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Guidance for Developing a Training Program for Quality Systems

EPA QA/G-10

FOREWORD

This guidance presents approaches to assessing quality assurance training needs and developing a training program for quality systems to support implementation and management of the Agency-wide quality system. This document is one of the *U.S. Environmental Protection Agency Quality System Series* documents. These documents describe the EPA policies and procedures for planning, implementing, and assessing the effectiveness of a quality system. Questions regarding this document or other *Quality System Series* documents should be directed to the Quality Staff at:

U.S. EPA
Quality Staff (2811R)
1200 Pennsylvania Avenue, NW
Washington, DC 20460
Phone: (202) 564-6830
Fax: (202) 565-2441
e-mail: quality@epa.gov

Copies of the EPA *Quality System Series* documents may be obtained from the Quality Staff or by downloading them from the Quality Staff Home Page:

http://www.epa.gov/quality

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

This document describes a process for developing a training program that will assist users in meeting the requirements of EPA Order 5360.1 A2. The process outlined in this document represents a method for building a quality systems training program that uses a focused needs assessment. It is not intended for use outside of this purpose. There are two approaches described in this document: the detailed approach in Chapter 2 and the simplified approach in Chapter 3. Users should read Chapter 2 to become familiar with the overall process, even if they follow the approach described in Chapter 3.

The steps described in this document are designed for a general audience with limited experience in training program development but can be used by anyone involved in quality assurance- and quality control-related training issues. Each organization should evaluate the steps described in this document and determine how they relate to the organization's needs. Each step should be reviewed for applicability and adhered to, as appropriate, to ensure thorough training program development takes place.

The intended audience for this document includes managers, quality assurance (QA) personnel, and other potential training providers that participate in environmental programs governed by the EPA Quality System. Users of this document should have primary or contributory roles and responsibilities for assessing the need for quality-related training and for developing a quality systems training program for a specific Region, National Center, Laboratory, or Program Office. Although this document focuses on EPA organizations, it can be tailored to the needs of a variety of other Federal agencies, State, local or Tribal agencies, and non-governmental organizations, as well as contractors and financial assistance recipients.

1.2 BENEFITS OF QUALITY SYSTEMS TRAINING

An effective quality systems training program is necessary to ensure that personnel who plan, implement, and assess environmental programs have the skills needed to perform their responsibilities. Quality systems training can:

- help institutionalize quality system requirements through learning,
- provide guidance on how to comply with quality system policies and requirements,
- enhance individual performance by developing proficiencies in the use of QA and quality control (QC) tools and related technical skills, and
- standardize quality systems policy throughout an organization.

The depth of each employee's knowledge and skills contributes to an agency's ability to achieve its mission and goals. Thus, all EPA personnel should be trained to a level that advances

the Agency's commitment to protect human health and safeguard the natural environment by providing environmental data that are credible, scientifically sound, and of sufficient and adequate quality. This document provides a systematic method for defining quality system training needs and developing a training program to help organizations incorporate the necessary QA and QC skills into the full training curriculum.

1.3 TRAINING AND THE EPA QUALITY SYSTEM

Since environmental data operations can be complex, a systematic structure for quality must be established to provide confidence in the quality of information used to support decisions. Such a structure is provided by a quality system and is defined by the organization conducting environmental data operations. The EPA Quality System (Figure 1) consists of three structural levels: Policy, Organization, and Project. Effective implementation of the EPA Quality System requires that training occur at each level of the organization that performs activities affecting environmental data quality. Training needs at the various levels of the organization are task specific. Senior and line managers can benefit from training to help understand the structure, concepts, and operating principles of the quality system. Technical personnel can benefit from training to help understand their organization's quality system and the QA and QC tools and techniques necessary to fulfill the requirements of the system.

The mandatory EPA Quality System is based on the national consensus standard, *Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs,* ANSI/ASQC E4-1994. This standard provides the management and technical elements necessary for developing and implementing a quality system. This standard also contains specifications for identifying training needs to provide the necessary level of skills in QA and QC practices for effective implementation of environmental programs.

Quality systems training ensures that all personnel involved in the planning, management, and implementation of data collection activities have the knowledge and skills to complete their tasks according to the policies and procedures in their organization's quality system. An organization typically specifies the process for determining training requirements in its Quality Management Plan (EPA, 2000a).

1.4 POLICY AND RESPONSIBILITIES

EPA Order 5360.1 A2, *Policy and Program Requirements for the Mandatory Agency-Wide Quality System* (2000), specifies that the collection of environmental data by, funded by, or provided to the U.S. Environmental Protection Agency (EPA) be supported by an effective quality system. This Order also requires all EPA organizations supporting environmental programs to identify program-specific QA and QC training needs for all levels of management and staff, and to provide resources for this training. The goal of this requirement is to assure that QA and QC responsibilities are understood at every stage of project implementation.

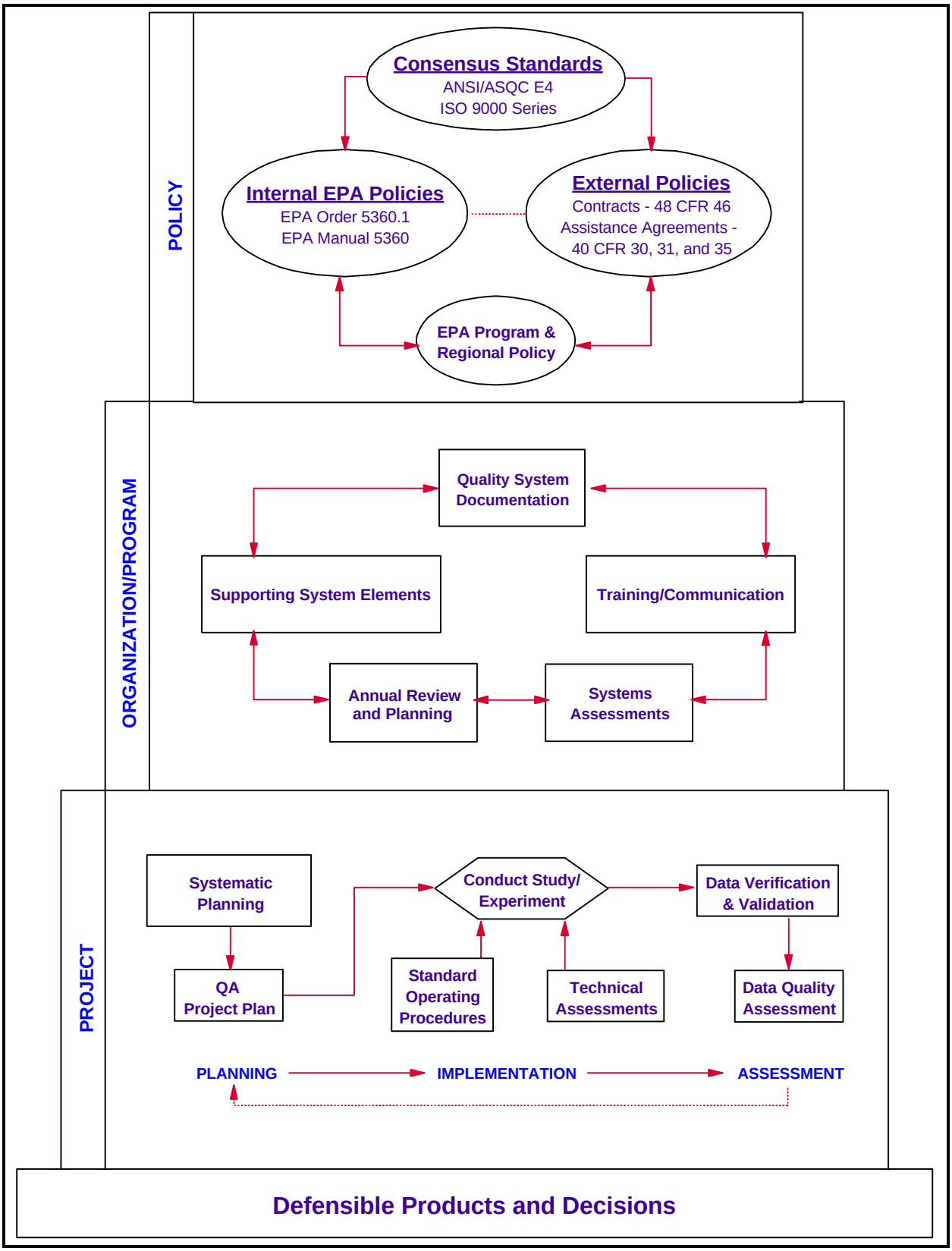


Figure 1. EPA Quality System Components

These requirements are externalized through 48 CFR 46 for contractors; 40 CFR 30, 31, and 35 for assistance agreement recipients; and through other mechanisms, such as consent agreements in enforcement actions.

EPA Order 5360.1 A2 states that the ultimate responsibility for ensuring that training needs are identified and appropriately addressed rests with the management of the organization. EPA's Senior Management Official for Quality is responsible for developing generic training programs for EPA management and staff. The national quality systems training program was developed in response to this requirement (see Chapter 4). The task of developing and implementing the national training program has been delegated to the Quality Staff.

