downloading from web sites. Although they are produced following the process outlined above, they are usually less media intensive due to **bandwidth** (telecommunications pipeline) restrictions and limitations.

Newer tools such as the Web-4M tool from JDH Technologies enable course designers and trainers to produce and deliver live training via the inter and intranets.

IVT. IVT involves the direct delivery of live instruction via a televised audio and video link to a variety of student locations. Class size should be kept to a manageable level to ensure the instructor can still effectively interact with the students. Other technology tools including a computer, document camera/visualizer, and supporting aids can also be distributed via the broadcast system to the students.

NOTE: PTC Yorktown will be partnering with the U.S. Navy' s CNET Electronic Schoolhouse Network to deliver IVT training program via a nationwide system of electronic classrooms. Courses can originate directly from TRACEN Yorktown and be distributed via the Navy system.

How Long Will It Take?

The time needed to create an ICW product is dependent on:

- Clear project goals. Without them projects tend to bog down and drift.

How Long Will It Take? (continued)

- The project' s complexity and fidelity including the type of media selected and the project' s scope.
- Whether the product is a new start (harder) or converting an existing course (easier).
- Available design and development tools and team experience with the tools (e.g., Designer' s Edge, RoboHelp, Authorware, etc.).
- Amount of reusable components (i.e., access to existing media can greatly reduce the authoring time).
- SME availability and access.
- Test results and level of rework needed after initial trials.

CBT and WBT. Design and development efforts run anywhere from 100 to over 500 hours of development work per finished hour of CBT and WBT. The wide range of hours required exists due to the enormous potential for variations resulting from the factors noted above.

IVT. IVT programs typically take very little time or up-front costs provided you have access to an existing system. A capable instructor can be easily trained to use the equipment and complete alterations to an existing 1- to 2-week resident curriculum in less than a month.

What Will I Get Out of It?

ICW products have several key benefits. Those are:

- Self-paced.
- Easily accessed.
- Improved consistency.
- Provide on demand or just-in-time training.
- Overtime cost less than resident-delivered training programs.

ICW products support self-pacing. Students who pace their own progress as they move through instructional material usually can cover content faster than it can be delivered by an instructor in a resident environment.

What Will I Get Out Of It? (continued)

ICW products are easier for students to access. Courseware can be distributed directly to the members--at the unit or at home. This eliminates the constraints imposed on resident training by available number of seats, travel funds, and berthing space. Students can also access the courseware at any time of night or day, weekdays, or weekends.

ICW' s content is consistently delivered and received. ICW products aren' t subject to the individual goals or objectives of an instructor.

ICW products can deliver training or performance support at exactly the right moment. Just-in-time training and performance support help people remember what they previously learned (and forgot) or acquire new skills or knowledge.

Infrastructure costs can be reduced. The resulting savings realized can then be applied to operational programs or to improving the quality of other instructional programs.

Why and When Do I Develop ICW?

Why:

Some of the reasons for developing ICW are:

- Training on operational equipment is dangerous to staff, students, or the equipment.
- Remotely delivered training would be more cost–effective.
- Those requiring training are consistently unable to obtain adequate quotas for the training they need.
- Trainees need to frequently requalify or be recertified/assessed.

Why and When Do I Develop ICW? (continued)

When:

- When a performance analysis or FEA indicates skills and knowledge are deficient and ICW should be considered, and an IP option has been selected and funded.
- When student throughput at a resident course is high enough to justify conversion costs (i.e., see Chapter 10, Conduct TRACEN-Level Triage).

What Is My Role?

Typical roles for instructors and SMEs in ICW production are:

- Provide key information, content, media, or visual aid samples.
- Serve as key team members for storyboard production and product reviews.

Your role may be to help contractors with incorporating accurate content. Multimedia designers and developers often lack the specific content expertise needed to accurately design and develop ICW products.

Individual instructors, course designers, and school support staff may also become involved in delivering live content over the web or via an IVT system.

Who Can Help Me?

PTC' s staff can provide instructors who are new to technology with appropriate coaching and mentoring.

If you have been tasked with developing a specific ICW product and get pre-approval, PTC may be able to help you develop the product. They maintain appropriate software and hardware for designated instructors to work on courseware. However, such projects must be pre-approved and will be conducted under the guidance and supervision of PTC' s staff.

Who Can Help Me? (continued)

Other good sources of help are:

- Fellow instructors with IVT and WBT experience.
- Attendance at DOD-sponsored courses.
- Attendance at local seminars and undergraduate courses.

What Is the Process for Getting Started?

WARNING: Do **NOT** undertake a technology-intensive ICW project without:

- Adequate analysis
- ROI calculation
- A careful review of the user population

PTC suggests that you use Allen Communications' Designer' s Edge software to design an ICW product. It lays out the key milestones for technologically intensive ICW projects. The tool closely approximates the ISD process and tells the user what tasks and steps to take--and when--to produce a successful ICW product. This tool is especially helpful to those who are novices at ICW production and who have little experience with or knowledge of ISD.

Most large-scale production of canned programs will usually be contracted out. However, PTC does conduct organic development of key prototypes depending on project priorities, available or required authoring systems, and personnel availability.

IVT alternatives can also be scheduled with the PTC. Contact the PTC for additional details.

To gain approval for a PTC-assisted project, be sure that:

- The performance problem has been properly analyzed.
- The choice of a specific ICW product is the result of a media selection analysis.
- Funding review has taken place.

What Is the Process for Getting Started? (continued)

- People whose skills match the project have been identified.
- The personnel needed for the project are available.
- The project' s priority is high enough to compete well with other projects.

Develop ICW Job Aid

NOTE: "**The ICW Development Process,**" a job aid extracted from The Coast Guard' s**ICW Standards and Styles Guide** is found at the end of this chapter. Follow COMDTINST 1554.1 and use that Coast Guard-specific job aid for developing Coast Guard ICW products.

- **CBT or WBT:** See COMDTINST 1554.1' s attachment, ICW Standards and Styles Guide and appropriate WBT tutorials.

- **IVT:** Contact the PTC. They have an instructor development training program for instructors slated to teach via IVT. Contact the PTC for additional details.

- **Hybrid:** Follow the specific guidance for ICW types (e.g., CBT, WBT, IVT) for applicable components of your project.

- **EPSS:** EPSS design and development is discussed in Chapter 29, Design and Develop Electronic Performance Support Systems (EPSSs).

Chapter 39: Complete Development of Level 2 Evaluations (Tests)

What Is It?

This development task means finishing up and fleshing out the level 2 evaluations (tests) you started in the design stage of ISD. That means completing the work you captured on the **Performance Objective Assessment Specification Worksheets**. The outputs of this task are the tests you need for your course.

NOTE: If design work was incomplete (or never happened!), you may have to develop tests from scratch. We' ll show you how to handle both types of situations.

How Do I Complete Development of Level 2 Evaluations (Tests)?

We' ll start the "how-to" part of this chapter by reviewing what you need to know if you are developing tests from scratch.

Tool:
See the tool, **Matching Tests to Learning Domains**, found at the end of this chapter. It will help you pick the right test for the performance you are evaluating. Or, if you are looking at Performance Objective Assessment Specification Worksheets, you can use this tool as a quick check to be sure test design matches up with performance being evaluated.

Developing Pre- and Post-tests. We also want to add a few words about pre- and post-testing. Pre-testing means giving the students a pre-test before they take instruction. Post-testing means testing the students again (with a different but similar test) when they have completed the training program. It is a very good idea to pre- and post-test because this technique is about the only way to be sure learning has taken place. That said, we know time constraints and several other factors mean you can' t always pre- and post-test.

Why pre-test?

- To find out if students have the pre-requisite knowledges and skills your "target audience" identification assumes they do (if they don' t, they may have trouble completing training successfully).

How Do I Complete Development of Level 2 Evaluations (Tests)? (continued)

- To identify how much prior knowledge/skills learners have regarding what you are about to teach (maybe they don' t need training).

However, there are times when pre-testing may not be called for. For example, you would probably not routinely pre-test "A" School students since "A" Schools are entry level programs. Another example might be a very short "C" School. You may not want to waste the time it takes to conduct a pre- and post-test.

NOTE: If you don' t have time to pretest, consider designing an abbreviated pre-test that tests TPOs and key subordinate objectives.

Now that you' re at the "develop" stage, it is time to talk about test **validity**, **reliability**, and **practicality**. We' ll go over what each of those terms means:

Validity. A test is valid if it actually measures or assesses what it claims to measure or assess. A test is valid if:

- Its individual items are consistent with the objectives the test claims to assess.
- The items for each objective are representative of the **range** of items possible to develop for that objective.
- Objectives upon which the test is based have been adequately sampled.

Reliability. A test is reliable if it consistently measures what it claims to measure, and we have a high degree of confidence in the scores that it produces. Tests are considered unreliable when something causes unpredictable error. Some of the ways you can ensure your test instruments are more reliable are:

- Avoid essay questions. It is very hard to grade them objectively and consistently. Therefore, they are not particularly reliable measures. If you have to use the essay format, use checklists, model responses, key words, or phrases to ensure more objective evaluation.

How Do I Complete Development of Level 2 Evaluations (Tests)? (continued)

- If you are testing competency, make sure your test distinguishes between skilled and unskilled learners.
- Do **NOT** use true/false questions. There is a fifty-fifty chance learners will get a true-false item correct.
- Use at least three distractors (i.e., wrong answers/choices) when constructing multiple-choice questions. Each additional distractor reduces the possibility of getting the correct answer by guessing.
- Watch test length. Too few test items, per objective, increase the likelihood that the successful test taker won' t really have learned the job. Using only one item per objective means the student may guess the right answer.
- Edit test items for clarity and easy-to-understand/interpret directions. Ambiguity can result in an unreliable test instrument.
- Unexpected or hostile conditions for taking the test can make it unreliable (e.g., too hot or cold, using a computer for the first time, excessive anxiety, etc.).
- Use a checklist or rating form, and practice grading all of one question for the entire class to increase test reliability.

Practicality. Time constraint mean that there is a trade off between making a test instrument valid and reliable and the realities of our work world. In short, as test designers and developers, we' ve got to balance practicality with reliability and validity. The one time we don' t want to compromise on ensuring high reliability and validity is for situations that involve life or death decisions. For example, for safety tests, certifying people in administering CPR, etc., we want to make sure our tests have high reliability and validity.

As we said in Chapter 25, your test items should be consistent with the performance objectives they' re supposed to measure. Make sure the performance you are asking students to do in the test matches the performance indicated in the objective.

How Do I Complete Development of Level 2 Evaluations (Tests)? (continued)

What types of tests can you develop?

- **Performance tests.** These tests measure skills. The learner must demonstrate the ability to do something such as operate equipment, drive a ship, or speak a foreign language. Simulations can be used for performance tests. In some cases, practicality will dictate that you have to develop a test that requires a performance equivalent to the one desired but not exactly the same

- **Knowledge tests.** There are two types of knowledge tests--**subjective** and **objective**. Essay questions are an example of a subjective knowledge test, but we' ve already told you to avoid using them unless you absolutely have to. Objective knowledge tests are:

    - Oral
    - True/false (do **NOT** use!)
    - Multiple-choice
    - Matching
    - Completion (fill in the blanks)

Given these choices, what types of tests should you develop for particular objectives? The answer to that question depends on the learning capability you are testing (i.e., verbal information, intellectual skills, motor skills, or attitudes). These are the things you want to think about when you are developing test items for the different learning capabilities:

Verbal information. Use the conditions and behavior parts of the performance objectives to guide your development work. Short answer, completion, or "fill in the blanks" are your best choices.

Intellectual Skills. Make sure students are given the materials specified in the conditions part of the objective and that they are required to respond in the same manner specified in the objective' s performance statement. Try to make directions separate from the test item.

How Do I Complete Development of Level 2 Evaluations (Tests)? (continued)

To help ensure directions are clear, state the intellectual skill to be performed first, then follow that with instructions about how to respond to demonstrate the skill.

Motor Skills. To measure performance of motor skills, you need instructions for the performance and a checklist you can use to record your evaluation of the performance. Be sure instructions tell the students how their performance will be judged.

Attitudes. For training that focuses on leadership or diversity, we suggest you use a checklist or rating scale survey for evaluating change in attitudes. For example, if you wanted a trainee to demonstrate a courteous manner toward customers, you could develop a checklist to be used when observing the student' s behavior during a role-play, etc.

NOTE: For an exhaustive list of "do' s and don' ts" for test item construction, we strongly suggest you use Training Center Yorktown' s**Nonresident Training Development Manual**. It contains a wealth of information on good test item construction, as well as numerous examples that serve as test item models.

Tool:
See **Do's and Don'ts For Various Types of Tests** chart at the end of this chapter. It will help you avoid some of the common mistakes in test item construction.

ICW tests: See the Coast Guard' s**ICW Standards and Styles Guide** for guidance in developing ICW product tests. We' ve extracted some of that information and reproduced it below:

- Provide an initial screen at the beginning of a test that states the number of test items and estimated time for completion.

- Provide an escape option for anyone who wants to back out at this point.

How Do I Complete Development of Level 2 Evaluations (Tests)? (continued)

- At a minimum, show items that were missed. (Students may recall wrong answers as correct if this is not done). Consider reviewing wrong items by showing the wrong answer selected along with the correct answer.

- Just as with any type of test item construction, avoid using:
  - None of the above
  - All of the above
  - True/False
  - Negatively worded test items

- When you have to use a negatively worded test item, capitalize the negative terms and underline them (e.g., NOT).

- Write completion items so that only one word, phrase, or value completes the sentence. Place the blank near the end of the sentence.

- Use a pre-test at the beginning of a module to collect information about the user such as prior knowledge of the material, learning style, and preferences.

- Use progress checks to determine if the learner is progressing as intended. The CBT can use this information to provide guidance to the users or send them to an appropriate section. The progress check also informs students of how they are doing and then lets them choose what to do next.

- Use a post-test to certify that the user has reached a specific level of proficiency. Be sure you "trap" the answers so that data are recoverable.

Short-answer test items: We strongly suggest you use Training Center Yorktown' s Nonresident Training Development Manual when developing short answer test items.

That covers all the issues you need to be concerned about as a test developer. Now we' re ready to go through the steps required to develop a test.

How Do I Complete Development of Level 2 Evaluations (Tests)? (continued)

Step 1: Determine the scope of the test.
Step 2: Determine what will be measured.
Step 3: Choose the style of test that matches the performance you' re measuring (e.g., matching, performance, survey, etc.).

Step 4: Determine the length of the test (how many items are required for a valid test?).

Step 5: Write the test or test items.

Step 6: Check test items against performance objectives to ensure each objective is tested either specifically or inclusively.

Step 7: Arrange the items in final form.

Step 8: Prepare the directions for taking the test (if you are writing a performance test, make sure to write directions both for the student taking the test and for the instructor evaluating the performance).

Step 9: Prepare the scoring device.

Step 10: Administer the test.

Step 11: Analyze results for possible course or test revision.

Step 12: If required, write new test items or tests.

How Long Will It Take?

Your first time around, this task will probably take quite a bit of time. However, there are ways to speed up the process:

- Use models from other courses, CDC, the Nonresident Training Development Manual, and NIDA courseware to speed up your work.

How Long Will It Take? (continued)

- "Repurpose" already existent data. The schools already have a wealth of performance tests and test items developed. See if you can retool any of those. Go to the schools that use actual training aids for samples of good performance tests (i.e., NATON, Marine Safety, MLE, and Engineering and Weapons). Ask the nonresident staff for some help in constructing short-answer test questions.

- Correspond with other TRACENs via e-mail. Maybe some of their test items and tests can help you out.

- Be careful about security. You may find other test item developers are unwilling to send you samples via e-mail because of possible compromise and security issues.

Once you develop a few kinds of tests, you will find development time speeds way up. It' s just a "learning curve" situation, and as soon as you get through the curve, you' ll be able to develop tests and test items in record time.

What Will I Get Out of It?

You will get the finished products you need to conduct level 2 evaluations--those tests that "prove" whether or not the student learned the objectives of your training program.

The absence of valid and reliable tests would make it impossible for the TRACEN to conduct level 2 evaluations.

Why and When Do I Complete Development of Level 2 Evaluations (Tests)?

Why:

The "why" we' ve just answered. Completing this task gives you the products you need to conduct level 2 evaluations (tests).

Why and When Do I Complete Development of Level 2 Evaluations (Tests)? (continued)

When:

The "when" depends on how new training programs or performance supports are developed and how old training programs and performance supports are revised. If done in-house, you will complete development of level 2 evaluations as part of the development phase of ISD. However, remember we said that changes to modern businesses and organizations mean you will probably merge design and development into one "rapid prototyping" task.

If the new start or revision is being delivered as an alternative delivery, you may develop test items prior to letting the contract so they can be provided to the contractor as government-furnished material.

Or, you might be working on designing a CBT product and develop test items when you are using Designer's Edge software.

You could be revising tests and test items for an older curriculum because level 1 and 2 evaluations indicate that the tests have problems.

Or, you could be tasked with designing and developing a "new start" curriculum for delivery at the TRACEN, so you are developing test items as part of that tasker.

What Is My Role?

We have really answered that question when we answered the "why and when" question.

Who Can Help Me?

Experienced school staff can help you. PTC can help you. The References Section of this SOP can help you. The Nonresident Training Development Manual is an excellent tool for those who need to develop test items.

What Is the Process for Getting Started?

Our answer to the "why and when" question is a partial answer to this question as well. It depends.

If an alternative delivery product is being developed by a contractor, you may receive tasking to develop tests and test items or to provide samples of those to the vendor as GFM.

If you' re working on designing and developing a new course, you' ll develop test items as part of the design and development phases of ISD.

To get started on this task, gather up the Performance Objective Assessment Specification Worksheets from the work done in the design stage and begin to flesh those worksheets out.

If no such sheets exist, go to the performance objectives and use this chapter, the references, and the staff we have mentioned to get started developing tests and test items.

Complete Level 2 Evaluations (Tests) Job Aid

A job aid for this task is found at the end of this chapter.

Step 1: Determine the scope of the test.

Step 2: Determine what will be measured.

Step 3: Choose the style of test that matches the performance you' re measuring (e.g., matching, performance, survey, etc.).

Step 4: Determine the length of the test (how many items are required for a valid test?).

Step 5: Write the test or test items.

Complete Level 2 Evaluations (Tests) Job Aid (continued)

Step 6: Check test items against performance objectives to ensure each objective is tested either specifically or inclusively.

Step 7: Arrange the items in final form.

Step 8: Prepare the directions for taking the test (if you are writing a performance test, make sure to write directions both for the student taking the test and for the instructor evaluating the performance).

Step 9: Prepare the scoring device.

Step 10: Administer the test.

Step 11: Analyze results for possible course or test revision.

Step 12: If required, write new test items or tests.

Tools:
See the **Test Item Analysis Checklist** at the end of this chapter. It will help you do a quick item analysis of your test items.

Look in the Nonresident Training Development Manual for a list of test item problems and suggested revisions.

NOTE 1: If you suspect that your test or test items have problems, but you can't find the solution, you can get help from PTC's staff or the nonresident staff in the training division.

NOTE 2: If you are developing self-paced print media instruction, you must develop feedback sheets as well as tests and test items.

Chapter 40: Conduct Formative Evaluations and Conduct a Pilot Evaluation

What Is It?

Two more kinds of evaluation you need to know about are:

- **Formative evaluation**
- **Summative evaluation**

Formative evaluation takes place **BEFORE** you complete design and development work and **BEFORE** you deploy a training program. The basic idea is that you capture data that allows you to revise the program *as you go*. You can also formatively evaluate a training program or performance support by "testing" its first convening or use. That type of formative evaluation is sometimes referred to as "conducting a **pilot** evaluation."

After the training program has been deployed, you can also evaluate to determine if the program is indeed effective. This type of evaluation is called a **summative evaluation.** Summative evaluation techniques are also used to determine the potential a DOD training program or a vendor-developed product has for meeting Coast Guard performance improvement needs.

We will discuss Coast Guard methods for formatively evaluating a course in this chapter of the SOP.

NOTE: Summative evaluation methods and techniques are discussed in Chapter 49 (implementation section) of the SOP.

To understand how you go about conducting a formative evaluation, you first need to know a little bit more about what it is.

Formative evaluation is something you do as you develop. Its goal is to develop effective instructional or performance support materials. You use this type of evaluation to identify immediate problems with media, objectives, tests, instructional strategies, first draft role play scripts and first draft case studies.

What Is It? (continued)

The results of formative evaluation allow you to "fix up" those problems ***as you continue to design and develop*** a training program or ICW.

We conduct formative evaluations to avoid the waste that comes from rework and because of time, resource, and funding constraints, primarily--particularly with a very expensive ICW product. You cannot afford to deploy a product--even after meticulous design and development work--only to find out it is inaccurate, or students hate it, or it doesn' t train. To avoid those situations, you formatively evaluate as you go. In contrast, a "pilot" evaluation is aimed more at first time use or the first convening or deployment of a training program. Its focus is to quickly revise performance objectives (i.e., EOs) that don' t work, add or delete material, take care of "down-time" issues, write better test items, create better and more believable scenarios--so that the next convenings or deployment of the training program benefit from that initial evaluation.

How Does the Coast Guard Conduct Formative Evaluations or a "Pilot" Evaluation?

First, we want to explain what you will find in this chapter and why we "sequenced" our "how-to" information about formative evaluation this way.

The **first** formative evaluation techniques we' ll talk about are those used in developing ICW. Our reason for giving this type of formative evaluation first priority is that Coast Guard instructors and course designers and developers are more and more often involved in this type of work. For that reason, we want to start with those techniques.

Second, we' ll talk about ways to modify the classic formative evaluation process to make it less expensive and less resource intensive. That is the time when we will discuss the "conduct pilot" concept.

Third and last, we will explain the classic formative evaluation process--the same process CDC trains. We want you to know about this process and recognize how important it is.

We also realize, though, that you may not always have the time to undertake this type of formative evaluation.

How Does the Coast Guard Conduct Formative Evaluations or a "Pilot" Evaluation? (continued)

I. ICW formative evaluation techniques:

NOTE: Although these techniques are used primarily in the design and development of ICW, they work just as well for formatively evaluating other instructional materials and performance supports you might be developing. Do **NOT** restrict their use to just formatively evaluating ICW.

Tool:
Use the **ICW Standards and Styles Guide** to formatively evaluate ICW products:

Methods:

1. Alternatives to One-to-One Methods:

- **Two-on-One:** Two learners review instruction. As they work through the program, they discuss with each other (and the evaluator) errors and problems that arise.

- **Think aloud protocols:** Learners describe their thoughts (reactions, plans, ideas, and confusions) to the evaluator as they proceed through the materials.

- **Computer interviewing:** Interviewers send questions via electronic mail to experts or learners. Or, computer-assisted data collection (CASAC) programs present questions on screens and register the answers, with or without an evaluator present.

2. **Expert Review Methods:**

- **Self-evaluation:** The designers prepare a set of evaluation questions and criteria to evaluate the instruction, and then arrange a time to conduct the "self-evaluation." Evaluation is conducted alone or with another team member acting as an evaluator.

How Does the Coast Guard Conduct Formative Evaluations or a " Pilot" Evaluation? **(continued)**

- **Panel reviews:** A panel review is a directed and structured group interview conducted by two or more experts. Methodology is similar to the discussion method used in the two-on-one learner evaluation. Experts and evaluator move through the instruction together. The panel discusses instruction and answers the evaluator' s prepared questions.

3. Small Group Field Test Methods:

- **Evaluation Meetings:** Learner groups discuss instruction with an evaluator. Then, a learner representative meets with the evaluator to discuss problems and possible changes. Based on meeting outcomes, the instruction is immediately revised and tried out on the same learner group.

- **Computer Journals and Networks:** Individual users of networked software use the computer journal to gather evaluation data by solicitation and then store comments. Students write in their individual, on-line journals about their reactions to the software. The instructor assesses this information, and the evaluator may use the network for follow-up questions. Students (or the evaluator) can post their comments for general discussion (e.g., Apple Open Collaboration Environment or Powertalk).

- **Rapid Prototyping:** A working portion of the final product is developed and immediately implemented with a group of learners or experts. Their input is used to revise the prototype.

NOTE: See the flowchart **"Where Formative Evaluation Fits Into Developing ICW Products"** at the end of this chapter. Also see the table, **Methods for Conducting Formative Evaluation on ICW Products** at the end of this chapter.

How Does the Coast Guard Conduct Formative Evaluations or a "Pilot" Evaluation? (continued)

II. Modified and speeded-up formative evaluation techniques:

There are some simple things you can do that will help formatively evaluate your design and development work as you go.

NOTE: These methods aren't prescriptions. They are just ideas for you to consider.

- Evaluate target audience by administering a reading test to determine if the reading grade level you've chosen is accurate.
- Ask content experts to review the results of task analysis for accuracy and completeness.
- Ask content experts to look at tests you've developed. They can tell you whether the test is practical and whether test items fully cover ("accurately sample") the objectives.
- Have experts (SMEs and instructors, ISSs, and ITs) review the materials. Ask them to answer the following questions:

    - Is the content accurate and up-to-date?
    - Does the content present a consistent perspective?
    - Are examples, practice exercises, and feedback realistic and accurate?
    - Are the instructional strategies consistent with the content area (psychomotor, cognitive strategies, verbal information, etc.)?
    - Is the instructional approach appropriate for the target audience?
    - Are instructional strategies consistent with principles of adult learning theory and instructional theory?

    NOTE: For example, if contingency planning exercises and case studies are designed by an O-3 school instructor, but the target audience is made up of O-5s with considerable experience under their belts, there may be a disconnect between the sophistication level of the exercises and students' expectations.

How Does the Coast Guard Conduct Formative Evaluations or a "Pilot" Evaluation? **(continued)**

To avoid this kind of problem, have a content expert formatively evaluate exercises and case studies and provide comments for making them better match the experience and sophistication level of the target audience.

The likelihood is that you will gain many comments from this kind of informal "design/content" and expert review. We suggest you categorize comments as:

- Make immediate revisions.
- Put aside until summative evaluation.
- Ignore (some comments will not address formative evaluation issues).

You can also modify classic formative evaluation techniques by treating the first convening of a course (**the "pilot"**) or the first use of a training program or performance support as a rich resource for "trying out" instruction. Such evaluations can be extensive (observation of entire course) or they can use a "quick sample" methodology.

Using formative evaluation for the pilot convening of a new class allows the school to gather extensive data on:

- How much time it really takes students to complete instructional materials and tests.
- Whether or not the instructional materials work.
- If audio-visual aids engage learners and are adequate.
- If there were any aspects of instruction that students did not understand, or if tests had obvious problems.
- If taking students through labs created "down-time" situations and if so, if any effective strategies were implemented for correcting that problem.
- If instructors appear up to the task.
- If training aids are adequate.
- If there is enough practice time built into the course.

Some of the modified formative evaluations instructors can use to evaluate instructional materials, training aids, and actual instruction are:

How Does the Coast Guard Conduct Formative Evaluations or a "Pilot" Evaluation? (continued)

- Have SMEs review and offer suggestions to instructional materials *as they are being developed.*
- Coordinate a "murder board" of several SMEs from the field, send them materials electronically, and have them "murder" materials, tests, and training aids by comments, suggestions, and revision.

III. The classic three-phase formative evaluation process:

NOTE: The three-phase formative evaluation we' re about to discuss is an **ideal** process. You may not be able to conduct all three phases because of time, money, management, or staffing constraints. When there isn' t enough time, money, or people to use this approach, rely on SMEs for validation of technical content.

Phase 1: One-to-One Evaluation. In this phase, the instructor works with individual students to obtain data to revise materials. One-to-one has two goals:

1. Revise obvious errors in the instructional materials.
2. Obtain the individual' s reactions to the material.

Conduct One-to-One evaluations with three target students:

- One slightly above average in ability.
- One average in ability.
- One slightly below average in ability.

When you conduct this phase of formative evaluation, you will give the three students instructional materials and tests to read, take, and critique. Be sure you set the stage properly by telling students you want them to find mistakes in the materials. Mention that any problems they encounter are probably the fault of the materials, not them. Tell them how important it is for them to talk about the material, to critique it and to find any mistakes so it can be fixed. Follow them around, and at predetermined points, discuss what has been presented in the instruction. Note any comments or suggestions students make as they work through the materials:

How Does the Coast Guard Conduct Formative Evaluations or a "Pilot" Evaluation? (continued)

- Discuss the process of a one-to-one test of materials with each student separately.
- Evaluate the test you have developed to measure entry-level behaviors:
  - Can students read the directions?
  - Do students understand the problems?
  - Do students have the required prerequisites?
- Sit with the student while the student goes through the material. Tell the student to:
  - Write directly on the materials to indicate any problems encountered or to discuss ideas and problems.
  - If the student fails to understand an example, try another verbal example. If that clarifies the issue, make note of the new example as the one-to-one evaluation continues.
  - If the student fails to understand an explanation, elaborate by adding information or changing the order of presentation. If that clarifies the issue, make note of expanded or revised explanations on your materials.
  - If the student seems bored or confused, try including larger or smaller chunks in the presentation before practice and feedback. Record changes.
  - Keep notes on all changes to examples, illustrations, information and sequence of instruction.

Phase 2: Small-Group Evaluation. After one-to-one evaluation, the instructor and course developer should select a group of 8-20 students who are representative of the target population. In this phase, students will study the materials on their own and then be tested to collect the required data. This phase of formative evaluation has two goals:

1. Determine the effectiveness of revisions made from the one-to-one evaluation.
2. Identify any remaining learning problems that the students may have.

How Does the Coast Guard Conduct Formative Evaluations or a "Pilot" Evaluation? (continued)

Select the students for this phase very carefully. If, for example, the course design is meant for independent study, the evaluator would try to have the evaluation take place in a realistic setting. Pick people who are as representative of the target population as possible. Ideally, selection should be random. If you use specific selection, make sure you include low, average and high achievers, different ratings (if applicable), males and females, inexperienced as well as more experienced people.

