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DOE STANDARD

GUIDELINES FOR EVALUATION OF NUCLEAR FACILITY TRAINING PROGRAMS

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

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FOREWORD

The Department of Energy (DOE) *Guidelines for Evaluation of Nuclear Facility Training Programs* establishes a single set of objectives and criteria for the evaluation of training programs developed to meet the requirements of DOE Orders 5480.18A and 5480.20, and other directives that address training and qualification. For the purpose of this standard, evaluation includes appraisals, surveillances, audits, reviews, assessments, and other activities intended to evaluate training. The standard is intended to assist personnel in performing evaluations of training and qualification programs. It should be used in conjunction with other regulations, policies, or directives that require the evaluation of training and qualification programs.

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1. SCOPE

1.1 Purpose. The *Guidelines for Evaluation of Nuclear Facility Training Programs* establish objectives and criteria for evaluating nuclear facility training programs. The guidance in this standard provides a framework for the systematic evaluation of training programs at nuclear facilities and is based, in part, on established criteria for Technical Safety Appraisals, Tiger Team Assessments, commercial nuclear industry evaluations, and the DOE Training Accreditation Program.

1.2 Applicability. This standard applies to organizations or persons involved in evaluating training methods, materials, and programs at DOE nuclear facilities. DOE nuclear facilities include Category A reactor facilities, Category B reactor facilities, and non-reactor nuclear facilities. The focus of the standard is evaluations that are conducted by DOE field organizations (Operations Office, Area Office, or Project Office as appropriate). It should also be used by others who conduct reviews of training, both internal and external to the Department.

Training programs will vary according to the complexity and hazard potential of a particular nuclear facility. Consequently, certain criterion may not be applicable to low-hazard facilities; hence, a degree of flexibility must be used when applying the criterion. When a criterion is not applicable, it need not be considered.

While this standard assumes specific methods of evaluation, alternate methods that are consistent with overall organizational needs, policies, and resources are acceptable.

2. APPLICABLE DOCUMENTS

2.1 Government Documents.

2.1.1 DOE Orders, Standards, and Guidelines Applicable to Standard Development. The following DOE Orders, standards, manuals, and guidelines were used in the development of this document.

DOE 5480.20, PERSONNEL SELECTION, QUALIFICATION, TRAINING, AND STAFFING REQUIREMENTS AT DOE REACTOR AND NON-REACTOR NUCLEAR FACILITIES, of 2-20-91, which establishes requirements for development and implementation of qualification programs for personnel involved in the operation, maintenance, and technical support of DOE nuclear facilities.

DOE 5480.18A, ACCREDITATION OF PERFORMANCE-BASED TRAINING FOR CATEGORY A REACTORS AND NUCLEAR FACILITIES, of 7-19-91, which institutionalizes a performance-based training process for designated job positions at high- and selected moderate-hazard nuclear facilities.

DOE/NE-0101T, TRAINING ACCREDITATION PROGRAM MANUAL, TAP 1, of 2-4-91, which provides an introduction to the accreditation process, functional descriptions for programs which require accreditation, and the objectives and criteria that must be addressed within a training program.

DOE-HDBK-1074-YR (under development), of 6-2-94, ALTERNATIVE SYSTEMATIC APPROACHES TO TRAINING, which provides guidance on how to select and implement appropriate training processes considering job complexity, hazard potential, and available training media.

DOE/EV/10782-T1, GUIDANCE FOR TRAINING PROGRAM EVALUATION, of January 1984, which provides a general framework for the systematic evaluation of training programs at DOE Category-A reactors.

GUIDELINES FOR EVALUATING DOE NON-REACTOR NUCLEAR FACILITY TRAINING PROGRAMS, of November 1985, which provides a framework for the systematic evaluation of training programs at non-reactor nuclear facilities.

DOE/EH-0135, PERFORMANCE OBJECTIVES AND CRITERIA FOR TECHNICAL SAFETY APPRAISALS AT DEPARTMENT OF ENERGY FACILITY AND SITES, of June 1990, which provides the performance objectives and criteria intended to serve as a working reference for Technical Safety Appraisals of the Department's more significant facilities and sites.

DOE-SR GUIDELINE FOR THE EVALUATION OF CONTRACTOR TRAINING AND QUALIFICATION PROGRAMS, of October 1993, which provides a job aid for DOE-Savannah River staff personnel who have responsibility for evaluating training and qualification programs.

2.1.2 DOE Standards that Assist in Meeting the Objectives and Criteria. The following DOE standards provide guidance and good practices to assist in meeting the objectives and criteria contained in the Appendix to this standard.

DOE-NE-STD-1001-91, GUIDE TO GOOD PRACTICES FOR TRAINING AND QUALIFICATION OF INSTRUCTORS, of November 1991, which provides guidance for the development of initial and continuing instructor training programs. This guide will assist in meeting Objective 2, Development and Qualification of Training Staff.

DOE-NE-STD-1002-91, GUIDE TO GOOD PRACTICES FOR TRAINING AND QUALIFICATION OF CHEMICAL OPERATORS, of November 1991, which provides guidance for the development of new training programs or the refinement of existing training programs for chemical operators. This guide will assist in meeting Objective 4, Determination of Training Program Content.

DOE-NE-STD-1003-91, GUIDE TO GOOD PRACTICES FOR TRAINING AND QUALIFICATION OF MAINTENANCE PERSONNEL, of November 1991, which provides guidance for the development of new training programs or the refinement of existing training programs for maintenance personnel. This guide will assist in meeting Objective 4, Determination of Training Program Content.

