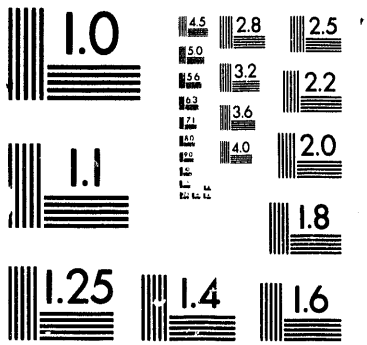
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DOE-STD-0101T
August 1993

Superseding
DOE/NE-0101T
July 1991

DOE STANDARD

TAP 1
TRAINING PROGRAM MANUAL

U.S. Department of Energy
Washington, D.C. 20585

FSC 6910

FOREWORD

The Training Accreditation Program (TAP) was established by the Department of Energy (DOE) to assist in achieving excellence in the development and implementation of performance–based nuclear facility training programs. The TAP establishes the objectives and criteria against which DOE nuclear facility training is evaluated for accreditation. The TAP Staff provides assistance to contractors, develops training guidelines, and evaluates the quality and effectiveness of facility training.

This manual describes the accreditation process, provides functional descriptions for positions which require accredited training programs, provides a brief discussion of performance–based training, contains the objectives and criteria that must be addressed in training programs subject to accreditation, and includes a glossary.

NOTE

It is recognized that many DOE facilities have training programs in place for some or all of the positions to be accredited. Some of these training programs have been in place for many years, and, while their development was not as structured as the performance–based training approach, over time these programs may have evolved to include many performance–based training characteristics. For other programs, efforts have been underway to enhance the programs using performance–based training approaches. The TAP does not intend that these programs be discarded, but rather that performance–based training methods be used to validate the content and methods of conducting these programs and to revise them where required.

CONTENTS

FIGURES

ACRONYMS

DOE	Department of Energy
TAP	Training Accreditation Program
ISD	Instructional System Design
SAT	Systematic Approach to Training
CRI	Criterion Referenced Instruction
TSD	Training System Design
NE–1	Assistant Secretary for Nuclear Energy
TPAP	Training Program Accreditation Plan
OJT	On–the–job training

TRAINING PROGRAM MANUAL
TAP 1

CHAPTER I
OVERVIEW

BACKGROUND

In recent years increased attention has been given to all aspects of the operation of Department of Energy (DOE) nuclear facilities. Contributing to this is the finding that the severity of the accident at Three Mile Island in 1979 has, in large part, been attributed to personnel training deficiencies. Initially the impact of the Three Mile Island accident and the lessons learned were directed at DOE Category A reactor facilities. This resulted in numerous initiatives to upgrade the safety of operations and to improve the training of personnel responsible for operating these facilities.

Given the wide variation in mission and individual processes performed and the wide variation in methods of training at DOE nuclear facilities, it is not surprising that different training program development methods exist. While some of these programs have proven effective in producing a proficient, knowledgeable workforce, many facilities have experienced difficulty identifying the most effective training process for the operation concerned. Often the documentation of training has not supported the training that has been accomplished. In addition, many facilities are faced with large percentages of the workforce who are at or near retirement. It is for these reasons that a standardized, proactive posture must be adopted by operating contractors to improve the level of expertise of the nuclear facility workforce, and thus ensure uniform standards for safe operation.

DOE goals include the development and implementation of contractor–administered training programs that provide consistent, effective, and efficient training for personnel at DOE nuclear facilities. Quality and effectiveness of these training programs will be established by the use of performance–based training, high and uniform standards, and training programs that are accredited by an independent accrediting board.

Performance–based training 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. The commercial nuclear power industry, as well as others in private industry, initiated a performance–based training development process which has had significant positive effect on personnel training. The performance–based training approach forms the basis of accreditation objectives and criteria. The Training Accreditation Program (TAP) formally endorses and supports performance–based training for DOE contractors. This ***Training Program Manual, TAP 1,*** is intended to provide not only an overview of the accreditation process, but also a brief description of the elements necessary to construct and maintain training programs that are based on the requirements of the job.

Two companion manuals titled ***Performance–Based Training Manual, TAP 2,*** and ***Training Program Support Manual, TAP 3,*** provide additional information to assist contractors in their efforts to accredit training programs.

PURPOSE

Training programs at DOE nuclear facilities should provide well–trained, qualified personnel to safely and efficiently operate the facilities in accordance with DOE requirements. A need has been identified for guidance regarding analysis, design, development, implementation, and evaluation of consistent and reliable performance–based training programs. Accreditation of training programs at Category A reactors and high–hazard and selected moderate–hazard nonreactor nuclear facilities will assure consistent, appropriate, and cost–effective training of personnel responsible for the operation, maintenance, and technical support of these facilities. Training programs that are designed and based on systematically determined job requirements, instead of subjective estimation of trainee needs, yield training activities that are consistent and develop or improve knowledge, skills, and abilities that can be directly related to the work setting. Because the training is job–related, the content of these programs more efficiently and effectively meets the needs of the employee. Besides a better trained work force, a greater level of operational safety can be realized.

Performance–based training has been utilized for many years and has been given numerous names, which include:

- Instructional System Design (ISD)
- Systematic Approach to Training (SAT)
- Criterion Referenced Instruction (CRI)
- Training System Design (TSD)
- Competency Based Training.

All of these systems are designed around the same basic premise: to provide training that supplies the information necessary for the job incumbents to perform their assigned duties at a predetermined level of expertise. This predetermined level of expertise is ascertained by a systematic evaluation of the job or position in question. This evaluation eliminates the historical method of subjectively estimating training requirements which, in many instances, resulted in insufficient training or in overtraining.

SCOPE

Applicable Programs for Accreditation

The accreditation of DOE nuclear training programs is applicable to programs at Category A reactors and at nonreactor nuclear facilities that have been designated as high–hazard or selected moderate–hazard operations. Hazard classifications are defined in Order DOE 5481.1A, SAFETY ANALYSIS AND REVIEW SYSTEM, of 9–23–86. Further specific guidance on the designation of hazard categories is provided in Order DOE 5480.5, SAFETY OF NUCLEAR FACILITIES, of 9–23–86; Order DOE 5480.6, SAFETY OF DEPARTMENT OF ENERGY–OWNED NUCLEAR REACTORS, of 9–23–86; and in the DOE–HQ memorandum, "Hazard Level Classification of Nonreactor Nuclear Facilities," dated March 1, 1985.