1.5 SUPERSESSION

This document represents a component of the EPA Quality System for which guidance has not been previously developed. Therefore, it does not supersede any other documents.

1.6 PERIOD OF APPLICABILITY

Per EPA Order 5360 A1, this document will be valid for five years from the official date of publication. After five years this document will either be reissued without change, revised, or withdrawn from the EPA Quality System.

1.7 ADDITIONAL RESOURCES

Several other documents have been developed to provide suggestions on developing suitable and effective quality systems for environmental programs. These documents establish criteria and mandatory specifications for QA and QC activities and provide recommendations for using the various components of the EPA Quality System. These documents are listed in Box 1. Since these documents contain guidance on activities critical to successful environmental data operations, they should be considered as resources when developing a quality systems training program. In addition, program-specific documents may be used as a resource.

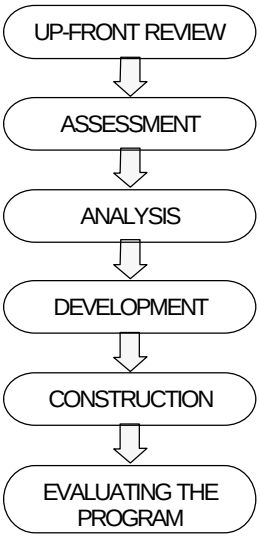
Box 1. Quality System Series Documents

EPA Requirements for Quality Management Plans *(QA/R-2)* (EPA 1999b)
EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations *(QA/R-5)* (EPA 1999a)
Guidance for the Data Quality Objectives Process *(QA/G-4)* (EPA 2000b)
EPA Guidance for Quality Assurance Project Plans *(QA/G-5)* (EPA 1998)
Guidance for the Preparation of Standard Operating Procedures for Quality-Related Operations *(QA/G-6)* (EPA 1995)
Guidance for Data Quality Assessment: Practical Methods for Data Analysis *(QA/G-9)* (EPA 2000a)

CHAPTER 2

A DETAILED APPROACH TO BUILDING A QUALITY SYSTEMS TRAINING PROGRAM

2.1 OVERVIEW



A quality systems training program should facilitate the achievement of an organization's mission, goals, and objectives. Once the details of the quality systems training program are established, they are documented in a training plan. To be properly aligned with the organization, the training program should be developed with accurate information, stakeholder participation, and attention to the unique needs and constraints of the organization. The process of creating a training program includes six phases that are explained in this chapter: (1) Up-front Review (Section 2.2); (2) Needs Assessment (Section 2.3); (3) Analysis of Needs Assessment Data (Section 2.4); (4) Development of the Quality Systems Training Program (Section 2.5); (5) Construction (Section 2.6); and (6) Evaluation of the Plan (Section 2.7). Blank copies of the forms used in these sections are contained in Appendix A. The focus of this chapter is on preparing a training program.

A quality systems training program may include a variety of methods for helping employees attain specific levels of knowledge, skills, and abilities (KSAs) to employees. Ultimately the quality systems training program should ensure that all personnel have the necessary level of experience or training to enable them to competently perform designated tasks.

Training needs will be specific to the tasks and functions at each level of the quality system. Therefore, it is important that each level of the EPA organization be analyzed in terms of its training needs and KSA requirements. An understanding of the typical tasks and functions that occur at each level will help in assessing an organization's quality-related training needs. Following is a list of typical functions and processes that occur at each level:

<u>Policy</u>

- agency mission, organizational functions, policies, and procedures;
- implementing Agency and government-wide regulations;
- decision- and policy-making processes for environmental protection; and
- budget formulation and executive processes.

<u>Organization/Managerial</u>

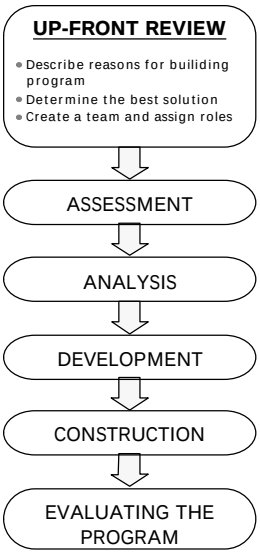
- defining roles and responsibilities of staff and
- carrying out the organization's mission through programmatic initiatives.

Project Level

- defining project scope and requirements;
- managing project time, cost, and performance;
- ensuring project quality management; and
- project procurement management.

The process outlined in the following pages is iterative in nature. It should involve participation of stakeholders with the organization that is developing the training program. The complexity of each phase will vary with the type and size of the organization or unit being addressed. The end result should be a quality systems training program that yields enhanced work performance by knowledgeable and skilled staff and a strengthened quality system.

2.2 PHASE 1: UP-FRONT REVIEW



The purpose of the *up-front review* is to:

1. describe reasons for building a quality systems training program,
2. determine the best solution, and
3. create a team and assign roles.

Reasons for Building a Quality Systems Training Program

Training programs are developed for a variety of reasons. Such programs may be used to meet directives from senior management or to address a performance issue. Understanding the need for the training program provides insight into the expectations the program must meet. If a directive from senior management provides the impetus for creating the program, one should become familiar with the reason for the directive. For example, is the organization ensuring that mission critical skills are available or does a performance issue exist?

A new job description, the introduction of new technology, or a change in responsibilities may result in a lack of knowledge, skills, or abilities needed to successfully perform a job. Training is often the most appropriate method for addressing these types of problems. Performance issues, including communication, management, and attitude, can sometimes benefit from training, but training alone rarely solves these types of performance problems.

Determine the Best Solution

In order to determine if training or some other method is the most appropriate method for addressing a job performance problem, the issue needs to be researched. Start with the initial source of the information. Try to find out:

- how the job performance issue was identified (i.e., internal or external audits, work product review, etc.),
- the criteria the proposed solution is expected to meet (cost versus benefit, time lines, and management's expectations),
- the scope of the job performance issue (individual, team, or organization), and
- from whose perspective the job performance issue exists (individual or management).

When at least part of the problem is that the worker does not know how to meet expectations for job performance, training is the best solution. When a lack of knowledge, skill, or ability is not the cause of the problem, then a non-training solution should be developed. Occasionally, the cause of a problem is determined to be a lack of training when in reality the correct solution is to make changes within a unit or organization. If a non-training solution is required, the organization's Human Resources Department may be able to provide assistance.

Create a Team and Assign Roles

The work involved in building a quality systems training program, including the up-front review, can be labor intensive. It should not be assumed that this process is the primary role of the QA Manager or the QA support staff. However, once the responsibility for developing the quality systems training program has been delegated, the QA Manager or designee should provide their opinion and validate results throughout the process.

The development and implementation of a training program can be simplified by pulling together a team of key individuals in the organization. This critical step helps to gain support for the project throughout the organization. Early on, those working on the process should be identified and their roles and responsibilities clearly communicated. Those roles and responsibilities should be reviewed and revised as necessary throughout the development process.

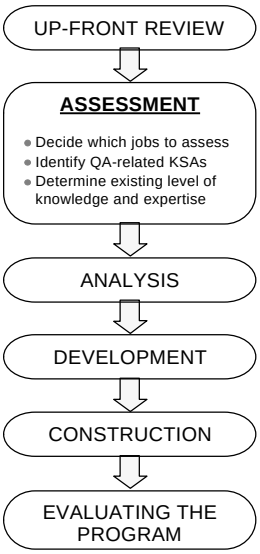
During the initial stages of this process, it is important to keep stakeholders and decision makers within the organization informed about the progress of the assessment and involve them where appropriate. It is also important to explain to stakeholders how the needs assessment process assists the organization in complying with the order. These results should be documented in a report and approved according to the appropriate chain of command.

Phase 1 Tasks

Complete these tasks to perform an up-front review.

_____ Identify the performance issue.
_____ Form a project team, as appropriate.
_____ Assign roles and responsibilities.
_____ Inform stakeholders and decision makers.

2.3 PHASE 2: NEEDS ASSESSMENT



A *Needs Assessment* is the process used to identify and understand the particular quality-related training goals of a specific job, team, organization, or agency (Figure 2). Identifying the training goals helps to ensure that the quality systems training program makes the best use of available resources. The needs assessment process involves identifying the gaps in KSAs that an employee needs to perform his or her job.

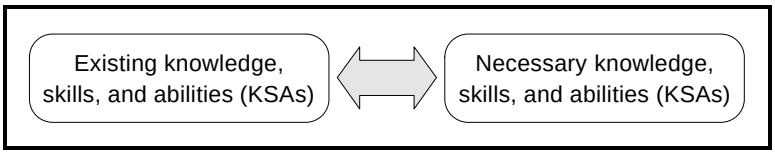


Figure 2. Needs Assessment Model

A *training program* outlines in detail the training needs and how they will be met. A *quality systems training program* outlines the particular needs of a unit or organization for which quality assurance related tasks are a primary focus.

There are three basic steps to performing a needs assessment:

1. decide which jobs to assess,
2. identify the quality-related KSAs required to perform the jobs, and
3. determine the existing level of knowledge and experience.

During the Needs Assessment process, it may also be helpful to review existing documentation. Additional information to support the process may be found in reports from management assessments, internal assessment studies, or Inspector General reports.

