

Office of Secure Transportation (OST)  
Curriculum Manual



31 May 2006

**SIGNATURE APPROVALS  
FOR OFFICE OF SECURE TRANSPORTATION (OST)  
CURRICULUM MANUAL**

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### **Implementation**

None

### **Evaluation**

None

### **Annual Requirements**

None

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## CHAPTER 1: INTRODUCTION

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### 1. Overview of the Curriculum Manual

The Curriculum Manual provides basic guidance on the process of developing training based on the instructional system design (ISD) methodology. Each chapter contains an overview of an ISD phase and the process steps to complete that phase. The basic steps are presented in the body of the Curriculum Manual. The information presented in each chapter assumes a basic understanding of the ISD process. Anyone new to the ISD process should be sure to take the necessary courses to acquire a background in the topic before beginning any curriculum development work. Applicable records and forms have been added to each chapter and form templates with instructions can be found for each phase in Appendix A (these are found electronically on the Office of Secure Transportation (OST) Web—OST Curriculum Tab under Forms). When a standardized form is called out in the Curriculum Manual, it is highlighted in *Italics*. Each chapter also includes the roles and responsibilities in that phase. The high-level responsibilities are listed in Chapter 1 (Introduction) and all team members are involved in all phases of the process. If there are specific roles and responsibilities for a given phase, these are included in applicable chapters.

### 2. Purpose of the Curriculum Manual

This Curriculum Manual provides detailed instructions supporting the OST Training Standard Operating Procedure. Department of Energy (DOE)/National Nuclear Security Administration (NNSA) have developed a Training Approval Program (TAP) that is the basis for the development of the objectives and criteria of OST courses. DOE Order 470.4, “Safeguards and Security Program,” outlines the standards to follow when producing training products.

OST training is performance based, which has proven to be a highly effective means of ensuring that operations, maintenance, and technical support personnel are trained to conduct their assignments safely and efficiently. Performance-based training is derived from job performance criteria. In establishing these criteria, every critically identified job task, skill, or knowledge required to perform that criteria are addressed and evaluated in training. With these criteria in place, the performance-based training process provides a total approach to the development and implementation of training. The process to develop training consists of five phases: 1) analysis, 2) design, 3) development, 4) implementation, and 5) evaluation (Figure 1). This Curriculum Manual was developed to provide more information on each of these phases within OST.

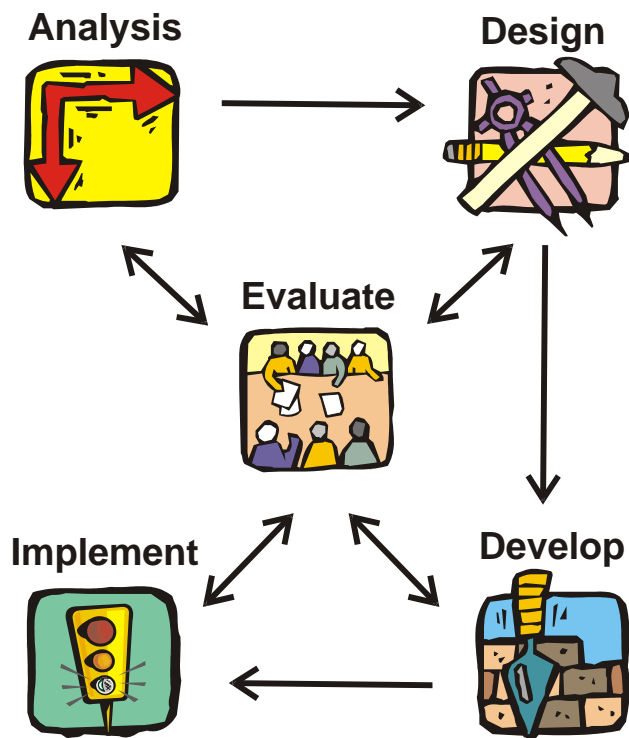


Figure 1: Five Phases of Training Development

### 3. Scope of the Curriculum Manual

The scope of this Curriculum Manual is to define the process and responsibilities for developing, improving, and maintaining a consistent, appropriate, and cost-effective training program that provides personnel with the knowledge and skills for the safe, secure movement of nuclear weapons, components, and materials across the nation's highways.

This Curriculum Manual applies to all training developed internally for OST. If the nature of the training is such that TAP is not appropriate, a waiver from the process can be requested in writing from the chief of curriculum. A written approval from the chief of curriculum will be provided.

### 4. Roles and Responsibilities

The basic roles and responsibilities listed here are for the key positions in performance-based training for the OST. All are normally involved in all of the phases of the ISD process. These are basic guidelines, however, and the responsibilities may vary due to program requirements, OST structure, and contractor organization. All of these positions may work on the tasks in the remaining chapters. Any unique responsibilities for a given phase are listed in the applicable chapter.

**OST Management:** Ensures the processes and procedures are followed and both DOE/NNSA and OST standards and requirements are met. The highest level of management needed to sign for the various phases' documentation and accept the training package for implementation is determined at the start of the project. This should include curriculum, training, and operations representatives.

**Course Owner:** The office, section, customer who funded the course and is accountable for ensuring the training requirement is met (may also be called the customer).

**Program Manager:** Training and Logistics Command (TRALOC), ordinarily consolidates training requirements and implements the training program (See Training Manual for more details).

**Chief, Curriculum:** Oversees compliance to the Curriculum Manual and the TAP.

**Course Manager:** Directs the course. Responsible for implementation (usually in the Training Branch).

**Training Team Lead:** The Training Branch representative who provides course/module content description.

**Curriculum Team Lead:** The OST curriculum lead representative for a specific course/module, who oversees the training development, coordinates the training development team effort, serves as the team lead for the training and development team (TDT) and ensure all curriculum documentation is complete.

**Instructional Designers:** Curriculum development personnel, usually contractors, who provide expertise in the phases of the curriculum development, assigned to the TDT, and ensure all curriculum documentation is complete.

**Training Development Team:** Consists of the respective course manager, subject matter advisor (SMA), curriculum and training team leads, and instructional designers and may also include any other representatives relevant to the particular course/module being developed. Their respective management assigns the team members.

**Subject Matter Advisors:** Individuals qualified and experienced in performing a particular task.

**Expert Job Performers:** Validate the tests and performance-based procedures and may act as SMAs, if available.

**Instructors:** Any person assigned the task of instruction on formal training program, who has been certified by the director of the Safeguards and Security Central Training Academy, or by the individual responsible for the DOE element or DOE contractor training program.

**Contractor:** Any industrial, educational, commercial, or other entity, grantee, or licensee, including an individual, that has executed an agreement with the federal government for the purpose of performing under a contract, license, or other arrangements. NOTE: This includes subcontractors of any tier, consultants, agents, grantees, and cooperative agreement participants.

**Target Audience:** The intended receiver of the training.

**Media Development:** Supports instructors, curriculum, and SMAs to determine the scope of media support and production timelines.