Accreditation formally recognizes reactor and nonreactor nuclear facility training programs as meeting established accreditation objectives and criteria for applicable programs. Accreditation processes are applicable to onsite, offsite, and subcontracted (vendor) training for personnel in positions selected for accreditation. If a training program is not awarded accreditation, the facility is not in compliance with the accreditation order. The effect on continuity of operations is a decision that will be made jointly by the Program Secretarial Officer, the field organization, and the Assistant Secretary for Nuclear Energy (NE–1).

For Category A reactors and high–hazard and selected moderate–hazard, nonreactor nuclear facilities the specific programs to be accredited are to be identified by the operating contractor with the approval of the cognizant Program Secretarial Officer. An accredited training program is required if a facility has personnel performing work as described in the functional descriptions for these programs. The programs are:

- Shift Supervisor/Shift Manager
- Operator/Technician (Reactor)
- Operator/Technician (Nonreactor)
- Instrument and Control Technician
- Radiological Protection Technician
- Chemistry Technician
- Electrical Maintenance Technician
- Mechanical Maintenance Technician
- Technical Staff.

Personnel performing work in these programs include individuals who are in one of the following categories:

- Part of an operating crew within the facility
- Physically located elsewhere and are providing support services to one or more facilities

- Providing long–term contracted support services for the facility but are not employees of the facility operating contractor.

  Note: An example of long–term contracted support in the maintenance area would be work performed on systems as regular in–house employees would perform it, single–system upgrades or outage work, for example, would not be considered long–term.

Functional descriptions for each of the programs to be accredited are provided below.

Shift Supervisor/Shift Manager

These individuals normally do not perform hands–on equipment operation but have the overall responsibility for supervision of the facility operation. They are responsible to ensure all work done in the facility is in accordance with approved procedures, in–house documents, technical specifications, and other appropriate documents. In addition to the shift supervisor or shift manager, first–line supervisors of operations, and any supervisors of operations between the first–line supervisor and shift supervisor or shift manager, should be included in this program.

Operator/Technician (Reactor)

These individuals are directly and primarily responsible for operation of a reactor. Operators (experiment loop operators, auxiliary operators, fuel handlers, charge/discharge operators, etc.) that perform duties that directly support reactor operation should be included in this program.

Operator/Technician (Nonreactor)

These individuals are directly and primarily responsible for operation of a facility. Duties may include product enrichment, isotope separation, production, fabrication, assembly, handling, processing, or storing of nuclear materials. Auxiliary operators (experiment loop operators, purification loop operators, power operators, process operators, etc.) that directly support facility operations or processes, should be included in this program.

Instrument and Control Technician

These individuals are directly and primarily responsible for performing repair, preventive maintenance, calibration, and related services on instrumentation and controls that directly affect facility reliability and safety.

Radiological Protection Technician

These individuals are directly and primarily responsible for monitoring of radiological conditions and the implementation of the necessary radiological safety measures as they apply to facility workers and equipment. These individuals perform tasks such as contamination evaluation, posting of radiological conditions, and calibration or source checks of radiation monitoring instruments. They may also perform radiological monitoring associated with the processing of radioactive waste.

Chemistry Technician

These individuals are directly and primarily responsible to perform qualitative and quantitative chemical analyses, prescribe chemical control measures based on such analyses, and operate chemistry–related equipment. They provide direct support for facility operations and may perform radioactive and nonradioactive monitoring. They may also support facility waste treatment operations by performance of chemical analyses in support of the environmental monitoring program.

Electrical Maintenance Technician

These individuals are directly and primarily responsible for performing installation, repair, preventive maintenance, calibration, and related services on electrical controls and power distribution systems that directly affect facility reliability and safety.

Mechanical Maintenance Technician

These individuals are directly and primarily responsible for performing installation, repair, preventive maintenance, alignment, rigging, welding, and related services on valves, piping, pumps, and related systems and equipment that directly affect facility reliability and safety.

Technical Staff

Personnel not directly and primarily responsible for the duties described in the other programs may be required to have an accredited training program that falls within Technical Staff. Because of the large variety of technical staff positions existing at DOE reactor and nonreactor nuclear facilities, and the multiplicity of job descriptions within the same job title, it would be impractical to attempt to list all applicable positions within the Technical Staff program. Although not all inclusive, the following are typical positions that fall within the Technical Staff program which may be included in this program: Radiological Protection Engineer, Reactor Engineer, Quality Assurance Engineer, Maintenance Engineer, Modification Engineer, and Chemical Engineer. It is the responsibility of the contractor to develop a specific list of technical staff positions that may have direct impact on employee, facility, or public safety. The intention is to ensure that those who perform these activities have an understanding of the systems, policies, and organization of the facility. Individuals in this program:

- Normally have a degree in engineering or a related physical science or equivalent related experience.
- Interpret engineering codes or other standards, determine Quality Assurance requirements, and apply them to work practices.
- Conduct engineering work and tests in lieu of having operators or others perform the work.
- Direct the activities of others during abnormal tests or infrequent activities.
- May have people reporting to them and are responsible to review and approve work for accuracy.
- May be required to perform in an advisory capacity in response to a facility emergency.

Complete job and task analyses will generally not be required for Technical Staff training. Rather, a broad scope assessment of training needs and program content is expected. Nonetheless, the TAP objectives and criteria should be applied to the extent practical.

Some nuclear facilities may have several different positions that perform work under one of the functional program descriptions described above. For example, a facility has four different operator positions: fuel handler, waste handler, process line operator, and control room operator. Here, the contractor should submit one Contractor Self–Evaluation Report under the Operator/Technician (Nonreactor) program. The four different positions would be described in attachments to the Contractor Self–Evaluation Report. If the number of positions that fall within a program precludes submitting all of them at once, more than one Contractor Self–Evaluation Report may be necessary.

Some nuclear facilities may have positions that appear to merge two programs. A Radiation/Chemistry Technician may be defined as one position or a facility may have Electrical/Instrumentation Technicians. Then, the contractor should submit one Contractor Self–Evaluation Report under the most appropriate program. For example, if a contractor has a position title Electrical/Instrumentation Technician, the contractor will determine which program they will submit this position under (i.e., either electrical or instrumentation).