Procedures for small-group evaluation are as follows:

- Arrange for the group to participate.
  - Ensure adequate time for required testing and instructional activities.
  - Choose motivated participants.
- As you administer the pre-test, instruction and post-test, make notes, suggestions, and changes you want to make based on your observation of the students.
- Pre-test: Tell students to:
  - Sign the test for future comparisons.
  - Circle any vocabulary that is unclear to them.
  - Check any directions or questions that are unclear.
  - Write additional comments, as desired.
- Instructional materials: Make sure the setting is as close to reality as possible. Make sure any instructional assistance required is available. Tell students:
  - You need their valuable assistance in evaluating the material.
  - To sign their work so you can compare their performance with your expectations based on their entry-level behaviors.
  - To circle any unclear words and place a check before illustrations, examples, etc. that are unclear.
  - You will record the time required for each student to complete instruction.

How Does the Coast Guard Conduct Formative Evaluations or a "Pilot" Evaluation? (continued)

- Post-test: Tell the students to:
  - Sign the test.
  - Circle any vocabulary that is unclear.
  - Check any unclear directions/questions.
  - Write additional comments on test, if desired.
- Administer the level 1 evaluation (student critiques).
- Have students discuss all components after they have completed instruction. Structure that discussion with pre-planned questions.

Phase 3: Field Trial. This is the final phase of formative evaluation. For this phase, the developer tries to simulate a learning situation that closely resembles the real-world situation in which students will receive the instruction.

NOTE: It is the field trial that is often referred to as a "pilot" evaluation.

The goals of this phase are:

- Determine if revisions from the small-group evaluation were effective.
- Determine if the instruction can be used in the training environment for which it was intended.

Before you conduct a pilot evaluation ("field trial"), make sure that all revisions to tests, courseware, and lesson plans received from the small-group phase have been made. Another important consideration is who should conduct the pilot. The course designer may be too close to the design and the instructor will have to implement changes. For those reasons, the instructor may be the better choice to conduct the field trial or pilot. The procedures for a field trial are:

- Arrange for the selected group to participate in the field trial. Ensure that:
  - There is an adequate number of participants.
  - Attendees reflect range of capabilities and skills of target audience.
  - There are adequate personnel, facilities, and equipment available.

How Does the Coast Guard Conduct Formative Evaluations or a "Pilot" Evaluation? (continued)

- Distribute all instructional materials to the instructor conducting the field trial.
- Discuss any instructions or special considerations that may be needed if the instruction is out of context.
- Play a minimal role in the field trial.
- Summarize data you have collected. Report on:
  - Pre-and post-test results.
  - Time required for each student to complete each test.
  - Time required for each student to complete instruction.
  - Remediation or enrichment needs that became apparent.
  - Reactions of both students and instructor.

The close of phase three work ends the formative evaluation process.

Now you can see why we said formative evaluations may not always be feasible. The three-phase process described above is obviously resource and time intensive, and probably would cost a fair amount as well.

How Long Will It Take?

If you use the formal, three-phase process for formatively evaluating resident instruction, it could take a long time. However, you may only evaluate some part of your course, a self-directed text, for example. Or, time, staff and money constraints may mean you can' t go through the whole process. It' s a question of cost-benefits.

For ICW, the process has been much speeded up. Given that fact, you may want to employ some of those newer methods on resident instruction. For example, you could try rapid prototyping--as you finish a portion of the course, you immediately implement it with a group of experts from the school. Their input is used to revise the prototype. Or you could electronically send a portion of the instruction to people who reflect the target audience and ask them to evaluate the product.

What Will We Get Out of It?

In the long run, the benefit you gain is instructional materials and tests with a high probability of being effective in their first time of being implemented (i.e., less rework).

In the short run, formative evaluation gives you a systematic way to improve instructional materials as you go. By building a formative evaluation methodology into your development work, you have an excellent chance of seeing your instructional materials succeed in their first time of use (effectiveness measure).

Why and When Do We Conduct Formative Evaluations or a "Pilot" Evaluation?

Why:

We' ve already covered why you conduct formative evaluations.

When:

We' ve also talked about the "when." You perform this task during development (even during design) to ensure that what you are developing is on the mark.

Again, note the newer methods developed for ICW products. Some of those can easily be adapted for resident instruction. They help prevent the waste that comes from rework, but they also address the "faster, better, cheaper" drivers that impact our global economy.

What Is My Role?

You may fill many roles:

- Instructor conducting a pilot (field trial) evaluation.
- Team member on a formative evaluation team.
- Course designer or developer working out a formative evaluation plan.

Who Can Help Me?

Your TRACEN IT, ISS, and TS staff have experience in conducting formative evaluations.

The References Section of this SOP also lists books and materials that will give you further ideas for formatively evaluating training products you are developing.

What Is the Process for Getting Started?

Once you enter the design and development stages for a new training program or performance support, begin planning for and actually initiating formative evaluation efforts. The Coast Guard does not have sufficient personnel to staff an evaluation branch. Therefore, formative evaluation efforts will be up to you.

NOTE 1: In the Coast Guard, course designers and developers are usually the same person.

NOTE 2: PTC staff has been tasked with doing many prototype development projects that have used formative evaluation techniques. They can help you choose methods, draft up a formative evaluation plan, or implement an actual formative evaluation process. They can also show you plans they used and the results they gained from ICW formative evaluation work.

Conduct Formative Evaluations and Conduct a Pilot Evaluation Job Aid

To stay consistent with CDC, the job aid for this task captures the steps for classic formative evaluation.

NOTE: Be sure you use the ICW Standards and Style Guide processes for formatively evaluating ICW products.

Tool:
See the **Formative Evaluation Checklist** found at the end of this chapter. It is a modified internal evaluation instrument you can use as you design and develop or revise training programs. For example, it is better to know the training program has no FEA or JTA before you get too far down the design and development road. Using the checklist, you can work up informal formative evaluation plans for everything you design and develop. And hopefully, in that process, save yourself (or somebody else!) significant rework.

Classic formative evaluation:

Step 1: Conduct one-to-one evaluation. Revise materials and methods as necessary.

Step 2: Conduct small-group evaluation. Revise materials and methods as necessary.

Conduct Formative Evaluations and Conduct a Pilot Evaluation Job Aid (continued)

Step 3: Conduct field trial.
Step 4: Summarize and analyze results.

Step 5: Make required changes to training program or performance support.

Chapter 41: Develop Training Program Documentation (Curriculum Outlines)

What Is It?

A curriculum outline is a document used by Coast Guard training and program managers and training program providers to document and archive the development, implementation, and approval of a training program. A curriculum outline is required by COMDTINST 1550 (series).

NOTE: If any of you have been involved in joint projects with DOD, you know they use a similar process and produce a document called a Program of Instruction (POI).

The curriculum outline has several purposes:

- It is the "capper" document in a training program's audit trail.
- It serves as the organization's archive for curriculum-specific information (i.e., What objectives does this training program train? What is the training program's target audience? What is the current cost of the program? What staffing, equipment, and infrastructure support does the program require?).
- It captures a training program's resourcing needs.
- It is the document ACE uses to accredit the course and to determine equivalent college credits our training program graduates can obtain.
- It is the kind of key document working groups need if they are trying to:
  - Determine training program redundancies.
  - Identify potential for "core-and-strand" training.
  - Answer whether a Navy training program that already exists might be a better choice than developing a Coast Guard-specific training program.
- Its unit objectives are the key inputs to level 2 evaluations.
- It is likely to be a key document for any decisions made from level 4 evaluations (results).

What Does It Look Like?

The current curriculum outline is made up of several sections that provide information on course content, staffing, equipment, and infrastructure requirements.

What Does It Look Like? (continued)

The parts of a curriculum outline are:

- **Cover page.** This page tells you:
  - Type of course ("A" or "C")
  - Course title
  - Total training days
  - TP' s name
  - Frequency of review (i.e., triennial, biennial, and so forth) and next review data
  - Once approved, the signatures of all review and approval authorities (e.g., commanding officer, program manager, training manager)
- **Table of contents.**
- **Summary of major course revisions.** (Lists the major issues regarding the curriculum and describes any major proposed changes to the curriculum.)
- **Mission and scope**. This part contains a brief description of:
  - Training program' s purpose
  - Training program overview
  - Type of billet targeted by the program (e.g., E-4, O-3, etc.)
  - Qual code eligibility
  - Target audience description
  - Training program prerequisites (if any)
  - Training program performance standards
  - Security classification (if any)
- **Units of instruction.** This section serves as a kind of outline (syllabus) of what the course will train. It lists:
  - Terminal Performance Objectives (TPOs)
  - Enabling Objectives (EOs) that support the TPOs
  - Methods of instruction used to train these objectives (e.g., discussion, lecture, small group, etc.)
  - Total time required to instruct each unit

What Does It Look Like? (continued)

- **Course content references.** (This table provides a list of the all the TPOs in the course and gives the justification/authority from which these TPOs were derived (i.e., FEA, JTA, other).

- **Time summary.** These pages provide a list of course TPOs with the following breakdown:

    - Administrative hours
    - Methods of instruction used and hours for each
    - Single instructor hours per method
    - Multiple instructor hours per method
    - Total hours for all categories above
    - Calculations showing course length in days and weeks

The remainder of the curriculum outline consists of **exhibits**.

NOTE: The exhibits have been modified by the **Coast Guard's Staffing Standards Study** results. Therefore, do **NOT** follow the curriculum outline job aid for determining instructor resourcing. Instead, ask Headquarters training managers or PTC staff to help you figure out the training program' s staffing standards. These calculations will allow you to determine instructor contact hours for your curriculum (i.e., how many instructors you need to implement the training program).

There are also **exhibits** that capture required training program support:

- Training aids and equipment
- Texts and references
- Facilities and space

Differences Between Instructional Plans and Curriculum Outlines

The Coast Guard is now using an **Instructional Plan** to capture possible options for training program delivery (e.g., CBT, resident training, hybrid, or EPSS).

Differences Between Instructional Plans and Curriculum Outlines (continued)

The IP captures multiple-design options and cost outs each option. When the IP is presented to program and training managers, they explore funding and other issues, and then select an option. The training provider may be asked to convert that option to a **Resource Change Proposal** (RCP) for submission in the next budget build.

This new way of doing business provides program, training, and TRACEN managers with the data they need to make good decisions about delivery systems. Sometimes an alternative delivery system makes sense, but sometimes a training program at a resident schoolhouse turns out to be the best alternative. The IP process also helps TRACEN staff. They do not have to waste time on designing and developing a training program that may never receive approval or funding. Finally, the IP process offers a more flexible and responsive way to determine the best and most cost efficient performance support for our people in the field.

However, the IP process takes place in the analysis phase. It does **NOT** address curriculum, design, or content-specific decisions because those decisions have not yet been finalized. Although it addresses staffing and resourcing issues, it does not provide the level of detail or the kind of information ACE needs to accredit Coast Guard training programs. Therefore, the IP does **NOT** replace the curriculum outline. Instead, the IP process **precedes** the curriculum outline process.

Interim Policy

Should the curriculum outline process be reengineered? COMDT (G-WT) is working the issue of revised policy for curriculum outlines. Perhaps the outcome of that work will be a new process and documentation.

But as you read this chapter, you want to know what to do **now**:

Interim Policy (continued)

Coast Guard Headquarters (G-WTT) issued curriculum outline interim guidance on 30 July 1998. That guidance states:

"Triennial submission of curriculum outlines is NOT required. The curriculum outline which established the course is sufficient as long as there has been no change in course requirements. Initial course establishment still requires documentation in the form of a curriculum outline or an instructional plan.

The elements of the outline include:

- *A rationale for training (documented performance issue and data-based recommendation for training as the solution most appropriate, e.g., FEA).*
- *Description of the target population.*
- *A listing of the tasks to be trained.*
- *A translation of those tasks into Terminal Performance Objectives and Enabling Objectives.*
- *Resources required to conduct the training including staffing.*
- *Documentation that supports the method of training (resident or non-resident).*

Changes proposed to the original curriculum document that include a change in TPOs, resource requirements, or type of training will require concurrence with our staff (G-WTT), G-WT-1 (program and facilities staff) and the program manager. In general, this concurrence can be accomplished by way of Coast Guard memo with supporting documentation.

The new Training Evaluation Policy, COMDTINST 1550.23, provides guidance and policy concerning internal (training center) requirements for level 1 and 2 evaluations. Additionally, level 3 evaluations will monitor course effectiveness and provide data to support course changes."

That guidance answers the questions you may have on curriculum outline development.

Develop a Curriculum Outline Job Aid

TRACEN Petaluma has designed a job aid for developing a curriculum outline that works quite well. Also, there is a macro to assist in developing a curriculum outline on SWIII.

NOTE: Some of its information is out of date (e.g., staffing standards).

If you need to develop a curriculum outline, we suggest you use this job aid or one of your school' s recently developed curriculum outlines. Contact Petaluma for a copy of the job aid if your school does not have one.

We also have some suggestions we think will help:

- Use a recent school-generated curriculum outline as a model (we have included a sample curriculum outline at the end of this chapter).
- Check with other schools, nonresident branch and TRACEN Petaluma to obtain an electronic template for the curriculum outline format.
- **BEFORE** submitting a curriculum outline, provide a copy to the Learning Center manager so that person can ensure Coast Guard Institute (CGI) has what it needs to manage our TRACEN training program accreditation needs.

We have included a sample curriculum outline to use as a model for any curriculum outline development work you do. Turn to the end of the chapter to find **Curriculum Outline for Class "C" Engineering Administrative EPO Afloat Course (MK-01A)**.

Chapter 42: Introduction To Implementation

Introduction

The implementation phase of ISD is the time when all the analysis, design and development work comes together, and:

- An instructor or facilitator conducts instruction
- A training program or performance support is deployed

Evaluation efforts increase because all stakeholders are anxious to see if the performance intervention works. Instructors and course designers are also watching instructional strategies, methods, course materials, visuals, and tests very closely to see if they are working as the course designer and developer intended them to work.

Definition

What is the implementation phase of ISD all about?

The fourth phase in the ISD model (ADD**I**E) means just what the word **implementation** implies:

- Actually conducting an instructional event
- Deploying a training program via the Web
- Delivering a performance support to the field, and so forth

This is the stage when "the rubber meets the road", so to speak. When we completed analysis work, we made the assumption that we had identified the "right" thing to do to improve performance. During design and development, we did our level best to be sure our (or a contractor' s) design and development work was aimed at producing the "right" product to improve performance.

In the implementation phase, we are actually delivering or deploying the intervention we think will work. And, because we want to be sure we' ve got the right intervention, we continue to evaluate as we deliver or deploy. Is it working? Is it doing what we thought it would do? Were our expectations realistic?

Typical Implementation Phase Work

During training program or performance support implementation, you should expect to see:

- Deployment and implementation of training programs
- Use of performance supports by people in the field
- Evaluation of learner' s ability to meet program objectives
- Evaluation of how well performance supports are working in the field
- Evaluation of program design by facilitators or instructors
- Review of materials prepared for the program
- Review of implementation-specific elements such as class size, student tracking devices, and so on
- Plans to modify training program design, instructional materials or performance supports as suggested by the results of initial evaluations

SOP Implementation Tasks

The chapters in this SOP that capture Coast Guard TRACEN-specific implementation tasks are:

- Attend Instructor Development Course (IDC) and Course Designer Course (CDC)
- Attend Continuous Professional Development Sessions (CPDS)
- Conduct Instruction
- Implement Level 2 Evaluations (Tests) --See also Chapter 52
- Implement Level 1 Evaluations (Student Critiques) -- See also Chapter 51
- Conduct Instructor Evaluations
- Conduct Summative Evaluations

Final Thoughts

This is the "make or break" phase of ISD. You are either prepared adequately to instruct or facilitate, or you are not. The alternative delivery program has been deployed and is either working or not working. You can see why this phase puts heavy emphasis on the combined tasks of "doing or deploying" and "evaluating."

Final Thoughts (continued)

Is the training program or performance support working or not working and why? What kinds of modifications need to be made for instructor delivery or learning to improve? That kind of emphasis is what the implementation phase is all about.

Chapter 43: Attend Instructor Development Course (IDC) and/or Course Designer Course (CDC)

What Are They?

Instructor Development Course (IDC) is the Coast Guard' s preparatory training program for members who are assigned instructional duties. This five-day exportable course provides instructors with what they need to facilitate training events. As the its goal states, graduates of IDC will be able to take any tasks that need to be trained, and facilitate training events that prepare their trainees (students) to satisfactorily complete those tasks.

IDC, formerly known as Basic Instructor Course (BIC), uses a multi-dimensional method of instruction to deliver a performance-based, trainee (student)-centered curriculum where instructors act as facilitators of the learning process, as well as experts in the course content. The course is designed to challenge different levels of instructor – from beginners to people who have had prior facilitator experience or training.

IDC is based upon the following instructor **core competencies**, as defined by the **International Board of Standards for Training, Performance and Instruction**. Those competencies are;

- Analyze course materials and learner information
- Assure preparation of the instructional site
- Establish and maintain instructor credibility
- Manage the learning environment
- Demonstrate effective communication skills
- Demonstrate effective presentation skills
- Demonstrate effective questioning skills and techniques
- Respond appropriately to learner's needs for clarification or feedback
- Provide positive reinforcement and motivational incentives
- Use instructional methods appropriately
- Use media effectively
- Evaluate learner performance
- Evaluate delivery of instruction
- Report evaluation information

What Are They? (continued)

IDC has evolved since its last curriculum review. It is has a new name, Instructor Development Course, a change from its former title, Basic Instructor Course (BIC). It now focuses on developing the skills of instructors and trainers at preparing for and delivering training. It also presents an introduction to the Coast Guard Training System and provides information regarding Human Performance Technology (HPT) and Instructional Systems Design (ISD) models.

Content of the course is derived from the *Guide for Improving Instructor Performance* in LEARN TO COMMUNICATE, Robert M. Gagne' s Conditions of Learning, Robert Mager' s How to Make InstructionWork, Bob Pike' s Creative TrainingTechniques Handbook, and Malcolm Knowles' s Theories of Andragogy.

IDC can be convened for groups ranging in size from seven to 21. The course student to instructor ratio of seven to one ensures adequate learning guidance and feedback.

The TPO is:

- Given a task needing to be trained, FACILITATE a training event using the *Guide for Improving Instructor Performance* in LEARN TO COMMUNICATE, so that the desired outcome of each trainee being able to satisfactorily complete the task, under the conditions specified, to the standard identified, is accomplished.

IDC trainers use a variety of methods to accomplish this objective. Some of those are demonstration, assessments, lecture, role-play, video, conference, group discussion, individual instruction, practical exercises, assigned readings and tests and reviews.

Once the member has completed IDC and demonstrated six months satisfactory performance as an instructor (or 12 months as a satisfactory instructor without attending IDC), he or she is eligible for the **"JC"** qualification code.

What Are They? (continued)

Course Designer Course (CDC) is the Coast Guard' s preparatory training program for members who are assigned to course development and delivery billets. This five-day resident or exportable workshop provides course designers and developers with what they need to create an intervention that improves performance on the job in the field. As the workshop' s goals state, using the HPT model, the ISD process, and adult learning theories, members will be prepared to create an intervention that improves performance on the job in the field.

CDC is based on the **instructional design** core competencies as defined by IBSTP. Those competencies are:

- Determine projects that are appropriate for instructional design
- Conduct a needs assessment
- Assess the relevant characteristics of learners/trainees
- Analyze the characteristics of a setting
- Perform job, task and/or content analysis
- Write statements of performance objectives
- Develop the performance measurements
- Sequence the performance objectives
- Specify the instructional strategies
- Design the instructional materials
- Evaluate the instruction/training
- Design the instructional management system
- Plan and monitor instructional design projects
- Communicate effectively in visual, oral and written form
- Interact effectively with other people
- Promote the use of instructional design

CDC has evolved since the last curriculum review. At that time, the course was offered as distance and self-directed learning. Also, the course did not contain its current information on adult learning theory.

What Are They? (continued)

In response to customer feedback, the current CDC is centralized and facilitated. It also contains information and training on adult learning theories. This addition enables course designers to design material that is aligned with the methodology taught in IDC.

That alignment eliminates a gap that existed between how courses were delivered and how they were designed. Additionally, the inclusion of adult learning theories enables course designers and developers to center their efforts on those methods proven most effective with adult learners.

Content of the course is derived from Robert Mager' s Analyzing Performance Problems and Preparing Instructional Objectives, Robert M. Gagne' s Conditions of Learning, Malcolm Knowles' Theories of Andragogy and Donald Kirkpatrick' s evaluation model.

CDC can be convened for groups ranging in size from six to 24. The course student to instructor ratio is 12 to one which ensures adequate learning guidance and feedback.

The Terminal Performance Objective (TPO) for the course is:

- Given a proposed performance improvement or course design project, use the human performance technology model, the instructional system design process, and adult learning theories to CREATE an intervention that improves performance on the job in the field.

CDC trainers use a variety of methods to accomplish this objective. Among them are demonstration, assessments, lecture, conference, group discussion, individual instruction, practical exercises, assigned readings and tests/reviews.

Once the member has completed CDC and demonstrated six months' satisfactory performance as a course designer, he or she is eligible for the **"JI"** qualification code.

What Are They? (continued)

IDC and CDC are "owned" by TRACEN Petaluma, the Coast Guard proponent for instructor and course designer training.

TRACEN Petaluma has the mission of working with G-WTT to ensure Coast Guard instructor and course designer staff training is state-of-the-art.

How Do I Attend IDC and/or CDC?

Some of TRACEN Yorktown' s staff have gotten clearance and qualifications from TRACEN Petaluma to deliver IDC. Those assigned to instructor billets at Training Center Yorktown should contact PTC' s yeoman to obtain a quota for this class.

The staff also offers IDC to specialized groups, on request and within staffing, tasking and time constraints. Examples of this kind of convening are IDC for International Maritime Officer Course (IMOC) attendees, strike teams, and so forth. Any group desiring such convenings should coordinate those events through PTC' s yeoman.

TRACEN school' s course designer/ developer staff obtain CDC quotas through coordination with the training officer' s administrative assistant.

How Long Will It Take?

Each of these professional development sessions is a five-day event. Once enrolled in either course, you will receive instructions, regarding any pre-requisite work required, or materials/projects that you need to bring to the class/workshop.

What Will I Get Out of It?

Commandant' s Instruction 1414.9,**Qualifications Manual**, lists attendance at IDC or CDC as one requirement for receiving the "JC" or "JI" qualification codes. The other requirement is six months satisfactory performance as an instructor or course designer or developer.

What Will I Get Out of It?
(continued)

NOTE: You can also obtain "JC" qualification through 12 months satisfactory performance as an instructor.

Training Center Yorktown Instruction 1550.4 describes the minimum requirements for qualification as an instructor. Core training requirements are attendance at IDC for instructors and attendance at CDC for course designers and developers.

In addition to obtaining qualification codes, attendance at IDC and CDC is the most efficient solution for ensuring you are up to speed with current changes and practices in the Coast Guard training system.

Lack of attendance at these two core training events can mean missing important information about how Coast Guard training and training design are conducted. It can also mean lack of standardization of efforts across TRACENs.

Finally, obtaining job and task knowledge only from an on-the-job point of view can mean that you acquire a relatively narrow view of what constitutes training today and miss taking advantage of the rich resources available to you.

Why and When Do I Attend IDC and/or CDC?

Why:

Attending IDC and CDC will give you the skills and knowledge you need to perform your assigned role at a TRACEN --either instructor or course designer and developer. Once you know the skills and knowledge involved in that role, the rest -- gaining proficiency -- is a matter of practice.

When:

Upon assignment to an instructor billet at TRACEN Yorktown, you will be scheduled to attend an IDC session as soon as possible.

Why and When Do I Attend IDC and/or CDC? (continued)

The Training Officer and PTC staff will try to ensure that you receive that training within the first three months of your assignment at the TRACEN.

Staff usually attend the CDC workshop based on the following:

- A staff member has gained experience and qualification as an instructor and is ready to take on the jobs of course designer and developer
- A school' s curricula requires a cadre of course designer and developer staff to work on new starts, review existing curricula, and so forth
- A program has asked the school to take on an initiative that requires a full understanding of course design and development work and issues

From your own awareness of these core training requirements and how they match up with your billet, you can request a quota for either event. However, school chiefs are in the best position to identify training needs and optimal attendance times for their staff. Ultimately, your cue to attend either of these training events will come from them.

What Is My Role?

Your role is as follows:

- Make sure that you are scheduled to attend IDC within the first three months of assignment to an instructor billet
- Make sure you are scheduled to attend the CDC workshop before taking on any significant curricula review or "new start" design and development project

Work with your school chief on scheduling your attendance at these two core courses.

What Is My Role? (continued)	Should you attend CDC because you think you might be involved in a curriculum project in the future? The standard answer to this question is probably "no", unless you are sure you will be involved in the project in the very near future. Learning decay sets in relatively quickly, so you want to schedule attendance at CDC as close to the time you will be working on a project as possible.
Who Can Help Me?	PTC staff can help you. The training officer' s administrative assistant can also tell you plans and dates for future convenings of the CDC workshop.
What Is the Process for Getting Started?	Work with the PTC yeoman for attendance at IDC. Work with training division' s administrative assistant for attendance at CDC.
Job Aid for attendance at IDC or CDC	TRACEN instructors and special needs for instructor training: • Contact PTC yeoman to schedule attendance at next IDC session TRACEN course designers and special needs for CDC training: • Contact training division's administrative assistant who will coordinate dates/times for course designers to attend CDC workshop.

Chapter 44: Attend Continuous Professional Development Sessions (CPDS)

What Is It?

Based on the recognition that all competitive organizations today must hire and grow "life-long learners", TRACEN Yorktown has tasked the PTC with coordinating and providing continuous professional development sessions (CPDS).

Currently, these CPDSs are held on the second Wednesday of each month at 0830. Locations vary from session to session. That information can be obtained from the PTC yeoman or from PTC' s secretary, extension 2391. A list of upcoming CPDS is also published on TRACEN YORKTOWN' s electronic bulletin board.

A wide range of talent presents at these sessions. The majority of presenters are staff from TRACEN Yorktown. However, some of the presenters are vendors who want to market a product or process they would like to sell, and some are presenters from other Coast Guard or DOD TRACENs or from headquarters.

The CPDS have particular application to TRACEN instructors, course designers, and training managers since these sessions are one of the prime ways that our TRACEN develops its people.

You might wonder why attending CPDS is so important to your job. To answer that question, we would like to first give you some background about basic human resource development (HRD) competencies, and then relate your need to develop those competencies back to the CPDS.

First, what is a **competency** and why is it important to you?

The IBSTPI says core competencies are **those behaviors a competent instructor, course designer or training manager must demonstrate to successfully instruct, design courses or manage training**. The core competencies define generic roles for each of those jobs. Core competencies are also independent of locations or organizations.

What Is It? (continued)

In other words, any instructor anywhere should exhibit the same core competencies as any other instructor.
If a person can demonstrate mastery of each of the core competencies, he or she is said to be a professional instructor, course designer or training manager.
Conversely, if the person has not developed all of the core competencies, he or she must do so to earn the titles of instructor, course designer or training manager.

We mentioned core competencies for instructors and course designers and developers in Chapter 43, Attend IDC and CDC. Let' s look at what IBSTPI says about another of our main jobs at a TRACEN. A **Training Manager's** core competencies are:

- Assess organizational, departmental, and program needs
- Develop plans for the department and programs
- Link human performance to the effectiveness of the enterprise
- Apply instructional design and development principles
- Assure the application of effective training principles
- Evaluate the instructional design, development, and delivery function
- Apply the principles of performance management to their own staff
- Think critically when making decisions and solving problems
- Assure that actions are consistent with goals and objectives
- Adapt strategies and solutions given change
- Produce effective and efficient solutions
- Develop and sustain social relationships
- Provide leadership
- Use effective interpersonal communication techniques
- Communicate effectively orally and in writing

Those competency standards date back to 1990 – ten years ago. More recent HR literature indicates other competencies need to be added as well:

- Feedback
- Job design
- Organizational design

What Is It? (continued)

- Rewards and incentives
- Motivation
- Ergonomics

Yet, out-dated or not, as you read through these competencies, you are most likely encountering some you know little or nothing about. That is a typical state for workers in today' s fast-paced, ever-changing organizations. So what do we do? We can:

- Send staff to seminars and conferences
- Encourage staff to take college courses
- Rotate staff within the organization so they gain experience
- Give staff new work assignments that "stretch" their abilities
- Provide staff with reading materials or access to videotapes, audiotapes, or computer-based/assisted training
- Provide mentors who serve as role models and coaches

These are all good ideas, and to some extent, we use all of them. However, we all know there is not enough money to send all of our staff to conferences. With so few people and jobs requiring a high degree of specialized knowledge, it is hard to rotate people around to gain more expertise. Yes, we have reading materials, but people don' t always know where they are or have time to read them. In short, we try hard, but it is difficult to make internal professional development efforts really work.

That' s where CPDS come in. They are tied to TRACEN YORKTOWN' s strategic plan (what do our people need to know to accomplish their jobs?) They cost nothing and take little time (an hour and a half every two weeks) away from the normal job. Finally, they address exactly those core competencies about which most people have little training or experience:

- Human performance technology
- ISD tasks
- Emerging technologies

What Is It? (continued)

- Doable applications for emerging technologies
- Potential work assignments for shared staff

CPDS also function as planned activities that give staff efficient ways to look at videotapes, CBT, WBT and EPSSs.

When you finish IDC or CDC, you leave with the minimum knowledge and skills an instructor or course designer needs to do his or her job. You will certainly develop greater and greater proficiency from practice (that is why the qualification codes for instructor or course designer stipulate six months to a year' s practice). However, the only current efficient method for keeping up with new developments in your field is CPDS. They are your ticket to becoming competent in your job, and in constantly working on currency in your field.

NOTE: The great challenge for post IDC/CDC graduates is to develop and hone professional skills while seeking to infuse correct technologies into instruction. CPDS is one means for allowing the schools and PTC to partner for identifying and implementing appropriate levels of technology (some technologies are still under review – some just aren' t appropriate for the Coast Guard).

NOTE: Other than leaving the TRACEN to attend expensive training elsewhere, CPDS are our only current means of getting instructors and course designers up to speed on EPSS, IVT, NIDA, advanced PowerPoint slide presentation, WBT, CBT and other types of emerging technology delivery and courseware production systems.

Attending CPDS will tell you exactly when you want to consider technology as a stand alone training course or as a support tool to be used in conjunction with resident training. PTC staff are prepared to coach and mentor other staff in any and all of those applications.

By a combination of attending IDC and CDC and ensuring continuous attendance at CPDS, you can be assured that you will complete your assignment at TRACEN YORKTOWN as a fully competent instructor, course designer, or training manager.