Decide Which Jobs to Assess

Deciding which jobs to assess will define the scope of the needs assessment and ensure its validity. The decision begins with the identification of an appropriate *unit* for assessment. The results of the up-front review may logically suggest a certain unit of jobs within an organization. A *unit* will contain related jobs that facilitate an organization's quality systems work. It can be a cross section of the organization or a sub-section within. It should cover all positions involved with environmental data operations, including data users, data generators, and decision makers. Because the quality system operates at the project, organizational, and policy levels, it is critical that the training program address the quality systems training needs of each level.

Once the unit of jobs has been defined, identify and document its associated responsibilities and activities. Most likely, this information already exists and can be found through the Human Resources Department, work plans, and staffing plans. The responsibilities and activities of the job(s) should be documented in the Unit Assessment Form (see Appendix A).

The focus of this phase is on the actual job roles or functions in the unit. The information will be used later to identify which KSAs personnel need to perform their jobs effectively. The Unit Assessment Form should result in a list of responsibilities and activities that can be examined in terms of what is needed to perform them. See Figure 3 for an example of a completed Unit Assessment Form.

Date: January 24	**Manager's Name:** Jane Doe	
Unit Description: Program Oversight Section		
Job List (include all functions in the unit listed above) Work Assignment Manager (WAM) Hydrologist Database Managers Technical Liaison		**Staff Size:** 8-10 full-time employees
Job Title	**Responsibilities**	**Primary Tasks**
Environmental Scientist	WAM	Assure effective performance
		Evaluate performance
	Technical Liaison	Manage communications networks for local governments

Figure 3. Example Unit Assessment Form

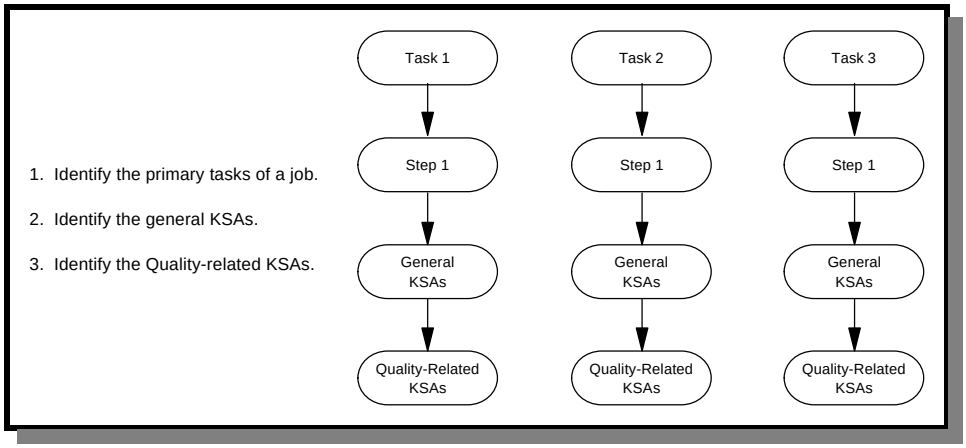
Identify the Quality-Related KSAs Required to Perform the Jobs

The list generated by the Unit Assessment Form provides the framework for performing the job assessment. Job assessment is the process of breaking a job down into specific tasks and evaluating the knowledge and skills needed to perform each task.

There are several methods for performing a job assessment, but the simplest method creates a hierarchy of tasks and sub-tasks necessary to perform a job. The Hierarchical Job Form can be used as a guide throughout the process. The completed form results in a list of quality-related KSAs required to perform each job within a unit. A model for identifying quality-related KSAs is contained in Box 2.

A job assessment requires several levels of detail. It is appropriate to break down the skills needed to perform a job task until entry-level knowledge is determined. Figure 4 contains an example Hierarchical Job Assessment Form. It provides an example of a job assessment conducted on a portion of a Work Assignment Manager's responsibilities. Appendix A contains a copy of this form.

Box 2. Hierarchical Job Assessment



The information from the job assessment should be validated with staff members who perform the tasks and their feedback should be implemented where appropriate. The product of this form should be a list of quality-related KSAs required to perform a specific job.

Determine the Existing Level of Knowledge and Experience

The final step in the needs assessment is to identify the existing KSAs of employees who are currently performing or will potentially perform quality-related functions. This step should validate the information collected so far and identify a baseline for the training goals. There are three steps involved in determining existing KSAs:

1. conduct research,
2. confirm findings, and
3. document findings.

To start this process, decide whether the unit will be assessed in its entirety, or whether it will be broken into smaller groups (for example, by job category or organizational level). It is inadvisable to break the unit down by individual employee since it is likely the quality systems training program will apply beyond a given employee's tenure in that particular position.

Examination of employee performance reviews and training records as well as interviews conducted with members of the unit are useful in identifying existing knowledge and experience within a job category or organizational level. Conduct interviews with the entire unit or a representative sample, depending on its size and the availability of resources needed to conduct the interviews.

Sample interview questions may include the following:

- Does the employee perform the task?

A. Job Title Work Assignment Manager		
B. Primary Job Tasks		
1. Assure effective performance 2. Evaluate performance		
C. List the Sub-tasks related to each task		
Task 1 Assure effective performance		**Task 2** Evaluate performance
Sub-task 1 Inspect work		**Sub-task 1** Conduct on-site inspection
Sub-task 2 Review progress reports		**Sub-task 2** Evaluate outputs/deliverables
Sub-task 3 Review outputs		
D. List KSAs needed to perform each sub-task		
Task 1 Assure effective performance		**Task 2** Evaluate performance
Sub-task 1 Inspect work **KSA:** Ability to evaluate and analyze technical and/or administrative issues involved in implementation of environmental programs		**Sub-task 1** Conduct on-site inspection **KSA:** Ability to evaluate environmental monitoring aspects of the work assignment
Sub-task 2 Review program reports **KSA:** Ability to communicate environmental information orally and in writing		**Sub-task 2** Evaluation of outputs **KSA:** Ability to review, analyze, and recommend modifications to outputs including QA Project Plans or data reports
Sub-task 3 Review outputs **KSA:** Knowledge of work plan and QA Project Plan development and review processes		
E. List Quality-Related KSAs		
Task 1 • Ability to apply QA and QC criteria to technical directives as appropriate • Knowledge of basic quality-related concepts and terms • Knowledge of QA Project Plan review skills criteria and procedures		
Task 2 • Ability to perform technical systems audits • Ability to perform environmental data evaluation		

Figure 4. Example of Hierarchical Job Assessment Form

- How frequently does the employee perform the task?
- What steps does the employee use to perform the task?
- What can the employee suggest for improvement?
- How would the employee rate his or her ability to perform the task?
- What are the employee's reasons for his or her rating?

Where practical, observe employees on the job, talk with those who are outside the job's scope but work with those who are within it, and review customer feedback records.

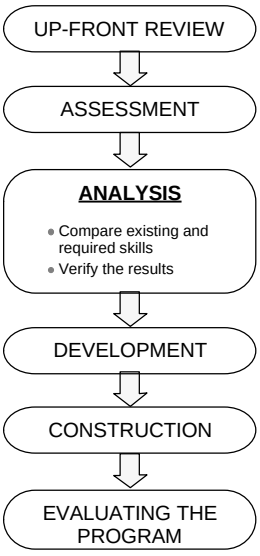
After current skills data has been collected, have members of the unit and/or stakeholders review the results and provide feedback to verify that all existing KSAs are noted and that none are there that do not belong. Ensure that information collected is that which was intended. Developing training goals based on inaccurate or non-representative information can be counterproductive to the organization.

Phase 2 Tasks

Complete these tasks to perform the needs assessment.

_____ Identify the jobs to be assessed.
_____ Document the unit's roles and responsibilities in a Unit Assessment Form.
_____ Complete a Hierarchical Job Assessment for each job to be assessed.
_____ Identify the KSAs for identified jobs.

2.4 PHASE 3: ANALYZING THE NEEDS ASSESSMENT DATA



Needs assessment information analysis is the process of identifying the differences or gaps between what is needed to perform a job and what performance criteria are currently being met. This process includes the following steps:

1. compare existing skills and required skills and
2. verify the results.

Compare Existing and Required Skills

The *Gap Analysis Matrix* (Table 1) was designed to assist in making the comparison between existing and required skills. To develop this matrix, enter a job category or unit description on the top row as indicated below. Enter the KSAs required to perform each job in the first column.

Table 1. Example of a Gap Analysis Matrix

Required KSAs	Requirement Met?
Ability to apply quality-related concepts to environmental study plans and reports	
Ability to apply QA and QC criteria to technical directives as appropriate	
Knowledge of basic quality-related concepts and terms	✔
Knowledge of QA Project Plan review skills	✔
Ability to perform technical systems audits	
Ability to perform environmental data evaluation	

For each job category, indicate where the existing level of KSAs are adequate to achieve satisfactory job performance by placing a mark in the corresponding box.

Any KSAs that are not currently met, either by job category or unit, should be documented. The resulting list of KSAs is the gap that needs to be bridged in the development of the quality systems training program and should be translated into training goals (see Figure 5). A training goal should be stated in as much detail as the KSA gap indicates, along with any other criteria the training program should meet. The training goals should describe what would change, how work might flow, how quickly it might be completed and to what result.