Those individuals who perform tasks falling within one or more of the above functional descriptions as part of an experiment or test, will be included in those portions of the accredited training program associated with those tasks. This requirement is not intended to apply to research scientists performing experimentation, except to the extent that they are included under Technical Staff training.

If the number of people requiring training precludes developing and providing a classroom training program, the training could be conducted using a structured self–study program while the students are free to perform duties for which they are qualified.

It is fully intended that training common to several facilities at a site be accredited under one program (e.g., Radiological Protection Technician) for the site versus the same program developed at each facility.

Exceptions to Accreditation

Positions excepted from accreditation must be addressed in the Training Program Accreditation Plan (TPAP). A written description of the rationale for the exception should be based on the following considerations:

- Impact on facility or public safety
- Degree of facility specific knowledge required
- Number of personnel in the position
- Existence of well–defined industry or professional programs
- Applicability of the position to the facility
- Degree to which the position is supervised.

In some instances only a few personnel are functioning in a position at a facility designated for accreditation and are routinely rotated to other designated or nondesignated facilities (e.g., maintenance and radiological protection personnel). Consideration should be given to accrediting the training program which covers all duties at all facilities as opposed to accrediting only the program for the designated facility.

Programs/Facilities Not Requiring Accreditation

Training programs not requiring accreditation are expected to be formally documented and implemented in accordance with applicable DOE Orders. Facilities that do not meet the facility hazard classification selected for accreditation are encouraged to apply the requirements of the TAP to the extent appropriate to the facility or program.

THE ACCREDITATION PROCESS

An overview of the accreditation process is described below and illustrated by Figure I–1. Contractors should refer to the Order DOE 5480.18, ACCREDITATION OF PERFORMANCE–BASED TRAINING FOR CATEGORY A REACTORS AND NUCLEAR FACILITIES for a complete description of this process:

- Identification of applicable programs
- Initial self–evaluation conducted by the facility contractor
- Development and approval of a TPAP
- Second self–evaluation and Contractor Self–Evaluation Report submission
- Accreditation Review Team evaluation
- Decision by the Accrediting Board
- Maintenance of accreditation
- Renewal of accreditation.

Identification of Programs

The contractor identifies positions which require accredited training programs in accordance with the functional descriptions previously described.

Initial Self–Evaluation

The contractor then conducts an initial self–evaluation by comparing the existing training program against the accreditation objectives and criteria. This evaluation identifies strengths and weaknesses of the existing programs and provides the basis for the TPAP. Guidelines for the conduct of the initial self–evaluation are found in the ***Training Program Support Manual, TAP 3***. Information from this evaluation may be used as part of the Contractor Self–Evaluation Report.

Training Program Accreditation Plan

The contractor will then submit a TPAP to document an implementation schedule which includes program, manpower, and facility needs required to address those areas that do not meet the accreditation objectives. The contractor will also include a justification for program exceptions from accreditation. Contractors should prioritize the implementation schedules for training program accreditation so that those training programs with the greatest impact on plant safety and operability are accredited first. The TPAP shall then be formally approved. Guidance for the development of this plan is found in the ***Training Program Support Manual, TAP 3***.

Contractor Self–Evaluation Report

When the improvements identified in the TPAP are completed, a second self–evaluation is performed and a Contractor Self–Evaluation Report is prepared for each of the programs listed in the functional

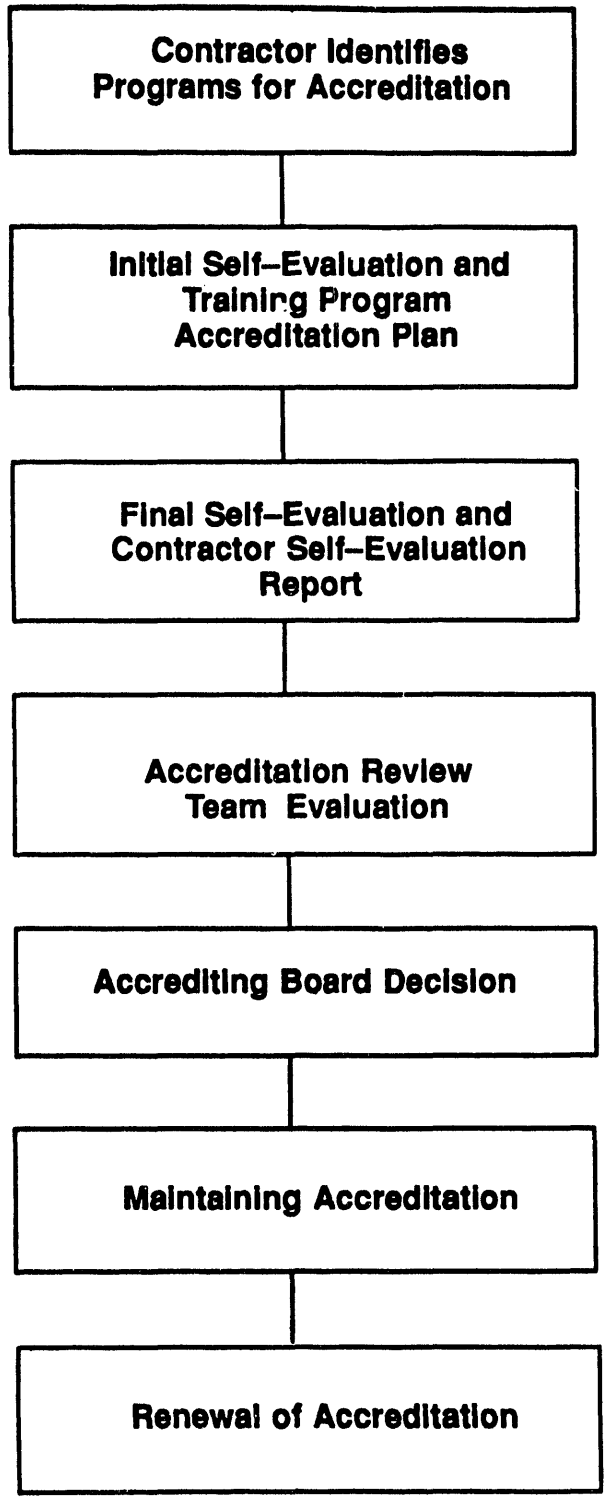

Figure I–1. The Accreditation Process.

descriptions. The report is finalized, and then forwarded to the TAP Staff. The Contractor Self–Evaluation Report is used by the Accreditation Review Team during the team evaluation of the facility.