How Do I Attend CPDS?

First, (if you haven' t already done this) work with your supervisor to develop an Individual Development Plan (IDP). In which of the core competencies are you weak? Are there any about which you know nothing at all? Which core competencies is your job going to highlight? Given current tasking, are you likely to need more than one set of competencies? Do you need cross-training?

Once you' ve identified your weaknesses and captured them in an IDP, check the bulletin board for current CPDS offerings. If they aren' t meeting your current needs, contact Chief or the Deputy, PTC (extensions 2391 and 2142) to make your needs known.

NOTE: As an even more efficient way of handling this issue, staff can provide current needs to school and branch chiefs who, in turn, compile those needs and send them to Chief or Deputy, PTC. The PTC will then tailor its offerings to meet the most pressing core competency needs.

Gate out time in your busy schedules for those CPDS that are applicable to your IDP needs. Your professional development needs are a first priority!

NOTE: You can certainly attend CPDS that are not currently related to your core competency needs. Life-long learning suggests you will attend many sessions just as a way of keeping up with the times.

E-mail or call the PTC yeoman to let him know of your plans to attend. That way, he can ensure that the location will be adequate to the numbers of people who plan to attend.

Fill out the level 1 evaluation form you will find at each of these sessions. That information will allow Chief or Deputy, PTC, to ensure CPDS is on the road to continuous improvement and responsiveness to TRACEN needs.

How Long Will It Take?

Not long. They are held every other Wednesday of the month, and a typical session lasts an hour to an hour and a half.

What Will I Get Out of It?

You will gain several benefits from attending CPDS:

- Continuing mastery of the core competencies of your trade
- The ability to stay up to speed in your field
- Networking opportunities with TRACEN staff
- Networking opportunities with vendors and contractors and other TRACEN staff
- The ability to gain new knowledges, skills and abilities (KSAs)
- An inexpensive and efficient means of satisfying the requirements of your IDP

NOTE: In the future, TRACEN YORKTOWN may be able to gain continuing education units (CEUs) for staff who regularly attend CPDS. The staff is working on that option right now.

Why and When Do We Attend Continuous Development Sessions?

Why:

We' ve already covered why you attend CPDS.

When:

As for when, that is up to you, your boss, your work schedule, and your IDP. Currently, there is no mandate to attend CDPS.

What Is My Role?

Your role is as follows:

- Using the core competencies, work up an IDP with your supervisor
- Check PTC' s schedule for CPDS events and compare those events to your needs
- If there is a priority or discrepancy, report that priority/discrepancy to your supervisor
- Coordinate attendance at the CPDS that meet your needs with the PTC yeoman
- Attend applicable sessions

Who Can Help Me?

Your supervisor can help you with checking your own progress and background against core competencies and identifying what should go in your IDP.

PTC management and staff can help you by ensuring CPDS offerings match customer needs.

What is the Process for Getting Started?

As soon as you read this section of the SOP or are tasked by the Division or Branch Chief, you should begin working up an IDP that captures your professional development needs.

As a next step, match those needs to upcoming CPDS and attend those that satisfy your requirements.

Let your School or Branch Chief know about any shortfalls in CPDS offerings. If PTC can meet those needs, it will.

Job Aid for Attending Continuous Professional Development Sessions (CPDS)

The steps required to Attend CPDS are:

- Check those core competencies for your job in which you are weak or for which you have no knowledge or no skills.
- Work up an IDP with your supervisor which captures your professional development needs.
- Match areas where you need development with CPDS schedule (electronic bulletin board).
- Provide feedback to school/branch chiefs on those areas for which you require development but that are not listed on the CPDS schedule.
- Attend applicable CDPS.
- Report attendance to your supervisor so you get credit for that event – both for your IDP and for possible future CEUs.

Chapter 45: Conduct Instruction

What Is It?

Conducting instruction means delivering a training program to students. Today, the task of delivering training (and performance support) can mean many things:

- Demonstrating how to do tasks on large engines in a lab.
- Conducting training to remote locations using Interactive Video Teletraining (IVT) links and sites.
- Helping students use simulators correctly.
- Acting as a coordinator for distance learning products, coaching and facilitating remote learners, and answering questions generated in an electronic chat room.
- Serving as a trainer for a TRADET, delivering training to another country.

You can deliver training to students who are physically present in the classroom with you. You can also deliver instruction to students located at sites remote to where you are actually delivering training. Or, you may be working in a computer lab where computers act as the interface between students and the instruction, and your role is more that of a facilitator or coach. Whatever the delivery method is, once students are actually interacting with the course materials, conducting instruction has begun.

Assuming the courseware design is good, it is now up to you (or the computer) to use the right strategies to deliver information and skills so that people can learn.

However, regardless of the delivery method, there are certain constants that do not change. To be successful, the instructor or facilitator should:

- Speak clearly and understandably.
- Demonstrate thorough mastery of the training program' s content.

What Is It? (continued)

- Model enthusiasm for learning and for the task, skills, and content.
- Provide positive consequences for the desired performance.
- Use visuals and training aids when it makes sense to do so and without distracting students from learning.
- Diagnose individual student problems and provide solutions.
- Handle a variety of instructional methods (e.g., role-plays, case studies, discussions, question-and-answer sessions, small groups, e-mail and chat room discussions, etc.).

NOTE: The Coast Guard' s IDC trains you in the task of conducting and facilitating instruction. This chapter is **NOT** a substitute for that event. Rather, it is meant to serve as a quick refresher and job aid for making sure you are on track. It can be particularly helpful as a job aid in reviewing "right" practices, just before you are evaluated.

How Do I Conduct Instruction?

The following guidelines tell you what to do when you are conducting instruction.

Preparation: First, and very important, is preparation. Did you order adequate materials? Has the order come in? Have student textbooks arrived? Do you plan to use the laser pointer for PowerPoint slides, and if you do, can you find it? Have you got enough of that pesky chart paper for easels, and did you remember to include masking tape for hanging chart paper up on the walls and for taping down electrical cords so students (and you!) won' t trip? Do you have enough name tents and marking pens for everyone? These and a thousand other issues need to be sorted out before the students even arrive. To ensure you have adequately prepared, do the following:

How Do I Conduct Instruction? (continued)

- Ensure lesson plan and resource materials are current and prepared for use.

- Check all training aids to ensure they work, you know how to operate them, and that backups--given power failure/computer crash--are available.

- Ensure that all required equipment, models, training aids, and tools are on-site and in sufficient numbers to meet student needs.

- Ensure any required safety equipment is on-site and working properly.

- Ensure classroom is thoroughly set up and prepared well before students arrive: Are easels, charts, and pens there? Backup laptop available for PowerPoint slide presentation? Is the projector working? Is the room too hot or too cold? Do you have a copy of the video you want to show, and is there a VCR? Leave nothing to chance. As every experienced instructor knows, Murphy' s Law is always working for instructors. Consider every possible scenario. Have extras/backup plans for whatever could break.

Opening events. Next comes opening events--how you set the stage for a positive learning experience to occur:

- Ensure you have a method planned for the class generating a session agenda or an adequate course overview prepared.

- Be prepared to deliver a value statement for the instructional event or scheduled exercise that addresses "what' s in it for them."

- Have an appropriate attention getting activity or ice-breaker prepared.

- Be sure you have worked up methods for identifying and explaining performance objectives and the level of expertise students will be expected to have reached by the end of the course.

How Do I Conduct Instruction? (continued)

- Be ready to explain performance tests, the assessment process, testing procedures, conditions, and standards.

- Be thoroughly familiar and comfortable with exercises and strategies to help students recall prerequisites they need to know for new learning to take place.

- Have strategies and methods in place for those students who do not appear to know the prerequisites (e.g., can' t use hand tools, can' t access an application on the Standard Workstation, don' t know how to manipulate a mouse, etc.).

- Be thoroughly familiar with the methods you are going to use to identify and review previously learned information.

Actual delivery of instruction. Now is the time you consider actual delivery of instruction:

NOTE: Part of this task is "personalizing" your lesson plan. Of course you already have a lesson plan, but someone else may have prepared it. Also, as you deliver the same instruction many times, your preparation will give you new insights about the content, and you will learn new things from your students and your own experiences. Jotting down new examples or capturing a fresh way of explaining a difficult concept is what we mean when we say you should "personalize" your lesson plan:

- Be prepared to introduce student materials in a timely manner in accordance with your lesson plan directions.

- Review many times the learning guidance you plan to use so you can inject it, as required and based on observed student need.

- Jot down appropriate examples and non-examples, analogies, stories, and illustrations that enhance learning.

How Do I Conduct Instruction? (continued)

NOTE: The dictionary defines "**analogy**" as a resemblance in some particulars between things otherwise unlike. Analogies are one of the best tools in your instructor and facilitator tool bag. They are so powerful because they help your students see that *something they don't know* **is much like** *something they do know*. For example, the lesson plan for introducing performance objectives (unfamiliar subject) compares objectives to a road map (familiar subject):

- Once you are actually conducting instruction, be sure you are role modeling proper military bearing and behavior. Pay particular attention to language, examples, etc., to ensure you are in compliance with Commandant policy regarding diversity, sexual harassment, respect for others, and so forth.

- Go over your game plan for supervising student learning and practice events. How can you improve that supervision from the last time? What have you learned that can help you enhance or improve a practice event?

- Check on and reinforce appropriate times in the lesson (while monitoring performance) for giving feedback. Make sure your feedback is both **motivational** and **developmental.**

- Are you maintaining a positive learning environment? Have you learned any lessons you need to incorporate to improve this area (e.g., humor, demeanor, more student involvement, etc.)?

- Plan and re-plan activities for promoting and encouraging student involvement and participation. If faced with a particularly quiet group of students, do you have methods available to increase student participation? Can you easily switch to those methods?

How Do I Conduct Instruction? (continued)

- Check your plans for tests and assessments. Do students have clear, understandable directions for tests? Have there been problems in the past, and have those problems been corrected? Do you need to do anything to help students with tests? Does your lesson plan clearly indicate when you will tell students about test/assessment processes and procedures?

- Look over those areas of the lesson plan that provide students an opportunity to practice under test conditions. Are there enough of them? Too many of them? Have they proved adequate to get students ready for testing? Are you managing class times well so students have enough time to practice? Do you have methods in place for your slower students? Faster students?

- Check your lesson plan for times when you plan to use questioning techniques. Have they worked well in the past? Do you need to work on any of your questioning techniques?

NOTE: IDC trains you in using **questioning techniques**. This is yet another powerful tool in your tool bag. Good questioning techniques can be employed as routine devices for maintaining communication, for discovering what students don' t know and where they need help--even for "controlling" troublesome students. We' ve included a quick refresher on questioning techniques below:

- **Directive questions** review factual material and help learners discover new insights. Directive questions are an excellent tool for helping students review material they have just learned (e.g., "What are the Coast Guard' s core values?").

- **Reflective questions** double-check feelings and can consolidate issues and insights (e.g., "Am I correct in sensing that you feel we' ve explored this topic more than enough?").

How Do I Conduct Instruction? (continued)

- **Open-ended questions**, ones which can' t be answered with a "yes" or "no," are useful for probing feelings and in testing what a learner knows (e.g., "What have you found out so far about how adults learn?").

- **Closed questions** do **NOT** promote learning. The question--"Can you tell me the Coast Guard' s core values?"--invites one of two responses--"yes" or "no." In either case, you and the other students listening to this response have not learned anything. To avoid this problem, use questions that begin with "who," "why," "when," "how," "where," and "which."

- **Open-ended questions** are a good technique to use when you sense student boredom or even hostility. They communicate concern and that perception allows students to redirect their energies (e.g., "How do you feel about this subject?")

- **Open-ended questions** often lead to the need for more probing and penetrating follow-up questions. It is an instructor' s job to probe trainees for clarification. That is one of the ways an instructor finds out if trainees understand what is being said. Examples of how to **probe** for more information are:

  - What do you mean by that?
  - Put it another way.
  - Show me.
  - Give me an example.

- **Framing questions**. The sign of a skillful instructor is the ease with which he or she asks a question and gets the right response back from the class. To ensure that happens, keep five points for framing questions in mind:

  - Keep your questions simply worded and focused on testing knowledge, skills, or attitudes.

  - Avoid ambiguity. Keep questions well-defined and concise so everybody understands what you are asking.

How Do I Conduct Instruction? (continued)

- Stay within the trainee' s knowledge or experience. To keep motivation high, make sure trainees have a reasonable chance of making the correct response.

- Make sure your questions are relevant. If the question isn' t leading toward students mastering the objectives, don' t ask it.

- Try to make your questions challenging and thought-provoking.

- **Overhead questions.** These are questions asked of the class as a whole. Use them in seminars, group discussions, and workshops to promote free discussion, challenge the group as a whole, or to elicit a range of responses.

- **Directed questions**. These are the questions directed to a specific trainee. Directed questions can help with group control, involve more quiet students, distribute discussion around the class, draw on everyone' s skill and experience, and assure a more even pattern of class participation. When asking directed questions, use a **proper questioning technique**:

  - **Ask.** Address the question to the class as a whole.
  - **Pause**. Allow some time to elapse.
  - **Call.** Call on a specific student by name.
  - **Analyze response**. Maintain eye contact with the student answering the question.
  - **Acknowledge.** Deal with the trainee' s response.

- **Redirected questions**. Student "A" gives a response. You acknowledge that response and then ask, "Petty Officer Smith, what do you think about Petty Officer Brown' s response?"

- **Relay questions.** Relay questions are those asked by a student that the instructor turns back to the group for an answer …"How would you answer Chief Martin' s question?"

How Do I Conduct Instruction? (continued)

- **Reverse questions.** The student asks the instructor a question that the instructor turns back to the student, but with some cue words to help him or her out. Reverse questions are used to help the trainee think out a solution. (**Question:** What is the difference between a front-end analysis and a job task analysis?" **Answer:** "Look at Chapters 11 and 13 in this SOP and see if you can tell me the answer to that question."

When using questioning techniques, there are some points to remember about what **NOT** to do:

- Avoid trick questions. These are questions the trainees can' t answer and which will have a high probability of making them feel inadequate. Never embarrass your students.

- Rhetorical questions. These are questions that do not require an answer from the trainee. Use such questions with caution. They are good devices for gaining attention, but should not be answered by the instructor. Use them as a way to open a discovery-oriented lesson.

- Never bluff when you don' t know the answer. Tell students you will try to find out the answer and bring it back to class with you.

- When trainees don' t know the right answer or give a wrong one, help them to find the right one. But, if they can' t, make sure that you answer the question correctly. It is important for trainees to know the correct response.

- Avoid the "any questions? -- trap," except at the end of a lesson or exercise.

- Don' t interrupt a student pondering the answer to a question with another question. Give him or her time to think.

- Don' t name the student you want to answer before you ask the question.

How Do I Conduct Instruction? (continued)

- Don' t call on students in a regular, predictable way. When students don' t know when they will be called on, they tend to answer every question in their own minds.
- When students ask questions, do not immediately redirect the question to someone else. Let the asker have the first chance to answer the question. That helps the student grow in self-confidence, and it lets students "discover" answers they are capable of finding by themselves.

- In general, do **NOT** answer student questions yourself, but rather, redirect them to the student or the class to answer.

NOTE: There are times when the instructor should answer a student' s question:

- Course logistics. Only the instructor knows the answer to those questions.
- The trainee specifically asked the instructor' s opinion.
- It is appropriate to color the discussion by revealing the instructor' s opinion.
- The class can' t come up with the answer.
- The search for the correct answer is going to take too long for proper class time management.

Along with questioning techniques, instructors also have to learn how to use **visual aids** properly. The only reason for visual support is to cause learning to happen. That is why it is important to think about the following "do' s" and "don' ts" when using visuals:

NOTE: See the chart "**Telling vs. Showing"** found at the end of this chapter. You may be surprised to see what happens to retention when you use both "telling and showing!"

- Try to keep your most distant viewers no farther away from screen than six times its width. Try to keep your nearest viewers two widths away from the screen.

How Do I Conduct Instruction? (continued)

- Based on good andragogic principles, try to involve students with audio-visual aids. For example, add discussion questions to visuals, have students write scripts and use the television camera for role-plays, or use the video camera for taping how they did in an actual performance of a task.

- Choose aids to match objectives (e.g., videotape to show specific psychomotor manipulations vice a still photograph).

- Use a variety of training aids (e.g., chalkboards, easels and chart pads, mock-ups, PowerPoint slides, videotapes, etc.).

- Make sure you know how to use the training aid and that it is properly prepared

- Introduce training aid at appropriate times.

- Explain complicated aids to the class.

- Keep training aids and equipment out of the way when not in use to avoid distractions.

- Display aids so all trainees can see them.

- When using training aids, always position yourself to keep eye contact with students. Stand alongside aids such as easels or chalkboard. Stand behind or alongside projectors. Try to avoid turning your back to students while you write something on a white board or easel.

- Make sure you can easily access any specific PowerPoint slide students may want to see again.

The final points you need to consider are:

- Be sure you are periodically checking students' progress and understanding.

How Do I Conduct Instruction? (continued)

- Watch time management. Did you "run over" the last time you gave the class? Did you have to forego any breaks? Did you let a discussion go on too long? The mistakes we made during the last session are what teach us to better manage our time the next session. Develop techniques for managing time (e.g., have a student monitor time; have an assistant monitor your time and periodically let you know how you are doing; keep a clock or watch handy; and so forth).

Close a learning event--make sure transfer of learning has occurred. These are the final points to consider:

- Check your lesson plan to be sure it has enough review and summary exercises. Are you using discussion to promote transfer of learning? Have you included some kind of transference exercise?

- Be sure you have test materials or equipment and adequate instructions or directions for students to take the test. If the test will be scored or the performance completed before the lesson is over, have you provided a method for reviewing results (e.g., report outs, critique of performance, feedback sheet)? If the test will be completed at the end of a lesson, have you added test review to the next lesson?

- Have you provided an opportunity for re-testing and additional practice for those you failed the test?

That takes us through all the steps required to conduct instruction. But, there' s another question to ask. How do you **improve**?

You improve and grow by attending conferences and workshops and by attending our CPDSs. However, there are other methods you can use to make sure you are continuously improving your performance as an instructor:

How Do I Conduct Instruction? (continued)

- First, know what good instruction is.
- Observe other good instructors (APs).
- Analyze individual characteristics (find your strengths and weaknesses – build on your strengths; work on your weaknesses).
- Concentrate on specific areas for improvement ("first walk, then run.") Make up an action plan for working on each area where you need to improve. As you do, check that item off and go on to the next one.
- Obtain feedback. [Most of us don' t ask for enough feedback. All feedback, whether "good" (constructive) or "bad" (critical) can help us know where we need to improve, or understand better something about the critical person' s wants and needs. Feedback is a gift! Ask for lots of it.]

How Long Does It Take?

That time varies, based on the overall course design. However, be aware that even adults' attention spans do not allow them to process information if it takes much over 50 minutes to deliver. Be sure you build adequate breaks into your lesson plan.

What Will I Get Out of Conducting Instruction?

We' ve discussed this issue when we talked about obtaining the "JC" qualification code and possible certification. We also mentioned the possibility of future college credits or CEUs.

Other benefits fall in the area of self-development and mastery of a difficult task (i.e., builds your self-esteem).

One of the most satisfying elements of conducting instruction is that you get the opportunity to make a real difference. When people are polled on those who have influenced them most, teachers and instructors are often at the top of the list.

Why and When Do I Conduct Instruction?

Why:

We conduct instruction in order to provide one very significant positive influence on Coast Guard human performance. Trainers are the keepers of the Coast Guard' s skill and knowledge torch. It' s up to us to ensure our people have the skills, knowledges, and attitudes they need to do their jobs.

When:

We conduct instruction based on annual schedules developed among programs, the Training Quota Center (TQC) and TRACENs, or when we receive a special tasking to do so.

What Is My Role?

Your role in conducting instruction is likely to be that of instructor or facilitator delivering instruction.

Or you may be managing how instruction is conducted (e.g., annual training schedule, staff training and development, etc.)

Or, you might be the course designer who designed and developed a self-directed training program students are now using (e.g., CBT, WBT, hybrid, etc.).

Who Can Help Me?

TRACEN Petaluma has the experts who train Coast Guard people in becoming instructors. They can help you.

The Yorktown IDC staff also trains local personnel (and others) in instructor tasks and development; they can help you.

Senior instructors in your own school can help you, by mentoring your efforts and monitoring your progress.

What Is the Process for Getting Started?

When you are assigned to a TRACEN, you will start the process of conducting instruction. You will be scheduled to attend IDC, if you haven' t already done that. Your school may also gradually break you into the instructor job by asking you to observe expert instructors and then "back them up," as an assistant instructor.

Conduct Instruction Job Aid

The job aid for conducting instruction is the **"Guide for Improving Instructional Performance"** found at the end of this chapter. Use it as a checklist before and after conducting instruction.

Chapter 46: Implementation Level 2 Evaluations (Tests)

See Chapter 52, Conduct Level 2 Evaluations (Tests)

Commandant' s Instruction 1550.23,**Training Evaluation Policy**, mandates a level 1 through 4 approach to Coast Guard training evaluation. For that reason, we grouped the chapters on conducting the different levels of evaluation in the last section (i.e., Evaluation Section) of this SOP. See Chapter 52, Conduct Level 2 Evaluations ("Learning" – Tests), for a discussion of the procedures for implementing (conducting) level 2 evaluations.

Chapter 47: Implement Level 1 Evaluations (Student Critiques)

See Chapter 51

Commandant' s Instruction 1550.23,**Training Evaluation Policy**, mandates a level 1 through level 4 approach to Coast Guard training evaluation. For that reason, we grouped chapters that discuss the different evaluation levels (i.e., level 1, level 2, and so forth) in the last section of this SOP. See Chapter 51, Conduct Level 1 Evaluation (Student Critiques) for a discussion of the procedures for implementing (conducting) level 1 evaluations.

NOTE

If you have not yet read Chapter 31, Design and Develop Level 1 Evaluations (Student Critiques), you may be wondering what your level 1 evaluation should look like and what data it should capture. The answer is that you don' t have to design and develop an instrument for level 1.

TRACEN Yorktown has made the decision to institute one standardized form to be used by all schools and training programs at Yorktown. That form has already been designed and developed in a prototype scannable format. We will tell you how to conduct level 1 evaluations in Chapter 51.

Chapter 48: Conduct Instructor Evaluations

What Is It?

Why evaluate our instructors?

- You can't receive your "JC" qualification code unless you attend IDC and show 6 months satisfactory performance as an instructor (or have not attended IDC but show 12 months satisfactory performance as an instructor)--in either case, there must be a program in place to evaluate instructors for satisfactory performance.

- The majority of billets at a TRACEN are instructor billets, so instructor evaluation is a good way to determine how we are doing in our attempt to be a first class training provider.

- Instructor evaluations make up a large part of many members' annual performance evaluations ("marks" or "fitness reports").

- Coast Guard instructors are role models--the "best of the best." We want to ensure that the instructional messages we are providing the field live up to that very high standard.

- Branch and school chiefs need to measure instructor performance as one very important indicator of how each branch or school is doing.

- What isn't measured can't be improved.

- Evaluating instructors gives us reliable and valid data for correctly identifying areas in which instructors need further professional development.

- TRACEN Yorktown Instruction 1550.4 mandates instructor evaluations.

- COMDINST 1550.23 mandates levels 1 and 2 evaluations, which can be used as part of an instructor's evaluation.

What Is It? (continued)

NOTE: Level 3 evaluation results are **NOT** a good indicator of instructor or course designer performance or proficiency. There are too many other variables and influences on field performance--work design, selection & assignment, motivation issues, etc.--to assume that lack of learning transfer is due to faulty instruction or instructional design.

Next, let's examine what instructor evaluations are.

TRACEN Yorktown Instruction 1550.4, subj: **Instructor Development and Qualification Program**, provides a standardized process for providing core training and qualification of entry level instructors at our TRACEN. It also establishes a professional development process designed to meet the future needs of the command.

NOTE: TRACEN Yorktown Instruction 1550.4 contains the **minimum** requirements instructors must meet to qualify as an instructor. Division, branch and school chiefs are encouraged to add additional tasks and developmental opportunities, as they see fit.

The TRACEN Yorktown instructor qualification process consists of the following steps:

Step 1: Prospective instructors must complete each of 14 instructor personal qualification standards (PQSs) listed in the instruction and have each PQS (task) signed off by a school-authorized person.

NOTE: We've included a sample copy of the instructor PQS at the end of this chapter of the SOP.

Step 2: Each prospective instructor must be formally evaluated (observed by branch/school authorized person and marked on **Instructor Performance Standard Form**) at least **TWO** times.

NOTE: No time period is set for these evaluations. However, the instruction indicates that most prospective instructors are expected to qualify as instructors within 6 months of their arrival. So it is logical to assume that the 2 evaluations will be completed by each school within the first 6 months the instructor is on board.

What Is It? (continued)

Step 3: Prospective instructors must receive a "passing" grade on 2 evaluations before qualifying as an instructor.

To be considered "passing," the instructor's evaluations should:

- Show a mark in 18 of the 24 blocks on the "**Instructor Performance Standard Form**" (copy included at the end of this chapter).
- Have no more than six marks in the "not observed" block.
- Show no individual mark less than a "3."

Step 4: Prospective instructors are also required to complete any other requirements assigned by the school or branch chief.

Step 5: Prospective instructors must obtain a positive recommendation for instructor qualification from all applicable managers (their immediate supervisor up to the branch chief).

Step 6: After these conditions have been met, the branch chief certifies that the prospective instructor is qualified to instruct. That certification and documentation are then provided to the member's Personnel Reporting Unit, indicating that the member is now qualified to receive the applicable (JC) qualification code. A copy of this documentation is then entered into the member's permanent record and training record.

NOTE: See Qualification Manual COMDTINST 1414.9. Current standards for the "JC" qualification code require **completion of IDC and 6 months satisfactory performance as an instructor OR 12 months satisfactory performance as an instructor (**member was NOT able to attend IDC for some reason).

Once prospective instructors are fully qualified, branch/school chiefs will determine how often and at what intervals instructors will be evaluated.

What Is It? (continued)

NOTE: Although formal instructor qualification and reception of the JC qualification code marks the end of the instructor qualification process, the command's expectation is that instructors will continue to professionally develop themselves during their assignment at a TRACEN.

Even during the qualification process and after qualification, new instructors need to continue to seek professional development opportunities. Since the professional development path listed in TRACEN Yorktown Instruction 1550.4 is somewhat dated, we suggest beginning instructors take full advantage of the concept outlined in Chapter 44, Attend Continuous Professional Development Sessions (CPDS). By working with their supervisors to develop Individual Development Plans (IDPs) and attending conferences, workshops, and CPDS, TRACEN Yorktown's instructors should be able to stay ahead of the learning curve.

Another way instructors can self-direct their own professional development is to strive to reach a mark of "6" on the Instructor Performance Standard Form. As you can see from looking at the words under each mark of 6 on the form, that mark represents a very high level of proficiency.

As you compare instructor PQSs and the Instructor Performance Standard Form, note the high correlation between the tasks and performances that both address. Completing instructor PQS goes hand in hand with being evaluated as an instructor. In short, you do not have to do two separate tasks.

The instructor PQSs and the evaluation form also mirror some of the IBSTPI core competencies identified for instructors. The competencies not addressed are all ones you will possess once you complete instructor qualifications (i.e., practice and experience gained over time).

What Is It? (continued)

The process we have just described **qualifies** instructors, but it does not **certify** them. To gain professional certification for our instructors would require paying fees and taking standardized tests. Although TRACEN Yorktown does not have an instructor certification process in place at this time, we may in the future.

In either case, the more tools you put in your instructor tool bag and the more professional development you gain, the more likely you are to be ready for instructor certification if the TRACEN is able to offer that opportunity.

NOTE: Although this chapter is about instructor evaluation, we want to take a moment out to discuss course designer qualification and reception of the JI qualification code.

Coast Guard course designer qualification:

Course designer qualification follows the same generic process:

- Attendance at CDC.
- Completion of and sign off of course designer PQS (obtain PQS from IBSTPI core competencies and from CDC).
- Evaluation of at least **TWO** designer and/or developer products.
- Any other tasks or projects assigned by school or branch chief.
- Positive recommendation from applicable staff.
- Branch chief memorandum and documentation requesting "JI" code qualification.

NOTE: See Qualification Manual COMDTINST 1414.9. Current standards for the "JI" qualification code require **completing CDC** and **6** months satisfactory performance as a course designer.

NOTE: In the future, the Coast Guard may examine the potential for gaining accreditation or CEUs for attendance at IDC and CDC.

What Is It? (continued)

For now, the more tools you put in your instructor tool bag, and the more professional development you gain, the more likely you are to be ahead of the game, as regards potential instructor certification or gaining college credits.

How Does the Coast Guard Conduct Instructor Evaluations?

Individual branches and schools will authorize personnel to conduct instructor evaluations. Any people conducting instructor evaluations will use the **Instructor Performance Standard Form** to capture individual levels of performance.

All prospective instructors should obtain a copy of that form **BEFORE** they are evaluated so they know the standards they have to meet.

Instructor Performance Standard Form:

We'll briefly go through what the form contains and how it should be used.

The form consists of four dimensions (subdivided into 23 areas to evaluate) of instructor performance:

- Preparation
- Instructional techniques
- Presentation skills
- Management

Additionally, it contains verbiage that sets the standards for marks that range from 1 to 7--very much like Coast Guard performance evaluation forms. There is a block to capture performance "not observed." There is also a block for the mark the evaluator gives the prospective instructor on any of the 23 areas.

Poor performance is indicated by a mark of "3" or below. To obtain qualification, the prospective instructor must obtain an average mark of "4" or greater, in each of the four sections, and can receive no individual mark less than a "3."

How Does the Coast Guard Conduct Instructor Evaluations? (continued)

Just as with a performance evaluation, the standards for each mark are very clearly written. The job of the evaluator is to observe and then pick the mark that best matches the performance observed for each item.

When circumstances mean the observer does not see a specific performance, the observer checks the "not observed" block. To obtain qualification, no more than **six** blocks may be marked "not observed."

Just as with performance evaluations, the mark of "6" represents a very high level of performance. A mark of "7" would indicate performance of the highest level possible in the organization. The expectation is that many marks of "7" would be a rare occurrence.

The authorized evaluator must observe and evaluate the prospective instructor's performance (using the Instructor Performance Standard Form) **at least twice** during the first 6 months the instructor is on board.