**Safety:** Supports the development of training using the integrated safety management five core functions and seven guiding principles.

**Logistics and Supply:** Review requests for materials and supplies to determine availability and support training needs.

**Administrative Support:** Assists with preparation of course/module documentation.

## 5. References

## **OST Curriculum Manual**

The following references are used throughout the Curriculum Manual (check DOE/NNSA listings for the most current version prior to using these references):

- DOE Order 470.1, Latest Revision–Safeguards and Security Program
- DOE Manual 470.4-3, Protective Force Program Manual
- OST, Training Program Plan(s) for current year
- OST Training Manual

### **6. Updating the Curriculum Manual and Appendices**

The Curriculum Manual chapters provide the general guidance for curriculum development within OST. To make changes to the Curriculum Manual:

Minor changes (such as organizational name changes, transfer of functions to other OST organizations, supporting document revisions, information contained in the appendices, table of content changes, typographical or aesthetic changes, and minor changes in work processes):

- Written request for changes to be made using the Program Revision Summary Form
- Request reviewed by curriculum lead for action
- Recommendation forwarded to OST chief of curriculum for approval
- Changes, if made, are tracked in a change log associated with this document
- Revisions sent to those having the Curriculum Manual

Significant changes (such as additions to the mission and/or requirements resulting in new or significantly modified programs) require the same review and approvals as the original document.

- Written request for changes to be made using the Program Revision Summary Form
- Request reviewed by curriculum chief for action
- Draft changes made to the Curriculum Manual
- Recommendation forwarded to chief, TRALOC for approval
- Changes are tracked in a change log associated with this document
- Revisions sent to those having the Curriculum Manual

The guidelines in this Curriculum Manual apply to training development efforts that begin after the approval sign-off date. Current training formats and guidelines will remain valid for training already approved or currently in development until changes/updates are made to the document.



## 7. Common Terms/Definitions

The following are common terms used in OST and are listed below to provide a common framework for the use of terms in this document. Program requirements may use terms interchangeably.

<b>Assessment</b>	An evaluation of the effectiveness of an activity/operation or a determination of the extent of compliance with required procedures and practices.
<b>Block of Instruction</b>	A group of related instructional units or modules covering a major subject area. In Web-based training, this is often referred to as a module.
<b>Briefing</b>	Presentation of information that is not testable but is helpful to the job. No objectives or tests are included but major areas of discussion and activities conducted during the briefing are included in the documentation. Briefings are not subject to TAP criteria for development or training.
<b>Course</b>	Several related or unrelated blocks of instruction, pilots, and classes grouped for training (recruit, operations center training would be examples of course areas).
<b>Experiential</b>	An informal opportunity for participants to experience a skill, process, or procedure with no learning objectives or testing required.
<b>Dry Run</b>	Course presentation that includes evaluation of training material for technical accuracy as well as instructional effectiveness. Data is compiled and evaluated to correct faults and improve the effectiveness of the lesson plans and training materials. Unlike a pilot course, this is designed only to run through the course and not evaluate students or the program against TAP requirements.
<b>Goal</b>	The result of achievement toward which the intent of a program of instruction, such as an instructional course, is directed.
<b>Guide/Job Aid/Desk Top Procedures</b>	A detailed series of steps or more detailed explanation of the process to accomplish any of the tasks in the Curriculum Manual. These can be developed at any level and are not considered formal documentation for the curriculum process.
<b>Iteration</b>	A recurrence of a course.
<b>Instructional Objective</b>	A statement that specifies measurable behavior that a trainee should exhibit after instruction, including the conditions and standards of performance.
<b>Lesson</b>	A related segment of criteria or a task that is presented in the smallest unit of instruction.
<b>Lesson Plan</b>	An instructor's document that outlines instructor and trainee activities, learning objectives, lesson content, and resources necessary for the conduct of training. Used for classroom, practical applications, and on-the-job (OJT) training.
<b>Limited Scope Performance Test</b>	A performance test designed to evaluate specific skills, equipment, or procedures. The events of the test may be interrupted to facilitate data collection, and may be purposely directed by evaluators in order to achieve certain evaluation goals. This is the type of test used most often in OST.

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**On-The-Job-Training** Training with a qualified trainer on actual or simulated equipment that uses performance objectives and tests to ensure participant is qualified to perform the skill.

**Performance-Based Training** A systematic approach to training that is based on tasks and related knowledge and skills required for job performance. The process includes analysis, design, development, implementation and evaluations phases (detailed below).

NOTE: This term is synonymous with ISD, systematic approach to training, criterion referenced instruction, training system design, and competency-based training. Consists of the following phases:

**Analysis**—identifies training requirements for a specific job position through (these are only a few of the types of analysis that can be conducted):

- Job Analysis—a systematic method used in obtaining a detailed listing of tasks of a specific job.
- Job/Task Analysis—a process that systematically describes the performance requirements of a job. Identifies and defines the valid task and the elements needed to satisfactory perform the analyzed job.
- Task Analysis—a systematic process of examining a task to identify the skills and knowledge required for successful task performance.

**Design**—uses information collected during the analysis phase to establish specific learning objectives sequenced into lessons and lesson specifications which guide the development of all training materials and strategies.

**Development**—encompasses the selection and development of appropriate instructional methods, settings, and training materials and strategies.

**Implementation**—consists of activities related to the actual conduct of training, as well as resource allocation, planning, and scheduling.

**Evaluation**—focuses on the effectiveness of the performance-based training in reaching the objectives and revises materials and techniques to improve the training.

**Performance Test** A test to confirm the ability of an implemented and operating system element or total system to meet an established requirement.

**Pilot Class** A tryout of the materials/course conducted on a small group of trainees or SMAs.

**Practical Application** The performance portion (or test) for a given lesson that demonstrates the ability of the participant to perform the action/steps.

**Procedure** A set of steps or tasks, usually written and published that detail the process of how to do a given task/objective. For example, OJT in OST is procedure driven and is based on the published procedures in the field.

**Process** A series of procedures that are followed in a standardized way to achieve a goal/objective. How something is done.