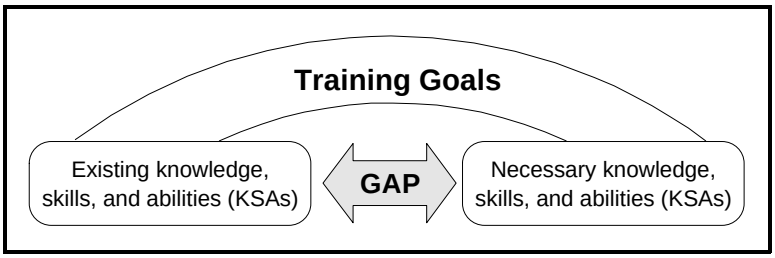


Figure 5. Gap Analysis Model

Depending on the size of the unit, the quality-related KSAs may differ widely among job categories. If this is the case, a separate analysis should be made of each. If no job category breakdown is necessary, the entire unit should be analyzed together.

If accurate and representative information are collected, the results will accurately reflect the quality-related training needs. This information should be described in a detailed report that explains how the process was performed, describes the results, and provides an interpretation of the results.

If the results indicate that there are no quality-related training needs, then the process ends with the analysis. If the results show a need for quality-related training needs, the information will be used during subsequent phases of this process.

Verify the Results

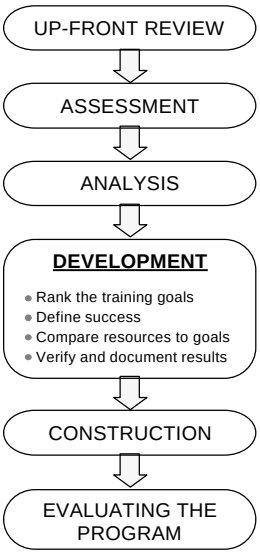
Obtain feedback on the results of the needs assessment from the stakeholders, regardless of what the results indicate. If the stakeholders cannot verify the results, their concerns should be taken seriously and discrepancies should be resolved prior to continuing the process. The person who originally requested that this project be completed may be a source for resolving any discrepancies.

Phase 3 Tasks

Complete these tasks to perform a needs assessment information analysis.

_____ Complete a *Gap Analysis Matrix* for each job category or group of jobs.
_____ Develop training goals based on the gap analysis.
_____ Verify the findings from the gap analysis.

2.5 PHASE 4: DEVELOPING A QUALITY SYSTEMS TRAINING PROGRAM



The purpose of the *development stage* is to create an approach for meeting the quality systems training goals. There are four steps:

1. rank the training goals,
2. define success,
3. compare the current quality-related training resources to training goals, and
4. verify and document the results.

Rank the Training Goals

There are many ways to rank training goals to establish priorities. Any selected method should involve an understanding of the stakeholder needs and the use of consistent criteria. An explanation of one process to rank training goals using weighted criteria follows (see Table 2).

First, list the training goals identified by the gap analysis. Link each training goal to the level of the organization where the training need exists (either policy, organization, or project). Discuss the training goals and their priority in the organization with the stakeholders until consensus is reached on the list to be ranked. This discussion should not revisit whether the goal is valid, but should determine how important it is to the organization. The example of a *Ranking Matrix* (see Table 2) lists the training goals on the left side.

Second, identify the criteria you will use to measure the relative importance of the training goals. The criteria should be selected by consensus with the stakeholder organization. Only the stakeholders can really determine the priority. The example of a *Ranking Matrix* (see Table 2) identifies the criteria for determining the priority of the training goals across the top.

Third, give each criterion a weight depending on how important it is to the organization. Criteria of lower relative importance should receive a lesser weight and criteria of higher importance should receive a greater weight. Assign the weight as a percentage of 100. (The total weight of all the criteria should equal 100.) Table 2 shows four criteria of varying weights.

Fourth, rate each training goal against each criterion, using a scale selected by the group. In Table 2 the scale is 1 to 5 with 5 being the highest (or most important). This rating can be done individually or by the group. If done individually, a composite rating must be calculated before moving on to Step 5. To calculate a composite rating, average the scores of all the group members by totaling all the ratings for a particular criterion and dividing the total by the number of people in the group.

Fifth, multiply the rating by the weight given for the criterion. In Table 2, the third training goal (ability to perform technical systems audits) rating is 3 when evaluated against the Agency Requirement criterion. When this rating (3) is multiplied by the weight for the Agency Requirement criterion (30%), the score is .90. The scores are shown in parentheses in each cell.

Finally, determine the total score for each training goal by adding together the scores for the training goal across all criteria. Enter that number in the last column. The totals for each row represent the relative priority the group gives to each training goal. The *Ranking Matrix* yields a list of prioritized training goals. In Table 2, the fourth training goal (Ability to perform environmental data evaluation) has the lowest priority and the third training goal (Ability to Perform Technical Systems Audits) has the highest priority.

Define Success

Defining success will:

- provide a unified understanding of each training goal,
- help to avoid confusion as the program is being developed, and
- describe the desired results so it is clear when success has been achieved.

Table 2. Example of a Ranking Matrix

	CRITERIA				
TRAINING GOALS	**Job Related** Weight 15%	**Mission Essential** Weight 30%	**Agency Requirement** Weight 30%	**Career Development** Weight 25%	**Total** Weight 100%
Ability to apply quality-related concepts to environmental study plans and reports	1 (.15)	3 (.90)	2 (.60)	1 (.25)	1.9
Ability to apply QA and QC criteria to technical directives as appropriate	1 (.15)	3 (.90)	2 (.60)	1 (.25)	1.9
Ability to perform technical systems audits	5 (.75)	1 (.30)	3 (.90)	3 (.75)	2.7
Ability to perform environmental data evaluation	1 (.15)	1 (.30)	1 (.30)	2 (.25)	1.0

In simplest terms, the quality systems training program will be a success if it results in a better trained workforce with improved job performance. The first measure of success is whether or not the training goals have been met. Other measures may include how well the training goals were met and the degree of job performance improvement. Any additions to the description of success should be made at this time and should be agreed upon by the stakeholders.

Compare the Current Quality Systems Training Resources to Training Goals

The next step is to research the quality-related training that is currently being offered and the training goal this training meets. Develop a *Training Resource Course Evaluation Matrix* (see example in Table 3) to document if an existing training resource meets each training goal. The current quality-related training resources should be listed on the left side of the matrix. Chapter 4 in this document discusses resources for generating such a list.

The training goals of highest priority should be listed across the top of the matrix. Each course should be evaluated in terms of how well it meets each training goal. A checkmark should be placed in the box where a course meets a training goal.

Table 3. Example of a Training Resource Evaluation Matrix

Resource	Apply quality-related concepts to environmental study plans and reports	Apply QA and QC criteria to technical directives as appropriate	Perform technical systems audits
Introduction to EPA Quality System Requirements Training Course		✔	
Management Systems Review Workshop			
Introduction to DQOs Training Course	✔		
Integrating QA into Project Development (Advanced) Workshop	✔	✔	
Sampling Designs for QA Project Plans (Advanced) Workshop	✔		
Data Quality Assessment Training Course	✔		
	Met	Met	Unmet

✔= Course meets training goal.

The *Training Resource Evaluation Matrix* will determine which training goals can be adequately met by current training resources. The matrix will also distinguish these training goals that cannot adequately be met by current courses. An approach for meeting the latter group of training goals will need to be designed and information about this can be found in Chapter 4 of this document.

Verify and Document the Results

All information should be verified by people familiar with the courses and the training goals. The final results of this phase should be documented in a report and shared with the appropriate staff.

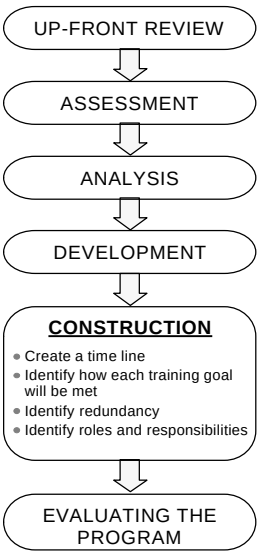
The completion of the *Training Resource Evaluation Matrix* concludes the information collection and evaluation portion of building the training program. The next portion focuses on constructing and evaluating the quality systems training program prior to its implementation.

Phase 4 Tasks

Complete these tasks to develop the quality systems training program.

_____ Rank the training goals using a *Ranking Matrix.*
_____ Identify gaps in resources using a *Training Resource Matrix.*
_____ Verify the results.
_____ Document the results.

2.6 PHASE 5: CONSTRUCTING THE QUALITY SYSTEMS TRAINING PROGRAM



Phase 5 of building a quality systems training program is the last portion of developing the program. The *Construction* phase puts together the conclusions reached during the information collection and analysis phases to attain the training goals. The process of constructing the training program includes:

1. create a time line for achieving each training goal,
2. identify how each training goal will be met,
3. identify redundancy, and
4. identify roles and responsibilities.