After the prospective instructor obtains qualification, it is up to each individual branch or school to determine the number of times and intervals at which to evaluate the instructor.

NOTE: Instructors should be evaluated at least **once** annually as critical input to their performance evaluations.

Individual branches and schools will determine how they want to maintain instructor evaluation records. These records should be considered, along with level 1 (student critiques) and level 2 (tests) evaluations, as critical input to an instructor's annual performance evaluation.

If you are asked to evaluate an instructor, you should:

- Ensure prospective instructor completes each of the 14 instructor PQSs found in TRACEN Yorktown INST 1550.4.

- Sign off on prospective instructor's successful PQS completion.

How Does the Coast Guard Conduct Instructor Evaluations? (continued)

- Use Instructor Standard Performance Form to evaluate each prospective instructor at least twice during first 6 months of assignment.
- Coordinate remediation efforts or suggest assignment to a different position if prospective instructor cannot pass evaluations.
- Prepare a draft memorandum and associated documentation once prospective instructor completes PQS and receives satisfactory grade on two evaluations.
- Send draft memo and documentation to branch chief for signature.
- Follow-up to ensure "JC" qualification code is properly entered in all applicable records.
- Continue monitoring and mentoring new instructor on continuing basis.
- Evaluate instructor as often as branch/school SOP indicates.

How Long Does It Take?

How long it takes to evaluate instructors will obviously depend on how many instructors require evaluations and how many staff members a school has to conduct such evaluations.

NOTE: It is not necessary to evaluate instructor performance during a whole training program or even a whole lesson--spot checks are fine, so long as the observer is able to capture performance in the dimensions listed on the Instructor Standard Performance Form.

Since instructor evaluations are tied to new personnel coming on board, schools should consider that the heaviest impact of instructor evaluations is likely to occur between June and November, and plan staff allocation accordingly.

What Will We Get Out of It?

Instructor evaluations provide branches and schools with measurement data on overall instructor performance. Instructor evaluations are also critical input to annual performance evaluations.

Individual instructors obtain feedback on how to improve, as well as the results they need to obtain the "JC" (or "JI") qualification code.

From instructor evaluations, branch and school chiefs can gain valuable insight into the most pressing needs for professional development.

Why and When Do We Conduct Instructor Evaluations?

Why:

We have already covered why instructors are evaluated.

When:

Instructors will be evaluated at least twice during the first 6 months of their assignment as a TRACEN instructor. Once they qualify (i.e., obtain "JC" qualification), they will be evaluated at least once annually.

What Is My Role?

You may be a manager who plans, schedules, and maintains records for instructor evaluations.

You may be the instructor who is being evaluated, in which case you should ensure that you are familiar with the standards found on the Instructor Standard Performance Form before you are evaluated.

You may be the person designated to conduct evaluations, in which case you will use the Instructor Standard Performance Form to conduct evaluations.

Who Can Help Me?

Senior instructor branch personnel can mentor you through this process.

Who Can Help Me? (continued)

The TRACEN IDC staff can help you in properly evaluating instructors or in solving unusual or off-normal problems.

TRACEN Petaluma is the proponent for instructor and course designer training. They have expert staff who can help you with any problems.

What Is the Process for Getting Started?

Your branch/school SOP will tell you the process your unit uses to conduct instructor evaluations.

If that document is not available or does not address these evaluations, ask the school or branch chief for the procedures to use.

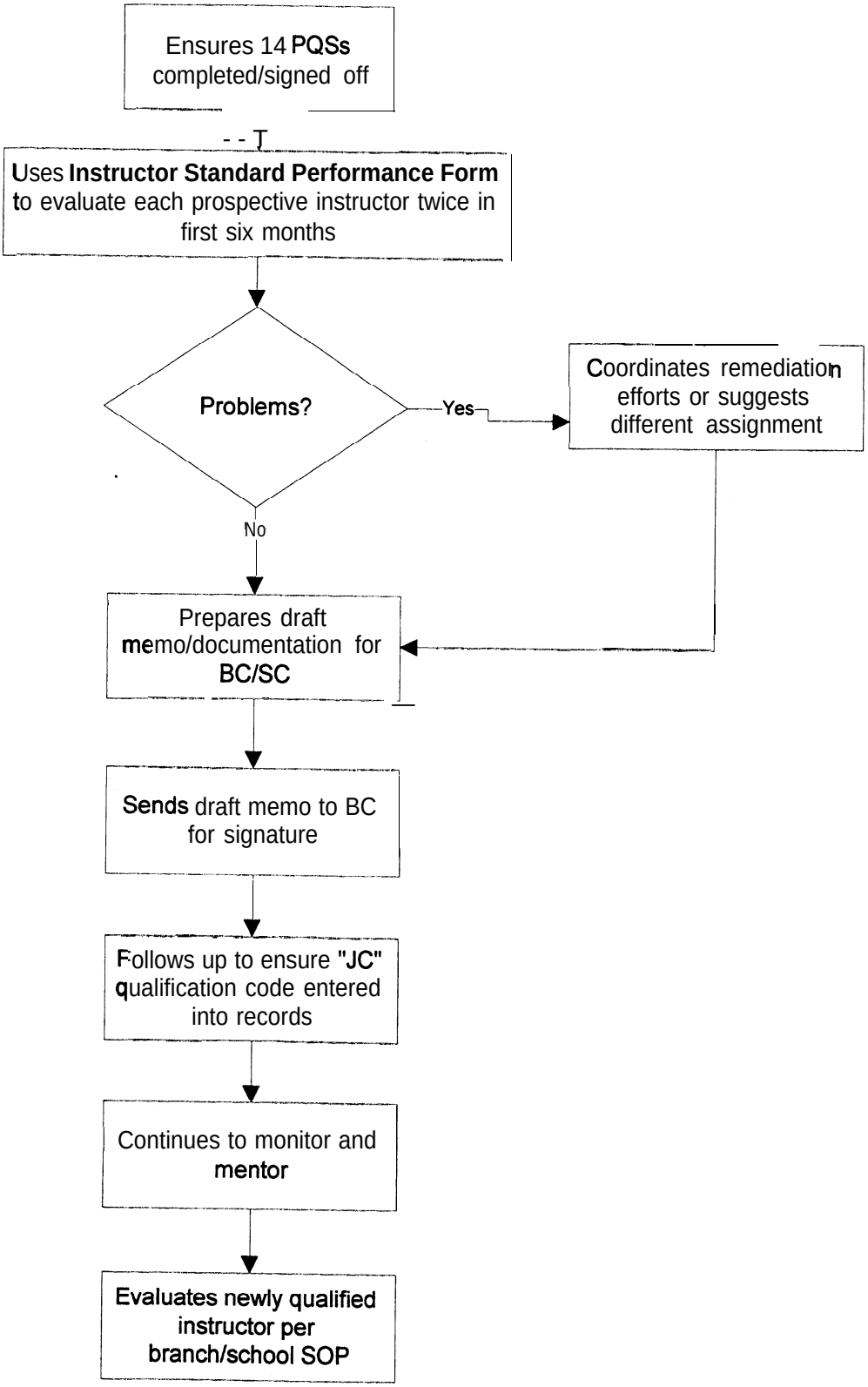
Conduct Instructor Evaluations Job Aid

A job aid for this task is found at the end of the chapter.

The person designated by the branch or school to conduct instructor evaluations should:

Step 1: Ensure prospective instructor completes each of the 14 Instructor PQSs found in TRACEN Yorktown INST 1550.4.
Step 2: Sign off on prospective instructor's successful PQS completion.
Step 3: Use Instructor Standard Performance Form to evaluate each prospective instructor at least twice during first 6 months of assignment.
Step 4: Coordinate remediation efforts or suggest assignment to a different position if prospective instructor cannot pass evaluations.
Step 5: Prepare a draft memorandum and associated documentation once prospective instructor completes PQS and receives satisfactory grade on two evaluations.
Step 6: Send draft memo and documentation to branch chief for signature.
Step 7: Follow-up to ensure "JC" qualification code is properly entered in all applicable records.
Step 8: Continue monitoring and mentoring new instructor on continuing basis.
Step 9: Evaluate instructor as often as branch/school SOP indicates.

Conduct Instructor Evaluations Job Aid



PERSONAL QUALIFICATION STANDARD (PQS)

INSTRUCTOR TASKS
Minimum Qualification Requirements

1-01 PREINSTRUCTION	SIGN	DATE
1. Obtains Materials	_____	__/__/__
(a) Lesson plan		
(1) Up-to-date		
(2) Approved by appropriate individuals		
(3) Personalized		
(b) Training aids		
(1) Up-cc-date		
(2) Operational prior to class beginning		
(c) Student materials		
(1) Up-to-date		
(2) Adequate number available		
2. Prepares Training Site	_____	__/__/__
(a) Checked and ready for instruction		
(b) Clean and orderly		
(c) Noise, temperature, and lighting (if controllable)		
(d) Safety equipment available, as required		
3. Prepares for Instructor Observation	_____	__/__/__
(a) Discusses lesson with observers prior to class		
(b) Provides lesson plan and student material to observers		

1-02 INSTRUCTION	SIGN	DATE
1. Orients Students to Lesson	_____	__/__/__
('a) Gains students' attention		
(b) Provides lesson overview/structure		
(1) Explainswhy lesson is important		
(2) Explains how lesson relates to future work experiences		
2. Presents. Lesson Objectives	_____	__/__/__
(a) Visually presents objectives		
(b) Conveys objectives in meaningful terms to students		
(c) Explains measurement (test exercise) format		
3. Conveys Class Prerequisites; Recalls Pertinent Information	_____	__/__/__
(a) Verifies students have prerequisite skills		
(b) Appropriately handles students without prerequisite skills		
(c) Associates lesson with other lessons or skills obtained		

1-02 **INSTRUCTION** (CONTINUED)	SIGN	DATE

4. **Presents** Subject **Matter**

(a) Establishes facts _____ __/__/__

(b) **Defines new** _____ __/__/__

(c) Provides principles **(rules) and** nonexamples _____ __/__/__

(d) Demonstrates procedures _____ __/__/__

(1) Provides procedures

(2) Follows **steps** as outlined

(a) Clearly explains each step

(b) Positions presentations **for adequate** viewing

(c) Explains safety **procedures**

(e) Graphically shows **processes** (charts and **handouts)** _____ __/__/__

(f) **Uses** acceptable transitional techniques **between** major **teaching points** _____ __/__/__

5. Provides **Learning Guidance**

(a) Uses appropriate **guidance** which aids learning _____ __/__/__

(I) Uses examples/non-examples

(2) Uses analogies

(3) Uses illustrations

(b) **Provides** explanations **to** enhance understanding _____ __/__/__

(1) Relevant **to** the **lesson** material

(2) Relevant to students

(3) Answers students' **questions**

1-02 INSTRUCTION (CONTINUED)	SIGN	DATE

6. Supervises Students' Practice _____ __/__/__

   (a) Informs students of activity procedures

   (b) Provides students with assistance

   (c) Monitors students' performances

      (1) Ensures each step completed correctly

      (2) Enforces safety procedures

7. Provides Performance Feedback to Students _____ __/__/__

   (a) Assesses students' performance

   (b) Provides constructive feedback

      (1) Acknowledges students' performance efforts

      (2) Provides encouragement

      (3) Bases feedback on students' actions

8. Administers Tests _____ __/__/__

   (a) Informs students of test procedures

   (b) Monitors students during test

   (c) Informs students of test results

   (d) Reviews test results with students

9. Enhances Retention and Transfer _____ __/__/__

   (a) Provides meaningful practice

   (b) Reinforces learning through "real world" examples

   (c) Provides reinforcement of learning by giving brief summaries

   (d) Provides for periodic review of material

1-02 **INSTRUCTION** (CONTINUED)	SIGN	DATE

10. Uses Appropriate **Questioning** Techniques

(2) **Uses a variety of questioning** techniques _____ __/__/__

(1) Emphasizes **key points**

(2) **Keeps students** alert

(3) **Checks** level of understanding

(4) **Reviews material or** stimulates thought

(b) Acknowledges students' **responses** _____ __/__/__

(1) Corrects **when necessary**

(2) Ensures **class hears responses**

(c) Uses questions **during the lesson** _____ __/__/__

(1) Ensures **class heers question**

(2) 'Provides/Solicits appropriate response

11. **Provides for Students** Involvement _____ __/__/__

(a) Involves **students in lesson**

(1) Requires **students' performance in lesson**

(2) Maintains **students' attentiveness**

(b) Encourages and **manages discussion of major points**

1-02 INSTRUCTION (CONTINUED)	SIGN	DATE

12. Uses Training Aids Appropriately _____ __/__/__

(a) Uses aids that enhance and support lesson activities

(1) Appropriate to lesson

(2) In good condition

(b) Displays aids properly

13. Uses Effective Communication Techniques

(a) Speaks appropriately _____ __/__/__

(1) Speaks clearly and exhibits no distracting speech habits

'(2) Few errors in usage

(3) Projects sufficiently for training site

(4) Avoids such overworked expressions as "oh" or "ok"

(5) Provides emphasis by variation in loudness and pitch of voice

(b) Maintains eye contact with students _____ __/__/__

(c) Uses natural and nondistracting gestures when appropriate _____ __/__/__

(d) Practices active listening skills when dealing with students _____ __/__/__

(1) Aware of both verbal and nonverbal cues from students

(e) Deals objectively and tactfully with students _____ __/__/__

1-02 INSTRUCTION (CONTINUED)	SIGN	DATE

14. Manages Learning Environment

(a) Conducts lesson activities within acceptable time frame . _____ __/__/__

(1) Gives breaks as needed during lesson

(b) Adapts pace to students' needs _____ __/__/__

(c) Ensures few disruptions in learning environment _____ __/__/__

(d) Resolves student or class problems _____ __/__/__

(1) Communicates the situation

(2) Identifies cause of the problem

(3) Establishes roles and follow-up

Instructor Performance Standard Form

Revised 12/93

Instructor's Name:	School:	Date:

Summary of Marks	PREPARATION	INSTRUCTIONAL TECHNIQUES	PRESENTATION SKILLS	EVALUATION	MANAGEMENT

Evaluator/Backer Signature | Instructor Signature | Supervisor Signature

PURPOSE: Instructor **Performance** Standard Form establishes the instructional performance standards for Reserve Training Center Yorktown

POLICY: This form will be used to evaluate individual classroom performances with respect to instructor qualification. Several forms may also be used over a period of time to assist supervisors and managers in identifying trends in an instructors performance.

Preparation: Measures how well an instructor prepares for class.

	1	2	3	4	5	6	7	Not Obs.	Mark
1. Prepares Material for Instruction	☐	Lesson plan unavailable or is in poor condition (e.g. contains incomplete material and/or missing segments). Inadequate student materials available. Aids and materials are of poor quality. ☐	☐	Lesson plan up-to-date and approved by appropriate individuals. Aids, equipment, and student materials available prior to class. Materials and equipment in acceptable condition. ☐	☐	Lesson plan personalized, up-to-date, and approved by appropriate individuals. Ensures visual/training aids and equipment are available and in operational condition prior to class. Adequate number of student materials available and are of excellent quality. ☐	☐	☐	
2. Prepares Training Site	☐	Training site is in disarray. Has made no apparent effort to prepare site. Adverse physical conditions seem to deter learning. ☐	☐	Has checked training site and made it ready prior to instruction. Classroom exhibits acceptable levels of cleanliness and orderliness. If controllable, physical conditions (noise, temperature, lighting) are at appropriate levels. ☐	☐	Training site is neat, orderly, free of safety hazards, and ready for instruction. Has arranged seating for optimum learning. Every effort has been made to ensure physical conditions (noise, temperature, lighting), if controllable, are at the appropriate level. ☐	☐	☐	
3. Prepares for Evaluator/ Backers	☐	Makes no preparations for evaluator/backers. Materials not available. ☐	☐	Materials available and arrangements make for evaluator/ backers. ☐	☐	Meets with evaluator/backers prior to class to discuss lesson. Materials and lesson plan reviewed together before class. ☐	☐	☐	
Total for preparation (add items 1 through 3).									
Compute average and enter in appropriate space above.									

Remarks:

Instructional Techniques: Measures an instructor's ability to present lesson content using accepted training techniques.

	1	2	3	4	5	6		Not Obs.	Mark
1. Orients Students to Lesson		Begins instruction with no statement as to what the lesson is about or how it relates to previous instruction. Does not relate lesson to future work experiences.		Gains student attention. Introduces lesson and briefly gives lesson overview/structure. Explains why lesson is important and how it relates to future work experiences.		Captivates student interest by presenting scenario, fact, or idea related to lesson. Provides learning motivation by using innovative ways of relating lesson to future work experiences. Ties lesson to other instruction. Provides overview or structure of lesson. cl			
2. Conveys Lesson Objectives		Fails to state objectives entirely or vaguely states objectives without any effort to make objectives meaningful.		States lesson objectives. Visually presents objectives to students (writes on board or shows overhead).		Thoroughly explains lesson objectives in meaningful terms to students. Provides students copy of objectives. Ensures students' understanding of performance criteria.			
3. Follows Lesson Plan Outline		Difficult to relate outline to what is being taught. Varies extensively from outline. Has no logical sequence. Uses long pauses to find place in outline. Ignores instructor activity notes in lesson plan.		Follows outline sequence in a logical/organized manner. Uses instructor activity notes in plan.		Creatively incorporates lesson plan sequence. Includes major teaching points without extraneous information. Material very well organized. Consistently uses instructor activity notes in plan. 11		3	
4. Uses Appropriate Questioning Techniques		Uses very few or no questions during lesson. Questions are irrelevant, unsuitable, vague and have no purpose. Calls on individual student prior to asking questions. Picks on only a few students to answer questions. Rarely acknowledges student response. Is judgmental of student answers. Does not permit questions from students; cuts students off abruptly. Tends to talk down to students. Sometimes seems to have attention elsewhere and fails to recognize student questions. Is reluctant to answer questions.		Uses some questions during the lesson but is limited in the variety of types used. Acknowledges students' responses and corrects when necessary. Willing to accept questions from students. Solicits student questions.		Uses a variety of questions relevant to the lesson to emphasize key points, keep students alert, check level of understanding, review material or stimulate thought. Distributes questions among the entire class; avoids calling on students in any set order. Acknowledges student responses; assists students to arrive at correct response. Ensures class hears responses. Solicits student questions using probing techniques. Admits lack of knowledge when doesn't know answer and follows through. Mannerisms encourage open communication. cl			

Instructional Techniques: Continued

	1	2	3	4	5	6	7	Not Obs.	Mark
Demonstrates Procedures Properly	☐	Fails to inform students of what they are observing. Students unable to see what instructor is performing. ☐	☐	Introduces procedures and follows steps as outlined. ☐	☐	Positions students and self for optimum viewing. Introduces procedures and clearly explains each step as it is performed. Uses others to demonstrate when necessary. ☐	☐	☐	
6. Supervises Student Activities or Practices Appropriately	☐	Fails to give activity guidelines. Students appear to lack direction. Ignores students' requests for assistance or unwillingly provides assistance. Fails to monitor students' performances. ☐	☐	Informs students of activity procedures. Provides students with assistance. Monitors students' performances. cl	☐	Gives clear directions prior to beginning activity. Continually monitors students' performances. Assists students when asked. Encourages self-learning through questioning techniques. Motivates students by providing encouragement and praise. Fosters team work where appropriate. cl	ll	☐	
7. Exhibits Competence in Subject Matter	cl	Unavailable to satisfactorily answer student questions; bluffs answers. Appears unprepared; provides misinformation; resorts to reading lesson plan without daboration or explanation. Frequently shows unfamiliarity with common procedures and/or terminology. ☐	cl	Is able to supply acceptable answers to most student questions. Refers to lesson plan as a guide only. Demonstrates knowledge of complex or little used procedures. Provides limited explanations of complex concepts. ☐	☐	Shows exceptional knowledge of subject matter. Answers students' questions comprehensively and accurately. Does not bluff material unsure of. Is able to translate complex concepts into easily comprehendible terms. Use of notes is minimal and natural. Demonstrates in-depth knowledge of even complex and unusual aspects. ☐	☐	cl	

Total for instructional Techniques (add items 1 through 7).

Compute average and enter in appropriate space on page one.

Presentation Skills: Measures an instructor's presentation skills, techniques, and delivery.

	1	2	3	4	5	6	7	Not Obs.	Mark
1. Provides Transitions and Summaries	☐	No transition statements used. Lesson flow is choppy. Provides no/or poor summaries. Over uses annoying phrases such as "uh" or "ok". ☐	☐	Uses acceptable transitional techniques. Generally avoids such overworked expressions as "ok". Provides reinforcement of learning by giving brief summaries. Uses internal summaries, rhetorical questions and/or transitional words such as "first" or "next". ☐	☐	Demonstrates creativity in the use of transitional techniques between major teaching points. Lesson flow is smooth. Reinforces main teaching points by asking students review questions or recapping main ideas. No annoying phrases such as "uh" or "ok". ☐	☐	☐	

Remarks:

Presentation Skills: Continued

	1	2	3	4	5	6	7	Not Obs.	Mark
2. Provides **Learning** Guidance	☐	Does not provide students with explanation of concepts, of expianation is confusing. Does not provide instruction or learning points to assist students in learning process. ☐	☐	Uses some examples, analogies and illustrations to clarify main teaching points. Explanations generally good; majority of students understand. ☐	☐	Is exceptionally imaginative in the use of comparisons, contrasts, analogies, illustrations, and examples to relate subject content to students. Gives students outline of lesson material. Gives precise understandable explanations. ☐	☐	☐	
3. Stimulates Student Involvement	☐	Does not allow for class participation; requires no action on student's part. Students look bored, uninterested and have difficulty in maintaining attention. ☐	☐	Generally involves students in lesson. Requires student performance in lesson. Students seem attentive to instructor. Some discussion of major points. ☐	☐	Consistently encourages student participation by asking questions or posing problems/situations to elicit student performance. Encourages discussion through questioning skills. Students appear alert, interested and actively involved with instructor. ☐	☐	☐	
4. Uses Training Aids Appropriately ☐	☐	Uses inappropriate or no aids to support lesson activities. Aids used are sloppy, poorly arranged, distracting, done in poor taste, too small to read from back of room; are confusing and/or contain too much material. Handles aids in a clumsy fashion; uses aids as a crutch. Explanations accompanying aid are insufficient. ☐	☐	Uses aids that enhance and support lesson activities. Aids are in good condition for student viewing. Makes few errors when displaying aids. ☐	☐	Creatively uses aids that reinforce the spoken word, aid the learner to perform objective, makes things clearer and/or assist in the retention of the material. All aids are large enough to be seen by everyone; neat; attractive to look at; and simple to understand. Displays aids smoothly with excellent accompanying explanations. Removes when explanation completed. ☐	☐		
5. Uses Effective Communication Techniques ☐	☐	Deficient in grammar or vocabulary; uneven, excessively choppy speech; generally too fast or too slow; uses profanity or makes sexist or ethnic remarks. Uses gestures that are stilted, meaningless or unnatural. Fails to look at students during lesson. Seems oblivious to class. Talks to aids. Uses distracting mannerisms. ☐	☐	Speaks understandably; projects clearly for training site. Seldom talks above or below students' level. Makes few errors in usage. Exhibits no undesirable speech habits. Generally maintains visual contact with students; recognizes students' needs. Uses mannerisms that do not appear to hinder student learning. ☐	☐	Exhibits excellent command of language; uses accurate grammar, enunciation and pronunciation. Uses vocabulary that specifically meets the needs of students. Projects voice so all can hear and speaks at an appropriate rate for student comprehension. Visually observes students (maintains eye contact). Is alert to puzzled looks or raised hands. Uses gestures that reinforce spoken word. Uses few distracting mannerisms and those did not appear to hinder student learning. cl ☐	☐	☐	

Remarks:

Presentation Skills: Continued

	1	2	3	4	5	6	7	Not Obs.	Mark
6. Maintains Professional Appearance	☐	Is not in proper uniform. Is in violation of governing regulations pertaining to personal grooming standards. Posture or bearing is unmilitary. ☐	☐	Presents good military appearance. Uniform is neat, clean and worn properly. Hair cut grooming to standards. ☐	☐	Sharp military appearance. Uniform serves as a model to others. Is impeccably groomed. Always presents an outstanding model of standards in appearance. ☐	☐	☐	
7. Projects Enthusiasm and Confidence when Performing Job	☐	Makes excuses to students. Is negative about instructing; voices negative feelings about instructor duties to students. Is extremely nervous. ☐	☐	Maintains positive attitude that fosters student learning. Demonstrates acceptable level of confidence in conducting lesson activities. ☐	☐	Exhibits positive, enthusiastic approach to instructing. Is poised; shows vitality and is confident in ability to perform job. Energy felt throughout class. ☐	☐	☐	
Total for Presentation Skills: (add items 1 through 7).									
Compute average and enter in appropriate space on page one.									

Evaluation: Measures an instructor's ability to effectively evaluate students.

1. Provides Student Performance Feedback	☐	Gives students vague or very little feedback. Shows evidence of prejudice towards individual students. ☐	☐	Assesses student's performance and relates to student. Provides constructive feedback & encouragement by acknowledging student's performance efforts. ☐	☐	Objectively monitors student progress. Provides prompt and specific feedback. Feedback is constructive and based on student actions, not instructor's opinions. ☐	☐	☐	
2. Administers Tests Appropriately	☐	Fails to give test instructions. Allows practices which foster student cheating. Does not maintain student control during testing. Makes fun of student test responses. cl	cl	Informs students of test procedures. Controls students during test. Provides critique. cl	cl	Ensures test directions are understood. Controls students during test; Critiques test and provides clarification of responses when needed. Ensures confidentiality of test results. cl	☐	☐	
Total for Evaluation (add items 1 and 2).									
Compute average and enter in appropriate space on page one.									

Remarks:

Management: Measures an instructor's ability to manage the training function.

	1	2	3	4	5	6	7	Not Obs.	Mark
1. Manages Class Time Appropriately	☐	Rushes or drags out lesson with no specfic purpose. Allots too little or too much time for material. Uses breaks to conform to stated lesson time. Fails to inform students of schedule changes. Exceeds alloted time by greater than 15 minutes. ☐	☐	Conducts lesson activities within acceptable time-frame. Gives breaks as needed during lesson. Does not seem rushed or too drawn out Runs over by no more than 15 minutes. ☐	☐	Paces class well. Keeps to main points and does not let discussion stray from lesson objective. Paces segments evenly. Informes class of schedule changes. Gives timely breaks. Does not run over allotted time. ☐	☐	☐	
2. Maintains Class **Control**	☐	Disrespect; disorder is evident. Uses ridicule and threats to maintain control. Lets one or more students dominate class. ☐	☐	Generally controls inappropriate student behaviors to ensure few disruptions in the classroom. ☐	☐	All inappropriate behavior extinguished through the use of instructional techniques. 'All problems addressed appropriately. ☐	☐	☐	
3. **Demonstrates Concern for** Student **During the Learning Process**	☐	Is not receptive to student's concerns. Never seems to take time with students. Lacks tact; is impatient and unapproachable. Does not seem to be able to cope with students. ☐	☐	Gives students attention. Is generally attuned to student's behavior. Shows empathy toward student during learning process. Is objective, tactful and patient when dealing with students. ☐	☐	Practices active listening skills when dealing with students. Is aware of both verbal and nonverbal cues (silence, facial expressions) to student's behavior which require instructor's attention. Helps student deal with frustrations resulting from learning. Is fair, just, patient, sincere and tactful when dealing with students. Establishes rapport with class. Displays flexibility in dealing with each student's individual learning needs. ☐	☐	☐	
4. **Observes and Enforces Safety** Standards	☐	Safety not a high priority. Does not demonstrate or enforce safety practices. Sometimes allows personnel to-disregard safety procedures or to work without safety equipment; corrects only obvious discrepancies. ☐	☐	Is safety conscious. Ensures safe operating procedures are followed. Includes safety briefings as part of the lesson. Safety equipment required for class is available and used properly. ☐	☐	Extremely safety conscious. Always stresses safety and is alert for unsafe situations. Safety briefing an integral part of the lesson. Requires all students to conform to each and every safety procedure. ☐	☐	1	

Total for Management: (add items 1 through 4).

Compute average and enter in appropriate space on page one.

Remarks:

Chapter 49: Conduct Summative Evaluation

What Is It?

Summative evaluation (SE) takes place after the training program or performance support has been deployed. Usually, that means "deployed for awhile."

One way to understand summative evaluation is to compare and contrast it with formative evaluation. The purpose of formative evaluations, as you recall, is to improve design and development of training programs or performance supports. As the program or products are being developed, formative evaluation attempts to work out "bugs" or improve design features that turn out to have problems. Formative evaluation techniques can also be applied to the first convening of a training program or first use of a performance support product. By examining problems that occur in a first convening or use, the training program or product can be improved before future convenings or use happen.

On the other hand, summative evaluation is more focused on collecting, analyzing, and summarizing data for decision makers' use in deciding to select one training program or performance support over another or in deciding to keep or delete a current training program or performance support from the Coast Guard inventory.

In terms of human performance technology, summative evaluation results can help answer three important questions:

- Did the training program or performance support adequately solve the performance problem identified during analysis? As result of a particular training program, do workers in the field now have the exact skills and knowledges they need to perform to standards? Is the performance support provided "solving" the performance deficiencies that led the organization to develop the product?

So summative evaluation results are used by the Coast Guard to:

What Is It? (continued)

- Make decisions about which training program to buy or use (e.g., Should we continue to train our junior officers at the Navy's Damage Control course in Rhode Island or should we develop our own Coast Guard-specific course?).

- Determine if the program or product is, in fact, solving the performance problem that caused us to develop training or a performance support (e.g., Is the EPSS we created for EM-20 providing adequate performance support to workers in the field?).

To sum up, the summative evaluation process involves designing a plan and collecting data that **verify** the effectiveness of a training program or performance support in improving the performance of learners or users. Its main purpose is to provide data to managers so they can:

- Make a go or no-go decision regarding keeping a current training program or performance support in place

- Determine the overall value of a training program or performance support (i.e., cost benefits).

- Determine if a new training program or performance support is achieving what we want it to achieve.

- Compare a training program or performance support produced by another agency or vendor with a Coast Guard program or product to see which one is more efficient and effective.