<b>Qualification</b>	The verification that a specific standard of knowledge or experience pertaining to a specified job or task has been demonstrated based on specific test requirements.
<b>Risk Assessment</b>	An evaluation of the proposed work or activity to identify potential hazards associated with the activity. Controls are recommended to mitigate these risks, and a risk ranking is assigned to the activity.
<b>Self Inspection</b>	The internal review and evaluation of individual agency activities and the agency as a whole with respect to the implementation of the program established under this order and it's implementing directives (E.O. 12958).
<b>Task</b>	A well-defined unit of work having an identifiable beginning and ending with two or more elements.
<b>Training</b>	Instruction designed to develop or improve on-the-job performance of a trainee or worker.
<b>Training Approval Program</b>	A DOE/NNSA Office of Safeguards and Security program to formally recognize safeguards and security training programs and courses conducted by an organization other than the Central Training Academy that have satisfied established objectives, standards, and criteria for a quality safeguards and security training program.
<b>Training Program</b>	A planned, organized sequence of activities designed to prepare persons to perform their jobs, meet a specific position or classification need, and to maintain or improve their job performance.
<b>Training Requirements</b>	Direction from DOE/NNSA/OST on course/modules needed to be developed. A training request formalizes the requirement for a new course/module and can be generated from the annual training conference, management directives, or from detailed analysis of job areas.
<b>Web-Based Training</b>	<p>A method of instruction that uses computer interfaces to present the information. It includes all the elements of classroom presentation but has different terminology for products created during the development of the course. These terms can be used interchangeably throughout the document and forms created to meet the specific development needs of CBT courses:</p> <ul style="list-style-type: none"> <li>• Process Map—similar to a course outline</li> <li>• Script/Storyboard—similar to the lesson plan</li> <li>• Matrix—similar to the task-to-training Matrix (TTM)</li> <li>• Beta Review—a tryout of the materials conducted on a small group of trainees or SMAs.</li> </ul>

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### **8. Records/Documentation**

When signatures are required for any stage of the ISD process, the key representatives should be included but may vary based on the training requirements and management directives. Normally the following should be included in the approval cycle for all training and additional signatures, such as management, may be added as directed:

- Curriculum representatives
- Training representatives
- Operations representatives
- Course owner or customer

The following records/documentation should include but are not limited to and be available and filed with Curriculum Manual documentation:

- Change Request to Curriculum Manual and Appendices
- Previous Approved Copies of the Curriculum Manual for historical purposes

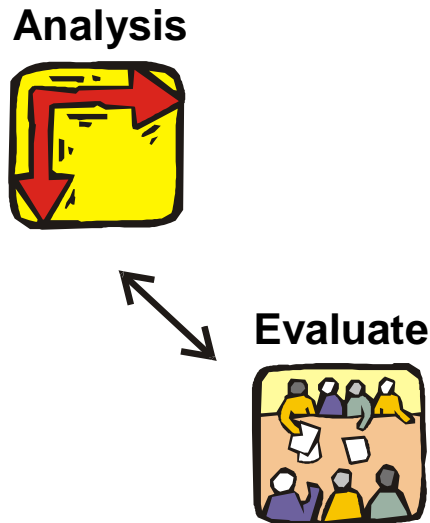
### **9. Appendices/Form Templates**

Program Revision Summary Form–Appendix A, Development Phase, Tab G

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## CHAPTER 2: ANALYSIS PHASE

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### 1. Overview

This chapter covers the analysis phase where basic requirements and audience needs are established. This chapter outlines the procedures to complete the analysis phase of the ISD process and provides guidelines both for training and for an OST job analysis.

The analysis process is used when:

- Analysis of a job position or added task is needed
- There is a need to identify whether additional training or revised training is needed to obtain an acceptable level of job performance
- Expected results or outcomes do not meet requirements

The analysis process may not be required for a specific lesson plan, block of instruction, or course based on DOE/NNSA regulatory- or management-directed requirements.

### 2. Roles and Responsibilities

Analysis roles may be filled by one individual or by a team. Analysis is normally conducted before a training program is designed but can be waived when DOE/NNSA management provides detailed guidance.

Refer to Chapter 1 (Introduction) for details on the general roles and responsibilities for curriculum development team members. Included below are specific roles or responsibilities included in the analysis phase.

**Target Audience** provides input through accepted methods to include surveys, questionnaires, feedback forms, etc.

### 3. Process Steps

The following are the basic steps of the analysis phase.

#### **Step 1—Receive Training Request(s)**

DOE/NNSA management presents a training problem, identifies the level at which the problem exists, and explains the desired requirements for knowledge and performance. This training requirement is coordinated through the chief of curriculum.

**NOTE:** The customer can provide the full scope and requirements for the course/module in a memo, which is kept with the course/module documentation, and waive any additional analysis step requirements. If this memo is received, the following steps are not required and the Plan of Action and Milestones (POAM) and TTM are initiated in the design phase.

#### **Step 2—Complete Preliminary Analysis Report/Mini Preliminary Analysis Report**

The preliminary analysis report (PAR)/mini-PAR is normally developed by the Training Branch or contractor representatives and submitted to the chief of curriculum. The Training Development Team can be formed at this time if a full analysis phase is required.

#### **Step 3—Prepare Preliminary Plan of Action and Milestones**

Once the course requirements are identified, a schedule using the POAM should be initiated and reviewed.

#### **Step 4—Determine Analysis Type**

Select an analysis type based on the needs determined by the PAR/mini-PAR.

#### **Step 5—Complete Selected Analysis (if required)**

Research data, review existing training, identify the desired performance change(s), and find any gaps to complete the selected analysis.

#### **Step 6—Document and Report Analysis Findings**

Match the findings to the training request(s) to identify the problem level and establish the training requirements for knowledge and performance. Other report elements include available resources and time and money constraints.

#### **Step 7—Initiate the Task-to-Training Matrix (if required)**

Initiate the TTM to list the tasks from the analysis phase that will become the training goals and objectives in the course.

#### **Step 8—Evaluate Analysis Phase**

As an informal process, evaluation is an integral part of the ISD process. Recommended check points in the analysis phase for evaluation are:

- What was the training request?
- What were the appropriate solution(s)?
- Was the correct analysis type selected?
- Was the PAR/mini-PAR completed?
- Was a preliminary POAM completed?
- Was the selected analysis completed?
- Were the analysis findings documented and reported?
- Was a TTM initiated?

- Was a plan developed for analysis review?

#### **4. Records/Documentation**

At the end of the analysis phase, the following records/documentation should include but are not limited to and be available and filed with curriculum documentation:

- Training request
- PAR/mini-PAR
- POAM
- TTM (if analysis was done)
- Final analysis reports (if analysis was done)

#### **5. Appendices/Form Templates**

Preliminary Analysis Report (PAR)/mini-PAR–Appendix A, Analysis Phase, Tab A

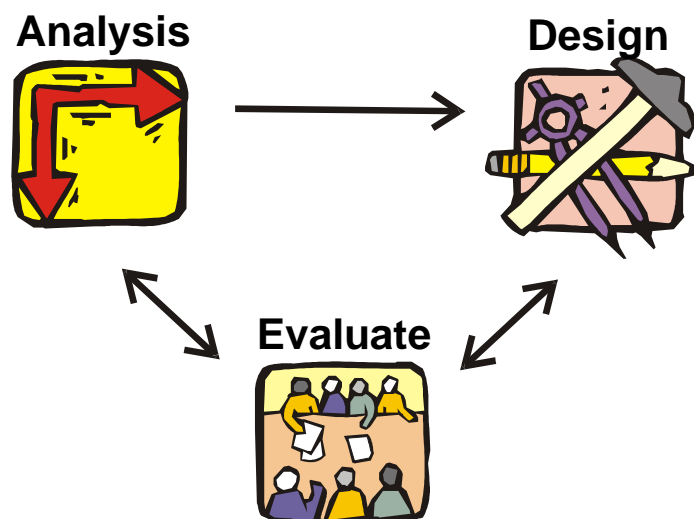
Task-to-Training Matrix–Appendix A, Analysis Phase, Tab B

Plan of Action and Milestones (POAM)–Appendix A, Design Phase, Tab A

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## CHAPTER 3: DESIGN PHASE

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### 1. Overview

This chapter covers the design phase where existing course materials are identified and new course/module materials are outlined.