Create a Time Line for Achieving Each Training Goal

The purpose of a time line is to determine which goals will be met at what point during the program's life cycle. This determination will be made according to two pieces of information — the priority of the training goal (Section 2.5) and the availability of resources needed to achieve the goal. This priority was identified in Section 2.5. Availability of resources refers to both the amount of resources that exist and the likelihood of obtaining the necessary resources. If resources are not available to fulfill a high priority training goal, it might be necessary to either identify alternative resources for meeting the training need or revisit its priority for the organization. Resolving any conflicts between priority level and availability of resources requires flexibility and management support.

The basic information needed to make these decisions comes from the results of the *Training Resource Evaluation Matrix* and the *Ranking Matrix* from Phase 3.

Identify How Each Training Goal Will Be Met

There are several considerations when deciding how to achieve an organization's training goals:

1. financial resources,
2. available time,
3. available personnel and their skills,
4. existing programs that can be adapted for use,
5. costs of these resources, including administrative costs,
6. types of training that are needed, and
7. personality, attitude, learning capabilities, and size of the audience.

These items will help determine if the match between the training goal and the existing courses is strong. These considerations will also begin the process of addressing the needs not met by current offerings. Some familiarity with the six basic training methods will also be helpful. Table 4 lists a variety of training platforms including formal training (classroom) and computer-based, video-based, print-based instruction, and informal on-the-job training . These platforms can be mixed and matched to suit a particular need.

Table 5 provides a template for documenting how the training goals will be met. For each Training Goal, list its priority, when it should be met, the method or methods that should be used, the resources needed, and the availability of resources.

Identify Redundancy

After reviewing the quality systems training program, there may be some organization-wide training goals that, because of their topics or methods of achieving the goal, can be linked together. For example, a Needs Assessment may establish that all Project Officers have quality-related tasks. An organization may have a training need or requirement for all of its employees to participate in Basic Project Officers Training. It may be possible that Basic Project Officers Training can fulfill some or all of the quality-related training requirements. Regardless of the extent to which the requirements can be met, making use of appropriate existing courses, rather than creating new ones, creates a cost-effective solution.

Identify Roles and Responsibilities

After the quality systems training program is developed, delegating implementation and management responsibilities to organizations, units, or individuals may be appropriate. There should still be designated individual(s) who coordinates the implementation plan. That individual may be the same person who coordinated the development of the training program, or it may be a

Table 4. Training Media

Medium	Advantages	Disadvantages
Classroom	• Inexpensive to develop • Easy to produce/reproduce • Allows student participation	• Travel costs • Limited availability of qualified instructors
Computer-Based Multimedia	• Interactive • Individualized • Realistic simulation capabilities • Consistent instruction	• High up-front development costs • Hardware access • Expensive to revise • Not flexible when operating system changes
Distance Learning	• Reaches geographically-dispersed audience	• High delivery costs
Video-Based	• Excellent for presenting overviews of programs • Easy to distribute • Attention getting	• Not easy to revise • High up-front costs
Print-Based	• Inexpensive to develop • Easy to produce/reproduce • Unlimited capacity for information	• Not as aesthetically pleasing as multimedia
On-the-job	• Low cost • Easy to implement • Flexible • Provides practicing opportunities	• May slow down pace of work and interfere with time limits for job performance

Table 5. Example of Resources to Meet Training Goals

Training Goal	Priority	Due Date	Training Method(s)	Resources Needed	Resource Availability
Apply quality-related concepts to study plans and reports	2	09/30	Classroom OJT	• Training dollars • Personnel availability • Training support	• Personnel availability
Apply QA and QC criteria to technical directives as appropriate	2	09/30	Classroom OJT	• Training dollars • Personnel availability • Training support	• Training dollars • Personnel availability • Training support
Perform technical systems audits	1	06/01	CBT	• Training dollars • Personnel availability • Training support	• Training support

completely different individual. If someone not involved in the initial development of the training program is assigned responsibility for coordination, the new coordinator should be familiar with how the training program was developed, its objectives, and the desired outcomes of the process.

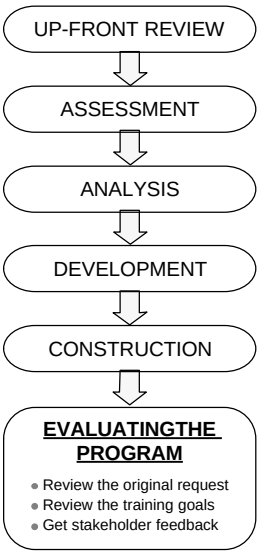
Maintaining open lines of communication with all stakeholders during the program's development is still important in this phase. Stakeholders should review the progress of the training program throughout the development process so that they remain involved and supportive of the plan.

Phase 5 Tasks

Complete these tasks to construct the training program.

_____ Create a time line.
_____ Choose training methods for achieving the training goals.
_____ Discuss the program with stakeholders.

2.7 PHASE 6: EVALUATING THE QUALITY SYSTEMS TRAINING PROGRAM



The last phase of building a quality systems training program is evaluating the program to make sure it is sufficient in scope and will meet the needs of its users. Evaluate the program to determine if it addresses training needs and priorities. The following three areas are important when evaluating a training program:

1. review the original request,
2. review the training goals, and
3. get stakeholder feedback.

Review the Original Request

Before considering the quality systems training program to be complete, the original request or directive that started this process should be reviewed for consistency. If the program does not meet the original criteria, there are two options. The first option is to alter the program to meet any criteria that are not met. This option is viable if the missing criteria are fairly simple to include and will not make major changes in the program's approach. If this is not viable, the second option is to meet with the originator of the request to obtain their input on the program. With some creative thinking, some pieces of the program may be salvaged or revised without having to repeat the entire process.

Review the Training Goals

It should be determined if the program has the reasonable potential to meet the original training goals and if any revisions might increase the likelihood of its success. To make this determination, refer to the training goals identified in Phase 3. Review the training goals and the plan to meet the goals, which are listed in Phase 5. If the suggestions in Phase 5 do not correlate with the training goals, revisions to one or both are necessary. Most likely the revisions need to be made in the approach rather than the goals, but both items should be considered. To make these revisions, refer back to the process recommended in the pertinent phase.

Get Stakeholder Feedback

If the stakeholders of the training program have been kept up-to-date on the various milestones of the project, this final review will not produce many surprises. To encourage stakeholder review, package the program in a format that is easy to read, and provide the stakeholders with guidance on the type of feedback being sought and a deadline for providing it. Once their feedback has been received, implement the stakeholders' suggestions wherever possible. Their feedback should represent the needs and concerns of the average user and will increase the support for the program.

After the first review, stakeholders' feedback should be implemented and the program should be sent out for subsequent reviews before it is finalized. While the same people can review the plan more than once, new reviewers might pick up different details than those who have seen it before. The number of reviews should be limited to only that which will enhance the quality of the plan.

Additionally, it is important to track the quality systems training program's contribution to the organization's mission and goals. This task involves getting feedback from the students, managers, and customers, some of whom may be included in the stakeholder review (described previously).

CHAPTER 3

A SIMPLIFIED APPROACH TO BUILDING A QUALITY SYSTEMS TRAINING PROGRAM

3.1 OVERVIEW

A successful training program facilitates the achievement of an organization's mission, goals, and objectives. Chapter 2 outlines one method of building a training program that works well when resources are not a limiting factor. However, limited resources require a simplified approach.

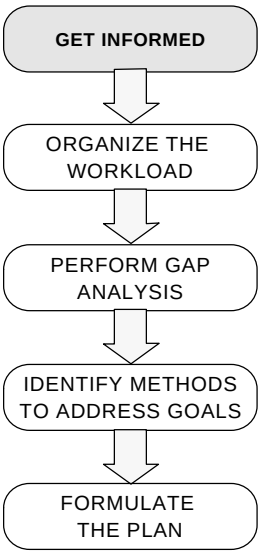
This chapter describes a simplified approach to developing a quality systems training program that can be used when time, personnel, or other resources are extremely limited. This approach offers flexibility, allowing the user to choose those recommendations that best meet the current needs. However, it should be understood that the closer the original process (Chapter 2) is followed, the more thorough the result will be. Steps in this approach include:

1. Get Informed (Section 3.2),
2. Organize the Workload (Section 3.3),
3. Perform Gap Analysis (Section 3.4),
4. Identify Methods to Address Goals (Section 3.5), and
5. Formulate the Plan (Section 3.6).

This process uses an outline similar to the more detailed process, but the techniques for completing each phase have been simplified. (Remember that by abbreviating the training program development, some of the benefits of a thorough detailed process may be lost.) Section 3.7 presents the steps of the detailed process and the impact of their removal.

Each step in the simplified process builds on the step that precedes it, with the exception of Organize the Workload. In both the detailed and simplified approaches to developing a training program, training needs will be specific to the tasks and functions at each level of the quality system.

3.2 ALTERNATE PHASE 1: GET INFORMED



The purpose of the *Get Informed* phase of the process is to identify two things: (1) the reason for developing a training program and (2) to what unit within the organization the training program should apply. The following tasks are included in this phase:

1. review existing information,
2. conduct observations, and
3. survey stakeholders.

The first task is to obtain and review existing documents or information. Examples of such documentation include:

- policies or directives,
- job descriptions,
- work plans,
- assessment reports, and
- Inspector General reports.