NOTE: A controversial issue in instructional design is who should conduct summative evaluations. Some think an external source should be used to avoid "fox and hen house" issues. Others believe that no one knows the program or product better than the course designer who designed it. Although using either internal or external resources for summative evaluation is acceptable, we mention the controversy so you can consider that factor when staffing a summative evaluation effort.

How Does the Coast Guard Conduct Summative Evaluations?

The first phase of summative evaluation is called "**expert judgment**." During this phase, evaluators poll experts to determine whether current training programs or performance supports--or other candidate programs or performance supports--have the potential for meeting defined performance needs.

During the expert judgment phase, evaluators use **congruent analysis** techniques to gather, summarize, and analyze data. They ask experts questions such as:

- How does the candidate program (e.g., a Navy course) match up with the Coast Guard' s instructional or performance needs and targeted audience?
- Will quotas for this program be sufficient to meet the Coast Guard' s needs (e.g., The National Wildfire Coordinating Group' s training for Incident Command System (ICS) position tasks)?
- If the training program or performance support is "owned" by private industry, can the Coast Guard afford to buy it?
- How accurate and complete is the training program or performance support?
- Is its design adequate and usable?
- What do current users say about their satisfaction rate in using the training program or performance support?

The second phase of summative evaluation involved collecting, summarizing, and analyzing data gathered from field trials. The purpose of the field trial phase is to document effectiveness of the training program or performance support with a targeted group in a setting that mirrors performance in the field. Field trial phase steps are:

Step 1: Planning.
Step 2: Preparing.
Step 3: Collecting data (i.e., performance measures, pre- and post-test scores, observations, interviews, and questionnaires).

How Does the Coast Guard Conduct Summative Evaluations? (continued)

Step 4: Summarizing and analyzing data.
Step 5: Providing go or no-go recommendations for Coast Guard adoption of the training program or performance support.

NOTE: As you can see, the summative evaluation process is not unlike some of the processes you have already learned about--conducting OTS analysis or drafting an Instructional Plan (IP), for example.

How Long Will It Take?

A full blown summative evaluation effort can take a long time. However, people in our organization who routinely conduct such evaluations can do so in a much shorter time.

Ask PTC staff for help in planning or preparing for a summative evaluation effort. They have done several studies for determining the relative effectiveness of different training programs and performance supports. They can share their methods and results with you so you don' t have to reinvent the wheel.

What Will We Get Out of It?

The end product of summative evaluation is a report that recommends go or no- go adoption of a specific training program or performance support.

What you get out of the effort is the kind of products managers need: data-driven recommendations to help with decision-making.

Why and When Do We Conduct Summative Evaluations?

Why:

We have already answered this question. You conduct summative evaluations to be sure the Coast Guard is adopting the "right" (i.e., most effective and efficient) training program or performance support.

Why and When Do We Conduct Summative Evaluations? (continued)

When:

Summative evaluation efforts are usually put in place when Coast Guard managers have to make a choice among competing training program or performance support options. A systematic process that produces reliable data is the kind of help they need in making those kinds of decisions.

What Is My Role?

There are several roles you may fill in summative evaluation efforts:

- An SME who evaluates training programs or performance supports.
- The planner who develops plans and makes preparations for the effort.
- A worker in the field who is targeted for the field trial.
- A person who designs questionnaires and interviews.

Who Can Help Me?

Your TRACEN IT, ISS, and TS staff have experience with summative evaluation efforts. They can help you.

PTC has conducted several summative evaluations. Their staff can save you time and effort by sharing lessons learned in planning, preparing for, and executing summative evaluations.

What Is the Process for Getting Started?

If you are tapped to conduct a summative evaluation or take a role in one of those efforts, you will receive tasking that defines the initial steps you need to take.

Conduct Summative Evaluations Job Aid

A job aid for this task is found at the end of this chapter.

The steps for conducting a summative evaluation are:

Step 1: Plan the summative evaluation (SE).

Conduct Summative Evaluations Job Aid (continued)

Step 2: Prepare for the SE (i.e., coordinate materials, resources, locations, etc.).

Step 3: Gather "expert judgment" data regarding the effectiveness of the training program or performance support. Evaluate:

- Congruence of training program or performance support with Coast Guard needs.
- Completeness and accuracy.
- Usefulness.
- Strategies used in program or product.
- Customer satisfaction.
- Costs and resources required to implement.
- Graduate and/or user attitudes about the program or product.
- Instructor attitude, if a training program.

Step 4: Conduct field trial with targeted group in setting that mirrors on-the-job performance and gather data (using same questions developed for expert judgment phase).

Step 5: Summarize and analyze data collected from both expert judgment and field trial efforts.

Step 6: Develop go or no-go recommendations.

Step 7: Prepare and deliver report of SE findings.

NOTE: These are the steps required in a "classic" SE effort. Today's organizations are focused on a global economy and the need for "faster, cheaper, more responsive." Thus, you may find you have to modify some of these steps to meet the suspense date for your SE project. See the PTC for examples of "quick analysis and evaluation" efforts they have conducted. Some of those examples may help you out in determining how to collect the "right" data quickly without sacrificing the systematic nature of the SE process.

Chapter 50: Introduction to Evaluation

Introduction

This introduction helps you see the "big picture" for Coast Guard evaluation work. It also discusses new policy for training evaluation and compares and contrasts new methods with the way we used to do business.

COMDTINST 1550.23

Commandant's Instructions 1500 series established initial policy for Coast Guard training evaluation. Much of that initial policy is repeated in COMDTINST 1550.23, **Training Evaluation Policy**, dated 21 July 1998. The big change is this. Consistent with a greater emphasis on performance (and in alignment with **Department of Transportation's Training Evaluation Guide**), the Coast Guard has adopted the four-level evaluation model (Reaction, Learning, Behavior, and Results) pioneered by Dr. Donald Kirkpatrick.

This new policy:

- Establishes a standardized evaluation methodology to be used throughout the Coast Guard formal training system.
- Defines new roles for training managers, program managers, training providers, the Coast Guard Institute (CGI), and unit commanders.
- Requires effective communications among the same entities to ensure all training programs receive regular and systematic review.
- Helps stakeholders identify which training programs meet the Coast Guard's performance improvement needs and which do not.

TRACEN Responsibilities

NOTE: COMDTINST 1550.23 uses a relatively new term, **training providers (TPs)**. You may be wondering why it doesn't use the term TRACENs instead. The Coast Guard uses over 700 resident and non-resident programs to train its people. Some of those programs are owned by the Coast Guard, but others belong to DOD, other agencies and private industry.

TRACEN Responsibilities (continued)

That is why new policy uses the term, TPs. It better captures the reality that many different organizations provide training to Coast Guard workers. When you see "TPs," remember that it refers to TRACENs too.

COMDTINST 1550.23 says TPs have the following responsibilities:

- Conduct levels 1 and 2 evaluations (i.e., administer and analyze results from student critiques and tests).
- Provide CGI with training program terminal performance objectives (TPOs) and/or performance indicators (i.e., critical inputs to level 3 evaluations).
- As required, partner with Coast Guard training and program managers to determine appropriate inputs to level 4 evaluations.

COMDTIST 1550.23 sees levels 1 and 2 as TRACEN work, but considers levels 3 and 4 as external to the training provider.

You may ask why that is. After all, isn't one of an instructor's or course designer's jobs to try to ensure transfer of skills and knowledge to on-the-job performance? Yes, it is. But, there are many influences on field performance that have nothing to do with what happens to students at TRACENs. These influences are outside of a TP's control. For example, a boss may want a job done a certain way, regardless of what Coast Guard training says. Or, the wrong person may be assigned to a specific job so all the training in the world is not going to affect that person's individual capacity for doing the job. Or, there may be reasons (e.g., Op Tempo) that act as demotivating factors for people performing the job according to what they learned in training. For all of these reasons, COMDTINST 1550.23 sees levels 3 and 4 (performance on the job and results) as more external than internal to the TRACEN.

The outcome of this change is that Coast Guard TRACENs are no longer responsible for the entire external evaluation (i.e., level 3) process. They do not have to design level 3 surveys. They do not have to mail such surveys.

TRACEN Responsibilities (continued)

They do not have to analyze results. All they are required to do is to provide objectives and/or performance indicators for each of their training programs and CG-6100 forms for each of their students.

CGI takes care of the rest of the job. When survey results are received, CGI will scan and analyze them and return reports to training and program managers and to TRACEN personnel.

If TRACENs no longer design surveys for capturing how well training transfers to the job, who does that work? COMDTINST 1550.23 mandates the use of standardized graduate and supervisor-of-the-graduate surveys. Copies of those surveys are extracted from COMDTINST 1550.23 and included at the end of chapter 53, Provide Objectives and Performance Indicators for Level 3 Evaluations (External Evaluations).

NOTE: At the end of this Introduction chapter, you will find an extract from COMDTINST 1550.23. It illustrates the "**Level 3 Evaluation Process for Existing Courses**." It is a helpful tool for identifying how the new level 3 process works. We have included a copy of the same flowchart at the end of chapter 53.

COMDNTINST 1550.23 does not fully define the Level 4 (results) process. We will discuss level 4 in chapter 54, Level 4--Organizational Evaluation of Results.

Benefits

Why change from what we had? What are the benefits of this new system?

Perhaps the most important benefit is something the Coast Guard has always lacked--one, standardized evaluation system for all training sponsored by the formal training system. That means "apples and apples" data collection so the Coast Guard can better manage its training opportunities.

Benefits (continued)

Perhaps just as important is the fact that this new training evaluation model links training directly to performance in ways the former system did not. This capability will go a long way in helping the Coast Guard identify valid ROI data for all of its performance improvement investments.

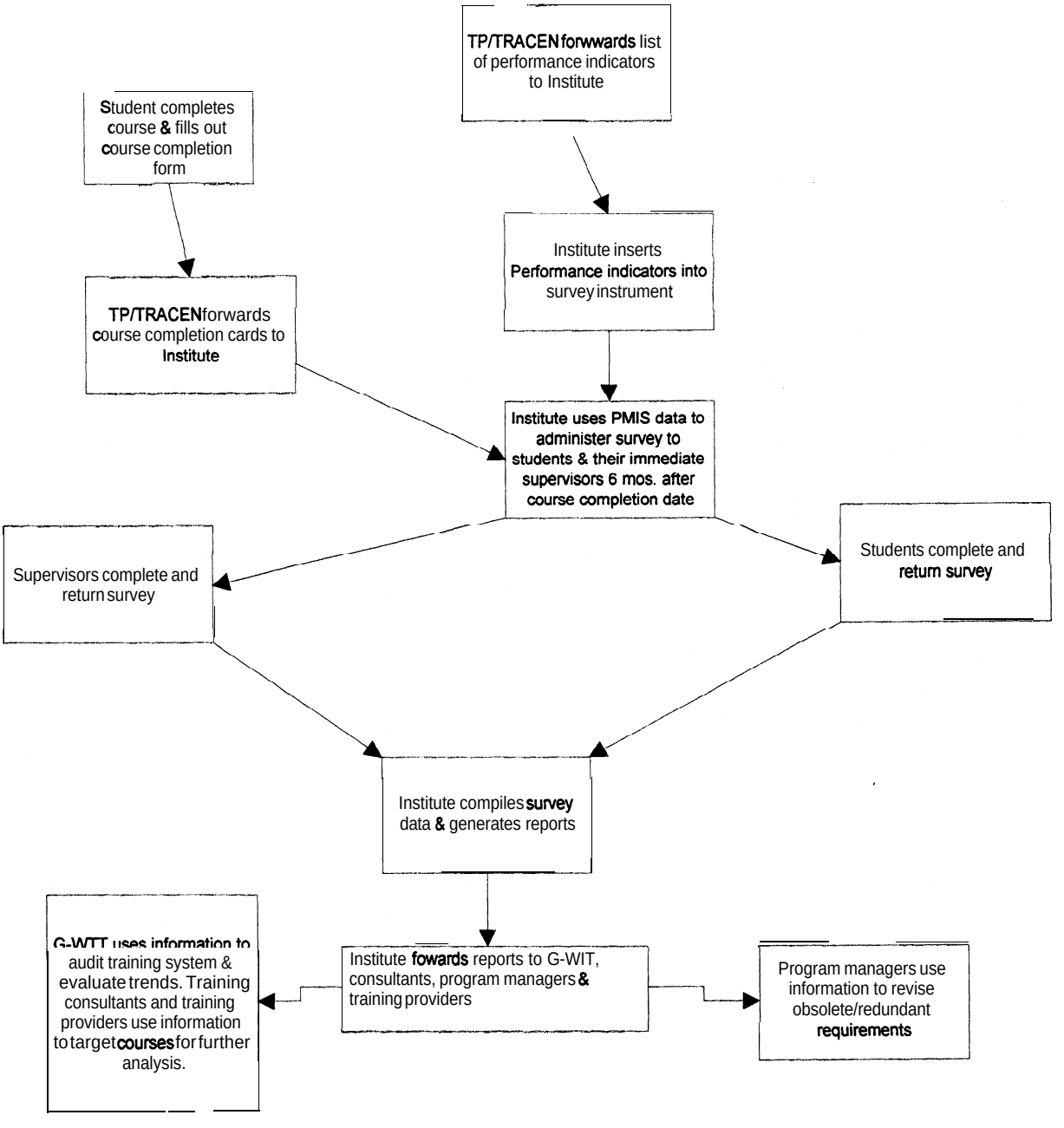
In a world of shrinking Federal budgets, it is very important for the Coast Guard to know what benefits its peoples' performance the most.

SOP Evaluation Tasks

The Evaluation Section of this SOP includes:

- Conduct Level 1 Evaluations (Student Critiques)
- Conduct Level 2 Evaluations (Tests)
- Provide Objectives and Performance Indicators for Level 3 Evaluations (External Evaluations)
- Level 4 - Organizational Evaluation of Results

Level 3 Evaluation Process for Existing Courses



Chapter 51: Conduct Level 1 Evaluations (Student Critiques)

What Is It?

Level 1 evaluations (student critiques) are the **first** level of evaluation you conduct.

What are level 1 evaluations? Usually, they are survey instruments that help us capture "customer satisfaction" data efficiently and effectively. You have no doubt seen and used such instruments when you have attended training yourself. Some people call them "smile sheets," and others call them end-of-course or student critiques.

What does a level 1 evaluation attempt to measure?

- How the students are reacting to training (positively or negatively or maybe some of both).
- How satisfied the students are with the training they received (customer satisfaction).
- What students can tell us about improvements we need to make to the course (e.g., different delivery system, better objectives, tests, handouts, course materials, better learning strategies, etc.).

While it is easy enough to understand why private vendors who make profits from training programs use level 1 evaluations, you may wonder why we use the same process. After all, don' t students have to attend Coast Guard training--whether they want to or not? If that is the case, does it really matter whether or not they are satisfied with the training we provide?

Well, of course it does make a difference. No government agency in our current economy can afford to provide a service that is not satisfactory to its customers.

But, there is an even more important reason to administer level 1 evaluations to our trainees. The four-level model the Coast Guard uses to evaluate its training opportunities is an ***iterative*** model. In level 1, we find out if people **reacted well** to training. "Smile sheets" do not tell us if people learned. Studies show that even when students think they have learned, they may not have.

What Is It? (continued)

What "smile sheets" do tell us is **how students felt** about the training program they attended. If it was de-motivating, they may not have learned. If it was poorly designed, they may not have learned. If the instructor was not very good, they may not have learned. If the program materials were poor, they may not have learned. That is what we mean by "iterative." Level 1 evaluation wants to find out if people reacted positively to the training experience. If they did, there is a good chance they learned something (i.e., level 2). On the other hand, if they reacted negatively, that fact may mean not much learning (level 2) took place.

A side benefit to a well-designed level 1 evaluation is that it can help us internally evaluate a training program. Who could we find better than the user--the targeted audience--to tell us if the instructional materials, tests, and training aids we designed are really working? So, level 1 results can also be used to improve the training program.

To recap, level 1 evaluation results provide:

- Valuable feedback that helps us evaluate the training program.
- Comments and suggestions for making program improvements.
- A tangible sign that the TRACEN wants to help students and cares about their reactions to the training experience.
- Quantitative data to managers for tracking how the TRACEN is doing.
- Quantitative data to instructors and their managers for how instructors are performing.
- Quantitative data that can be used as a baseline and for establishing standards for future performance and progress.

How Do I Conduct Level 1 Evaluations?

TRACEN Yorktown has designed a sample level 1 evaluation form that will be used as the standardized level 1 evaluation form for **ALL** TRACEN Yorktown schools.

How Do I Conduct Level 1 Evaluations? (continued)

NOTE: We have included a copy of this form at the end of this chapter.

During the next year, training division will pilot this level 1 evaluation instrument and collect bench mark data for establishing standards. Working with G-WTT, the training officer will also coordinate outreach efforts with other TRACENs and TPs to test the level 1 evaluation instrument for possible use as a standardized level 1 instrument for all Coast Guard TPs.

NOTE: TRACEN Yorktown has a separate survey, a Facilities Critique, that tracks visitor reactions to our facilities (e.g., barracks, gym, recreation opportunities, food management issues, and so forth).

Before we go over the process of conducting level 1 evaluations, there are a few points you need to consider about these evaluations:

First, you want to obtain a 100 percent response rate to your level 1 evaluations. That mean thinking about and planning for the following factors:

- How long is the training program you are evaluating? If it is more than 1 week, you may want to collect level 1 evaluation data on a weekly basis. If the program course is only 1 week long, but you want to know specifically how the student reacted to each day' s instruction, you may want to collect level 1 evaluation data on a daily basis.

- Should you distribute level 1 evaluations at the beginning, middle, or end of the course? If distributed at the beginning, the students may misplace them. If distributed at the end, their minds may be on ending the course and getting in a car or on a plane or train to go home. You will probably want to distribute them at the beginning of the course--stressing how important and valuable the data they give back to the TRACEN is.

How Do I Conduct Level 1 Evaluations? (continued)

Then, you will probably want to remind students toward the end of the course that you will be collecting those forms very soon. Finally, you want to allow sufficient time at the end of the course for students to "thoughtfully" complete the evaluations.

- This may require asking them to complete the forms the night before the program ends as homework, or right after lunch on the last day of training. You want to avoid handing them out the last 5 minutes of the class; you won't get the data you want and need by that method. Do NOT send the forms with the students to their home units. You won't get a 100 percent response rate with that method.

- Try to conduct level 1 evaluations that capture honest responses. The Coast Guard is a relatively small organization. Often, instructors and students know each other from serving together in the field. To avoid receiving responses that are overly flattering or that were given to avoid attribution, we suggest you NOT ask people to put their names on level 1 evaluations (our TRACEN Yorktown level 1 survey does **NOT** ask the student's name). If there is a reason (demographics, etc.) to know the students' names, you can ask them to provide that information, but make it optional so the students do not have to do so if they prefer not to.

Second, you want to measure student reactions against standards and take appropriate action. In short, it may be nice to collect all this data, but what are you going to do with it?

- Do you want to establish standards? The survey's Likert scale lends itself to quantifying results. You could, for example, determine that any item that falls under a "3" is an item you want to examine more closely.

- Are you going to look at survey results as a kind of trend analysis? Only pay attention to spikes and take an "if it ain't broke, don't fix it" attitude toward the rest?

How Do I Conduct Level 1 Evaluations? (continued)

- What about written comments? Who will be responsible for reviewing those comments and for making the decision to make changes to the training program?

- Will you pay attention to every comment students make? For example, if they say you should add instruction about a new piece of equipment, will you do that, or will you add that piece of information to other analysis efforts and check with the program and training managers before you make that kind of decision?

And **third** and last, for level 1 evaluation efforts to be successful, you also need to communicate results. It is understandable that such results might be kept "in-house" so that those closest to the program could take necessary action. However, if level 1 evaluation results indicate that the majority of a school' s instructors are not good at instruction, that is a fact the IDC staff needs to know. Or, if certain kinds of instructional strategies and methods are not working with this generation of students, that is information course designers need to know.

The conduct level 1 evaluations process is a simple one. You should:

- Pick the best time or times in the training program to administer the survey.
- Ensure you get a 100 percent response.
- Encourage students to take advantage of the written comments items.
- Work with the branch and school chief to develop acceptable standards.
- Provide surveys to PTC for scanning.
- Measure level 1 evaluation reactions against standards.
- Take appropriate action.
- When required, communicate results.

How Long Will It Take?

Since our level 1 evaluation is a one-page survey, it should take no longer than 5 to 15 minutes to distribute and collect results. Note, though, that you may have reasons for distributing level 1 evaluations to be completed as homework (even less time taken from the course).

What Will I Get Out of It?

Benefits you will receive from conducting level 1 evaluations are:

- Data that shows level of customer satisfaction with training.
- Data that shows students' reactions (positive and negative).
- Comments and suggestions for improving the course.
- Standards you can establish so you can track trends and make corresponding improvements.

Why and When Do I Conduct Level 1 Evaluations?

Why:

You conduct level 1 evaluations to keep your training program vital, dynamic, and responsive to the field' s needs. You also conduct these evaluations as a form of internal evaluation. Level 1 evaluations will give you much of the data you require to make important changes and revisions to the course.

When:

When you evaluate depends on your personal preference and the length of the course, but for all courses, you want to:

- Devise a plan that allows students ample time to fill in the survey.
- Make sure that students receive surveys at different times in the course, if there is a great deal of data to track.

Why and When Do I Conduct Level 1 Evaluations? (continued)

- Ensure that you allow the student to fill out the critique while still at training, so the response rate is 100%.

What Is My Role?

As an instructor, you will probably be the person distributing, collecting, analyzing, and maintaining level 1 evaluations (and level 1 data).

As a course designer and developer, you may revise or develop a new and better survey for capturing level 1 data or you may decide the best time(s) to conduct level 1 evaluations for a specific training program.

Who Can Help Me?

This chapter can help you. PTC will help you by scanning survey results.

Given a standardized survey, the job of conducting level 1 evaluations should be quite routine. All that is required is:

- Ensuring that students complete the surveys before completing training.
- Providing completed surveys to PTC for scanning.
- Picking up results of evaluations from PTC.
- Communicating cross-school or branch results.

What Is the Process for Getting Started?

As soon as a resident course convenes or an alternative delivery comes on-line, the TRACEN should begin the work of:

- Collecting level 1 results for baseline data.
- Establishing standards.
- Tracking level 1 results against standards.
- Communicating results to the proper organizational elements to ensure improvement and change.

Conduct Level 1 Evaluations Job Aid

A job aid for conducting level 1 evaluations (student critiques) is at the end of this chapter.

You will also find a copy of TRACEN Yorktown' s prototype survey, TRACEN Yorktown Course Evaluation Survey.

The steps for conducting a level 1 evaluation are:

Step 1: Pick the best time or times in the training program to administer the survey.
Step 2: Ensure you get a 100 percent response.
Step 3: Encourage students to take advantage of the written comments items.
Step 4: Work with the branch and school chief to develop acceptable standards.
Step 5: Provide surveys to PTC for scanning.
Step 6: Measure level 1 evaluation reactions against standards.
Step 7: Take appropriate action.
Step 8: When required, communicate results.

Chapter 52: Conduct Level 2 Evaluations (Tests)

What Is It?

Conducting level 2 evaluations means assessing students' performance to see if they have learned the knowledges, skills, and attitudes the training program is trying to convey.

For an instructor, conducting level 2 evaluations means administering tests.

NOTE: For a computer-delivered training program, level 2 evaluation means providing frequent checks for students' progress and periodic testing to ensure they have learned new material or skills. Based on how students perform, the computer-based training program is designed to branch learners to new skills and knowledges or to return them to something they haven' t grasped until they learn that material or those skills.

When instructors or computers administer tests, students receive **feedback** about their performance. Of all the influences on performance, studies show feedback is one of the most powerful. Trainees need feedback. That is how they learn to distinguish between excellent and mediocre performance.

Instructors need feedback as well. Based on level 2 evaluation results, they learn whether or not they need to adjust the training program' s pace or the content of instruction.

The Coast Guard needs the feedback level 2 results provide to assess trainees and to improve programs. For example, if we need our petty officers to be qualified gas free engineers, and we send them to a course to get trained, level 2 results will show whether or not most students gained certification. Level 2 evaluation results tell us whether or not people can do the things we need them to do in the field. Coast Guard programs fund training programs to ensure people learn the skills, knowledge, and attitudes they need to perform Coast Guard jobs. Therefore, programs count on level 2 results as insurance that people will be able to do the jobs the Coast Guard needs them to do.

What Is It? (continued)

For all these reasons, conducting level 2 evaluations is a very important part of an instructor' s job. This chapter of the SOP will cover what instructors (and course designers) need to know about conducting or administering tests and assessments.

How Do I Conduct Level 2 Evaluations (Tests)?

Let' s start with the basics:

Prepare the test site:

- Have all testing materials ready
- Provide the best testing conditions
- Give trainees a good start
- Conduct the test carefully

Prepare the test site before you conduct the test. Make sure labs and classroom are free of all unnecessary distractions and as clean and orderly as possible. For knowledge tests, make sure students are positioned so that they can' t see each other' s work. Have all testing materials and equipment ready in advance.

Start test administration:

Make sure that:

- All notebooks, texts and reference materials are put away--unless they are part of a performance test.
- Go over the test instructions and procedures with the trainees to ensure everyone understands them the same way.
- Go over any "off-normal" condition for a test (open-book, requires two people, etc.).
- If the test is timed, state (and write) the start and stop times.
- Offer any other good test-taking advice (i.e., relaxation techniques, answer the easiest ones first, etc.).

How Do I Conduct Level 2 Evaluations (Tests)? (continued)

Administer the test:

The test proctor should:

- Maintain order.
- Not allow talking, unless it is a performance test, or it is appropriate to the testing situation.
- Stay alert to the trainee' s possible need to ask questions; do **NOT** do other work.
- If the test is a written test, walk around the room to ensure students are doing all right and are where they should be in relation to the time.
- If a performance test, ensure that the appropriate number of instructors are available to assist in administering the test (i.e., several groups working with training aids, lab situation, etc.).
- If the test is timed, make sure it is timed accurately; announce or write down the times periodically, and give a warning that the test time is about to end before that time arrives.

Score tests and collect level 2 data:

- For knowledge-type tests, schools should maintain test scoring records that lend themselves to later ***item analysis***. To conduct item analysis, the instructor must be able to see all of the students' answers to each question at one time, as well as the percentage of people who got that answer right or wrong.
- From such information, instructors and course developers identify test items that need revision (e.g., items that consistently are answered correctly by 100% of all students may be too easy; those that show a high failure rate may be poorly constructed).

  NOTE: If tests are part of a CBT design, capturing test item data may be a built-in capability of that program.

- A summary of the errors made for each item in a knowledge test or for each type of performance test can also yield useful data: are there weaknesses in the way that particular objective is being trained?

How Do I Conduct Level 2 Evaluations (Tests)? (continued)

Does the instructor need to develop more or better learning strategies (more examples, more practice sessions, etc.)? Was the objective fully covered? Were directions unclear? Terms misunderstood? Do some of the students require more help--perhaps some special remediation? Cues to weaknesses in instruction can often be found in trainee responses or behavior.

NOTE: See Chapter 39, Complete Development of Level 2 Evaluations (Tests). It discusses test item analysis and provides a tool, **Test Item Analysis Checklist**, that helps you evaluate your tests. The **Nonresident Training Development Manual** is also a very helpful resource for those who are trying to improve test items.

There are also some other factors you need to consider when conducting level 2 evaluations. Those special considerations are:

1. Pre- and post-testing:

- Where it is practical to do so, schools should try to administer, score, and maintain pre- and post-test data. This practice is the most reliable way to determine if the training provided actually produces learning.

NOTE: We know it is not always practical to administer pre- and post-tests.

2. Performance tests:

Even though instructors depend on observation as their prime method for evaluating performance, they should keep records for capturing data (e.g., the number of times it took students to perform any one step of the test).

- For example, if several students are having trouble with one of the steps in a task, that may indicate a need to demonstrate this step more often, and to add fading, shaping, or backward chaining strategies to how the lesson is currently being taught.

How Do I Conduct Level 2 Evaluations (Tests)? (continued)

- Performance tests may also yield data about prerequisite knowledge that students need, but don' t possess.

3. Conducting after-test critiques:

Tests or assessments should normally be followed by a class discussion or critique since tests (level 2 evaluations) are one of the ways people learn. From a well-conducted critique, students can discover their weaknesses and correct any misconceptions or misinformation they may have:

- If there is more than one "right" answer to a case study, scenario, or performance, stress that fact so that students don' t adopt stereotyped solutions or try to "guess" solutions.
- If the test is written, write comments on each individual test, and provide those back to the trainee to review before collecting and storing exams.
- Critique test performance as close to the time the assessment was given as possible--for observation tests, the best time is right after the observation.
- Respect the sensitivity of adult trainees.
- Make criticism constructive and tactful so it contributes to improved performance.
- Make comments in a straight-forward, impersonal manner.
- Start out by addressing strengths--what people did well; what went well.
- When covering errors or what didn' t go well, address only the specific points in the test and the types of errors made by trainees.
- Relate performance on the test back to the course objectives. This will reassure trainees that they are being assessed in accordance with the criteria that have been clearly established.

How Long Will It Take?

Times will vary, based on the type of test, course content, number of students, student abilities and capability levels.

How Long Will It Take? (continued)

However, your lesson plan should indicate the approximate times to allow for tests, so you will have that information handy whenever you need to conduct a level 2 evaluation. Typically, course designers or developers allow enough time for each level 2 evaluation to be finished by the slowest member of the class.

If you note, however, that the lesson plan does not allow enough time for a particular test, you can make that adjustment during formative (or summative) evaluation of the course.

What Will I Get Out of It?

You will get very valuable data!

- Pre- and post-test scores can be compared to "prove" that good instruction was one of the causes for learning.
- Test score data can be provided if there is a legal issue or a question in the field about whether a task was sufficiently trained.
- Test item analysis results can help you make the right revisions to your level 2 instruments.
- Analysis of the results of all tests can help you identify instructional design improvements for your training program.
- Feedback from level 2 results can tell you where you need to improve instruction.
- Critiquing the results of level 2 with the students is one of the best ways to help them retain and transfer what they have learned.

Why and When Do I Conduct Level 2 Evaluations (Tests)?

Why:

We' ve already covered why you conduct level 2 evaluations.

When:

Your lesson plan and growing experience will tell you when to conduct level 2 evaluations.

What Is My Role?