It is recognized that line items, such as building a training facility, may not be complete. These items should not deter the facility from submitting a Contractor Self–Evaluation Report. However, enough of the program must be implemented to determine effectiveness of the training and the training feedback system. The TPAP will be implemented with action plans in place, and problem resolution nearing completion prior to forwarding a formal Contractor Self–Evaluation Report.

Accreditation Review Team Evaluation

When the Contractor Self–Evaluation Report is completed, an Accreditation Review Team is appointed by the TAP Staff to visit the facility. Headquarters program office, field organization, and Accrediting Board personnel may participate in the evaluation as observers. The Accreditation Review Team consists of personnel with collective expertise in nuclear facility or reactor operation, nuclear facility training, instructional processes, and training evaluation. During the evaluation the team evaluates whether the training program meets each accreditation objective and supporting criteria.

The Accreditation Review Team prepares a report for the contractor and the field organization that describes training activities and contains conclusions and recommendations for improvement. A copy of the report is forwarded to NE–1, the cognizant program office, and the field organization. The contractor submits a written response to the report that provides clarification or describes corrective actions taken. The Accreditation Review Team report with the contractor's response incorporated is submitted directly to the Accrediting Board.

Accrediting Board Decision

An Accrediting Board consists of five members with combined expertise in the following areas: nuclear facility and/or reactor operations, nonnuclear industrial training, instructional processes, and educational accreditation. Alternate members are selected to facilitate the scheduling of meetings.

Senior contractor representatives and the Accreditation Review Team Manager are present at the Board meeting to answer questions and describe the current status of programs prior to the Board's deliberations. Program office and field organization accreditation coordinators may be present at the Board meeting as observers. The Board informs the Manager of the TAP Staff of its decision. The Manager of the TAP Staff delivers the decision and basis for decision to the cognizant program office and field organization accreditation coordinators, and the contractor. When accreditation is awarded, it normally remains in effect for four years. If accreditation is deferred, the field organization and the program office are responsible for ensuring that the training program is upgraded and that the contractor reapplies for accreditation.

Maintaining Accreditation

Accreditation is maintained during the four–year period by submitting an Accreditation Maintenance Report two years following accreditation. The report should be brief and should contain specific information with appropriate documentation regarding actions taken and changes made to the accredited programs during the two–year period.

A summary of the Accreditation Maintenance Report is forwarded by the TAP Staff to the Accrediting Board for review. The Board determines whether to continue accreditation, continue accreditation in a probationary status for up to 120 days, or withdraw accreditation.

Renewal of Accreditation

Renewal of accreditation occurs no later than four years from the initial accreditation and each four years thereafter. The contractor should maximize the number of programs submitted for renewal to reduce costs and impact on operations. Renewal of accreditation consists of the following activities:

- The contractor writes one Contractor Self–Evaluation Report that includes all of the programs accredited four years prior to request for renewal.
- An Accreditation Review Team is appointed by the TAP Staff to visit the facility.
- The Board determines whether to renew accreditation, continue accreditation in a probationary status for up to 120 days, or withdraw accreditation.

PERFORMANCE–BASED TRAINING

Performance–based training is a method which provides a total approach for the development and conduct of training programs. Performance–based training consists of five phases: Analysis, Design, Development, Implementation, and Evaluation (see Figure I–2). The first four phases (analysis, design, development, and implementation) are generally sequential, with the output of one phase providing the input to the next. The evaluation phase is interactive and is applied throughout the process. It should be recognized that there is considerable overlap of the phases when lessons are actually being developed. The following is a brief description of each phase of performance–based training. Procedural guidance for each phase is found in the ***Performance–Based Training Manual, TAP 2***.

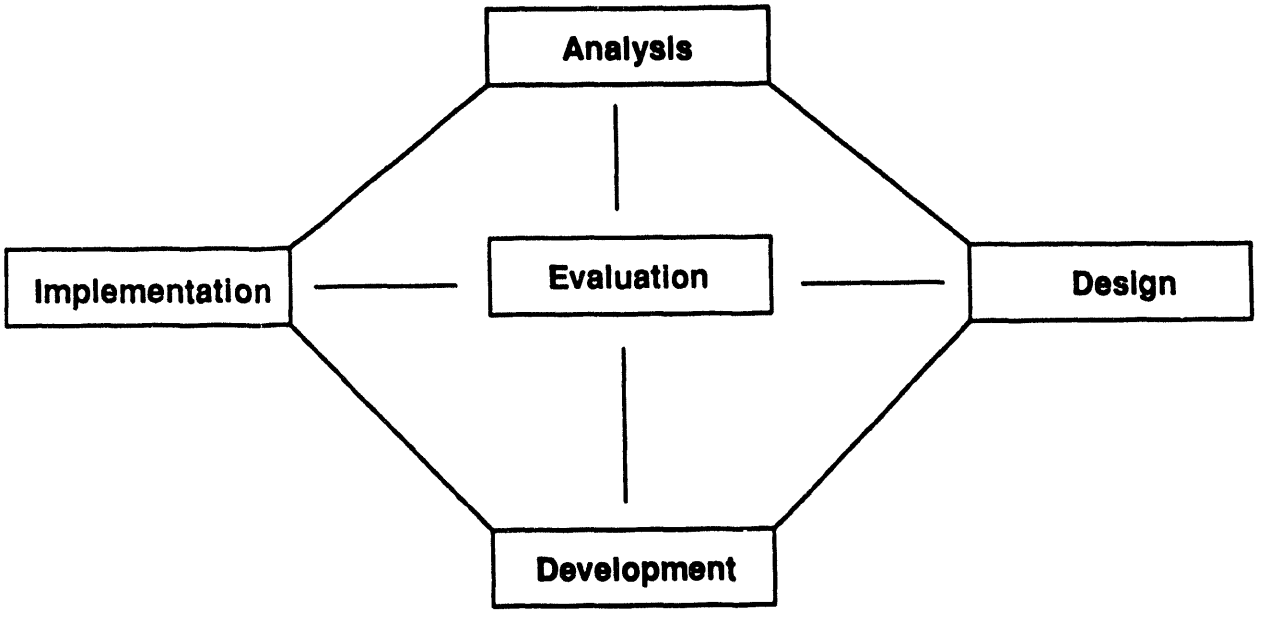

Figure I–2. Performance–Based Training.