Assessment reports may not attribute findings to a specific training need, but may point out where performance issues exist within an organization. The other documents may indicate skills needed by employees to fulfill either a new policy or a particular job. This information will help determine if training is the most appropriate solution for the performance issue. When a lack of knowledge, skill, or ability is not the cause of the performance problem, then a non-training solution should be developed.

The next step in this phase is to conduct on-the-job observations. The observer should have some familiarity with the tasks at hand or the job being observed. Performance issues can be validated or reasons for developing the training refocused by observing employees as they go about their work. The person making the observation should pay attention to an employee's:

1. understanding of the task/job,
2. ability to perform it within a reasonable amount of time,
3. method of approaching the task/job, and
4. quality of work.

The observations should be documented and included in the full report developed at the end of this phase. If you are operating under time constraints, ask the employee to give you a detailed description of his or her work.

The final step in this phase is to survey stakeholders, defined as those who have a significant interest in the outcome of the training program, to determine to what extent current quality systems training meets the needs of the organization. This information will contribute to

understanding of the reasons for developing the training needs identified in the first two tasks. It can also be a means for performing a customer service check of the training currently provided to the unit. The survey may indicate that the training topic or format can be altered to provide maximum benefit to the employee.

At the completion of the first three activities in Phase I, document your findings in a report. The report should include:

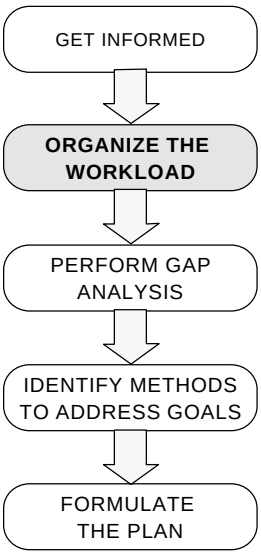
- the results from the information review,
- observations of employees' work, and
- the results of the stakeholder survey.

Alternative Phase 1 Tasks

Complete the following tasks to get informed.

_____ Review existing documents that indicate training needs.
_____ Observe employees on the job, or review detailed work descriptions.
_____ Survey stakeholders to determine to what extent current training meets their needs.
_____ Record conclusions in a report.

3.3 ALTERNATE PHASE 2: ORGANIZE THE WORKLOAD



Under optimal circumstances, a team will be responsible for attending to all the details of developing a training program. The development team can be as small as two individuals or as large as resources allow. For more information on working as part of a team, refer to Section 3.2, Phase 1. If these resources do not exist, an individual can develop a successful training program as long as he or she is well organized and communicates with stakeholders frequently. The following tasks are useful in identifying the best individual(s) to develop the plan and for assigning the project to them:

1. identify skills and experience needed to develop the plan,
2. identify the roles required to develop the plan,
3. list the possible candidates, and
4. select the best choice(s).

The first task is to identify what skills and/or experience will facilitate the training program development process. Such skills or experience might include:

- familiarity with work of the unit,
- understanding of the relationship between the work of the unit and EPA's quality assurance requirements, and
- familiarity with training principles or plans.

Once the necessary skills and/or experience to perform the job have been identified, a list of candidates to work on developing the training plan should be prepared.

The second task of this phase is to consider the roles of the team or individual creating the plan. Roles might include those knowledgeable in information collection, fiscal resources, or organizational work processes.

After responsibility has been assigned, the following must also be done:

- list the tasks to be completed using this document for guidance,
- establish specific guidelines for completing these tasks,
- identify time frames in which the tasks should be completed, and
- assign the tasks to a team member if the team approach is being used.

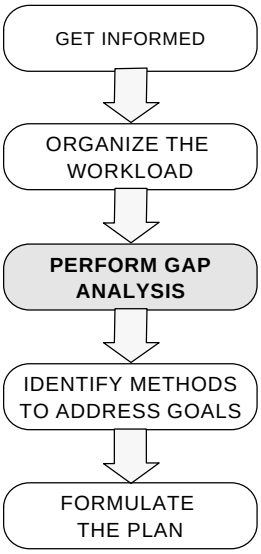
Before beginning Alternate Phase 3, the responsible parties should have a clear understanding of their assignment and the roles they are expected to fill.

Alternate Phase 2 Tasks

Complete these tasks to organize the workload.

_____ Identify the people or person responsible for developing the training program.
_____ Ensure that those responsible understand the project requirements.
_____ Make decisions about task assignments and time lines.

3.4 ALTERNATE PHASE 3: PERFORM GAP ANALYSIS



The purpose of performing a *gap analysis* is to identify the difference between what skills a unit requires to perform optimally and what skills currently exist. This is similar to the needs assessment done in Section 2.3. To identify the gap, the following tasks should be completed:

1. identify job roles and responsibilities,
2. identify required quality systems skills,
3. identify existing skill levels,
4. describe gaps, and
5. verify results.

Interviews of selected staff managers will provide information for the first three activities within this phase -- identifying tasks of the unit, quality-related skills required to perform them, and existing skill levels within a unit. The focus of the first two tasks is on the jobs in the unit, rather than the individual employees. Training needs to be targeted toward specific jobs because its shelf life will be longer than the average employee's tenure in any one job.

Interviews for the first task can be structured into two parts:

1. Identify the required skills of the unit:
   - What tasks *should* be performed in the unit?
   - What skills are *required* to perform the tasks?
   - Which of those required skills are quality-related?

2. Identify existing quality-related skill levels:
   - What quality-related tasks *are performed* in the unit?
   - What skills *are used* to perform the quality-related tasks?

The fourth task is to compare the list of required skills against the list of existing skills to see where the gaps exist. Refer to the *Gap Analysis Matrix* in Section 2.4 for a more structured approach to the review. Describe those gaps in as much detail as possible, making note of questions that arise during the review.

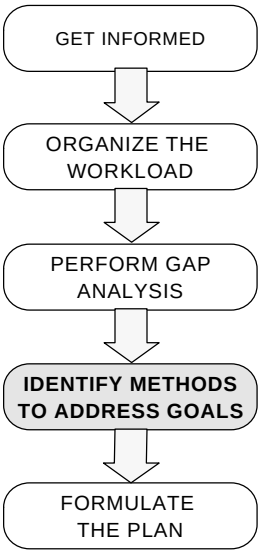
Finally, confirm the information and obtain answers to questions by meeting with managers, stakeholders, and/or employees. Wherever possible, implement feedback from these individuals.

Alternate Phase 3 Tasks

Complete this task to perform a gap analysis.

_____ Identify, describe, and validate the gap

3.5 ALTERNATE PHASE 4: IDENTIFY METHODS TO ADDRESS GOALS



To *identify methods to address goals*, it is necessary to:

1. rank quality systems training needs,
2. determine what progress should look like, and
3. identify available training that meets high priority needs.

If all of the training needs cannot be met at once, it is useful to know which needs are critical to the organization's mission and which are lower priorities. Discuss the training needs with the stakeholders and try to obtain some agreement on their ranking.

For some organizations, diagraming these priorities showing secondary and tertiary needs might be necessary, since some secondary and tertiary needs may support a primary need. A more detailed approach for ranking the quality systems training goals can be found in Section 2.5.

After ranking the quality systems training needs, develop a list of milestones so that progress can be identified and reported. This provides checkpoints for success.

There may be existing training that will meet some training needs in-house. Discuss this possibility with training coordinators or managers. Chapter 4 contains more information about quality systems training resources.

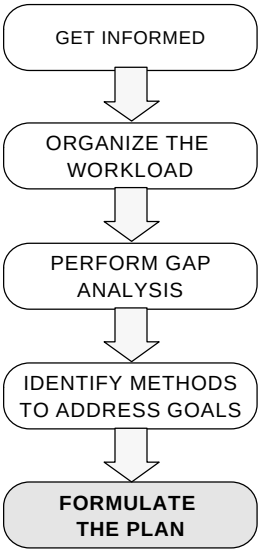
List the training needs and any existing training that can meet them, understanding that some training may meet several needs and that others may meet partial needs. Refer to the *Training Resource Evaluation Matrix* (Table 3) for assistance. All of this information should be noted in detail so it can be included in the training program. Include the following: (1) training goal, (2) its priority, (3) how it will be addressed, (4) the resources required to address it, and (5) the availability of the necessary resources.

Alternate Phase 4 Tasks

Complete this task to identify methods to address goals.

_____ Identify and document which of the currently available training meets quality systems training needs and to what extent.

3.6 ALTERNATE PHASE 5: FORMULATE THE TRAINING PROGRAM



The final step in developing a quality systems training program is to take the information gathered in the first four phases of development and *formulate the training program*. There are four steps to this phase:

1. write a draft quality systems training program,
2. evaluate the program,
3. obtain feedback from stakeholders, and
4. develop a final quality systems training program.

The draft quality systems training program should include the following information:

- **Reasons for developing a training program**: A detailed account of the conclusions drawn from Alternate Phase 1: Get Informed.
- **Gaps between required and existing skills**: The results of Alternate Phase 3: Perform Gap Analysis.
- **Plan of action**: The results of Alternate Phase 4: Identify Methods to Address Goals, a time line for addressing each goal, and assignments for roles and responsibilities for completing each piece of the plan.