You may:

- Be an instructor administering level 2 evaluations.
- Make any changes to the course design or level 2 instruments that the evaluations suggest.
- Manage records, data, and results from level 2.
- Use level 2 results for one of the many jobs of management.

Who Can Help Me?

You probably won' t need any help in conducting level 2 evaluations, but if you do, you have this SOP chapter to refer to.

Just as with all the jobs of an instructor, you will probably first learn your school' s procedures for administering level 2 evaluations through observation and back up of a senior instructor.

Any experienced instructor can provide advice and mentoring on how to conduct level 2 evaluations.

Ask your school chief for the division or branch SOP that tells you what kinds of records to keep and if your school uses any centralized data management procedures.

NOTE: Although written from the student' s point of view and to meet students' needs, the**Training Center Yorktown Study Guide** is a valuable tool for seeing test-taking through the eyes of students. It is also a very useful tool for counseling students who are having trouble taking tests. We' ve included a copy of the study guide at the end of this chapter.

What Is the Process for Getting Started?

Check with your supervisor or the school chief to find out your school' s expectations regarding level 2 evaluations.

For an existing resident school course, conducting level 2 evaluations should be a routine activity.

Conduct Level 2 Evaluations (Tests) Job Aid

There is no "cookbook" job aid for this task. Procedures vary from TRACEN to TRACEN and from school to school. Ask your supervisor to provide a copy of your branch or school SOP (if available) for this activity.

Chapter 53: Provide Objective or Performance Indicators for Level 3 Evaluations (External Evaluations)

What Is It?

Level 3 evaluations are focused on changed **behavior** after training or performance.

As instructors or course designers, one of our jobs is to work on "transfer" issues when we conduct instruction or design a training program. We may even be innovative enough to provide transfer-type exercises, job aids, or training support packages to graduates as they leave the TRACEN or complete a CBT. But once they go back to the field, they are out of our hands.

In the field, our graduates will be inundated with influences that have nothing to do with the training they received:

- Shortages of "right" people to do the job.
- Long working hours and frantic Op Tempo pace.
- Many new requirements taking up their time that have nothing to do with the training they just received.

Yet, the Coast Guard must somehow determine if transfer of learning took place:

- Did graduates transfer and convert those new knowledges, skills, and abilities (KSAs) to changed behavior in the field?
- Are supervisors satisfied with the performance of new graduates after training?
- Did we provide the "right" KSAs?

If you are an experienced instructor or person familiar with Coast Guard training, you may be thinking, "that sounds just like external evaluations. We' ve always done those--or tried to do them. What' s so new about this level 3 stuff?"

What Is It? (continued)

That is a good question. Level 3 evaluations are a type of external evaluation. The instrument used to obtain level 3 data is a survey sent to graduates and their supervisors--the same practice we used before. The survey asks similar questions: Did training provide complete knowledge/skills to proficiently perform task? Task performed or not performed at the unit? Are there tasks performed at the unit that were not addressed in training?

NOTE: We have extracted copies of the graduate and supervisor standardized surveys from COMDTINST 1550.23 and placed them at the end of this chapter.

So far, level 3 seems very familiar--maybe even identical to the process we used before. However, there are some significant differences in this new approach to evaluating training:

- The level approach is iterative and systematic--level 2 builds on level 1, level 3 builds on level 2 and so forth. *Our former evaluation process was not iterative and it was not systematic.*

- Although former Coast Guard policy dictated external evaluations, not all TPs routinely performed this practice for all their training programs. *New policy says all training provided to Coast Guard workers will receive level 3 evaluations.*

- External evaluation survey instruments differed from TP to TP--even from school to school at a TRACEN. There was no standardized instrument and process for obtaining external evaluation. *The new process uses one standardized survey format for both graduates and their supervisors.*

- By mutual agreement among stakeholders, results were sometimes ignored. If the strong perception existed that training needed to take place, then even if external evaluations indicated people were not performing those tasks in the field, the training program continued. *New policy says results will be reviewed for "redlines/spikes" by **all** stakeholders so appropriate action can be taken.*

What Is It? (continued)

However, as significant as these differences between our old and new methodologies are, perhaps the most important difference is the focus a 4-level approach puts on performance and its results. What do we mean by that statement?

You see, no matter how well you trained students (i.e., smile sheets say you did a great job!) or how well they learned because of your excellent instruction (everybody passed every test first time around with a GO!), the *real value of training is what they can do when they get back to the field (i.e., their behavior)*:

- Will job conditions allow them to apply new behaviors?
- Do they have the tools they need to do the job?
- Will a frantic work pace mean there is no time to apply new skills, so that learning decay sets in?
- Will graduates be motivated to change their behavior?
- Are they assigned to jobs where they cannot use the new KSAs--for example, the equipment they learned is not installed yet?

We told you level 3 evaluations are trying to find out if the learning you provided has now, indeed, transferred to the job. But that' s what external evaluations tried to do. The difference between external evaluations and level 3 is the focus on performance and what causes performance (behavior) to change or stay the same. What level 3 evaluations are really all about is getting a true read on all the influences that either help or hinder a person from transferring learning to on-the-job performance:

- Is the person allowed to transfer learning?
- Is the graduate properly assigned?
- Are there incentives in place to motivate the graduate to transfer learning?
- Are there dis-incentives in place that influence the graduates to keep their behavior the same?

Right now, you might be thinking those sound like analysis questions. Level 3 does go back to analysis.

What Is It? (continued)

Suppose an FEA said policy needed revision, people lacked a specific tool they needed to do the job, assignment and selection needed to be relooked, and there were dis-incentives in the field that worked against people performing as they should.

Suppose that same FEA said people lacked some skills and knowledge they needed, so job aids with some training were also an appropriate intervention for improving performance. Based on those results, the TRACEN was asked to develop a training program. And let' s say they did just that--developed a terrific training program supported by a state-of-the-art EPSS.

When you entered this scenario as the training program' s instructor, you did a great job of providing the skills and knowledge needed. The "smile sheets" were full of praise for your instructor skills. Every student passed every test the first time around. In short, you could not have done a better job.

Now the results of level 3 come back, and it looks as if learning hasn' t transferred to the job. Data shows strong trends toward "tasks performed at unit but my duties do not require me to complete this task" and "task not performed by anyone at this unit." Furthermore, none of the comments mention the EPSS, even though graduates took that tool back with them to the job. You know testing showed this powerful tool improved performance over 50%. What goes on?

Here is the difference between our old and new approaches to level 3 evaluation. Did those other recommendations from the FEA ever get adopted? Are graduates able to access a computer so they can use the EPSS (new tool) you provided? Has policy been rewritten so supervisors know they need to manage a different process? Has assignment and selection been revisited and changed to reflect changed jobs in the field? If none of those events have taken place, there is a strong likelihood training won' t make much difference in changing graduate behavior (i.e., performance).

What Is It? (continued)

Thus, the level 3 results you are looking at do not mean you have done a bad job or even that training wasn' t called for. What they do mean is that it is time to examine all the influences on behavior and make sure everything that needs to happen to change behavior has happened.

You can see now why we say level 3 has to be a collaborative effort. We can improve training, but we can' t do much to change the Coast Guard' s assignment policy. We can design training programs that capture the "right" stuff, but if people don' t have the tools to do the job, our training won' t help them very much. Since those kinds of issues are program-level problems, we need a partnership among stakeholders to ensure all the influences that affect performance are considered.

Training Centers will continue to get level 3 results. We should review those results and get in touch with our training and program managers when problems appear. The big difference from the past is that we are not solely responsible for level 3 evaluations anymore. Today, we look at level 3 data, and if it shows no problems, we continue on with what we' re doing--"steady state." On the other hand, if our level 3 dashboard gauge redlines or shows a spike, we know who to get in touch with and we will likely be part of the analysis team that examines what is wrong.

Let' s look at two scenarios to see how the new evaluation system works.

Scenario 1:

Level 3 results come back from a training program and it turns out respondents indicate they aren' t using a piece of equipment currently covered by that program. They suggest you add another piece of equipment they are currently using to the training program. But, when G-WTT gets the results, they do a quick FEA. The results of analysis show them that people already know how to use the equipment or that an excellent job aid for using it already exists.

What Is It? (continued)

Instead of adding the new piece of equipment to the training program (old way of doing business), G-WTT and the program affected are likely to provide that excellent job aid to the field (new way of doing business) and revise policy to indicate the job aid should be used by all workers performing that task.

Scenario 2:

On the other hand, let' s say the results of evaluations come back, and training is right on the money. Graduates formerly lacked skills and knowledges required for their jobs; they got what they needed at the TRACEN; they' ve transferred learning back to the job and supervisors can see they' re exhibiting new and desired behaviors. No need to change that program. Stay steady state. End of story.

That sums up the "big picture" for level 3 evaluations.

How Do I Provide Objectives or Performance Indicators for Level 3 Evaluations?

Now, let' s examine the TP' s role in carrying out level 3 evaluations.

Level 3 evaluation is a standardized process. Using inputs received from TPs and two standardized survey formats for collecting data from graduates and their supervisors, CGI ensures that each graduate and his or her supervisor receive level 3 instruments within 6 months of course completion. Data collection focuses on:

- Is the task, for which training was provided, performed on the job?
- How confident are trainees in their ability to perform the tasks?
- How often do the trainees perform the trained for tasks?
- Could on-the-job training meet the needs of the trainee or is formal training required?
- Are there any influences that prevent the trainee from becoming proficient in the tasks associated with training (e.g., tasks are automated, do not perform tasks at that level or rank, outdated procedures or policies are being taught in training)?

How Do I Provide Objectives or Performance Indicators for Level 3 Evaluations? (continued)

The role a training provider plays in this process is to:

- Ensure the training program being evaluated has valid TPOs.

NOTE: This guidance applies for "soft-skill" courses too. For example, leadership and PCO/PXO course should have valid TPOs. Level 3 evaluations will not work without valid, specific TPOs.

- Convert TPOs to performance indicators, if there are many TPOs.

What are **performance indicators**? COMDTINST 1550.23 says, "A single performance indicator may encompass several TPOs and should be worded to clearly capture the expected on-the-job performance." In other words, if students are demonstrating the "performance indicator" behavior on the job, they are also demonstrating a grasp of several other behaviors (tasks or task steps) that fall under that performance indicator.

In case you are still not sure what a performance indicator is, let' s look at TRACEN Yorktown' s Machinery Technician (MK) "A" School. They use "Tear down and rebuild an internal combustion engine" as a performance indicator for several TPOs--"operate an internal combustion engine," "run an internal combustion engine," "test an internal combustion engine." The performance indicator, "tear down and rebuild an internal combustion engine," also covers any knowledges and skills the person needs to possess to perform this task.

- At the end of each course convening, have all students complete form CGI-6100.

What is a form **CGI-6100**? This is the **Coast Guard's Resident Training Graduate Survey Information** form that provides the data CGI needs to mail surveys to graduates (and to their supervisors) 6 months after course completion.

How Do I Provide Objectives or Performance Indicators for Level 3 Evaluations? (continued)

NOTE 1: We have included a sample CGI-6100 and **Instructions for Completing Form CGI-6100** at the end of this chapter. From the block of numbers each TRACEN has received, they assign a four-digit ("course code") number to each course they "own." CGI uses the information extracted from CGI-6100 to make sure each graduate and his or supervisor receive a level 3 survey and to manage and track survey mailing times for each level 3 effort.

NOTE 2: TRACEN Yorktown is assigned the following numbers: nonresident courses use current course codes, 0000 through 2999 and resident courses are assigned the numbers 5000-5999. Be sure you check with your school chief to ensure a new course is assigned the right number, and that you have the correct number for a course already on-line.

- Forward the completed CGI-6100 forms and performance indicators to CGI

NOTE: Exceptions to the 6-month interval may be approved by G-WTT when appropriate. For example, when students finish FT "A" School, they are immediately routed into another course. Therefore, if CGI sent out a level 3 survey to FT "A" graduates and their supervisors 6 months after graduation, the graduates would not have had time to demonstrate behavior. This is the kind of situation that calls for a waiver to policy.

- Review level 3 reports received back from the Institute.
- Contact G-WTT or applicable stakeholders if there are any "spikes/redlines" on the level 3 "dashboard gauge."
- Work with stakeholders to determine if further analysis is appropriate and if it is, work with who is responsible for performing that analysis.

How Do I Provide Objectives or Performance Indicators for Level 3 Evaluations? (continued)

NOTE: To ensure you use the right course code numbers and to stay abreast of an evolving and changing situation, we strongly suggest you coordinate with CGI before providing objectives and/or performance indicators the first time. The office to contact is the Institute' s Measurement & Production Division at (405) 954-7252 or 7238.

How Long Will It Take?

Not long at all. This is a routine, administrative job that should become part of every instructor' s or training manager' s duties. Once it is done the first time, the same indicators can be used over and over, unless the course changes or the course is eliminated.

Identifying performance indicators is a job that could easily be added to the course designer job. Along with identifying performance objectives, the course designer could also develop performance indicators.

What Will I Get Out of It?

By providing objectives or performance indicators and CGI-6100 forms, you are helping the Coast Guard properly evaluate field performance.

That' s very important for two reasons:

- Properly conducted level 3 evaluations mean we can better capture all the influences that affect our people' s behavior in the field, and that means we have a real chance of improving performance.
- Level 4 evaluations depend on level 3. Until we get level 3 "right," we won' t be able to determine training' s return on investment.

Why and When Do I Provide Objectives or Performance Indicators for Level 3 Evaluations?

Why:

We' ve already covered why you provide objectives to CGI for level 3 evaluations.

Why and When Do I Provide Objectives or Performance Indicators for Level 3 Evaluations? (continued)

When:

As soon as a course or training program is finished, you provide completed CGI-6100 forms to CGI as well as a list of TPOs and/or performance indicators for the course. Unless you receive other instructions from CGI, you will do this every time a training program is completed or a course convening is over.

What Is My Role?

Your role will probably vary, depending on your job.

You may coordinate with CGI and G-WTT to ensure your school is conducting its part of level 3 evaluations correctly. You also may get in touch with G-WTT and the applicable program when you discover a "spike/redline" in results from a level 3 evaluation.

You may be the person sending completed CGI-6100 forms and performance indicators to CGI at the end of every course convening.

Or you may be a course designer or developer tasked with converting current large numbers of TPOs into performance indicators.

Who Can Help Me?

CGI has the major responsibility for level 3 evaluations so you should ask them for help if you have any questions about survey input, CGI-6100 forms, their proper completion, or performance indicators.

However, if you discover a problem from level 3 results, you need to get in contact with the appropriate program manager and G-WTT. Based on what all of you see, a decision will be made concerning whether to do further analysis (feasibility) and if that is the recommended action, who will do the analysis. In that last case, the person doing the analysis might be you.

What Is the Process for Getting Started?

If you haven' t already done so, you should start with level 3 evaluations right now. Call the Institute to make sure you' re up to speed on the latest directions they' re providing, and begin providing objectives and/or performance indicators and completed CGI-6100 forms to CGI at the end of each convening of all your courses.

NOTE: CGI may indicate that you do not have to capture every convening. Check with them for how many convenings of a course they need to capture.

Provide Objectives or Performance Indicators for Level 3 Evaluations Job Aid

A job aid for providing objectives or performance indicators for level 3 evaluations is found at the end of this chapter.

The steps for this task are:

Step 1: Ensure all your courses have valid TPOs.

Step 2: If there are many TPOs, convert them to performance indicators.

Step 3: Maintain this list of course TPOs and performance indicators by keeping it constantly current.

Step 4: At the end of each course convening, have each student complete aCGI-6100 form.

Step 5: Forward the CGI–6100 forms and the performance indicators to CGI.

Step 6: Review level 3 reports received back from the Institute.

Step 7: Contact G-WTT and program if there are any "spikes/redlines."

Step 8: Work with G-WTT and program to determine if further analysis is appropriate and if it is, who should do it.

Chapter 54: Organizational Evaluation of Results

Introduction

NOTE: We have not used the Frequently Asked Questions (FAQs) format for this chapter because the Coast Guard has not yet fully developed a level 4 process.

In this last chapter of the SOP, we will tell you:

- Kirkpatrick' s concept for level 4 evaluations
- What COMDTINST 1550.23 says about how the Coast Guard plans to conduct level 4 evaluations

COMDTINST 1550.23

The Kirkpatrick model for evaluation says level 4 evaluations capture the **results** accrued by the organization from its training efforts.

For example, let' s say Coast Guard analysis efforts identify a skills and knowledge lack that is having an adverse impact on search and rescue (SAR) mission accomplishment in the field (e.g., Morning Dew incident). We establish a training program and provide performance supports. Level 3 evaluation data indicates behavior did change and people are performing to standards. When we get to the level 4 stage of evaluation, we are asking what results those actions we took have for the Coast Guard.

If we convert what Dr. Kirkpatrick calls "results" into what that might mean for the Coast Guard, our level 4 evaluations would probably look at factors such as:

- Increased production.
- Improved quality.
- Decreased costs.
- Reduced frequency and/or severity of accidents.
- Increased lives saved.
- Increased drugs or aliens seized or interdicted.
- Pollution prevented or the results of pollution speedily cleaned up.
- Reduced turnover (better retention of people).
- Increased customer satisfaction.
- Good public relations.
- The "right" people certified.
- An increase in recruitment.
- Higher ROI.

COMDTINST 1550.23 (continued)

So, our level 4 evaluation for the performance interventions we put in place to prevent incidents such as the Morning Dew from happening would probably capture statistics for:

- Increased or decreased numbers of incidents.
- Improved or worsened public relations for the Coast Guard.
- Increased or decreased customer satisfaction and customer confidence level.

These benefits (or worsening situation) would be weighed against the costs and benefits of the performance interventions we put in place and the decision would be made to keep the interventions, eliminate them, or try something else.

COMDTINST 1550.23 says the following about level 4 evaluations:

- Coast Guard training is based on business needs as identified by programs. Level 4 identifies whether or not specific training is meeting these business needs.

- The Coast Guard does not have an established formal process for capturing level 4 data. Program managers will work with PCs and TPs to identify business needs and link these needs to training.

- Once the process is in place, the data will be reviewed jointly by PCs and program managers with appropriate follow up analysis.

Going through the background behind why the Coast Guard adopted a four-level evaluation model will give you a better understanding of why we ultimately need to conduct level 4 evaluations.

Do you recall we talked about "current state" in the chapter on analysis? For organizations to think and act strategically, they must continuously scan their current state (Where are the gaps?), while simultaneously defining their optimal state (What would success look like?).

COMDTINST 1550.23 (continued)

With regards to successfully defining our training efforts, the Coast Guard' s current state can best be described by looking at the factors that drove a need for a new training evaluation policy:

- We know how well training is presented, but not how well it helps improve performance on the job.
- Demand for AFC-56 (training budget) funding of training courses far exceeds the annual amount allocated to that budget.
- We don' t have accurate data or a good process for assigning value to current training courses (Class C courses, in particular).
- Our attempts to find out how well training transferred to on-the-job performance (level 3, external evaluations efforts) have not been standardized.
- The perception persists that current pipeline training is "broken." This situation is only likely to get worse as we maintain legacy ships and equipment in the inventory while simultaneously adding new ships and equipment with different training needs.
- In the past, Headquarters staff did not approach external evaluations as a behavior assessment or take a more overarching view of what the results of external evaluations might tell us about performance influences.
- Training should be based on needs, but since few existing courses started from a bona fide front-end analysis, we don' t really know if current courses are based on needs. We need data to determine what our return on investment for conducting current training is.
- In our current state, we have no solid basis for decisions to continue or improve training in the face of high-velocity change. Once institutionalized, our past history tells us that courses take on a life of their own and tend to run without too much regard for continuing usefulness.

COMDTINST 1550.23 (continued)

- We must make the paradigm shift from "butts in seats" to accountability for organizational results.

- In our organization, level 4 evaluations are virtually nonexistent. Yet, this most difficult evaluation is the most important one we can do because it matches up training results with program business needs. In other words, level 4 evaluations, if properly conducted, will show us the contribution training did (or did not) make in meeting program business needs (return-on-investment data).

That is the current state COMDTINST 1550.23 is trying to change. We need standardized, valid data to help us make decisions about the best (i.e., most effective and efficient) performance interventions we can put in place for our people.

What Is My Role?

Since the level 4 evaluation process is not yet fully fleshed out, our role is not clearly defined. However, we will have a role, and probably a key one at that.

Current policy indicates that *"program managers will work with training managers and training sources to identify business needs and link these needs to training."* Therefore, our role will involve helping program and training managers link identified business needs to the training we conduct.

We realize you are left with many questions about level 4 evaluations. Still, if someone asks you what they are or wants you to work on developing that type of evaluation, you will have some idea of what they are and what that work involves.

Glossary

Term	Definition
80% solution	A solution that is workable, but that does not achieve 100% of the desired result. Organizations accept 80% solutions when (1) they work and (2) it is cost effective to do so (i.e., it is not necessary to spend more since the 80% solution works).
Ability	Power to perform an act, either innate or as the result of learning and practice. Latent capacity. Ability requires knowledge, skills, attitude, and application in complex and novel circumstances. Abilities are developed over time through practice and feedback. Example: Persons with basic skills and knowledge may be competent in performing a task, but not fluent. They may be able to read and understand Spanish (competence) without being able to adequately function in a Spanish-speaking environment (fluency).
Accomplished Performer	(AP) A person whose skill or performance is an example of the optimal or desired state. An exemplar; a person who has figured out how to do a task or job most effectively and efficiently; the "best of the best."
Accomplishment Based Curriculum Development	(ABCD) Developed by Dr. Joe Harless and associates and currently owned by HPT, the ABCD system is a sub-system of the Performance Improvement Process (PIP) model. The ABCD system is designed for persons who analyze, design, develop, test, and evaluate skills and knowledge interventions. Typical jobs targeted by ABCD include course developer, education specialist, curriculum specialist, and training technologist.
Accreditation	The recognition (i.e., numbers of equivalent college credit hours) afforded to a Coast Guard training provider' s training programs when they have met accepted standards of quality applied by an accepted, professional accreditation agency such as the American Council on Education (ACE).

Acquisition System	The Coast Guard process for procuring new major equipment and/or systems, typically involving multiple headquarters program offices. The Coast Guard' s procurement officials are linked to the training system via the Commandant' s Instruction that requires analysis of performance issues associated with new equipment prior to purchasing or developing training.
Action verb	Verb that conveys action or behaviors and reflects the type of performance that is to occur (e.g., troubleshoot, inspect, board). Action verbs used in performance objectives must reflect behaviors that are measurable, observable, verifiable, and reliable.
Actuals	Actuals represent the current state of performance. Actual performance is the way Coast Guard workers are presently performing their jobs. Actuals are the performances our members currently do or think about.
Adult Learning Theory	(ADL) That body of knowledge and cognitive theory that studies the adult learner and defines his or her needs. Adult learning theory is also referred to as "andragogy"; the foremost proponent in this field is Malcolm Knowles.
Advance organizer	An instructional strategy that helps students put new information into a broader framework ("advance organizer") that they already know (e.g., training students first in general techniques for using CFRs, then training them in the use of a specific CFR).
Advanced Distributed Learning	(ADL) Advanced distributed learning leverages the full power of computer, information, and communication technologies through the use of common standards in order to provide learning that can be tailored to individual needs and delivered *anytime-anywhere*. Advanced distributed learning also includes establishing an interoperable "computer-managed instruction" environment that supports the needs of developers, learners, instructors, administrators, managers, and family. Advanced distributed learning encompasses all the methodologies mentioned above, and, in addition, includes ongoing and expected improvements in learning methodologies.

Algorithm (TA method)	Another method for conducting task analysis. The algorithm method is especially good for tasks that require "yes/no" decisions.
Alternative deliveries (CBT, WBT, IVT)	As their name implies, alternative deliveries are methods other than traditional, resident-based instruction for delivering required skills, knowledge, and information to workers. They include (but are not limited to) CBT, WBT, IVT, EPSSs, and hybrids.
American Council on Education	(ACE) The accreditation organization that reviews and approves Coast Guard training programs for conversion to civilian academic credit.
American Society for Training and Development	(ASTD) A society dedicated to the continuing professional development of training professionals, through the interventions of sponsoring conferences, workshops, providing trade magazines and publishing books of interest to the fields of instructional and performance technology.
Analogy	An instructional strategy that uses analogies to enhance learning. An instructionally useful analogy must contain at least one concept that is within the prior knowledge of the learner, while the other is distinctly unfamiliar. The familiar concept is called the "vehicle" and the unfamiliar concept is called the "topic." Trainers must be sure to discuss similarities and differences between the vehicle and the topic [e.g., atoms circling around a nucleus (topic) are like planets orbiting the sun (vehicle)].
Analysis	In general, analysis is study prior to action. In the HPT context, analysis allows us to focus on what really needs attention to improve workforce performance.
Analysis, Design, Development, Implementation, Evaluation	(ADDIE) The five phases of the Instructional Systems Design (ISD) model. ADDIE is a mnemonic device to help people remember the names and purposes of the model's five phases.

Apprenticeship	A structured training program involving instruction, work experience, and testing, usually for a set period of time, leading to certification in a given area.
Assignment & selection	One of the influences on performance. Inaccurate assignment and selection can place an inexperienced person or a person who does not have the required capacity in a job that requires such experience or capacity. Such a practice will result in substandard performance.
Attitude	The mental state of an individual that influences behavior, choices, and expressed opinion. For example, first a non-rate must know what, where, when, how, and why to do what he or she is required to do. Next, the non-rate must possess the skill to be able to do that task. Finally, the non-rate must have the right attitudinal component to choose to do a particular task. Generally speaking, people choose to do things when they value the results and have confidence in their capacity to perform a task.
Audio-visual training materials	(AV) Auditory and visual media that simulate actual work situations, engage the learner' s senses (i.e., multi-sense) and therefore enhance the learning experience. "A picture is worth a thousand words."
Audit trail	The paper and/or electronic files kept and maintained for a project; files and records that tell us the history of a work effort or project. A systematic documentation of actions taken that lead to or support decisions about performance improvement, support, and interventions (e.g., training, tools, work redesign, etc.). Audit trails include the data, information, and rationale that influence training program and performance support development and implementation processes. Maintenance of a complete audit trail enables performance support and training modification and revision in a logical, coordinated, and systematic manner.

Authoring	Authoring software are computer programs designed to aid in the creation of computer-based, web-based training and ICW products. Such software varies widely in price and capabilities. Object-oriented (drag and drop) programs are easier to learn and lend themselves to the most development. Scripted programs are typically used to develop high-end products (e.g., complex simulations or virtual/three-dimensional displays). "Authoring" can also refer to using an authoring software product and its associated tools to develop ICW. Some of the many authoring software products available are Quest, Authorware, Toolbook II, and so forth.
Authorware	The Coast Guard approved authoring software and tool suite for developing ICW (e.g., computer-based training (CBT), web-based training (WBT), etc.)
Aviation Workforce Structure Study	The first OPA-level HPT success story for the Coast Guard. This study looked at all influences on aviation maintenance ratings--rating stagnation, insufficient promotions, etc. The study' s results merged five ratings into three and offered significant savings to the Coast Guard.
Backward chaining	An instructional strategy that lets students practice the steps for a procedure in backward order. The advantage of backward chaining is that the student gets to see the result of the previous step that is the stimulus or input for the step being practiced.
Bandwidth	Data transfer capacity of a system. Bandwidth is often the limiting factor in transferring large amounts of data (e.g., multimedia) over inter/intranets. Bandwidth capacity ranges from a relatively low level over Plain Old Telephone System (POTS) lines to high over a satellite transmission network or ISDN system.
Behavior	An observable activity or action. The performance of a skill.
Benchmark	A measured, "best-in-class" achievement; a reference or measurement standard for comparison; a performance level recognized as the standard of excellence for a specific business practice.

Benchmarking	A systematic and continuous measurement process; a process of continuously comparing and measuring an organization' s business processes against business leaders anywhere in the world, to gain information that will help the organization take action to improve its performance.
Bookmarking	A capability that can be built into ICW. A bookmark allows students to exit an ICW lesson when they want, and then reenter the lesson at the same place they left.
Branching	An instructional technique in which the student' s next step of instruction is determined by the student' s last response. In automation, the next step may be determined by the pattern of responses to a series of items relating to the subject matter.
Business goals	Those accomplishments (e.g., number of lives saved, pollution prevented, aliens and drugs interdicted, etc.) that are most valuable to the organization.
Case study	An instructional method that allows students to seek solutions to oral or written accounts of a conflict situation. A case study is used for the same purpose as a role-play but focuses on the skill and knowledge requirements for individual decision-making, management practices, and technical skill application.
Causes, barriers, drivers	Descriptive terms for the physical, procedural, policy, or skill, knowledge, and attitude impediments to desired performance. They are the reasons a performance gap exists now or may exist in the future (e.g., performance required for new acquisitions or systems).
Certification	Written verification of proficiency in a given task or tasks.

Clustering	Used in course or training program design; describes the grouping or classification work the designer performs to create a course or training program structure that will enhance learning (i.e., clustering or grouping or classifying skills and knowledge into topic-centered, task-centered, or problem-solving units). Can also be defined as the process of organizing many tasks or performance objectives into logical groups based on some criteria or sequencing groups of objectives within a course of instruction (i.e., presenting terms that are unfamiliar to students in categories that help them learn--e.g., capacitor components).
Coast Guard Advanced Distributed Learning Strategy	(CGADLS) The Coast Guard' s advanced distributed learning strategy is to establish a system that: Employs emerging network-based technologies to create common standards that will enable reuse and interoperability of learning content, lower development costs, and promote widespread collaboration that can satisfy common needs. Enhances performance with next-generation learning technologies. Works closely with industry to influence the COTS product development cycle. Establishes a coordinated implementation process.
Coast Guard Formal Training System	The Coast Guard formal training system is the combination of all elements of its training and education entities working together to bring about the preparation of members to perform their missions and personnel to effectively perform their assigned jobs. The training system consists of training hardware, facilities, and personnel subsystems. The Coast Guard' s formal training system is made up of its training managers, COMDT G-WT, and five units that provide training or education (i.e., TRACENs ATTC, Cape May, Petaluma, Yorktown) and the United States Coast Guard Academy.
Coast Guard (CG) Training Centers	(TRACEN) Those Coast Guard training centers that belong to the formal training system (i.e., TRACENs ATTC, Cape May, Petaluma, Yorktown, and the U.S. Coast Guard Academy). Other Coast Guard TRACENs are managed by operational programs (i.e., NMLBS, C2CEN, Fisheries, ATC Mobile).