During the design phase, activities should include but are not limited to:

- Assembling the TDT—if not already established in the analysis phase
- Creating or finalizing the POAM
- Determining the instructional goals and objectives
- Identifying and developing test materials (if applicable)
- Identifying instructional methods
- Completing the design document
- Initiating or updating the TTM

### 2. Roles and Responsibilities

Design is conducted before a training lesson or course is developed and requires input from many sources to ensure the training requirement is being accomplished in the course/module. Refer to Chapter 1 (Introduction) for details on the general roles and responsibilities for curriculum development team members. Included below are specific roles or responsibilities included in the design phase.

**Curriculum Team Lead**—provides expertise in the design and organization of the content, ensures use of accepted techniques for designing objectives and tests, and acts as the curriculum liaison to the TDT.

**Training Team Lead**—provides subject matter expertise in the content and test materials for the key training areas to be included in the course/module (this is done in conjunction with the SMAs or expert job performers).



### 3. Process Steps

The following are the steps in the design phase:

#### **Step 1–Assemble Training Development Team**

Team members are assigned by their respective managers. NOTE: if an analysis phase was required, the TDT is already formed and this step is not required.

#### **Step 2–Review Analysis Documents**

TDT members should review the PAR/mini-PAR, POAM, and TTM from the analysis phase. If DOE/NNSA regulatory or management directive did not require an analysis phase, review the training request and PAR/mini-PAR received from the Training Branch or customer for all requirements.

#### **Step 3–Initialize/Finalize Plan of Action and Milestones**

Once the course requirements are identified, a schedule for completing the curriculum development should be established using the POAM.

#### **Step 4–Determine Instructional Goal**

The instructional goal focuses on the anticipated outcome of instruction and it states the overall purpose or intent of the lesson or course.

#### **Step 5–Write Objectives**

Objectives are measurable statements of intent and state the expected outcomes of each stage of training. Objectives clearly state what participants should know (cognitive) or be able to demonstrate (performance) after training, under what conditions it takes place, and what standard of performance must be achieved. These are translated directly from the task statements developed in the analysis phase or from management directives and are identified in the TTM or detailed management guidance.

The OST community normally accepts 70% as a standard for cognitive- and performance-based outcomes. Higher standards may be developed based on the following considerations:

- Criticality
- Liability
- Safety
- Regulations
- Content
- Impact on job performance
- Number of test questions/performance criteria on the test instrument

The reason for choosing a higher or lower standard should be documented in the design document.

#### **Step 6–Identify Resources/Materials**

Research all available resources for training materials. These may include but are not limited to:

- Existing training materials
- Analysis report(s)
- Regulations and manuals
- Industry guidelines
- SMAs

#### **Step 7–Identify Test Methodology**

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The purpose of a test is to determine what knowledge (cognitive) and skills (performance) a participant gains. How does the participant/team demonstrate performance of the objectives? Examinations and performance evaluations measure achievement of each objective required for the task.

The instruments can also be used to document the methodology and reference the test items to specific objectives, lesson plans, and data analysis. In choosing how to test, the designer looks at the interplay between instructional considerations and resource limitations. Both cognitive and performance objectives should be evaluated.

### **Step 8–Design Test Instruments**

Written examinations and performance evaluations measure achievement of each instructional objective required for the task. In the early design stages, the test may only include the key areas to be covered. Actual test questions and performance criteria can be updated and added continuously as the training material is developed.

### **Step 9–Identify Instructional Methods**

Choose any or a combination of instructional strategies that enable the instructor to lead participants to match the cognitive or performance levels identified in the objectives.

### **Step 10–Write Design Document**

The design document addresses all the issues relevant to development of training material (such as logistics, location, and equipment) and is a signed document.

### **Step 11–Initiate/Update Task to Training Matrix**

If the TTM was not initiated in the analysis phase, it should be initiated at this point. The objectives relate to the specific tasks required in training.

### **Step 12–Evaluate Design Phase**

As an informal process, evaluation is an integral part of the ISD process. Recommended check points in the design phase for evaluation are:

- Do the goals, objectives, test materials, and instructional methodologies support the original training request requirements?
- Are all tasks listed in the analysis document included in the course/module (if analysis document was completed)?
- Was design document completed and signed off?

## **4. Records/Documentation**

At the end of the design phase, the following records/documentation should include but are not limited to:

- TTM
- POAM
- Design document

## **5. Appendices/Form Templates**

Task-to-Training Matrix, Appendix A, Analysis Phase, Tab B

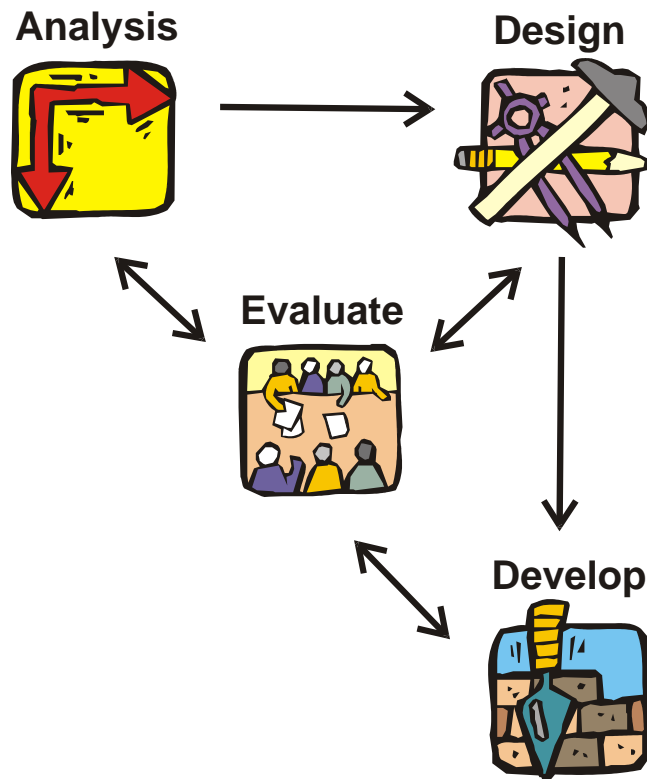
Plan of Action and Milestones (POAM), Appendix A, Design Phase, Tab A

Design Document, Appendix A, Design Phase, Tab C

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## CHAPTER 4: DEVELOPMENT

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### 1. Overview

This chapter covers the development phase where the actual lesson plan content and supporting training materials for instructor(s) and participants are created to support the goals and objectives of the course/module. These materials may be in an electronic format, such as for Web-based training or hard copies of the training material for classroom and performance-based skills. In either case, the materials are based on the results from the analysis and design phases.