Analysis

Analysis ensures that training programs are oriented specifically to the job tasks of the position. The analysis phase identifies training requirements for a specific job position. Training needs are determined by needs analysis, job analysis, and task analysis. Program goals are then established and the scope of training content is defined. The ***Performance–Based Training Manual, TAP 2***, describes the conduct of the required analyses.

Needs Analysis

A needs analysis is a systematic evaluation that accurately identifies solutions to job performance discrepancies. Many things can contribute to performance problems that cannot be solved by training. An effective needs analysis must involve knowledgeable personnel who are aware of the requirements of the job and the standards of performance necessary to properly and safely perform it.

Job Analysis

The job analysis is a determination of the specific tasks associated with the performance of a job. The analysis determines tasks which are critical to the competent performance of the job (i.e., are highly frequent, repetitive, important, difficult, or have a high probability of error associated with them). When translated, these items represent the foundation for the development of performance–based training program objectives, curriculum, and evaluation instruments. For less complex facilities, position job analysis will not require the level of effort required at a complex facility; therefore, costs incurred in less complex facilities will be less. A job analysis that determines the tasks performed within a position is required regardless of complexity of the facility.

Task Analysis

Task analysis is the breakdown of an individual task to determine knowledge and skills required to perform the task. Task analysis can be used to identify appropriate content for training programs, verify procedures, locate problems associated with the performance of a task, or to develop the steps necessary to perform the task.

Design

During the design phase terminal objectives are developed based on the information from the analysis phase and training/evaluation standards are developed to provide guidance for on–the–job training. Skills and knowledge associated with a task are translated into enabling objectives. These are organized into instructional units and sequenced to aid the learning process. The objectives form the "blueprint" which guides the development of all training materials, tests, and strategies. Additional activities during the design phase include development of test items and examinations and writing a "Training Development and Administrative Guide" to document the key components of the training program.

Development

All materials developed during this phase are based on the results of the design phase. The development of lesson plans and guides, training aids, and student materials is completed during this phase. Development of additional enabling objectives, test items, and sometimes, rewording of objectives may occur during this phase. Both technical and instructional reviews of the products of program development are conducted. Recommendations are incorporated as necessary to assure that program content is both technically and educationally sound. All reviews of material produced during the development phase are documented.

Lesson Plans/Guides

The instructional materials used by the instructor should reflect the learning objectives and appropriate methods of presentation to achieve the objectives. For each training program, a set of lesson plans or guides is developed. Lesson plans should contain sufficient procedural and content detail so that two different instructors using the same lesson plan would present essentially the same lesson content.

Training Aids

Training aids directly support the instructional objectives by enhancing the presentation. Training aids are used to clarify, illustrate, and emphasize points; reinforce concepts; maintain interest; add realism; and afford nonclassroom experiences. Training aids such as video tapes, films, models, slides, flip charts, chalkboards, transparencies, and tape recordings may be utilized to support the lesson.

Student Materials

Student materials include all resources identified by lesson plans and used by the student during a training program (e.g., textbooks, technical publications, self–study guides, design documents, procedures, manuals, or instructor–prepared handouts). These materials reflect program objectives which are appropriate to the student. They should be both technically accurate and current.

Implementation

Implementation consists of activities related to the actual conduct of training, as well as resource allocation, planning, and scheduling. Program implementation requires assigning instructors and support staff, and scheduling training and facilities. During implementation, qualified instructors conduct training.

Qualified personnel (who have satisfactorily completed training programs comparable in content and in performance standards) may be released from portions of training on an individual case basis. Exception from training should be based on a review of previous training records (i.e., transcripts), personal interviews, and on exams based on the objectives stated for the training program.

Evaluation

Evaluation provides the critical feedback loop to ensure the training is up–to–date and reflective of the current job. Feedback obtained from instructors, students, and supervisors is reviewed for its potential effect on future training programs. Although presented as a separate phase, program evaluation is a continuing process occurring during all phases of performance–based training. The results are translated into action items or recommendations which are factored into program content. Specifically, training programs are evaluated using the following criteria: content adequacy, test adequacy, presentation adequacy, documentation adequacy, and after–training job performance.

The evaluation data generated at the conclusion of the program focuses on the consistency and relevance of the completed program. The suggestions received from the evaluation process are used to modify and improve program content and delivery. The program content should be continuously monitored and revisions made as a result of changes in areas such as policies or procedures, system or component design, job requirements, regulatory requirements, and industry guidelines or commitments. Adjustments should also be made as a result of analyses of operating experience information such as unusual occurrence reports, inspection reports, information notices, circulars, and bulletins.

Program Documentation

Documentation provides a continuous record of the five phases of performance–based training and substantiates the validity of the training program. To facilitate training program development, modification, or revision, it is essential to document the actions and decisions made during the entire process. This record maintained on an ongoing basis is usually referred to as the "audit trail." The critical portion of the audit trail is not only the decisions themselves, but also the rationale that led to making them. The audit trail is maintained throughout the lifetime of the program to document its development and subsequent modifications.

Program documentation requirements are significantly different from departmental record requirements which are personnel–oriented and regulatory– or commitment–based. Master files should be created for each training program to store documentation requiring maintenance and control. Administrative controls in the form of procedures, guidelines, or instructions provide the necessary direction for the maintenance of training program records.

CHAPTER II
ACCREDITATION OBJECTIVES AND CRITERIA

The Training Accreditation Program (TAP) establishes the accreditation objectives and criteria against which selected DOE training programs are evaluated to determine readiness for accreditation. Training programs are evaluated against the accreditation objectives and criteria by facility personnel during the contractor self–evaluation process, by Accreditation Review Team members while performing their onsite evaluations, and by the Accrediting Board during its review. To obtain accreditation, a facility must demonstrate that its training programs meet the accreditation objectives and criteria.