After the draft program is written, make sure that the plan will:

- address the original issues,
- meet the training goals identified in Alternate Phase 3, and
- identify quality-related training needs that overlap with other organizational training requirements.

The draft training program should be shared with the stakeholder group. Include their feedback in the final training program. Upon completion and approval of the final training

program, training should be implemented as quickly as possible to maintain the momentum built by the development process.

Alternate Phase 5 Tasks

Complete these tasks to formulate the training program.

_____ Create a draft training program.
_____ Evaluate the draft training program.
_____ Validate the draft training program.
_____ Develop the final training program.

3.7 EVALUATING THE APPROACH TO BUILDING QUALITY SYSTEMS TRAINING PROGRAMS

Resource constraints may prompt the user to choose those aspects of the process that best meet the needs of the organization. Careful evaluation of the impact of eliminating steps is warranted in such cases. Table 6 chart explains the approach to building training programs. It outlines the steps and purpose of each sub-process in Chapter 2, and the effect of eliminating each step. The phases and steps listed here match the those in Chapter 2, however some steps have been combined for streamlining purposes.

Table 6. Rationale of the Approach to Building a Quality Systems Training Program

Phase	Steps	Purpose	Effect of Elimination
1. Up-front Review	Describe the reasons for building a training program	To provide insight into the expectations the plan should meet; to identify the problem the training program will address	Unclear expectations, confusion, lack of coordination of efforts, scope creep
	Determine the best solution	To research the problem and determine if training or some other method is the most appropriate solution	Lack of information, unclear expectations, lack of mission, lack of perspective, waste of time
	Create a team and assign roles	To identify who will be responsible for what; to gather a dedicated staff to work on issues; to create a group of stakeholders and supporters	Lack of support from organization, no dedicated staff, unclear expectations and no accountability, ambiguous leadership roles and unwieldy responsibilities
2. Needs Assessment	Decide what jobs to assess	To identify the unit of jobs needing assessment (Unit Assessment)	Lack of clear starting point, no consensus on where to begin
	Identify the KSAs required to perform the jobs	To identify responsibilities and activities required for each role; to break down the jobs into specific tasks and evaluate the knowledge and skills needed to perform them. (Main tasks, decisions and options, sequence in order of performance, create flowchart, identify quality-related KSAs) (Hierarchical Job Assessment)	No identification of desired state. If tasks are not broken down, it's hard to see what skills are required. This step helps create a systematic approach; otherwise the large amount of information may become unwieldy, causing confusion and overlooking important skills

Table 6. Rationale of the Approach to Building a Quality Systems Training Program

Phase	Steps	Purpose	Effect of Elimination
	Identify those KSAs that are quality-related	To identify those tasks that require quality-related KSAs (Hierarchical Job Assessment)	Lack of knowledge of required quality-related skills; won't have a clear idea of what needs to be accomplished
	Determine the existing knowledge and experience	To examine the KSAs currently held by groups of employees who are/will be performing quality-related functions (identify unit of assessment, conduct research, confirm findings, document)	Won't have good idea of the level of knowledge, skills, and abilities that already exist. Impacts the ability to target training
3. Analyzing the Needs Assessment Information	Compare existing skills with required skills	To determine the gap between desired and existing skills	Won't have good idea of what needs to be accomplished; need to know what is in place in order to figure out what needs to be done
	Validate the results	To get feedback from stakeholders and resolve discrepancies	May be missing important feedback, input, news, developments, support, perspective, buy-in
4. Developing a Quality Systems Training Program	Rank the training goals	To prioritize needs and goals to make sure the program will address most important issues; to gather input from representatives of each level and assess how important each goal is to the unit	Won't have priorities in place; won't know what goals should be accomplished first; may start on a path that isn't optimal or sanctioned; won't have the big picture

Table 6. Rationale of the Approach to Building a Quality Systems Training Program

Phase	Steps	Purpose	Effect of Elimination
	Define success	To provide a unified understanding of goals; to specify how people will know that the quality systems training needs have been achieved (how it would look if the goal were achieved, how work would flow, speed of work completion, results)	Won't know when real progress has been made or where changes need to be made
	Compare the current quality systems training resources to training goals	To determine what quality-related training is currently being offered and how it could be used to meet training objectives	May cause redundant work, wasting time, money, and effort
	Validate and document results	To get feedback from people familiar with the courses and training needs	Won't have the full information on a subject or the right perspective; might think that a course achieves a goal that it doesn't
5. Constructing the Quality Systems Training Program	Create a time line for achieving each training goal	To determine when goals will be met (based on priority and available resources); to provide a framework for determining success and progress	Won't have a clear schedule; might cause confusion, slow down the pace, and cause missed deadlines
	Identify how each training goal will be met	To balance the pros and cons of each approach to addressing training needs; to detail priorities, deadlines, approaches, resources needed, and availability of resources for each goal	Might choose the wrong approach and not know it until it is too late; might cause waste and rework

Table 6. Rationale of the Approach to Building a Quality Systems Training Program

Phase	Steps	Purpose	Effect of Elimination
	Consolidate programs; Identify redundancy	To determine when needs or efforts to address them are being duplicated, to save time, resources, fill needs	Redundancy, waste of time, money and effort
	Identify roles and responsibilities	To determine who should be doing what; to familiarize new members with the background of the program	Confusion and irritation for involved staff; unrealistic expectations; low group cohesion, lack of accountability
6. Evaluating the Quality Systems Training Program	Compare the program to the original request	To review original reasons for this training program; to make sure the project is on track; if not, to correct; to get input from originator of request	Won't know if the training program is correctly focused; waste of time, money, and effort if later it is determined that the training program doesn't address concerns
	Compare the program to training goals	To determine if program is likely to meet original goals; to determine the need for revisions to meet goals	Waste of time, money, effort if later it is determined that the training program does address goals
	Obtain stakeholder feedback (should happen throughout -- not at end)	To get feedback from stakeholders; to implement suggestions from stakeholders	Lack of support, perspective, help, buy-in; leading to an incomplete effort

CHAPTER 4

QUALITY SYSTEMS TRAINING RESOURCES

A single generic training program cannot address all possible EPA-wide quality systems training needs. Organizations and programs are complex and diverse. However, core training courses should be able to address and satisfy basic organization-specific training needs.

Changing roles and priorities as well as new organizational needs all contribute to the challenge of maintaining skills and developing new areas. An organization chooses resources based on identified training needs, selected training strategies, and budget allowances. Some training resources are discussed below. Other possible resources include Human Resources Departments and other Federal and State agencies. This list is not all inclusive, but provides a starting point in evaluating resources for the quality systems training program.

4.1 AGENCY-WIDE QUALITY SYSTEMS TRAINING RESOURCES

The Quality Staff is one resource for the EPA Quality System that provides training materials, guidance documents, trained instructors, and assistance to EPA organizations. Two types of training resources have been developed by the Quality Staff:

- generic training materials for Agency-wide tailoring and use, and
- advanced training courses delivered by the Quality Staff.

Generic courses developed by the Quality Staff are intended to provide users with a working understanding of the EPA Quality System and its components. These training courses enhance an employee's ability to address tasks associated with planning, implementation, and assessment of the EPA Quality System. The generic courses may be tailored to fit the specific requirements of EPA organizations. Staff and management must be trained to adequately perform quality-related tasks defined in EPA Order 5360.1 A2.

While there is no Agency-wide quality systems training requirement, Table 7 shows examples of quality-related functions and suggested training to support those functions. For a complete listing of Quality Staff training, contact the Quality Staff (see Foreword).

4.2 IN-HOUSE COURSE DEVELOPMENT

There will likely be instances when current quality systems course offerings and contractor services are not readily available and in-house development is the only option. This section provides information about the general steps involved with course development. More information can be found in the reference section of this document. The general steps involved in creating a course include:

Table 7. Quality Systems Training Matrix Example

QA and QC Functions	Suggested Quality Systems Training	Quality System Level
Establish, document, and periodically revise Agency policies and procedures for planning, implementing, and assessing the effectiveness of the mandatory, Agency-wide Quality System.	• Introduction to EPA Quality System Requirements	Policy
Ensure that all organizational components and applicable programs fully comply with the requirements of EPA Order 5360.1 A1.	• Introduction to EPA Quality System Requirements	Program
Perform periodic assessments of environmental programs to determine the effectiveness of their mandatory quality systems.	• Management Systems Review Workshop • Planning and Implementing Quality System Audits	Program
Ensure that environmental data are of sufficient quantity and adequate quality for their intended use and are used consistent with such intentions.	• Introduction to DQOs • Integrating QA into Project Development (Advanced) • Sampling Designs for QA Project Plans (Advanced)	Project
Ensure that all Agency funded environmental programs implemented through extramural agreements comply fully with applicable QA and QC requirements.	• Introduction to EPA Quality System Requirements • Introduction to DQOs • Integrating QA into Project Development (Advanced) • Data Quality Assessment	Project

- develop course objectives,
- select training methods,
- select practice activities,
- develop a course outline,
- develop a training schedule, and
- develop a training syllabus.

4.2.1 Develop Course Objectives

The *course objective* describes what an individual will know or be able to do after completing the course. A course objective should include three components:

- what KSAs are to be demonstrated,
- who is to demonstrate the KSAs, and
- when the KSAs are to be demonstrated.