During this phase, developers should keep the following areas in mind:

- Expected benefits and costs of the lesson to the organization
- Instructional objectives and available resources
- Value of the learning activities and the means to carry them out
  - Does the activity enhance the participant's motivation to learn?
  - How does the activity lead to the desired learning?
  - Do the activities promote learning retention and transfer of learning to the job?
- Type of feedback to evaluate and validate participant's progress,
- Program plan information (implementation schedules, memos, calendars, equipment requests, facility agreements)
- Using the approved design document

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Products of this step should include but are not limited to:

- Lesson plan(s) or flow chart and scripts, including any instructor guidance, tests, practical application, resources (SB Form 43)
- Participant materials
- sign-off sheet for the LPRC and signed lesson plan cover page
- Course/module documentation (attendee sheet, certificates, task certifications, schedule, and course files)

### 2. Roles and Responsibilities

The TDT works to develop the materials in conjunction with the SMA and instructors. Refer to Chapter 1 (Introduction) for details on the general roles and responsibilities for curriculum development team members. Included below are specific roles or responsibilities included in the development phase.

**Instructional Designer** is responsible for coordinating and maintaining the documentation produced by the team and ensures use of accepted techniques for developing lesson plans.

### 3. Process Steps

The basic tasks of the development phase can be broken down into the following steps:

#### Step 1–Review Design Document

#### Step 2–Develop Lesson Plan Outlines

If existing course materials exist, modify these outlines for the course/module. When no lesson plan materials exist, the TDT should develop an outline based on the design document. Many considerations such as equipment and logistics should be reviewed in the design document prior to developing outline. The Lesson Plan Outline Instructions are used to create a high-level outline to include the major sections (roman numerals, alpha numerals, etc.). Outline materials are provided by the SMA/training lead during the design phase or in the training request document in the analysis phase.

**NOTE:** Once training content is identified, ensure that a derivative classifier reviews the material for classification.

#### Step 3–Lesson Plan Outline Review and Approval

The lesson outline is reviewed by the TDT and signatures, electronic signatures, or documented telecon approvals can be used to show concurrence on the TDT sign-off sheet.

#### Step 4–Receive Course Content from the SMA

Once the course content is outlined, the team can begin to develop the actual content of the training. To do this, the SMA or course owner must deliver the needed details in the form of procedures, drawings, step-by-step instructions, and other applicable materials. Without this information, development cannot continue.

#### Step 5–Write Training Materials

The purpose of this step is to provide a complete package of materials required for the implementation of training. Lesson plans and instructional media must focus on the information necessary to perform job-related objectives and performance standards (not just “nice-to-know” information). Instructional materials and appropriate guidelines may include but are not limited to:

- Lesson plan(s)
- Training aids

- Risk assessment for practical applications and other than non-hands on classroom activities

### **Step 6–Develop Participant Materials**

Participant materials enhance the learning and provide reference materials for the participant. The materials can be designed or identified at this stage. Final production should not be done until approved at the LPRC. Participant materials can include but are not limited to any of the following:

- Workbook
- Job aids
- Lesson plan outlines
- Checklist
- Terms and definitions
- Viewgraph copies
- Handouts
- References
- Level 1 Participant Reaction Form.

If the delivery format is not classroom training or practical application, an electronic version of the above item may be developed within the programming format.

### **Step 7–Review Training Materials**

The TDT reviews the final training package. It is highly recommended that a dry run be conducted prior to the LPRC to identify problems in technical content, supporting instructional materials, and design. This dry run can be a talk through of the materials and/or an actual course/module conducted as a walk through.

### **Step 8–Conduct Dry Run**

When time or customer requirements allow for a walk through of the course, prior to the LPRC or prior to the first iteration of the course, a dry run may be conducted. This allows the curriculum development, training, and instructor representatives a chance to go through the course under actual training conditions.

It is a technical review to ensure the training materials are technically accurate, current, and consistent with OST systems, equipment, and procedures. A dry run also includes an evaluation of the instructional effectiveness and safe conduct of the course. Data is compiled on the TDT sign-off sheet and evaluated to correct faults and improve the effectiveness of the lesson plans and training materials. An SMA who provides feedback to the material developer who corrects any identified deficiencies should conduct the review. Additionally, for quality purposes, a training assessment can be used to evaluate if the course meets TAP requirements. If changes are required, these will also be documented on the TDT sign-off sheet.

### **Step 9–Distribute Training Package to the Lesson Plan Review Committee**

The LPRC is a documented meeting to review the training materials and ensure the training request requirements have been met. If a dry run was conducted and documented on the TDT sign-off sheet, the LPRC also ensures that any agreed-upon revisions from the dry run have been made to the material.

Prior to the LPRC, draft copies of all training materials are sent to the LPRC members in sufficient time to permit advance review and comment (2 weeks recommended). Designated members or their representatives from the following areas should attend the LPRC (on a case-by-case basis, other representatives may attend based on TDT or OST management recommendation):

- Curriculum
- Course manager
- Instructional designers (federal or contractors)
- Training team lead (or their designated representatives)

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- Safety
- Logistics

### **Step 10–Conduct LPRC Meeting**

Any recommended changes should be documented and can be made after the meeting. After the review, the signature process begins. Any member of the LPRC who are in the signature process may sign at the LPRC. The LPRC is the final review approval prior to implementing the training in the curriculum development process.

If, as a result of the LPRC review, there are major revisions, the training material is returned to the TDT for further development, and when completed must be presented to the LPRC again.

### **Step 11–Revise Lesson Plan based on LPRC (as necessary)**

### **Step 12–Complete Production of All Materials**

The TDT and administrative staff are responsible for producing the instructional materials for the course/module and should include but are not limited to:

- Training materials
- Participant materials
- Course/module documentation (attendee sheet, certificates, task certifications, schedule, course files, feedback forms)

### **Step 13–Compile Documentation**

The TDT and administrative staff compile and verify that all training development documentation from the previous chapters are filed with the appropriate curriculum department and should include but is not limited to those documents listed on the Curriculum Development Documentation Checklist.

### **Step 14–Conduct Informal Curriculum Assessment**

As a quality check of the curriculum development process a curriculum assessment should verify that all documentation and training materials are completed and meet TAP requirements. This is normally a programmatic assessment done annually and not by lesson/course.