The accreditation objectives describe the expected results of an effective, well–managed training program. The criteria are principles or methods that support the accreditation objectives and are to be applied with judgment. The expectation is that all objectives and criteria will be met. Some objectives and criteria will not be applicable to some programs. This situation would prevail when, for example, a particular method such as laboratory training is not used. The method chosen to meet the objectives and criteria is determined by the contractor. Contractors that have questions about what is required to meet the objectives and criteria can obtain assistance from the TAP Staff.

OBJECTIVE 1

Organization and Management of the Training System—The facility is organized, staffed, and managed to facilitate planning, directing, evaluating, and controlling a systematic training process that fulfills job–related training needs.

Criteria:

1.1 Line management is responsible for the effective conduct of training and qualification programs.

1.2 Line management ensures that the content and conduct of the training and qualification programs will produce competent and professional workers and supervisors.

1.3 Actions needed to achieve high quality, job–related, performance–based training programs eligible for accreditation have been identified through a systematic evaluation of existing programs.

1.4 Written contractor and facility goals establish the required character and quality of key aspects of the training system. Supporting objectives are procedurally implemented at each organizational level.

1.5 The job function, responsibilities, authority, and accountability of personnel involved in managing, supervising, and implementing training are clearly defined in writing.

1.6 A performance–based training system is implemented as the primary management tool for analyzing, designing, developing, conducting, and evaluating training.

1.7 Procedures are documented and implemented to ensure that all phases of instructional activities can be conducted reliably and consistently.

1.8 Training to be completed prior to qualification/certification is clearly defined. Trainee and incumbent exceptions from training may be granted when justified and supported by a documented examination of prior training and experience.

1.9 Training records are maintained in an auditable manner consistent with DOE requirements. Training records support management information needs and provide required data on each individual's training participation, performance, and verification of medical evaluations.

1.10 Programs offered under subcontract remain under the control of the sponsoring contractor and are evaluated by it to ensure that the accreditation objectives and criteria are met.

1.11 The work load of the training staff indicates that there are sufficient qualified personnel to accomplish assigned duties and responsibilities.

OBJECTIVE 2

Trainee Selection—Trainee candidates meet the minimum requirements for entry into the training program.

Criteria:

2.1 Entry-level criteria include minimum educational, technical, and experience requirements; a medical evaluation; and certification of the physical capabilities identified for the position.

2.2 Remedial training programs are provided, as necessary, to prepare the trainee to meet the identified training program entry-level requirements for areas where they may be deficient.

OBJECTIVE 3

Development and Qualification of Training Staff—Training staff (contractor and subcontractor, if used) possess the technical knowledge, experience, and the developmental and instructional skills required to fulfill their assigned duties.

Criteria:

3.1 Training staff responsible for program management, supervision, and development have and maintain the education, experience, and technical qualifications required for their jobs.

3.2 Instructors have the technical qualifications, which include adequate theory, practical knowledge, and experience, for the subject matter that they are assigned to teach.

3.3 Developmental and instructional qualifications of instructors include theory, practical knowledge, and evaluated work experience in analyzing, designing, developing, conducting, and evaluating training, as appropriate to their job assignments.

3.4 Methods are implemented to ensure that individual instructors meet and maintain position qualification requirements.

3.5 When facility or subcontractor instructors have not yet attained the required instructional qualifications or instruct only occasionally, training quality is maintained through appropriate additional assistance and supervision.

3.6 The instructional skills training program develops the necessary instructor capabilities to fulfill training program requirements.

3.7 Instructor performance, in each training setting in which the individual instructs, is evaluated regularly by the individual's supervisor. Results are used to improve performance.

3.8 Continuing instructor training maintains, improves, and advances required knowledge and skills and is based, in part, on evaluations of instructor performance.

3.9 The training staff maintains facility technical qualifications and familiarity with job requirements as appropriate to their job assignments.

OBJECTIVE 4

Support of Training with Facilities, Equipment, and Materials—The training facilities, equipment, and materials adequately support training activities.

Criteria:

4.1 Classroom and other instructional facilities meet training needs.

4.2 The training staff has necessary instructional aids and equipment to support training material development and presentation of classroom and practical demonstration training consistent with program learning objectives.

4.3 Technical reference materials including current facility procedures, drawings, or training manuals are readily available to the trainees and instructors.

OBJECTIVE 5

Conduct of Job Analysis and Identification of Tasks for Training—The tasks required for competent job performance are identified, documented, and included in the training program, as appropriate.

Criteria:

5.1 Facility personnel, training staff, and other subject matter experts, as appropriate and as needed, have conducted a job analysis to develop a valid facility–specific task list.

5.2 Subject matter experts (appropriate facility technical personnel, training staff personnel, or knowledgeable outside personnel) assist in the selection of tasks for training.

5.3 Each task selected for training (initial or continuing) from the facility–specific task list is matrixed to supporting procedures and training materials and compared with existing training materials in sufficient depth to determine if existing training adequately supports task performance.

5.4 The facility–specific list of tasks selected for training and the comparison to training materials are reviewed periodically and updated as necessitated by changes in procedures, facility systems/ equipment, job scope, and advances in technology.

OBJECTIVE 6

Establishment of Training Program Content—Training program content provides the trainee with the knowledge and skills needed to perform tasks associated with the position for which training is being conducted. The content of initial training prepares the trainee to meet the minimum criteria to perform the job for which the candidate is being trained. The content of continuing training maintains and improves incumbent job performance.

Criteria:

6.1 DOE and other appropriate training guidelines (e.g., training design specifications) are used as a guide for selecting, sequencing, and verifying training program structure and content.

6.2 Tasks are analyzed, as necessary, to determine the task's supporting skills and knowledge to be included in training programs.

6.3 Personnel qualified in the position for which training is being developed and conducted help determine training content and confirm its completeness.

6.4 Current facility procedures, technical and professional references, and facility/industry operating experience are used to identify training content and facility–specific information for use in developing training materials.

6.5 Initial training program content is modified to reflect the results of program review and evaluation by facility and training staff personnel.

6.6 Continuing training content includes refresher training on selected initial training topics, facility and industry events, facility and procedure modifications, retraining addressing task performance deficiencies, and refresher training on infrequently performed tasks.

6.7 The results of trainee and program evaluations are used to help determine the content of continuing training.

OBJECTIVE 7

Development of Learning Objectives as the Basis for Training—Learning objectives that identify training content and define satisfactory trainee performance are derived from job performance requirements.