In addition, a course objective can include two more components:

- what tasks the individual may be given to demonstrate the KSAs and
- what level of achievement is required for the KSAs.

Each course should have at least one objective. Each course objective should be supported by a series of *enabling objectives* that outline the KSAs one must acquire in order to achieve the course objective.

The Objectives Form (Box 3) provides a guide for creating course objectives and their enabling objectives. Enabling objectives provide order to training presentations because they lead the training to the course objective. Enabling objectives consist of two components:

- the action to be taken and
- the object of the action.

Box 3. Objectives Form

Course Objective: After completing this course, *the student* will be able to *apply quality-related concepts to environmental study plans and reports*.

Enabling Objectives: To attain the course objective, *the student* will:

1. *Identify quality-related concepts*
2. *Identify the purpose of environmental study plans and reports*
3. *Understand the impact of quality-related concepts on plans and reports*

4.2.2 Select Training Methods

The selection of the *training method* relies heavily on the objectives that are to be taught in the course. There are several considerations to be made in making this selection.

- Is the method appropriate for the objectives?
- Are the resources available?
- What facilities are required?
- What is the projected size of the group to be trained?
- What is the background of those attending?

- What are the most common training methods (illustrated lecture, demonstration, discussion, case studies, guided practice, self-paced learning, distance learning, coaching, on-the-job)?

4.2.3 Select Practice Activities

Individuals receiving information or developing skills should be able to practice their new knowledge and receive feedback on their applications. These *practice activities* should be dynamic and engaging, and they should require the individual to interact with the content and/or other people in the course.

Feedback should occur as soon as possible after the activity and be clearly stated so that the student can integrate it with their new knowledge.

Here are some examples of practice activities.

- Solve a series of problems.
- Answer a series of questions.
- Locate information in a manual.
- Perform a series of calculations.
- React to a case study.
- Practice a skill following instructions in a technical manual.
- Participate in a role play.
- Conduct an interview.

4.2.4 Develop Course Outline

The *course outline* is a plan of the training that will be delivered. It is divided into five columns as illustrated in Table 8.

Table 8. Course Outline Template

Topics	Sub-topic	Teaching Points	Instructional Strategy	Duration
Primary concepts to be covered during the course	Concepts that support each topic. There will likely be more than one sub-topic for each topic	A list of items to be discussed during the discussion of each sub-topic	Method for conveying the concepts (for example, lecture, exercise, video, experiential activity)	How long it will take to complete each Instructional Strategy. The time can be totaled at the end of each topic

4.2.5 Develop a Training Schedule

From the course outline, a *training schedule* should be created to distribute to participants on the first day of training. The schedule will help the developer ensure that all training objectives and activities are completed in the allotted time.

4.2.6 Develop a Training Syllabus

A *training syllabus* provides information about a course and is often given to participants in advance of the course. It can include the following information:

- course title and description,
- course objectives,
- course topics,
- description of the target audience,
- length of the course,
- course prerequisites,
- location of the course,
- information about the instructor,
- description of materials the participant will need or receive, and
- description of any items the participant should bring to the course.

In conclusion, developing a course can be resource intensive and should not be attempted without careful consideration of the costs and benefits. Prior familiarity with the topic, the use of existing documentation, and effective collaboration among the principals involved in design and delivery of training materials will expedite the process.

4.3 USE OF CONTRACTORS/CONSULTANTS

Many situations may warrant procurement of training expertise from outside sources. Quality-related responsibilities may require highly technical and specialized expertise. Additionally, the most cost effective approach may be to use the services of contractors or consultants. Using consultants may be the most cost-effective way to meet training needs when you need unique skills, specialized experience, or knowledge that is not readily available within your organization.

Organizations such as the American Society of Quality, the American Chemical Society, and others offer comprehensive lists of quality-related training courses that cover a wide range of topics. Private firms also offer courses in quality management and related quality topics.

4.3.1 Inherently Government Functions

Contractors and consultants often can be used to create or to support the production of training materials. However, many quality system activities involving environmental data

operations are inherently governmental functions and must be performed only by EPA personnel or by personnel explicitly authorized by EPA based on statute, regulation, or by the terms of an extramural agreement. Such representatives may include other governmental personnel and with specific authorization, contractor personnel. When such quality management tasks are performed by a contractor, the contract must be appropriately managed and must remain under the control of the authorized EPA contracting representatives. **EPA cannot use cooperative agreements or grants to provide quality management activities such as QA and QC services for EPA because it is an inappropriate use of financial assistance (Office of General Counsel memorandum, August 2, 1994).**

Technical direction or other instructions to an extramural organization, relating to performance of an extramural agreement, shall be provided only by authorized EPA or other Government representatives in accordance with the terms of the applicable extramural agreement. Only authorized EPA or other Government representatives are to provide direction or instructions to an extramural organization providing quality systems support for environmental programs. This is to avoid such actions as:

- providing directions or instructions that are inconsistent with the terms of an extramural agreement,
- unauthorized access to confidential business information, or
- unauthorized access to information that may allow an extramural organization to gain an unfair competitive advantage.

4.3.2 Prepare and Present Quality Systems Training Materials and Courses

Exclusively EPA Functions are defined as inherently governmental work which must be performed only by responsible EPA officials, including the QA Managers, or authorized EPA representatives. Exclusively EPA training related functions include developing and presenting detailed guidance and training for QA and QC activities based on interpretation of Agency-wide requirements and guidance.

Discretionary Functions are defined as activities that may be performed either by EPA personnel or by non-EPA personnel under the specific technical direction of and performance monitoring by the QA Manager or other responsible EPA or Government official under an approved contract, work assignment, delivery order, task order, etc. Discretionary training-related functions include:

- providing or coordinating quality-related training for the organization in special skill areas identified by the Agency and not generally available to the organization; and

- providing allowable technical and/or logistical assistance in preparing and presenting quality-related technical training (within the Agency's implementation of special management and control measures and the constraints of potential for

conflict of interest, of revealing confidential business information, or of appearing to be interpreting or representing Agency policy).

4.3.3 Additional Considerations

When using contractor services for training needs, the process of articulating requirements, setting project parameters, and defining outputs so that specific training needs are met can be complex. Accordingly, it is important to:

- ensure that the organization's needs are explicitly defined;
- define the task completely before beginning the procurement process;
- agree on checkpoints, outputs, and expected results; and
- carefully monitor progress and provide direction as needed.

If the primary role of the contractor is to design and deliver instructional materials, it is helpful to ensure that the selected firm has a working knowledge of the Instructional Systems Design process, various training methods, and the application of technology in training practices. It can also be helpful for the firm to have some knowledge and understanding of the topic being taught. When considering contractor/consultant services for training instructional design services, it is important to determine that the firm has:

- an understanding of the EPA Quality System;
- a demonstrated capacity to assess organizational training needs;
- a strategy to involve the organization in assessment, planning, and critical stages of decision making;
- an approach that will adapt established methodologies for training strategies to the specific organization with which they work; and
- the ability to change from a content-based technique to a process orientation as organizational needs and issues arise.

Finally, contractor/consultant services should enhance the overall training effort without imposing a consultant-created plan. The organization’s contributions to the training program are critical to its success.

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APPENDIX
FORMS FOR DEVELOPING A TRAINING PROGRAM

Unit Assessment Form

Date:	**Manager's Name:**	
Unit Description:		
Job List (include all functions in the unit listed above)		**Staff Size:**
Job Title	**Responsibilities**	**Primary Tasks**

Hierarchical Job Assessment Form

A.	**Job Title**		
B.	**Primary Job Tasks**		
	1. 2.		
C.	**List the Sub-tasks related to each task**		
	Task 1		**Task 2**
	Sub-task 1		**Sub-task 1**
	Sub-task 2		**Sub-task 2**
	Sub-task 3		
D.	**List KSAs needed to perform each sub-task**		
	Task 1		**Task 2**
	Sub-task 1		**Sub-task 1**
	Sub-task 2		**Sub-task 2**
	Sub-task 3		
E.	**List Quality-Related KSAs**		
	Task 1 • • •		
	Task 2 • •		

Ranking Matrix Form

TRAINING GOALS	CRITERIA			Weight %	Total Weight %100
	Weight %	Weight %	Weight %		

Training Resource Matrix Form

Courses	Training Goals			

Quality Systems Training Program Form

Training Goal	Priority	Due Date	Training Method(s)	Resources Needed	Resource Availability

Course Objectives Form

Course Objective 1: After completing this course, _____ will be able to _____

Enabling Objectives: To attain the course objective, _____ will:

1._____
2._____
3._____
4._____

Course Objective 2: After completing this course, _____ will be able to _____

Enabling Objectives: To attain the course objective, _____ will:

1._____
2._____
3._____
4._____

Course Objective 3: After completing this course, _____ will be able to _____

Enabling Objectives: To attain the course objective, _____ will:

1._____
2._____
3._____
4._____

Course Objective 4: After completing this course, _____ will be able to _____

Enabling Objectives: To attain the course objective, _____ will:

1._____
2._____
3._____
4._____

Course Outline Template Form

Topic	Sub-topic	Teaching Points	Instructional Strategy	Duration