### **Step 15–Deliver Training Materials to Course Manager**

### **Step 16–Evaluate Development Phase**

As an informal process, evaluation is an integral part of the ISD process. Recommended check points in the development phase for evaluation are:

- Was the development process planned during the initial team meeting?
- Was a lesson plan and instructor guide developed?
- Was a written test and/or performance checklist constructed?
- Were participant materials developed?
- Was a dry run conducted to review the instructional materials?
- Did the LPRC approve the lesson plan?
- Were all instructional materials produced?
- Were all curriculum development documents filed?
- Was an informal TAP curriculum assessment conducted?

## **4. Records/Documentation**

At the end of the development phase, the following records/documentation should include but are not limited to:

- Training materials
- Participant materials
- Signed lesson plan cover page
- Course administrative materials (schedules, feedback forms, remediation forms etc.)

## **5. Appendices/Form Templates**

Lesson Plan Outline Instructions–Appendix A, Development, Tab A

TDT Sign off Sheet–Appendix A, Development, Tab B

Lesson Plan/Practical Application/OJT/Briefing Template/Instructor Guide–Appendix A, Development, Tab C

SB Form 43–Appendix A, Development, Tab D

Risk Assessment–Appendix A, Development, Tab E

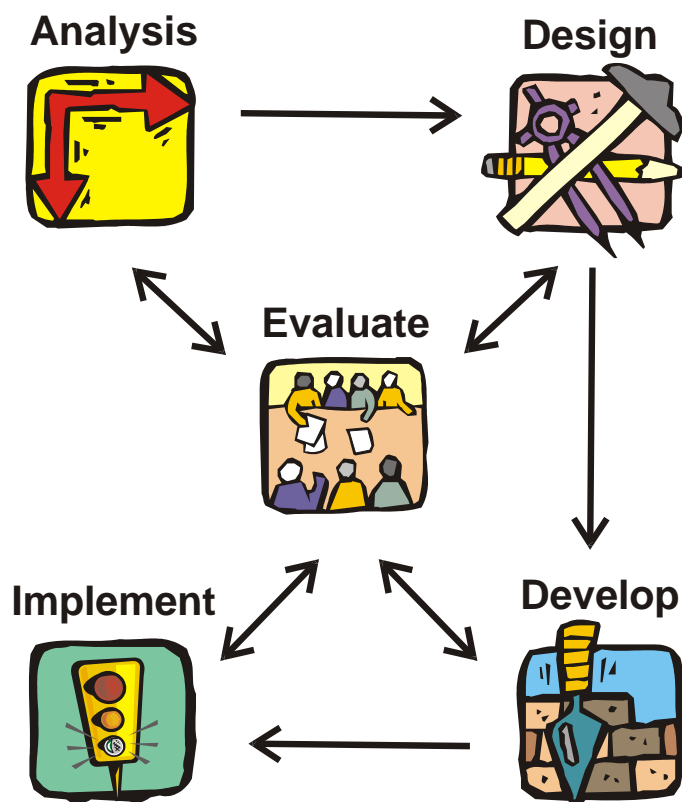
Level 1 Participant Reaction Form–Appendix A, Development, Tab F

Program Revision Summary Form–Appendix A, Development, Tab G

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## CHAPTER 5: IMPLEMENTATION

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### 1. Overview

This chapter presents the actual presentation and validation of the course/module from the perspective of the developers. Additional guidance on training management, course/module administration, and records can be found the OST Training Manual and are not addressed in this Curriculum Manual.

The implementation phase is the ISD instructional phase and begins after the development phase is complete. Also, this stage provides the designers and developers with the opportunity to observe and evaluate the program under actual training conditions.

### 2. Roles and Responsibilities

Refer to Chapter 1 (Introduction) for details on the general roles and responsibilities for curriculum development team members. Included below are specific roles or responsibilities included in the implementation phase.

**Course Owner** is the DOE/NNSA point of contact for the course/module and with assistance of training personnel, is responsible for the implementation phase, coordinating the team effort, and ensuring all documentation is complete.

**Instructor(s)** perform the classroom management necessary before the course/module begins and deliver the training using the lesson plan(s). Refer to the OST Training Manual for more information.



**Instructional Designer** is responsible for validating the course/module to ensure use of accepted techniques for implementation and coordinating and maintaining the documentation produced during the implementation phase.

**Target Audience** actively participates in the training and completes the tests or practical applications and the Level 1 Participant Reaction Form.

### 3. Process Steps

The basic tasks of the implementation phase can be broken down into the following steps:

#### Step 1–Prepare Training

TDT members work with instructor on course/module materials if necessary.

#### Step 2–Dry Run

A dry run may also be conducted after the LPRC (see Chapter 4, Step 8 for details). A Program Revision Summary Form is required to document any changes.

#### Step 3–Pilot Class

Each lesson should go through the validation process that ensures the course meets the training requirements. One way to begin this validation is through a Pilot Class after the LPRC has approved the lesson plan. The pilot is a tryout of the materials conducted on a small group of trainees (specifically selected for the pilot or trainees attending the first iteration of the course). The trainees should possess the entry-level skills and knowledge expected of future trainees. During the pilot the training setting should be simulated as closely as possible. The lessons are presented, and all appropriate tests are administered and scored. The following areas will be evaluated during a pilot:

- Trainees are monitored to determine if the presentation of materials and directions for study are clear and easily understood.
- Presentations and directions that require modification or clarification are documented on the Program Revision Summary Form.
- Questions that are asked by the trainees that relate to effectiveness of training are recorded.
- The length of time taken by trainees to complete activities and tests is recorded.
- Materials are reviewed to ensure ease of use by the instructors.

Present at the pilot should be designated representatives from the following:

- Curriculum
- Training Branch
- Course manager
- Designated contractor curriculum representatives
- Safety (for practical applications/other than classroom)

For quality purposes, an informal TAP training assessment may also be conducted during the pilot class using TAP guidelines. Document all suggested changes on the Program Revision Summary Form. A memo for the course files should be completed to document the pilot class activities and recommendations.

#### Step 4–Revise Lesson Plans (if necessary)

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If content errors are found and are at the administrative level,

Minor content errors at the administrative level (spelling, punctuation, minor organization changes of the outline, etc.) can be made without re-submittal to the LPRC by the TDT. If changes to the goals, objectives, testing methodologies, or performance checklists are made the training package must go through the LPRC process.

### **Step 5–Deliver Updated Training Materials to the Course Manager (if necessary)**

#### **Step 6–Conduct Formal TAP Training Assessment**

This is a formal assessment of the program that verifies the usability of training material under the intended conditions and confirms revisions are made to the material following the pilot class. During the assessment, learning and administrative problems are noted and trainee comments on the training are obtained.

NOTE: There may be times when the pilot/training assessment are the same class (course only given once) or there may be a long period of time between course iterations, or the training assessment may not be conducted for a year or more after the pilot.

#### **Step 7–Deliver Assessment Report**

At the end of the formal assessment, a detailed report from the OST assessment team on the course/module compliance with TAP requirements is completed. The report should be provided to the course owner and filed in the curriculum files. If there are no findings or changes needed to the lesson plan, the course/module is considered validated by TAP standards and may be taught as an OST course.