Cognitive dissonance	An instructional strategy sometimes used in training programs designed to change attitudes. The theory of cognitive dissonance states that a person cannot believe two inconsistent things at one time (i.e., cognitive dissonance), so to reduce discomfort, students will try to reduce dissonance or downplay its importance. One possible outcome of this conflict is changed behavior.
Cognitive learning	A domain of learning that is concerned with knowledge and the various mental activities and processes by which the learner acquires knowledge and mental skills.
Cognitive modeling	An instructional strategy that uses an experts to talk about what they are thinking while they demonstrate a new skill or procedure.
COMDTINST 1550.23, Training Evaluation Policy, 21 July 98	Coast Guard policy that delineates roles, responsibilities, and guidance for conducting training evaluation.
COMDTINST 1554.1, Development and Management of Interactive Courseware for CG	Coast Guard policy that delineates roles, responsibilities, and guidance for the development of interactive courseware (e.g., CBT, WBT, IVT) for CG training and performance support.
Common operating environment	(COE) The Coast Guard' s standard architecture or standard image for its networked computing environment (i.e., SWSIII). For example, Access is a part of SWSIII' s COE, but Authorware is not.
Competency	The level of skill and knowledge required to perform a given task to standard under required conditions.

Competency analysis	An analysis of the traits or behaviors that are critical to superior performance. The analysis of these worker competencies is accomplished through behavioral event interviews and the development of a competency model. The competency model lists those core competencies required by a specific job (similar to the IBSTPI competencies listed in this SOP for instructor, course designer, and training manager).
Competency-based instruction	Training that is organized around an agreed upon set of competencies and which provides learning experiences designed to lead to the attainment of these competencies (e.g., IDC and CDC).
Computer-based training	(CBT) A type of ICW, CBT enables the user to access information, provides extensive cues/stimuli, and requires complex participation. Complete courseware: Creates situations that help the learner perform required tasks. Provides remediation and testing. Documents learner performance. CBT is delivered by a computer as opposed to an instructor. A successful CBT is media rich and highly interactive. Because it is self-paced and can branch each individual performer to exactly where the performer needs to go, it is a highly effective means of delivering instruction to a worker.
Conditions	That part of a performance objective that states the conditions/limits under which the task will be performed. Conditions statements should try to be as close to the real conditions in the field as possible (e.g., performed as night ops, performed in a highly-stressful and dynamic situation, etc.) If computers are used to perform the task in the field, the conditions should list those same computers as required equipment for the training event.
Constraints	Limiting or restraining conditions or factors such as policy considerations, time limitations, environmental factors, and budgetary and other resource limitations.

Content analysis	A type of analysis that analyzes the content of a job; an analysis of skill and knowledge information that classifies each task step or "subject" as a fact, concept, procedure, process, or principle. These five classifications are known as content types.
Continuing educational units	(CEU) Points awarded to students who attend training that does not provide academic credits, but does provide CEUs (e.g., how to start a small business, etc.).
Continuous professional development sessions	(CPDS) TRACEN Yorktown' s bi-monthly series of workshops and presentations that provide additional professional development opportunities for TRACEN instructors, course designers, and developers and training managers.
Core competency	Those behaviors a competent professional (e.g., instructor, course/training program designer and developer, or training manager) must demonstrate to successfully instruct students, design courses, or manage training. The International Board of Standards for Training, Performance, and Instruction (IBSTPI) is the organization that defines core competencies for instructors, course designers and developers, and training managers.
Core enabler	One of the key processes or procedures used by the Coast Guard to ensure accomplishment of its business goals.
Cost-benefit analysis	(CBA) A type of analysis that examines the cost of producing a product, service or process, its tangible and intangible benefits, and its ROI and presents that information as data-driven recommendations for adopting one product, service or process as opposed to others management might select.
Course	A planned and organized series of learning experiences related to a particular job or group of tasks or to a topic. A course is also a series of units of instruction designed to fulfill a specified purpose such as qualification to enter a rating or specialized field or to enhance job qualifications.

Course designer	A person, usually located at a CG TRACEN, who designs the plan (blueprint) and course map that tell course developers what materials, strategies and methods, training aids, and media to use to achieve effective and efficient instruction.
Course designer course	The Coast Guard' s five-day workshop that trains subject matter experts (SMEs) or instructors to perform course design work.
Course developer	A person, usually located at a CG TRACEN, who develops strategies and methods, course materials, lesson plans, media, and training aids in accordance with what the design (i.e., plan, blueprint and course map) tells him or her to develop to achieve effective and efficient instruction.
Course map	A chart, "blueprint" or map that depicts the designed sequence of presentation for a given course, established during course design. The course map tells the course developer how a particular training program is set up and how materials, training aids, media, etc., should be developed to support that training program.
Courseware	An actual instructional package (including content and technique) loaded in a computer, training device, or other instructional delivery system.
Criterion-referenced	(CR) A standard by which a measurement of something can be made. For example, criterion-referenced tests are those that measure whether or not a student's performance of prescribed behavior, under predetermined conditions, meets the standard specified in one or more TPOs or EOs. Criterion-referenced grading refers to a way of grading students in relation to a predetermined standard (go or no-go). The standard is based on job requirements.
Criterion-referenced instruction	(CRI) Instruction aimed at training students to perform established objectives (performance criteria) to the prescribed standard.

Criterion-referenced test	A device, technique, or measuring tool that establishes whether or not an individual or group performs the objective to the established standard. Performance is measured as go or no-go against a prescribed criterion or set of criteria. It is scored based upon absolute standards, such as job competency, rather than upon relative standards, such as class standings.
Cross training	The systematic training of Coast Guard workers on tasks related to another duty position.
Cue	A word, situation, prompt, or other signal for action. An initiating cue is a signal to begin performing a task or task step. An internal cue is a signal to go from one element of a task to another. A terminating cue is a signal that the task is completed. Cueing is a term that refers to a deficiency in a test question (i.e., the correct answer can be found or implied from information provided elsewhere in the test).
Current state	A synonym for "actuals."
Curriculum	A course of study. A Coast Guard curriculum consists of course design, lesson plans, training aids, instructional materials, student evaluation plan, tests, course map, all other associated training materials, and a curriculum outline.
Curriculum outline	A control document for a curriculum that is expressed in outline form. The current documentation the Coast Guard uses to capture a training program' s lesson titles (units), its terminal performance and enabling objectives in sequential order, methods of instruction, hours required to instruct each unit, resources required (i.e., equipment and staffing), infrastructure required (i.e., lab or classroom and their sizes), and so forth. The curriculum outline is a multipurpose document that provides different layers of CG management with the detailed information they need to approve and maintain a training program. The curriculum outline is also used by ACE to accredit Coast Guard courses for purposes of obtaining college credits for training received by Coast Guard members.

Data	Objective, factual information that supports a conclusion or a recommendation gained through a valid, repeatable process.
Defense Automated Visual Information System	(DAVIS) A searchable database listing of Department of Defense (DOD) audiovisual (AV) productions and interactive multimedia instruction (IMI) products.
Defense Instructional Technology Information System	(DITIS) A searchable database listing of Department of Defense (DOD) audiovisual (AV) productions and interactive multimedia instruction (IMI) products.
Delivery system	The combination of teaching methods, media, and instructional setting required to present instructional effectively and efficiently (e.g., resident, exportable training, CBT, WBT, IVT, and so forth).
Demonstration	A two-way instructional method that allows the instructor to tell and show students the correct way to do something while allowing students the chance to practice that performance and receive feedback. Usually, this method is accompanied by verbal commentary and cueing. The idea behind the method is that skill comes from the students seeing how something is done, then doing it themselves under the eye of an instructor. Generally speaking, the instruction is prefaced with an explanation of what students should look for when the skill is demonstrated.
Design	The second phase of the ISD model, design work involves creating a blueprint or course map that plots out how the training program will be delivered, what methods and strategies will be used, how people will be tested, what training materials and media need to be developed, and so forth. Design work acts as a blueprint for the developer to use in developing the training program or performance support.

Desired state	Desired state refers to optimal performance. In other words, desired performance means the most accurate, reliable, and efficient performance that can be accomplished considering the constraints that may influence or affect performance. The desired state is made up of the performances we ideally want members to do or think about. The desired state is also referred to as "optimals."
Development	The third phase of the ISD model, development work consists of developing or producing products from the plan ("design") provided by the course designer. Typical development work involves completing tests (level 2 evaluations), developing lesson plans, course materials, media, training aids, case studies, role plays, and so forth.
Diagnostic FEA	One of the two types of front end analysis, diagnostic FEA is used when there is a documented performance problem that the organization wants to correct (e.g., too many CASREPs, too many losses of lives, boilers not being maintained properly or lasting as long as they should, etc.).
Didactic	A one-way method of instruction in which the instructor tells students the knowledge or information that makes up the instructional event. Usually, didactic modes rely upon the lecture method to communicate information.
Difficulty-importance-frequency model	(DIF) One of several models used to select tasks for training and to select proper site for training (i.e., on-the-job or at a schoolhouse). Using this model, the analyst prepares instruments that help workers identify critical tasks based on their relative difficulty, importance, and frequency as regards job performance. The tool the analyst uses to "filter" survey results allows him or her to identify tasks that should be trained in a program of instruction, those that do not require training, those that should be trained on-the job, and those that should be job-aided.
Discovery learning	Instruction, usually through questioning techniques, that leads the learner to "discover" a particular strategy.

Discussion	An instructional method that uses the exchange of ideas about a given topic between the instructor and students as a way to learn information.
Distance learning	The application of multiple means and technology to deliver standardized training to Coast Guard members at the right place and right time. A delivery system for training or education that is delivered to students who are remote (i.e., at a distance) from where the training or education program is being conducted. For example, an interactive video teletraining delivery of Deliberate Planner might originate at TRACEN Yorktown but be beamed to students at Coast Guard units all over the United States. Also referred to as distributed learning.
Distractor	In testing, incorrect answer choices to multiple-choice or matching-type test items.
Distributed Learning	Also referred to as "distance learning," distributed learning is structured learning that takes place without the physical presence of the instructor. Distributed learning is enhanced with technology. It may draw upon resources which are physically distant from the location where learning is taking place and may include the use of one or more of the following media-correspondence course materials, audio/videotapes, CD ROMS, audio/video teletraining, interactive television, and video conferencing--to provide *right-time, right-place* learning.
Dramatic statement	A term used in designing role-plays. A dramatic statement is a component of a role-play that sets the scene for what is to occur (i.e., similar to a cliff-hanger in a movie).

Duties	A duty is a major subdivision of a job. Each duty is comprised of a group of related tasks. A duty normally exists in one functional area and is characterized as (1) a recognized segment of a job that occupies a principal portion of a billet incumbent' s time, (2) occurs frequently in the work cycle, and (3) involves work requiring closely related skills and knowledge. A duty is generally performed according to a prescribed method to meet a set standard. The method and standard employed may be documented or oral, and may have been established by precedent or by higher authority. Some examples of duties are supervise personnel, develop instructional media, conduct instructional systems, and so forth. Duties can also be those tasks that are performed as part of a specific job that may require specific skills, knowledges, and training, but that are not necessarily intrinsic to that job (e.g., watch stander, Civil Rights Officer, etc.).
Education model	A model that teaches people subjects, content, and how to think as opposed to how to do. For example, a History of Fine Arts course will teach different styles of painting and sculpture created during certain periods of history, but will not necessarily ask students to paint or sculpt.
Education Specialist	A job title found in the private sector; is one of the occupational series in Federal government. They are expected to have a background in teaching, training, or designing curricula for adult learners and have graduate-level course credits in education. Given the changes brought about by emerging technologies and an increased focus on performance, the title has tended to change to other more specialized designations. Within the Federal government, most former education specialists have obtained technology training or on-the-job experience that allows them to make the change to Instructional Systems Specialists (ISSs).
Elaboration	An instructional strategy that trains students to put unfamiliar terms in a sentence or other mnemonic device that will help them remember such information.

Electronic Performance Support System	(EPSS) Electronic performance supports designed to assist a performer in accomplishing a given task or set of tasks. EPSSs can be built into equipment operating systems (i.e., embedded support) or provided to a performer through a software application to assist him or her in performing a task. Computer software online help programs and electronic equipment self-diagnostic systems are examples of EPSSs. A CG example is the EPSS designed to assist company commanders with soft skill development at Recruit Training Center Cape May.
Embedded training	Training that is provided by capabilities designed to be built into or added onto operational systems to enhance and maintain the skill proficiency necessary to operate and maintain that equipment and item.
Emerging technologies	Those cutting-edge technologies that are constantly emerging (e.g., OOP) that may be beneficial for Coast Guard operations, performance support, performance improvement, and training.
Enabling Objective	(EO) An objective developed from a skill or knowledge that describes in measurable and observable terms a necessary step to accomplish the related TPO. It contains a stated and measurable standard of performance.
Ends	The results, impacts, or accomplishments we get from applying the means. Ends are what is achieved or accomplished.
Enlisted Advancement Study Team	(EAST) A recent Coast Guard performance analysis study that looked at the issue of enlisted advancement. The study reviewed advancement processes for all the military services and concluded that the Coast Guard had the best and most fair method for advancement. The study also looked at the issues of having both an end-of- course and servicewide examination. Although they are still working this issue, the study concluded that one examination will be sufficient for advancement purposes.

Enlisted rating and performance qualifications review	A process that is still being defined by which a specific Coast Guard rating' s qualifications are validated and published and renewed.
Enterprise schema	An instructional strategy that tells the student the entire purpose of what is being learned (i.e., the enterprise)--e.g., maintaining an engine--so that he or she can better remember a particular lesson (e.g., inspect the manifold) under the larger enterprise schema.
Environment	The environment that surrounds and affects performance is made up of policies, procedures, processes, available time, physical space, and tools.
Ergonomics	The engineering science of the physical environment in which work takes place. Essentially, it matches work design to the capacities and limitations of the human body.
Evaluation	A systematic process to obtain measurable information (feedback) about the strengths and weaknesses of a training program or examination. Evaluation is also the collection, analysis, and reporting of information pertaining to performance with respect to a designated standard. The purpose of evaluation is to provide trainers and managers with evidence of the effectiveness and efficiency of a training program or performance support.
Experiential learning	Theory that learning occurs from the suddenly occurring reorganization of a student' s field of experience (e.g., student has a "new idea" or "discovers" the solution to a problem).

Expert judgment	The first main phase of a summative evaluation effort. The expert judgment phase is anchored in the model for systematically designing instruction. During the expert judgment phase, the evaluator begins by evaluating the congruence between the instructional needs of the organization and the goals of instructional materials being evaluated. Completeness and accuracy of materials are also evaluated. SMEs are then asked to verify the instruction' s content, and the evaluator reviews instructional materials for the quality of their instructional strategies, their utility, and their influence on current users. Materials that "pass" the expert judgment phase are then subjected to the second phase of summative evaluation, a field trial.
Extant Data Analysis	Research and analysis of existing data.
External evaluation	The primary purpose of external evaluation is to find out if graduates can do the job for which they were trained. Another purpose of external evaluation is to determine if the job has changed since it was first analyzed. External evaluation is conducted AFTER the trainees have finished training and have been assigned to the job typically for 6 to 18 months.
Fading	A type of shaping, fading is an instructional strategy that provides many cues and then gradually reduces those cues and coaching until finally all cueing and coaching is completely withdrawn and the students are on their own.
Family of job aids	A term for a group of job aids developed simultaneously to provide performance support for related jobs. Examples are job aids for the LST-5D or job aids for positions specific to an Incident Command System (ICS) stand-up.
FEA or JTA Report	The report of FEA or JTA findings that is provided to stakeholders at the completion of an FEA or JTA project.
Feedback	Information to a worker or student about the results of an action taken; feedback is used to improve performance on future actions. Feedback can be both information and data, and provided both within and outside of the training system.

Fidelity	The degree to which an ICW program accurately represents the environment. Fidelity usually includes the level of interactivity and the quality of visual, tactile, or audible information. ICW programs range from basic level 1 systems (page- turners with limited graphics/media, some testing and feedback, limited branching) to level 4 programs (branching, extensive media, testing, remediation/feedback, and high fidelity learner interactions).
Field trial	The second phase of a summative evaluation effort, this phase involves trying out those instructional materials or performance supports that successfully "passed" the expert judgement phase on a representative sample of the target population. The field trial gathers data on the effectiveness of the instruction or performance support in regard to error rates, criterion test performance, and time to complete the course.
Flowcharting (TA Method)	Another method for conducting task analysis. It is a particularly effective method for "picturing" how a task is performed and ensuring that decision points are properly captured.
Formative evaluation	"The collection of data and information during the development of instruction, a training program, or a performance support which can then be used to improve the effectiveness of that instruction, training program, or performance support." (Dick and Carey)
Formative feedback (constructive criticism)	An instructional strategy that uses constructive criticism to help students learn how well they are performing a task at the time of performance and what they need to do to improve.

Front-end analysis	A level of PA that is a subset of program level analyses. FEAs are limited to specific individual jobs, specialties, or activities and they are geared toward individual performance. HPT' s Phase 1 of the ABCD system is a structured approach that is recommended for Coast Guard members conducting FEAs. If using this methodology for a group or unit with varied jobs, the PC will more likely conduct a series of FEAs, one for each of the individual jobs. The FEA report includes a set of required skills that are used in the follow-on design of training. The report also includes other recommended nontraining interventions. The ABCD system approach uses two types of FEAs: New Performance Planning for new starts and Diagnostic FEAs for actual performance problems.
Goal analysis	Goal analysis is a type of analysis that allows instructional designers to determine what skills must be learned in order to achieve a specific goal (e.g., the learner will choose to make decisions about his or her life-style that reflect positive lifelong health concerns). A goal analysis includes two fundamental steps. The first is to classify the goal statement according to the kind of learning that will occur. The second step is to describe exactly what a student will be doing when the is performing the goal.
Government-Furnished Material	(GFM) Government-furnished materials are those items provided to a contract and spelled out in the Statement of Work (SOW). Typical GFM for training contracts are manuals, references, illustrations and graphics, lesson plans, visuals, slides, etc. GFM are also called government-furnished information (GFI) and government furnished equipment (GFE).
Government Performance Review Act	(GPRA) A law that changed the focus of government agencies from activities to producing results. Results are now directly linked to outcomes.
Grouping	An instructional design strategy that involves clustering tasks to provide learning structure. For example, skills and knowledge requiring training can be grouped by topic, problem-solving, or task-centered models (there are other possible groupings than the three listed here).

Hands-on performance	Student practice of training on actual equipment, simulators, and training aids.
Holistic	Emphasizing the organic and functional relationship between parts and whole (opposite of atomistic)
Human Performance Technology	(HPT) A careful and systematic approach to solving problems--or realizing opportunities--related to the performance of people, groups, or organizations. HPT results in solutions that improve a system in terms of achievement or accomplishments that the organization values.
Hybridization	Convergence of multiple distribution systems approach. Examples of hybridization include CBT/ICW with WBT, e-mail, and video-conferencing.
Hyperlinks	Electronic links that enable the user to quickly jump from one location or activity to another. Hyperlinks are created by using a mark-up language, usually SGML, HTML, or XML. Typical applications include inter-intranet electronic documents, and EPSSs.
Hyperlinks	Electronic links that enable the user to quickly jump from one location or activity to another. Hyperlinks are created by using a mark-up language, usually SGML, HTML or XML. Typical applications include inter/intranet documents, EPSSs, and ICW.
Hypertext Mark-up Language	(HTML) Computer coding commonly used to hyperlink text, graphics, and other media within computer files. Most common mark-up linking language used on the internet. Development tools are inexpensive and easy to use. HTML browser is part of SWSIII office package.
Implementation	The actual conduct of training by any method of instruction using validated training materials created during the design and development phases.

In-Progress Reviews	(IPR) Conducted during the development of contractor-produced products as an opportunity for clients and developers to jointly review technical accuracy and validation of products. Periodic, scheduled meetings at which the contractor developer and Coast Guard ITs, ISSs, and SMEs review progress on a product so far and offer recommendations for its improvement.
Incentives & rewards	Those things provided by an organization that ensure or reward desired performance (e.g., formal awards, feedback, praise, bonuses, or time-off).
Incident Command System	(ICS) The Incident Command System is used to manage an emergency incident or a nonemergency event. It can be used equally well for both small and large situations. The system has considerable internal flexibility. It can grow or shrink to meet differing needs. The Coast Guard uses ICS for "all hazard/all response" incidents.
Individual capacity	An individual's innate abilities and characteristics--individual strength, height, weight, etc.,--e.g., can lift 50 lbs or more, is 5' 4" and cannot reach the overhead tool bin. Innate capability, competency, or fitness to perform. For example, an individual's physical capacity includes muscle strength, endurance, vision, and hearing as well as other physical skills.
Individual Development Plan	IDP) A plan developed jointly by a worker and his or her supervisor that captures the activities, events, training or education, reading, etc., the individual needs to accomplish in order to further his or her professional development.
Influences	Elements such as tools, work design, feedback, assignment and selection, policy, and training that impact human performance positively or negatively.
Information	Knowledge (usually job or task-related) obtained from a training program or instruction.
Instructional design	A systematic process for working the principles of learning and instruction into plans for an instructional event.

Instructional materials	All items of material prepared, procured, and used in a course or training program as part of the learning process. This includes the general categories of training aids and devices, training equipment, and instructional literature.
Instructional methods	A variety of techniques and procedures for presenting instruction that, when used properly, enhance learning (e.g., lecture, demonstration, case study, role-play, independent study, etc.).
Instructional plan	(IP) A pre-decisional document and presentation that presents three or more possible deliveries for a training program or performance support, costs out each, and makes recommendations on which one has the best ROI. The IP must be developed and one option approved before alternative delivery design work begins.
Instructional strategies	Various techniques worked into instructional design that have a proven record for enhancing learning of a particular skill or knowledge (e.g., fading, shaping, backward chaining, etc.).
Instructional Systems Design	(ISD) The systematic approach model the Coast Guard uses to produce effective and efficient instructional events. The model consists of five phases: analyze, design, develop, implement, and evaluate.
Instructional Systems Specialist	(ISS) An occupational designator used by Office of Personnel Management (OPM) for an individual involved in working with instructional technologies, various models (e.g., ISD) for designing and developing instruction, and applying the principles and procedures of performance technology to problems with human, on-the-job performance.
Instructional Technology	(IT) The instructional technology program provides the mid-grade officer with the skills needed to apply the Systems Approach to Training (i.e., analysis, design, development, implementation, evaluation) to Coast Guard performance improvement programs.

Instructor	A person who leads or facilitates instructional activities.
Instructor development course	(IDC) The Coast Guard' s five-day training program for converting SMEs to instructor and facilitators.
Instructor evaluation	A documented report, provided by qualified observers of an instructor' s training ability, skill, and knowledge.
Instructor-led	Instruction that is dependent on an instructor or facilitator; the term is often used to distinguish instruction led by an instructor from instruction that is self-paced and student-centered.
Item analysis	The process of determining whether a test item is functioning as intended. Alternatively, the use of results on individual test items to determine effectiveness of the item. It can be used to obtain feedback on training deficiencies, score exceptions, and improve future versions of the test.
Interaction	"The time period when a student responds to a computer stimulus using just-learned knowledge." (Fritz, 48). Examples include a drag-and-drop exercise, answering a multiple-choice question, or solving a case problem.
Interactive courseware	(ICW) Computerized courseware that disseminates information. Ideally, CBT enables the user to access information, provides extensive cues or stimuli, and requires complex participation. Complete courseware creates situations that help the learner perform required tasks, provide remediation and testing, and document learner performance.
Interactive video-teletraining	(IVT) IVT uses land or satellite networks to deliver training to various locations. Two-way communications and interaction between the trainees and the instructor put the "interactive" in video-teletraining.

Interactivity	A two-way communication in which stimuli and response is direct and continual. Levels of interactivity for CBT, WBT, etc., range from level 1 (i.e., passive, "page-turner") to level 4 (i.e., real-time participation).
International Board of Standards for Training, Performance, and Instruction	(IBSTPI) The organization that defines and establishes core competencies for training and performance improvement professionals.
International Society for Performance Improvement	(ISPI) A society dedicated to providing professional development experiences (i.e., workshops and conferences, presentations, local chapters, paper publication, magazine and book publication and dissemination, etc.) for performance technologists and performance consultants.
Interservice Training Review Organization	(ITRO) Group whose major effort is directed toward improving the cost effectiveness of training through voluntary cooperative efforts among the services. ITRO is guided and directed through a structure consisting of boards and committees, superimposed on the formal organizational structures of the services concerned.
Interventions	The recommendations that are the outcome of a PA. Implemented as a whole solution set, these recommendations *intervene* to eliminate a performance gap.
Iterative process	A process that repeats its steps (i.e., say or do over again).
JC qual code	The qualification code Coast Guard instructors earn after attending IDC and 6 months satisfactory performance as an instructor, or 12 months satisfactory performance as an instructor.
JI qual code	The qualification code Coast Guard course designers and developers receive after attending CDC and 12 months satisfactory performance as a course designer and developer.

Job	A job consists of the performance elements that are the responsibility of an individual assigned to a specific billet.
Job aid	A place to store information needed at the workplace other than in long-term memory. Job aids are guides and performance supports that help members perform tasks they do infrequently, or that are too complex to memorize, or that are comprised of critical steps. Job aids can take many forms such as checklists, document templates, or aviation repair maintenance cards. Job aids may either supplement or replace training. They are the foundational documents for Coast Guard course design work.
Job aid analysis	A type of analysis that involves two steps and provides two outputs: Determining if job aids are appropriate given environmental and ergonomic or social constraints. Determining if job aids can stand alone or if they require introductory or extensive training.
Job aid with extensive training	One possible outcome of a job aid analysis. Job aids with extensive training means the job aid must be used as a training aid and supported by extensive training (i.e., introduction and context, practice, repeated practice, fading, shaping, and backward chaining).
Job aid with introductory training	Another possible outcome of a job aid analysis. Job aids with introductory training means job aids require relatively little training. It should be sufficient to introduce them, demonstrate their use, and provide initial cueing and practice.
Job Aids Workshop	(JAWS) A Harless-developed and HPT-sponsored workshop that trains people in appropriate times to use job aids and in the techniques for developing effective job aids.
Job performance requirements or measures	(JPR) Tests that are used to evaluate proficiency of job holders on each task they perform.

Job task analysis	(JTA) A type of performance analysis that determines the duties and tasks that are, or should be, performed by personnel occupying a given type of billet or fulfilling a given function.
Joint Rating Review	(JRR) The Coast Guard study that used occupational analysis techniques and processes to simultaneously analyze 10 enlisted ratings that maintained or operated electronic equipment. The purpose of the study was to develop recommendations for best positioning the ratings for optimal performance through 2010. The ratings analyzed were BMs, EMs, ETs, FTs, GMs, MKs, QMs, RDs, TCs, and TTs.
Joint training	Training in which elements of more than one service of the same nation participate.
Junior Officer Needs Assessment	(JONA) The Junior Officer Needs Assessment (JONA) study was one of several needs assessments undertaken to determine the varying professional development needs of different segments of the Coast Guard' s workforce.
Knowledge	Knowledge is information acquired and stored in memory. Knowledge can be classified as facts, procedures, concepts, or principles that guide performance. It can also be defined as the information or facts required to perform a skill or to support task performance. For a trainee, acquiring knowledge means being able to accurately recall information or explain where to find critical to the job information with a minimal search time (i.e., the source instruction or reference). Knowledge acquisition makes up the building blocks for higher order performance. Job context is the criterion for deciding what needs to be memorized and what can be left to the open-book real world. This decision will also depend on task-specific characteristics such as frequency, timing, criticality, and complexity involved in performing the task.
Knowledge Qualification TA Worksheet	A specialized "task analysis" tool that can be used to analyze knowledge qualification factors.

Learner Plan	(LP) Called an IP by CDC, the new term, an LP, is the final output of Coast Guard design work. It includes a course map or blueprint--a detailed plan of learning activities and experiences that describe what learners will do and use (i.e., a blueprint, course map, and outline).
Learning	Learning is the acquisition of knowledge, skills, and attitudes through the integration of education, training, and performance aiding in a comprehensive, mutually supportive system. R. Gagne: "A change in human disposition or capability that persists over a period of time and is not simply ascribable to processes of growth." Mager: ". . . the relatively permanent change in a person' s knowledge or behavior due to experience."
Learning assessment/test	A device, technique, or measuring tool used to determine if a student or group can accomplish the objective to the established standard; determine if training does what it is designed to do effectively and efficiently; or measure the skill, knowledge, intelligence, abilities, or other aptitudes of an individual or group.
Learning decay	The rate at which an individual loses the ability to perform a task or can no longer recall supporting knowledge and skills.
Learning hierarchy	The relationships among objectives in which some objectives must be mastered before others can be learned. A learning hierarchy helps show that intellectual skills are not learned in isolation but rather have relationships to each other. (Simple rules may be prerequisite to the learning of a more complex rule. Once that rule is learned, it may be combined with another rule to learn even more complex rules. The entire set of intellectual skills forms a learning hierarchy that describes the average and efficient route to the attainment of the highest order of intellectual skills.)

Learning objects	Smallest piece of training material stored in the distribution system. Developing courseware by using small training objects enables developers to easily reuse courseware. For example, a hydraulics module could be used across a wide variety of training and performance applications provided the learning object is stored in an easily identified and retrievable format.
Learning theories	Those theories that attempt to describe, explain, and predict learning.
Lecture	("chalk & talk") An instructional method that uses a speaker (i.e., instructor/facilitator) talking to an audience on a particular topic.
Lesson	The basic building block of all training--the level at which training is designed in detail. The lesson is structured to facilitate learning.
Lesson plan	A detailed plan that describes the learning activities and experiences that learner will do and use. It is a document that outlines a lesson' s strategies, methods, activities, tests, recall and feedback, and practice exercises, etc. A good lesson plan follows a strategy such as using Gagne' s nine instructional events. It also contains enough information for a novice to use (e.g., "sea stories," techniques, mnemonics, learning hierarchies, etc.). Personalizing a lesson plan refers to making another standardized lesson plan your own by adding your own notes, "sea stories," analogies, and annotations of what would work better the next time.
Level 1 evaluations (student critiques)	The first level of training evaluation in Dr. Kirkpatrick' s four-level evaluation model, level 1 evaluations assess student reaction to the instructional event or training program. Reaction is important because negative reactions can impede learning--the goal of an instructional event or training program.
Level 2 evaluations (tests)	The second level of training evaluation in Dr. Kirkpatrick' s four-level evaluation model, level 2 evaluations assess learning. Level 2 tests are the test results that demonstrate whether students did or did not learn. The model advises pre- and post-testing as the best means for determining if learning took place.