Criteria:

7.1 The minimum trainee entry–level skills, knowledge, and experience for the position are considered when developing learning objectives.

7.2 Learning objectives are derived from an analysis of job performance requirements and are the basis for trainee/incumbent evaluation.

7.3 Learning objectives state the action (knowledge or skills) the trainee must demonstrate, the conditions under which the action will take place, and the standards of performance the trainee should achieve upon completion of the training activity.

7.4 Learning objectives are grouped by similar training setting (e.g., classroom, simulator, laboratory, and facility).

7.5 Learning objectives are sequenced based on their relationship to one another and help trainees move from one level of skill and knowledge to another.

OBJECTIVE 8

Organization of Instruction Using Lesson Plans and Other Training Guides—Lesson plans and other training guides provide guidance and structure to ensure the consistent conduct of training activities.

Criteria:

8.1 Lesson plans for classroom instruction provide for effective, consistent class presentations.

8.2 Lesson plans or equivalent training guides are used for laboratory training, on–the–job training, and simulator training and include standards for evaluating proper trainee performance.

8.3 Lesson plans and other training materials are developed or modified using learning objectives derived from job performance requirements.

8.4 Review and approval requirements are established and utilized for all lesson plans, training guides, and other training materials prior to their issue and use.

OBJECTIVE 9

Conduct of Classroom and Individualized Instruction—Classroom and individualized instruction is effectively and consistently presented.

Criteria:

9.1 Training is implemented as outlined by approved performance–based training materials and is well–organized and current.

9.2 Training activities encourage direct trainee participation in the learning process.

9.3 Instructors prepare adequately to ensure effective and consistent delivery of the material.

9.4 The instructor uses instructional techniques appropriate to the lesson content and learning objectives.

9.5 When individualized instruction is used, either the training materials contain the information to be learned or referenced texts are readily available.

9.6 Trainee mastery of learning objectives is evaluated regularly using written or oral examinations and quizzes.

9.7 Subcontracted training is evaluated to ensure that trainees are achieving the specified learning objectives as measured by appropriate written or oral examinations and quizzes.

OBJECTIVE 10

Conduct of On–the–Job Training—On–the–job training (OJT) is effectively and consistently presented.

Criteria:

10.1 OJT is delivered using well–organized and current performance–based training materials.

10.2 Designated personnel who are instructed in program standards and methods conduct OJT.

10.3 Completion of OJT and task qualification is by actual task performance. When the actual task cannot be performed but is simulated or walked–through, the conditions of task performance, references, tools, and equipment reflect the actual task to the extent possible.

OBJECTIVE 11

Conduct of Simulator Training—Simulator training is effectively and consistently presented.

Criteria:

11.1 An appropriate simulator is used for hands–on training to demonstrate operational characteristics and for recognition and control of normal, abnormal, and emergency facility/process conditions. Differences between the simulator and the facility/process are accommodated in the training session.

11.2 The training program content is implemented as outlined by approved performance–based training materials and is well–organized and current.

11.3 Instructors prepare adequately for simulator sessions to ensure effective and consistent training.

11.4 The instructor uses instructional techniques appropriate to the situation.

11.5 Individual trainee and team performance are evaluated regularly against established learning objectives.

11.6 Subcontracted training is evaluated to ensure that trainees are achieving the specified learning objectives, as measured by appropriate evaluation methods and performance standards.

OBJECTIVE 12

Conduct of Laboratory Training—Laboratory training is effectively and consistently presented.

Criteria:

12.1 The training program content is implemented as outlined by approved training materials and is well–organized, current, and structured to provide practical experience.

12.2 Conditions of task performance, references, tools, and equipment reflect the actual job to the extent possible.

12.3 Training activities encourage direct trainee participation in the learning process.

12.4 Instructors prepare adequately to ensure effective and consistent delivery of the material.

12.5 The instructor uses instructional techniques appropriate to the situation.

12.6 Trainee performance is evaluated regularly against established learning objectives.

12.7 Subcontracted training is evaluated to ensure that trainees are achieving the specified learning objectives, as measured by appropriate evaluation methods and performance standards.

OBJECTIVE 13

Examinations and Evaluations Leading to Qualification/Certification—Examinations and OJT/laboratory/simulator performance evaluations are content valid, administered consistently, controlled, and documented.

Criteria:

13.1 Development, approval, security, administration, and maintenance of examinations and examination question banks are systematically controlled.

13.2 Examinations and OJT/laboratory/simulator performance evaluations contain a representative cross-section of knowledge, skills, and abilities required for the position.

13.3 Trainees and incumbents who fail examinations or OJT/laboratory/simulator performance evaluations are provided structured remedial training and reevaluated. Minimum progress standards are established.

13.4 All examination questions are referenced to one or more learning objectives.

13.5 The content of examinations is changed at intervals sufficient to prevent compromise.

13.6 Examinations and OJT/laboratory/simulator performance evaluations are administered and graded in a consistent manner. Acceptance criteria to be used are defined in advance of the examination and performance evaluation.

OBJECTIVE 14

Systematic Evaluation of Training Effectiveness—A systematic evaluation of training effectiveness and its relation to on–the–job performance is used to ensure that the training program conveys all required skills and knowledge.

Criteria:

14.1 A comprehensive evaluation of individual training programs is conducted by qualified individuals on a periodic basis to identify program strengths and weaknesses.

14.2 Training delivery is monitored in all instructional settings and evaluated with regard to instruction, materials, and instructor performance.

14.3 Feedback from trainee performance during training is used to evaluate and refine the training program.

14.4 Feedback from former trainees and their supervisors is used to evaluate and refine the training program.

14.5 Change actions (e.g., procedure changes, equipment changes, facility modifications) are monitored and evaluated for their applicability to the development or modification of initial and continuing training programs and are incorporated in a timely manner.

14.6 Facility and industry operating experience is monitored and evaluated for applicability to development or modification of initial and continuing training programs and is incorporated in a timely manner.

14.7 Improvements and changes to initial and continuing training are systematically initiated, evaluated, tracked, and incorporated to correct training deficiencies and performance problems.

14.8 Changes in job scope are evaluated to determine the need for development or modification of initial and continuing training programs.

14.9 Subcontracted training is evaluated for its contribution to meeting job performance requirements and to ensure that its quality is consistent with the facility training standards.