#### **Step 8–Revise Lesson Plans (if necessary)**

Curriculum findings in the assessment regarding content and organization changes can be made without re-submittal to the LPRC. If any goals/objectives, testing methodology, or performance checklist problems are noted as a result of the TAP assessment, the TDT must make the changes and re-submit the training package to the LPRC.

### **Step 9–Deliver Updated Training Materials to the Course Owner (if necessary)**

#### **Step 10–Complete Training Documentation**

Documentation for the implementation phase of a course/module is maintained at a location designated by the appointed course manager or contractor representative. All other curriculum development documentation (hard copy or electronic) are maintained by OST either at a central location or at a contractor facility (with a pointer in the OST files to those files). The OST curriculum chief designates where files are stored. Actual training documentation is discussed in the OST Training Manual.

#### **Step 11–Evaluate Implementation Phase**

Evaluation is an integral part of the ISD process. Recommended check points in the implementation phase for evaluation are:

- Were instructional equipment and facilities considered?
- Were course/module administration supplies available?
- Was a pilot of the lesson plan conducted?
- Was training delivered (according to lesson plans)?
- Was remedial training routinely necessary?
- Was all training documentation completed?
- Was an OST training assessment conducted?

- Were completed course/module materials delivered to the course manager?
- Was course/module documentation completed and filed?

#### **4. Records/Documentation**

At the end of the implementation phase, the following records/documentation should include but are not limited to:

- Training materials
- Tests and checklists
- Level 1 Participant Reaction Forms
- Reports or memos generated by management, OST assessment team, or participants in support of course/module instruction
- Course/module documentation (attendee sheet, certificates, task certifications, schedule, course/module file)

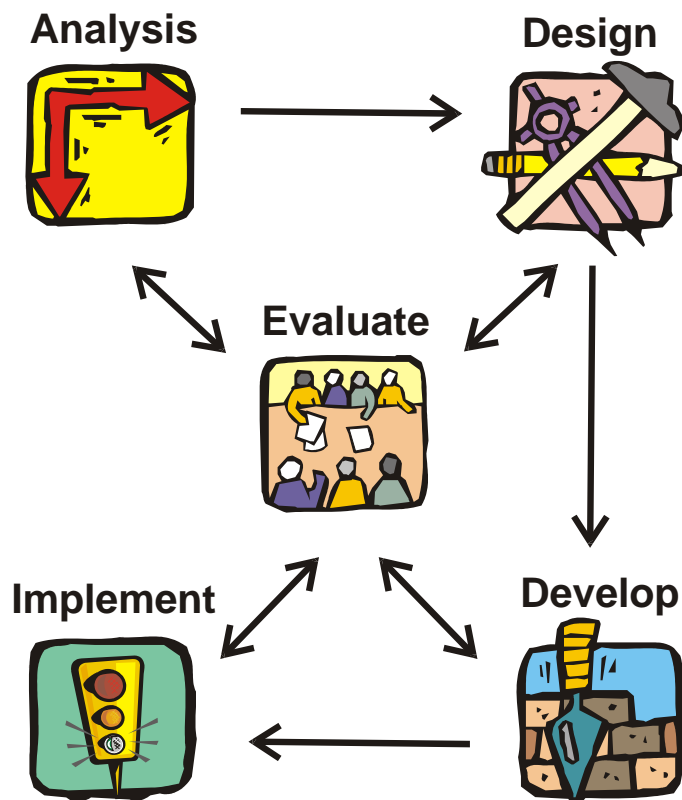
#### **5. Appendices/Form Templates**

None

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## CHAPTER 6: EVALUATION

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### 1. Overview

The evaluation process provides additional information on how well the designed training meets stated objectives. Evaluation and quality checks are ongoing throughout each ISD phase and more detailed information on this type of evaluation is found at each phase in the specific chapter on that phase. This chapter looks at evaluation data generated at the conclusion of the training and focuses on the effectiveness, consistency, and relevance of the completed course/module. It also addresses looking at the overall process and compliance with the Curriculum Manual. That data is used to improve and update the course/module and determine if training has occurred and is used to modify and improve the course/module content and delivery after it has been validated.

Evaluation consists of many different levels, including both short and long term. Short-term evaluation consists of course/module/instructor reaction evaluation, knowledge tests, and practical applications. Long-term evaluation consists of interviews with trainees/supervisors after the training, course/module critique evaluation, skill transfer, and organization impact.

### 2. Responsibilities

Refer to Chapter 1 (Introduction) for details on the general roles and responsibilities for curriculum development team members. Included below are specific roles or responsibilities included in the evaluation phase.

**OST Management**, with the assistance of training support personnel, support Level 3 (Change in Behavior) and Level 4 (Results) evaluation by reviewing the evaluation data to determine future training efforts.

**Course Owner** is the DOE/NNSA point of contact for the course and, with assistance of training personnel, is responsible for the evaluation phase, coordinating the team effort, and ensuring all documentation is complete.

**Instructors**, along with curriculum support, are responsible for coordinating and conducting the evaluation process and ensuring the completion of the Level 1 (Participant Reaction Form) and Level 2 (Learning Evaluation Instrument).

**Curriculum Team Lead** ensures that the TDT has created the Level 1 (Participant Reaction Form) and Level 2 (Learning Evaluation Instrument). Also supports the Level 3 (Change in Behavior) and Level 4 (Results) evaluation methodology, if appropriate. Curriculum maintains all evaluation documentation.

**Target Audience**, by providing feedback, participates in all levels of the evaluation process.

**Supervisors** provide strong support for transfer of training to job performance.

**Safety** receives and provides feedback and improvement related to safe conduct of the activity and to provide tailored hazard controls where needed.

### 3. Process Steps

#### Step 1—Collect and Analyze Data

Evaluation data, generated at the conclusion of the training (Level 1 and 2), is compiled per the instructor reporting requirements found in the OST Training Manual. The Training Branch uses the data received from the evaluation process to modify and improve the course/module content and delivery.

#### Step 2—Evaluate TDT Process/Documentation (Quality Control Check)

The TDT should review their process to ensure all documentation is completed and that the process was completed. Any problem areas or discrepancies should be noted and forwarded to the chief of curriculum.

A designated representative from the curriculum program, other than a TDT member, should audit the curriculum development course/module documentation and ensure compliance with directives.

#### Step 3—Evaluate Evaluation Phase

As an informal process, evaluation is an integral part of the ISD process. Recommended check points in the evaluation phase are:

- Was the Level 1 Reaction documentation collected and analyzed?
- Was a report done on the Level 1 Participant Reaction Forms?
- Was the Level 2 Learning data complete?
- Was the Level 2 Learning documentation inserted into the master file?
- If appropriate, was the Level 3 Change in Behavior and Level 4 Results process initiated?
- If appropriate, was the Level 3 Change in Behavior and Level 4 Results data collected, analyzed, and compiled?
- If appropriate, was the Level 3 Change in Behavior and Level 4 Results Report submitted?
- Was course documentation complete?
- Was the curriculum development process evaluated?