Level 3 evaluations (external evaluations)	The third level of the Kirkpatrick training evaluation model, level 3 evaluations assess behavior back on the job. Level 3 evaluations seek to determine if changed attitudes and learned skills and knowledges are resulting in the performance the Coast Guard desires on the job.
Level 4 – organizational results	The fourth level of the Kirkpatrick training evaluation model, level 4 evaluations look at organizational results. In other words, if levels 1-3 showed positive results, was there a related positive impact on results? (e.g., more lives saved, fewer CASREPs, etc.).
Life cycle management	Refers to the need to plan the management of a major training program or performance support from its inception, through design and development and then until the ultimate phase out and disposal of the program or support.
Linear process	A process that is carried out or accomplished by going from step-to-step, in a straight line (e.g., step one, followed by step two, etc.).
Major accomplishment	The outcomes or products produced by the workers in an organization; what is left behind after work or performance is done.
Means	The way in which we do something. Means are the processes, activities, resources, methods, or techniques we use to deliver an outcome or organizational accomplishment.
Media	A means of conveying or delivering information. Examples of training media are paper, film, videotape, broadcast television, computer program, etc.
Media selection	A form of analysis that allows the individual performing media selection to choose the most effective means of delivering instruction.

Media shot list	The list the training program or performance support designer and developer provides to the photographer or videographer. The media shot list tells those individuals the pictures, photographs, and videos they should take. The outputs of a media shot list are critical media inputs to developers producing a multimedia program.
Mental practice	An instructional strategy that has the student mentally practice (i.e., visualize) the steps of a task.
Methods of instruction	Various ways for presenting instruction to students. Examples of various methods are lecture, discussion, demonstration, etc.
Migrate	The process of converting a traditional resident or paper-based course to some form of alternative delivery.
Mnemonic device	An instructional strategy or device that helps the student associate a known thing with something that is unknown. For example, ADDIE is a mnemonic device that is easy to remember and it helps jog a person' s memory to recall that ISD has five phases: analysis, design, development, implementation, and evaluation.
Module	A course component, especially one that can stand alone, that will be learned independent of other units (e.g., CG policy statement on sexual harassment).
Motivation	The personal desire to perform. Motivation is comprised of both value and confidence. Value is knowing why the desired performance is important and confidence is the member' s belief that he or she can do it.
MTU engine	Brand name of propulsion engines currently on board 87' WPBs.

Multimedia	In training, the use of more than one medium to convey the content of instruction. Media may include (but not be limited to) text, videotapes, audio tapes, slides, films, television, or computers. Multimedia is also the industry term used to define both the presentation and the training that is delivered via a multimedia workstation or personal computer. It uses test, graphics, digital audio, animation, and full motion digital video. Usually, multimedia is delivered via hard disc, floppy disc, CD-ROM, or intranet.
Multisense instruction	Instruction that involves and engages as many of the student' s senses as possible (e.g., visual, auditory, tactile, etc.).
Murder board	A kind of formative evaluation that uses a panel of SMEs who try out developed instruction and provide criticism aimed at improving the final product.
Needs	The difference between the desired results (optimals) and the current results (actuals). Needs differ from wants in that needs are based on identified performance gaps, whereas wants are preferred or valued means that may or may not be linked to a performance gap or clear performance goals.
Needs Analysis	The study of performance and the environment that influences it in order to make effective recommendations and decisions about closing the gap between actual and desired performance. Sometimes the recommendations involve training, and other times they do not. Needs analysis is also referred to as performance analysis or front-end analysis.
Needs Assessment	A systematic process that enables identification of the general causes of discrepancies between what exists and what is required. Needs assessment can be proactive or reactive. Allison Rossett defines needs assessment as the "systematic study that incorporates data and opinions from varied sources in order to create, install, and evaluate educational and informational products and services. The effort commences as a result of a handoff from the performance analyst and should concentrate on those needs that are related to skill, knowledge, and motivation." Also known as training needs assessment.

New Performance Planning FEA	(NPP FEA) The type of FEA used for defining performance and performance support needs for new equipment, new acquisitions, a new process--in short, any new start for the organization.
New start	A term commonly used to indicate something that is new to the organization--whether that be a new training program, new form of performance support, new piece of equipment, or acquisition of a new system.
NIDA	NIDA Corporation is a business leader in electronics training equipment and computer-assisted instruction. They offer a complete line of training equipment and courseware for electronics including basic electronics, avionics, automotive, communications, computer repair, microprocessors, fiber optics, and more. NIDA trainers are equipped with cards that have fault insertion capabilities that can be activated and deactivated manually or electronically by the test console. NIDA trainers are extensively used in Coast Guard electronics training.
Nine instructional events	Robert Gagne' s instructional strategy for designing and delivering instruction that enhances transfer and retention of learning. The nine events are: (1) gain attention, (2) inform learners of objectives, (3) stimulate recall of prior learning, (4) present content, (5) provide learner guidance, (6) elicit performance, (7) provide feedback, (8) assess performance, and (9) enhance retention and transfer.
Non-rate Needs Assessment	Another Coast Guard study to determine both the overall and specific performance and professional development needs of Coast Guard non-rates.
Nontraining solution	A solution to an identified performance deficiency other than training (e.g., new tools, clarified policy, etc.).
Norm-referenced	A test or instruction that grades students based on the performance of other students taking the same test or instruction. The test is scored based upon relative standards, such as class standing, rather than upon absolute standards, such as job competency.

Object-oriented programming	(OOP) An emerging technology that, when merged with authoring software, offers the potential to produce just-in-time training tailored to only what the learner wants and needs. OOP is already being used by some private sector companies to provide small nuggets of learning to employees on demand.
Occupational analysis	(OA) OA refers to a number of procedures to measure the job structure of an occupation. In most organizations, these procedures are referred to as "job analysis." However, most analysts for military organizations examine "job" families such as those in the Coast Guard enlisted rating structure.
Occupational Analyst	(OA) People in the Coast Guard who conduct occupational analysis.
Off-normal	A term used in the ABCD system to indicate performance that is unusual or not part of the normal job (e.g., performance in an emergency).
Off-the-shelf analysis	(OTS) Off-the-shelf analysis is a process used to evaluate commercial-off-the-shelf (COTS) or government-off-the-shelf (GOTS) ICW products for possible inclusion in a Coast Guard training program or as potential stand-alone products the Coast Guard could procure or buy. The procedures for analyzing COTS and GOTS products are found in COMDTINST 1554.1.
One-to-one formative evaluation	Within classic formative evaluation, one-to-one is the first stage of formative evaluation, and its purposes are to identify and remove the most obvious errors in instruction and to obtain initial reactions to the content from learners. ICW formative evaluation uses a modification of this technique in two-on-one, a method by which two learners work through the instruction and discuss with each other (and the evaluator) the problems they encounter with instruction. In one-to-one formative evaluation, the designer directly interacts with three or more individual learners who are representative of the target population. The designer learns what these individuals find problematic in the instruction and what their reactions to training content are. That data is used to improve the final product.

Operating tempo	(OPTEMPO) The annual operating miles/hours for systems in specific units required to execute the program' s operational strategy. All equipment generating significant operating and support cost has an established operating tempo.
Optimals	The desired state for organizational performance.
Organizational PA	(OPA) The level of PA called for in projects that have multiple program involvement and wider organizational impact. This type of PA is more cross-functional, and requires a more systemic approach as well as a PC who has a greater degree of experience and resources to lead the effort.
Overlearning	Practice beyond what is required for retention. This term is often referred to as over-training.
Paired associate learning	An instructional strategy that asks students to associate new labels with previously learned ideas or events.
Part skills	An instructional strategy for breaking down complex motor skills into part skills that are easier for the student to learn and remember.
Peer training	A form of instruction in which students at the same or more advanced level of knowledge provide instruction to other students at the same or lower level of knowledge on specific objectives.
Performance	The ABCD system defines performance as "the work by humans in the job situation; performance means both the behaviors and the accomplishment produced by behavior." (HPT)

Performance analysis	(PA) A systematic process used to determine what is causing ongoing performance problems or to anticipate performance opportunities and potential problems in new acquisitions and the rollout of new systems. The Coast Guard' s HPT analysis program includes two levels of PA: organizational PA and FEA. Typically, in a PA, a desired state is compared to the actual situation. The resulting difference or gap is caused by a variety of reasons that are uncovered through analysis. The outcome of a PA is a comprehensive list of recommended solutions to eliminate any performance gaps. New or improved training, equipment, processes, policy, and revised incentives are some examples of what could be included in a recommended solution system. PAs take anywhere from a few days to several months to complete, depending on their complexity and the resources available. The scope of a PA is considered to best determine which level of analysis is most appropriate.
Performance-based training	Instruction that develops student performance proficiency via task-based performance objectives written with an action verb. Students prove competency by actual performance of the objectives to the established standards. Creating a training program that will ask students to learn, do, and practice levels of performance similar to or the same as what they will have to do on the job. It also means designing training that simulates real life job scenarios and conditions to the greatest extent possible, given the delivery system the training program uses.
Performance checklist	A job aid used to determine or ensure a process or procedure is followed. The elements of the activity are listed in the sequence in which they are executed. A check is usually placed beside each element as it is accomplished.
Performance Consultant	(PC) Performance consultants are performance technologists who are in the business of analyzing performance problems and opportunities and identifying, designing, and developing interventions to improve performance.
Performance gaps	The difference or delta that exists when the desired state (optimals) differs from the actuals, or current state of performance.

Performance indicators	Performance indicators demonstrate the performances a trainee has learned. For example, tear down or rebuild an engine is a performance indicator for several performances: Start the engine Run the engine Troubleshoot the engine.
Performance Objective Assessment Specification Worksheets	A tool that helps the course designer design tests. This SOP suggests that course designers use these worksheets to begin initial design work for a training program' s or course' s tests.
Performance objectives	The objectives a course designer creates from a task listing. The Coast Guard uses performance objectives as the basic building block of a training program or course to ensure instruction and training are performance-based. The two types of performance objectives are: terminal performance objectives (TPOs) and enabling objectives (EOs).
Performance statement	See the term "terminal performance objective" (TPO) for an explanation of what a performance statement is.
Performance support	Any tool, device, or program that exists to help workers perform their jobs. Examples of performance supports are job aids and EPSSs.
Performance Technology	(PT) A field of work that takes an engineering approach to attaining desired accomplishments from human performers by determining gaps in performance and designing effective and efficient interventions to eliminate those gaps.
Performance Technology Center	(PTC) The designated focal point for Coast Guard expertise related to human performance analysis and the associated performance technology applications and tools that are most germane to Coast Guard projects and products. Includes identification and use of the tools and processes needed to complete focused analysis, evaluation, and cost-effective product creation. Relies on a "virtual environment" that includes other CG developers and centers of human performance excellence.

Pilot (formative) evaluation	A kind of formative evaluation. Conducting a pilot evaluation involves looking at the first convening of a training program or use of a performance support to determine what needs to be improved before further program convenings or performance support use.
Pipeline	The total time involved in training personnel once they are designated as trainees, including time traveling to the training activity, time awaiting instruction, time of training, and time from termination of training until reporting to the ultimate duty station. Pipelines may include more than one training activity.
Practical exercise	The hands-on application of the performance required in the EO or TPO. Gives trainee opportunity to acquire and practice skills, knowledges, and the behaviors necessary to perform the objective successfully.
Preproduction plan	Term used for ICW design work (e.g., look and feel of ICW, navigation buttons, bookmarking, avatar choice, etc.).
Prerequisite training	The training which personnel must have successfully completed in order to be qualified for entry into training for which they are now being considered.
Pre-test	A test administered prior to instruction to determine how much the student knows and to determine if the students need to take this particular instruction.
Problem statement	An outcome of a FEA alignment meeting, the problem statement is a detailed definition (with supporting evidence) of the performance problem that an intervention is expected to fix .
Problem statement	Also a term used in designing case studies. A problem statement states the theme or central issue of the case.

Problem-solving structure	One of the methods for structuring a course (i.e., grouping tasks or topics) used during training program design work. This structure groups tasks as they would be used in problem-solving activities.
Professional development	A range of activities and processes that enable professionals to grow and mature in their professions (e.g., attendance at workshops and conferences, self-directed reading, cross-training, networking, obtaining further college credits, etc.).
Proficiency	Levels of skill that exceed the competency requirements for correct performance of a given task.
Program Level Performance Analysis	A type of PA, a program level PA requires greater depth and breadth of knowledge to complete than does an FEA, but this type of analysis normally does not cross program lines. TRACEN training and performance analysts who have attended IT school or had considerable on-the-job experience will normally be assigned program level PAs.
Program Manager	(PM) The staff officer at Headquarters designed by and responsible to the program director for the detailed management of a Coast Guard program (e. g., search and rescue or maritime law enforcement).
Program of instruction	(POI) A DOD requirements document that provides a general description of course content, duration of instruction, types of instruction, and resources required to conduct peacetime and mobilization training in an institutional setting; (similar to curriculum outline).
Proponent	An organizational element that has been assigned the primary responsibility for a function or subject matter.
Prototype	An original model on which something is patterned.

Qualification factors	This term is synonymous with performance qualifications, formerly called practical and knowledge factors. Performance qualifications or qualifications factors are those essential job tasks that personnel in each rate and rating must be able to perform in order to advance.
Questioning techniques	One of the strategies instructors use to ensure their students learn. A good grasp of questioning techniques means being familiar with the different kinds of questioning techniques available as well as knowing how and when to use them (e.g., relay, redirect, directive, open-ended, framing, overhead, reverse, etc.).
Random selection	A process of choosing people or objects at random rather than through some systematic plan. A selection is random when all elements available for selection have the same chance of selection.
Rank order	The relative standing of an individual or a given trait with reference to other members of the group. For example, when all members of a group of 10 are arranged in order from lowest to highest, the number 1 may be assigned to the highest and the number 10 to the lowest.
Rapid prototyping	A type of formative evaluation that uses a working portion of the final product for immediate implementation with a group who then evaluates the portion. From results, developers continue to develop and improve the final product.
Rating Manager	(RM) Formerly called force manager, the rating manager is that individual within a program manager' s organization responsible for the oversight of a Coast Guard enlisted rating. This oversight includes structural concerns for the rating' s size and grade distribution, location of billets, the setting of performance standards, and the content of performance qualifications.
Reliability	A test is reliable if it consistently measures what it claims to measure.

Remediation	Special techniques and processes used to help trainees who have been unable to pass tests.
Remote learning center	A location designated to receive distributed learning that is not a resident TRACEN. Remote learning centers must be relatively close (i.e., within driving distance) of the job site when possible.
Resource Change Proposal	(RCP) Also called Resource Proposal (RP), is a document that officially requests a change in the way the Coast Guard spends its base budget.
Resources	People, equipment, funding required to perform Coast Guard operations, or bring a project to successful completion.
Retention	"The ability to reproduce learned behavior after a period of time has elapsed since the last performance." (R. Gagne)
Return on investment	(ROI) The savings generated by a program over its lifetime. Technology intensive tools often require significant up-front investment. ROI calculates when the program will save enough money to "pay-off" that investment and recurring costs. High ROI programs pay-off faster and then generate additional savings. ROI is usually computed based on a 3- to 5-year life cycle. However, life cycles can vary based on the organization and program.
Reusable learning objects	Smaller parts of larger training, CBT, ICW, EPSS, WBT & IVT programs; arranged in brief modules, accessible in random order. By digitizing and organizing parts of a training program (learning objects) into 10-30 minute modules, learning objects on topics and tasks common to several types of jobs (e.g., hydraulics maintenance) can be re-used by several different programs and accessed, just-in–time by workers with various training needs.

Role-play	A method of instruction that uses learner activity within an instructional environment to model the behaviors or attitudes desired in a conflict situation. The actor (i.e., the learner or another person) "plays out" the role rather than using an actual role model. Role-plays can be open (i.e., participants know all the information) or covert (i.e., some of the information is held in reserve from the participants).
Sample	A limited number of observations out of the entire population for use in making inferences about the entire population [e.g., all DCs at TRACEN Yorktown would represent a sample (but not a random sample) of DCs Coast Guard-wide.] A sample is a subset of a population.
Self-directed learning	Learning situations in which the learner takes the major responsibility for processing information, skills, and knowledge; also called self-regulated learning.
Self-paced	Instruction that is student-centered and that consists of materials, structured exercises, and tests that the students move through at their own pace as opposed to an instructor-led instructional event that moves at the pace the instructor sets.
Sequencing	In training design, sequencing is the proper ordering of instruction which allows the student to make the transition from one skill or body of knowledge to another and assures that supporting skills and knowledge are acquired before dependent performances are introduced. A related term is "sequential training" which refers to ordering training so that the learning of new or more complex skills or knowledge is built on and reinforces previously learned material.
Shaping	An instructional strategy that makes practice easier by providing many cues, either through a job aid or coaching.
Simulation	Any representation or imitation of reality. Simulating part of a system, simulating the operation of a system, and simulating the environment in which a system will operate are three common types.

Simulator	A training device that substitutes for, by emulation, the functions and environment of the actual process, equipment, or systems. Any training device, machine, or apparatus that reproduces a desired set of conditions synthetically. Specifically for training, a relatively complete item or training equipment, using electronic or mechanical means to reproduce conditions necessary for an individual or a crew to practice operational tasks in accordance with performance objectives.
Skills	The ability to perform a job-related activity that contributes to the effective performance of a task performance step.
Solution system (sometimes referred to as solution sets)	A comprehensive solution system is a set of recommendations that is the result of an FEA. These recommendations may include (but are not limited to) new or improved training, new equipment or tools, new or revised incentive programs, or revised processes, policies, and procedures.
Specialized practice	An instructional strategy that uses a "recognize, edit, produce" model to help students learn. For example, students are first asked to distinguish between examples of good and bad performance objectives, then they edit objective samples to improve them, and finally they write their own performance objectives.
SPS-73 Surface-Searching Radar	Radar equipment installed on the majority of Coast Guard cutters.

Staffing Standards Study	A major Coast Guard study contracted out to U.S. Army Force Integration Support Agency (USAFISA) due to lack of Coast Guard expertise in staffing standards development. USAFISA was asked to design and develop manpower standards to support TRACEN billet requirements and to meet Congressional mandates. The study was conducted using approved management and engineering methodology used by both DOD and other Federal agencies and tailored to meet Coast Guard working requirements and data. The basic premise of the study was that if workload increased, staffing should increase proportionally, and if workload decreased, staffing should also decrease. Data collection began in FY 92 and the study results were implemented for the FY 95 workload. Staffing standards from this study are still being used by Coast Guard Headquarters (i.e., G-WTT and G-CPA).
Standard Generalized Mark-up Language	(SGML) SGML is an international standard that describes the relationship between a document' s content and its structure. It is commonly used to hyperlink U.S. Navy technical publications. SGML production and use requires high-cost development software and proprietary browsers.
Standard personnel support costs	(SPC) SPCs (AFC-20) are full-time equivalent costs for military & civilian billets used for projecting personnel costs in the acquisition of new platforms and equipment that will require adding force structure to support and cost out changes to existing force structure. Computations for SPCs include full basic pay with entitlements, medical, leave, retirement, and moving costs.
Standards (i.e., criteria)	A statement that establishes criteria for how well a task or performance objective must be performed. The standard specifies how well, completely, or accurately a process must be performed or a product produced. The task standard reflects task performance requirements on the job. The performance objective standard reflects the standard that must be achieved in the formal training environment which should be as close to on-the-job performance as possible, but which may have to deviate from that standard given training environment constraints.
Statement of Work	(SOW) The document that describes to the contractor precisely the level of effort and products required from a contractor effort.

Stem	he part of a multiple-choice test item that asks a question.
Stimulus-response (TA Method)	One of several methods for conducting task analysis. The stimulus-response method is trained as part of HPT' s ABCD system.
Storyboards	A collection or series of small pictures or sketches arranged sequentially that describe the action and content in an interactive media (IM) production.
Streamlining	Both a Coast Guard FY 94 study and a managerial technique and process for reducing excess assets, infrastructure, equipment, people, units, etc.
Structured on-the-job training	(OJT) An instructional method that provides training at the job site and structures that training experience through lesson plans, workbooks, tests, and turn-key training packages that answer the field' s need for OJT but provide training support that standardizes instructional content.
Student-centered learning	Student-centered learning is instruction which takes place that revolves around the student. Characteristics of student-centered learning : Students take an active role in their training Instructors facilitate as opposed to teach Emphasis is on the students gaining skill or knowledge, not on the instructor "performing" well "Every" student is required to participate Activities "force" students to take an active role.
Subject matter expert	(SME) A person who is identified as an expert in a specific skill or performance that is included in an analysis.

Summative evaluation	Summative evaluation is defined as the design of evaluation studies and the collection of data to verify the effectiveness of instructional materials with target learners. Its main purpose is to make go no-go decisions about maintaining currently used instructional materials or about adopting materials that have the potential for meeting an organization's defined instructional needs. Summative evaluations have two main phases: (1) the expert judgment phase to determine whether presently used materials or other candidate materials have the potential for meeting an organization' s defined instructional needs, and (2) the field trials phase which is used to document the effectiveness of promising materials with target group members in the intended setting.
Supra-system	An overarching system under which subordinate systems are subsumed (e.g., the Coast Guard uses HPT as its supra-system for performance analysis).
System	A group of objects or units combined to form a whole and to work together to achieve results not possible from the individual parts.
Systemic	An approach that concentrates on and focuses on the "whole" rather than the parts.
Systems approach	A method that examines those factors, both internal and external to the organization that impact human performance. A systems approach applies a rigorous and methodical approach (e.g., ISD is a systematic approach that analyzes first, then designs and develops, then implements and finally evaluates).
Target audience	The persons for whom the instructional event or performance support is designed. The task of identifying the target audience consists of accurately identifying the correct student composition for a training program (i.e., determining who should and who should not attend or receive training--the "right" people). The task also involves accurately describing the target population' s characteristics (i.e., range of individual qualification and all relevant physical, mental, physiological, biographical, and motivational dimensions that make up that target population).

Task	A task is a work operation that constitutes a logical and necessary step in the performance of another higher order activity. A single task is composed of a set of task elements that lead to a common goal. A task produces a meaningful product, service, or consequence that is readily observable and highly significant in view of the overall objective of the job. It is meaningful to perform the task solely for the sake of obtaining its specific results. A set of operationally related tasks constitute a duty, the next higher order of work activity. Job tasks are the "heart" of the ISD process and become the basis for planning, developing, and evaluating instructional systems.
Task analysis	(TA) The analysis process and procedures for identifying the various elements (steps and substeps, conditions, standards, references, tools, equipment required) that are essential to the accomplishment of a task.
Task-centered structure	One of several methods course designers use to structure a training program design. The task-centered structure groups or clusters several tasks together based on their relationship to job tasks (e.g., troubleshooting unit, using CFRs unit, etc.).
Task inventory	(TI) An organized list of task statements that, taken as a whole, make up the job. In the Coast Guard, a task inventory is the list of tasks jointly developed by the rating manager (RM) and the occupational analysts (OAs) before an occupational analysis effort begins. The task list is compiled of tasks it is assumed different pay grades in the rating (job) are performing as well as tasks that may be performed on specific platforms due to new equipment, trends, and new technologies affecting the rating. The TI is the basic source document from which the OA develops interview questions for interviewing SMEs on site.
Task listing Method	A method for conducting TA that uses Coast Guard SMEs with a great deal of experience in how the task is performed to list all steps and substeps required to perform the task in the order those steps are performed on the job.
Task steps	Taken together, the steps of a particular task. The component and related sets of activities required to complete the task.

Technology	A technical method of achieving a practical purpose.
Terminal Performance Objective	(TPO) A description of what the student will be required to do upon completion of the instruction. It is a statement of task performance that has three parts: the conditions statement (tools, reference materials, environmental situations, etc.) under which the task will be performed in real life; the statement of actual performance which should take the form of an action verb, object, and qualifier; and a standards statement which tells how well the task must be performed to meet minimal acceptance of entry level work on the job.
Tolerances	The allowable deviation from a standard (e.g., torque to + or – 2).
Toolbook II	An authoring software program and associated tools for authoring interactive courseware (e.g., CBT, WBT, etc.).
Tools	Those devices used by workers to perform their jobs. Tools can range from hand tools (e.g., hammers, chisels, etc.) to computers and other electronic equipment. One of the influences on performance; the absence, presence, and condition of tools can have a profound effect on human performance.
Topic-centered structure	One of several methods for grouping or clustering tasks (or knowledges) together for purposes of training program design. This type of structure groups objectives by topic; main topics become the training program' s units (e.g., Diversity, Sexual Harassment Prevention, Compliance with Equal Opportunity Legislation, etc.).

TRACEN-level triage	A three-phased prioritization process that helps TRACENs determine which courses should be converted to alternative deliveries first. The first phase costs out and rank orders all TRACEN courses from most to least expensive; the second phase uses a matrix to analyze courses for specific training characteristics that indicate a high probability for successful conversion to alternative delivery; the third phase identifies the top 10 courses for most successful conversion to alternative delivery and the top 10 courses that should first receive FEAs or JTAs.
Training 2000 Study	A FY 97 through 98 training study undertaken in response to a chief of staff determination to update the Training Infrastructure Study. Training 2000' s focus was on training requirements for the year 2000 and beyond (i.e. training we expect to need; the delivery infrastructure needed for that training; and the training management infrastructure needed for that training). The first phase of Training 2000 used a modified form of triage to look at the over 700 courses of instruction the Coast Guard uses to train its people. The study yielded the first database of Coast Guard courses and listed course characteristics (e.g., likely candidate for alternative delivery, etc.).
Training aids	Noninstalled material used as an instructional tool. The training aid is not the physical object of the instruction but a representation of the actual object. For example, a map might be a training aid for instruction on geography if it is used to represent the Earth' s surface (e.g., the physical object of the instruction).
Training delivery	The combination of teaching methods, media, and instructional setting required to present instruction effectively and efficiently.
Training equipment	Installed or noninstalled machinery or material, used as objects of instruction (e.g., a gun mount or an engine or SPS-73 surface-searching radar installed and used in a classroom or lab).
Training Infrastructure Study Group	(TISG) An FY 94 Coast Guard study of training that concentrated on identifying excess training infrastructure that might be considered for closing or mergers.

Training Manager	(TM) Commandant (G-WT) who is responsible for all active duty resident and nonresident training and education programs; also responsible for the development and validation of Reserve ADT courses and certain nonresident training and education programs.
Training model	As opposed to the education model, the training model is focused on training individuals to perform tasks and jobs.
Training needs	Training needs are one outcome of a front-end analysis of a job performance problem that indicates training is one of the solutions desired to improve performance. Training needs represent the gap between the current skills and knowledges the workforce possesses and the skills and knowledge they need to perform to standard.
Training needs assessment	(TNA) A form of analysis that is only appropriate after a PA determines that new or improved classes, job aids, EPSSs, or some similar training solution is warranted. A TNA may also be appropriate when a training solution is mandated, thereby eliminating the need for an FEA. A TNA substantially focuses on obtaining correct and complete content for a training-related solution. Design and development of training, job aids, or other performance supports follow a TNA. The process for conducting a TNA may either be Allison Rossett' s TNA methodology or Mager' s criterion-referenced instruction (CRI) process which is taught in the Coast Guard' s CDC. Content or task anlaysis and other similar analyses are usually conducted as part of a TNA.
Training program	The planned activities and resources programmed to support training; a collection of tasks organized for training to enable Coast Guard members to perform their jobs and units to accomplish their missions.
Training program components (e.g., course, unit, module, etc.)	The various elements that make up a training program or course: units, modules, lesson plans, and so forth.
Training providers	(TP) A generic term used in Coast Guard training policy documents to delineate those who provide training (e.g., Coast Guard TRACENs, DOD, vendors, private industry, etc.).

Training Specialist	(TS) An occupational series that requires subject matter expertise background coupled with the ability to instruct that subject matter. Although training specialists often work interchangeably with ISSs and ITs, the TS has a grounding in subject matter and an operational background that the IT and ISS may lack.
Transfer	In training, the ability to apply learned behavior (task, or supporting skills and knowledges performance) to an operational setting under operational conditions.
Turnkey Training Support Package	A complete, exportable package integrating training products, materials, and/or information necessary to train one or more critical tasks. The "turnkey" descriptor refers to the characteristic of completeness – the training support package has everything needed to provide training on site.
Tutorial	A student-centered method for instruction that provides students with the learning materials and activities they need to learn and then lets them learn at their own pace. The instructor' s role is to answer questions or facilitate informal discussions.
Unit	A basic component of a course or curriculum. A unit is made up of a major task or task group to be learned within the course (e.g., troubleshooting tasks).
Validity	A test is considered valid if it actually measures what it claims to measure.

Waterfall effect	In terms of training, the waterfall effect refers to the way organizations have often applied the ISD model (e.g., first they analyzed performances, then they provided analysis outputs to designers who designed interventions; then designers gave those plans to developers, and so forth). Perceived problems caused by the "waterfall effect" are: It takes too many people. Is nonresponsive and overly bureaucratic. Newer conceptions of an ISD-like model use evaluation methods such as rapid prototyping to quickly improve a product and teams that work analysis, design, development, and evaluation issues simultaneously and as quickly and efficiently as possible.
Web-based training	(WBT) Training or instruction delivered via the World Wide Web. This form of on-line training provides faster access to learning, immediate grading of tests, and e-mailed certification or qualification.
Work Breakdown Structure (TA method)	(WBS) A method for task analysis.
Workforce Cultural Audit	(WCA) A Coast Guard study, performed by a contractor, that analyzed worker' s satisfaction levels for a variety of factors (e.g., diversity, professional development opportunities, etc.). The Coast Guard used its first WCA to strategically plan improvements to its human resources.
Workforce Performance & Training Strategy	(WPTS) The latest of the Coast Guard' s training studies, the WPTS provides direction to develop a Coast Guard-wide strategy to harness the power of learning and information technologies to modernize education and training.

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