CHAPTER III
GLOSSARY

Accreditation is a process to formally recognize reactor and nonreactor, nuclear facility training programs as meeting established accreditation objectives and criteria.

Accrediting Board is an independent group of individuals responsible for making the decision to award or defer accreditation. The Accrediting Board consists of five members with collective expertise in nuclear facility or reactor operations, nonnuclear industrial training, instructional processes, and educational accreditation.

Accreditation Coordinators are individuals, appointed within the program office and field organization, who are responsible for reviewing accreditation documents, and maintaining the communication between DOE and the contractor concerning all accreditation activities associated with the office.

Accreditation Maintenance Report is a report written two years after accreditation or renewal of accreditation that describes changes in the accredited training programs since the last accreditation review.

Accreditation Review Team is a group of individuals representing the Training Accreditation Program with collective expertise in nuclear facility or reactor operations, nuclear facility training, instructional processes, and training program evaluation. This team reviews the facility's Contractor Self–Evaluation Report, visits the facility, evaluates training, and prepares a report of conclusions and recommendations.

Assist Visit is a visit coordinated by members of the Training Accreditation Program Staff for the purpose of assisting the contractor in preparing for and meeting the requirements for accreditation.

Certification is the process by which facility management provides written endorsement of the satisfactory achievement of qualification of a person for a position.

Contractor Self–Evaluation Report is a formal report prepared by the contractor summarizing the comparison of a training program to each accreditation objective and its supporting criteria.

Enabling Learning Objective is a learning objective that supports the terminal learning objective.

Exception is a release from the requirements of the Order DOE 5480.18 ACCREDITATION OF PERFORMANCE–BASED TRAINING FOR CATEGORY A REACTORS AND NUCLEAR FACILITIES, for a training program within an accreditable facility. Exception also refers to a release of an individual from portions of a training program through prior education, experience, and/or testing.

Exemption is a release from the requirements of the Order DOE 5480.18, ACCREDITATION OF PERFORMANCE–BASED TRAINING FOR CATEGORY A REACTORS AND NUCLEAR FACILITIES, for facilities listed in Appendix A or B.

Full–Scope Simulator is a simulator incorporating detailed modeling of systems of the reference plant with which the operator interfaces in the control room environment. The control room operating consoles are included. Such a simulator demonstrates expected plant response to normal and abnormal conditions.

Individualized Instruction is instruction in which the pace of training is controlled by the trainee and guided by the program materials. Individualized instruction does not require the full–time presence of an instructor. Students study on their own and learn at their own pace.

Instructor is an individual who presents classroom, laboratory, on–the–job, or simulator instruction, or one who develops training programs and materials, and/or evaluates trainees.

Job Analysis is a systematic method used in obtaining a detailed listing of the tasks of a specific job.

Learning Objective is a statement that specifies measurable behavior that a trainee should exhibit after instruction, including the conditions and standards of performance.

Lesson Plan is an instructor's document that outlines instructor and trainee activities, learning objectives, lesson content, and resources necessary for the consistent conduct of training.

Manager of the Training Accreditation Program Staff is an individual with the responsibility and authority for appointing and administering the Accreditation Review Team and Training Accreditation Program Staff.

On–the–Job Training (OJT) is formal training that is conducted and evaluated in the work environment.

Performance–Based Training is a systematic approach to training that is based on tasks and the related knowledge and skills required for competent job performance. Performance–based training consists of the following phases:

- **Analysis Phase** is the phase that identifies training requirements for a specific job position by using needs analysis, job analysis, and task analysis.
- **Design Phase** is the phase that uses information collected during the analysis phase to select training settings, establish a training program development plan, write specific learning objectives, and test specifications, that guide the development of all training materials and strategies.
- **Development Phase** is the phase that uses the outputs of the design phase to select appropriate instructional methods and develop training materials.
- **Implementation Phase** is the phase that consists of activities related to resource allocation, planning and scheduling, and the conducting and documenting of training.
- **Evaluation Phase** is the phase that focuses on the effectiveness of each of the other phases of performance–based training in reaching their objectives.

Qualification Standard is a document that states and defines the knowledge and skill requirements necessary for successful completion of a training program.

Qualified is the satisfactory completion of a training program based on knowledge, skills, and abilities that are necessary for the performance of assigned responsibilities.

Self–Evaluation is a critical evaluation of a facility training program measured against the accreditation objectives and criteria. This evaluation is conducted by the contractor.

Standby is that condition in which a reactor or nuclear facility is neither operable nor declared excess, and documentary authorization exists to maintain the facility for possible future operation.

Subject Matter Expert is an individual qualified or previously qualified and experienced in performing a particular task. A subject matter expert may also be an individual who by education, training, and/or experience is a recognized expert on a particular subject, topic, or system.

Task is a well–defined unit of work having an identifiable beginning and end which is a measurable component of the duties and responsibilities of a specific job.

Task Analysis is the systematic process of examining a task to identify knowledge, skills, and abilities required for successful task performance.

Terminal Learning Objective is a learning objective that clearly states the measurable performance the trainee will be able to demonstrate at the conclusion of training, including the conditions and standards of performance.

Training is instruction designed to develop or improve job performance.

Training Accreditation Program Staff is an organization contracted by NE–1, responsible for developing and providing documents, training, and assistance to those who must comply with the Order DOE 5480.18 ACCREDITATION OF PERFORMANCE–BASED TRAINING FOR CATEGORY A REACTORS AND NUCLEAR FACILITIES. This staff also conducts the team evaluations for accreditation.

Training/Evaluation Standard is a document that specifies the objectives for training development activities and the evaluation standards to measure a trainee's performance of a task.

Training Program is a planned, organized sequence of activities designed to prepare individuals to perform their jobs, to meet a specific position or classification need, and to maintain or improve their job performance.

Training Program Accreditation Plan is an action plan developed following a thorough contractor self–evaluation and identification of training programs requiring accreditation. The Training Program Accreditation Plan identifies scope and resource needs for accomplishing accreditation.

Training Setting is the environment in which training is conducted. Examples of training settings include classroom, laboratory/workshop, on–the–job training, simulator, and self–paced instruction.

DOE/NE-0101T

CONCLUDING MATERIAL

Review Activities:

DOE
NE

Preparing Activity:

DOE-NE-73

Project Number:

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