### **4. Records/Documentation**

At the end of the evaluation phase, the following records/documentation should include but are not limited to:

- Level 1 Participant Reaction Form documentation
- Level 2 Learning Evaluation Instrument documentation
- Level 3 Change in Behavior documentation (if completed)
- Level 4 Results documentation (if completed)

### **5. Appendices/Form Templates**

Level 1 Participant Reaction Form–Appendix A, Development, Tab F

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## CHAPTER 7: REVIEW REQUIREMENTS

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### 1. Overview

This chapter covers the review requirements as required by TAP. It ensures that training is occurring and the goals and objectives are still valid for the workforce. Changes may be made any time the course or module requirements change or equipment/job tasks are updated. Even if no changes occur, the TAP assessment and annual reviews provide a formal, regularly scheduled review of the training program and can be considered an extension of the ISD evaluation phase.

### 2. Roles and Responsibilities

The chief of curriculum, or their designated representative, ensures the TAP assessment and review requirements are completed.

### 3. Process Steps

#### A. Job/Task/Function/Job Qualification Standard Analysis Review

##### Step 1–Determine What is to be Reviewed

OST Curriculum determines when a job analysis (JA), task analysis (TA), function analysis (FA), or job qualification standard (JQS) should be reviewed. The process of sending out and collecting review information can be delegated to the administrative staff or designated contractor. Curriculum may delay or waive this review based on program needs. A written memo should be included in the curriculum files to annotate this.

##### Step 2–Send out Information to Designated Reviewers

Job tasks are not stable. Jobs are continuously being redefined to accommodate the organization. As jobs change, so should the analyses. Review and update the analysis data to ensure they still reflect the job environment. Determine if a task is still being done or if it has been deleted. Add any new requirements to the job that have been included due to new equipment, procedures, or tasking.

##### Step 3–Compile Review Data

The designated personnel will consolidate all SMA or reviewer inputs and forward them for review to the Curriculum representatives.

##### Step 4–Determine Level of Changes Needed

- No changes to the JA/TA/FA/JQS: no comments on the Program Revision Summary Forms or notification by other means that any changes are required. Go to Step 5.
- Minor changes to task equipment/procedures/names or deleted tasks or errors at the administrative level (such as spelling, punctuation, minor organization changes of the outline, etc.)—review the Program Revision Summary Forms and list/redline the changes. Go to Step 5.
- Major changes such as a new task (when a new job or task is added), changes to training recommendations, and major revision to an area, review the Program Revision Summary Forms and list/redline the changes. Go to Step 5.

##### Step 5–Document JA/TA/FA/JQS Review Findings

A Program Revision Summary Form and other supporting documentation should be completed that lists any recommended changes/additions made to the JA/TA/FA/JQS. The Program Revision Summary Form

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should then be coordinated with the same level of signatures as the original JA/TA/FA for approval and action. The following are typical recommendations based on the level of changes:

- No changes—file completed Program Revision Summary Form with JA/TA/FA/JQS files.
- Minor changes—based on management direction, these changes can be filed with the document for update during the next major revision, be sent out as pen and ink changes, or sending out a new revision to the document.
- Major changes—in addition to the changes being listed on the Program Revision Summary Form, include any proposed analysis requirements and timelines for new tasks/equipment.

### **Step 6—Notification of Changes**

If changes or additions to the JA/TA/FA/JQS have been approved, the changes are sent out, or a change memo is distributed.

## **B. Curriculum Review of Lesson Plans/Module**

### **Step 1—Determine Lesson Plans/Modules to be Reviewed**

OST Curriculum determines when lesson plans/modules are to be reviewed. The process of sending out and collecting review information can be delegated to the administrative staff or designated contractor. Curriculum may delay or waive this review based on program needs. A written memo should be included in the curriculum files to annotate this.

### **Step 2—Send out Information to Designated Reviewers**

OST Curriculum or their designated representative will review training documentation for inputs from evaluations, assessment, or management reports, JA/TA/FA/JQS review and any other sources on the lesson plan/module/course. The curriculum representative will consolidate all comments/review findings and send out or direct administrative staff to send this information to the reviewers.

The lesson plan/module/course is sent to the SMA/course owner for technical review and content update. Red lined copies are returned to the curriculum representative for revision.

### **Step 3—Compile Review Data**

The designated personnel will consolidate all SMA or reviewer inputs and forward them for review to the Curriculum representatives.

### **Step 4—Determine Level of Changes Needed**

- No changes: no comments on the Program Revision Summary Forms or notification by other means that any changes are required. Go to Step 5.
- Minor changes to task equipment/procedures/names, deleted tasks or errors at the administrative level (such as spelling, punctuation, minor organization changes of the outline etc.)—review the Program Revision Summary Forms and list/redline the changes. Go to Step 5.
- Major Changes such as a new task (when a new job or task is added), changes to training recommendations, major revision to an area of the lesson plan/module, changes to goals, objectives, testing methodologies or performance criteria—review the Program Revision Summary Forms and list/redline the changes. Go to Step 5.

### **Step 5—Document Review Findings**

A Program Revision Summary Form and other supporting documentation of changes should be completed that lists recommended changes or additions made to the lesson plan/module. The Program Revision Summary Form should be coordinated with the same level of signatures as the original lesson



plan/module for approval and action. The following are typical recommendations based on the level of changes:

- No changes—file completed Program Revision Summary Form with course files and update the review information on the cover page of the course and keep the original LPRC date.
- Minor changes—based on management direction, these changes can be filed with the document for update during the next major revision, be sent out as pen and ink changes, or sending out a new revision to the document. Update the review information on the cover page of the course and keep the original LPRC date.
- Major changes—new course materials will have to be developed and submitted to the LPRC process. Use management guidance on where in the ISD process the course must re-enter development. The course would not be considered a review at this point and the process will return to the appropriate ISD phase (Chapters 2-6).

### **Step 6—Notification of Changes**

If changes or additions to the lesson plan/module have been approved, the updated versions of the lesson plan/module should be sent out or a change memo distributed.

## **C. TAP Assessments**

Programmatic assessments on the compliance of training programs to the TAP requirements are conducted when directed by OST. Copies of report and findings should be forwarded to curriculum and filed with the course/module documentation.

## **4. Records/Documentation**

At the end of the review, the following records/documentation should include but are not limited to:

- Updated JA/TA/FA/JQS materials
- JA/TA/FA/JQS Program Revision Summary Form
- Updated lesson plan/module materials
- Lesson plan/module Program Revision Summary Form
- Updated review information on the original lesson plan cover sheet
- New LPRC materials (if appropriate)
- Historical file of previous lesson plan versions or notes on changes (optional)
- Any TAP assessment reports/findings

## **5. Appendices/Form Templates**

Program Revision Summary Form—Appendix A, Development Phase, Tab G