DOE-STD-1005-92, GUIDE TO GOOD PRACTICES FOR DEVELOPING LEARNING OBJECTIVES, of July 1991, which provides information and guidance for the development of learning objectives. This guide will assist in meeting Objective 5, Design and Development of Training Programs; specifically Criterion 5.1.

DOE-STD-1006-92, GUIDE TO GOOD PRACTICES: EVALUATION INSTRUMENT EXAMPLES, of July 1991, which provides examples of various methods and techniques for developing evaluation instruments. This guide will assist in meeting Objective 7, Trainee Examinations and Evaluations.

DOE-STD-1007-92, GUIDE TO GOOD PRACTICES FOR TEAMWORK TRAINING AND DIAGNOSTIC SKILLS DEVELOPMENT, of July 1991, which provides guidance for the development, implementation, and improvement of training on teamwork and diagnostics. This guide will assist in meeting Objective 6, Conduct of Training; specifically Criterion 6.2.

DOE-STD-1008-92, GUIDE TO GOOD PRACTICES FOR TRAINING OF TECHNICAL STAFF AND MANAGERS, of July 1991, which provides guidance for the design and development of technical staff and managers' initial and continuing training programs. This guide will assist in meeting Objective 4, Determination of Training Program Content; specifically Criteria 4.2 and 4.3.

DOE-STD-1009-92, GUIDE TO GOOD PRACTICES FOR THE DEVELOPMENT OF TEST ITEMS, of July 1991, which provides guidance for the systematic development of valid and reliable examinations. This guide will assist in meeting Objective 7, Trainee Examinations and Evaluations; specifically Criteria 7.1 and 7.2.

DOE-STD-1010-92, GUIDE TO GOOD PRACTICES FOR INCORPORATING OPERATING EXPERIENCES, of July 1991, which provides guidance for establishing an operating experience review program and incorporating the results into training programs. This guide will assist in meeting Objective 8, Training Program Evaluation; specifically Criterion 8.4.

DOE-STD-1011-92, GUIDE TO GOOD PRACTICES FOR THE DESIGN, DEVELOPMENT, AND IMPLEMENTATION OF EXAMINATIONS, of July 1991, which provides guidance for the construction and administration of written, oral, and performance examinations. This guide will assist in meeting Objective 7, Trainee Examinations and Evaluations; specifically Criteria 7.1 and 7.2.

DOE-STD-1012-92, GUIDE TO GOOD PRACTICES FOR ON-THE-JOB TRAINING, of July 1991, which provides guidance for the design and development of on-the-job training (OJT) programs and for instructors who conduct OJT and performance examinations. This guide will assist in meeting Objective 6, Conduct of Training; specifically Criterion 6.3.

DOE-STD-1056-93, GUIDE TO GOOD PRACTICES FOR LINE AND TRAINING MANAGER ACTIVITIES RELATED TO TRAINING, of February 1993, which provides guidance for line and training managers relative to participation in and evaluation of the facility's training and qualification programs. This guide will assist in meeting Objective 1, Management and Administration of Training and Qualification Programs.

DOE-STD-1057-93, GUIDE TO GOOD PRACTICES FOR THE SELECTION, TRAINING, AND QUALIFICATION OF SHIFT TECHNICAL ADVISORS, of February 1993, which provides guidance for the design and development of a shift technical advisor (STA) training program. This guide will assist in meeting Objective 4, Determination of Training Program Content.

DOE-STD-1058-93, GUIDE TO GOOD PRACTICES FOR DEVELOPING AND CONDUCTING CASE STUDIES, of February 1993, which provides guidance for the design, development, and conduct of case studies for use in the training program. This guide will assist in meeting Objective 5, Design and Development of Training Programs.

DOE-STD-1059-93, GUIDE TO GOOD PRACTICES FOR MAINTENANCE SUPERVISOR SELECTION AND DEVELOPMENT, of February 1993, which provides guidance for the design and development of maintenance supervisor training programs. This guide will assist in meeting Objective 4, Determination of Training Program Content.

DOE-STD-1060-93, GUIDE TO GOOD PRACTICES FOR CONTINUING TRAINING, of February 1993, which provides information and guidance for the development and implementation of a continuing training program. This guide will assist in meeting Objective 5, Design and Development of Training Programs, and Objective 8, Training Program Evaluation; specifically Criterion 5.4, 8.4, and 8.5.

DOE-STD-1061-93, GUIDE TO GOOD PRACTICES FOR THE SELECTION, TRAINING, AND QUALIFICATION OF SHIFT SUPERVISORS, of February 1993, which provides guidance for the design and development of shift supervisor training programs. This guide will assist in meeting Objective 4, Determination of Training Program Content.

2.2 Non-Government Documents. The following non-government publications were used in the development of this document.

IAEA-TECDOC-525, GUIDEBOOK ON TRAINING TO ESTABLISH AND MAINTAIN THE QUALIFICATION AND COMPETENCE OF NUCLEAR POWER PLANT OPERATIONS PERSONNEL, of November 1989, which provides guidance for the systematic approach to training issued by the International Atomic Energy Agency, Vienna, Austria.

A CHECKLIST FOR TECHNICAL, SKILLS & OTHER TRAINING, American Society for Training and Development, Undated; Edited by William Garry, Rosemary Springborn, Charles Gessert, and John Gammuto.

3. DEFINITIONS

All key terms used in this standard are defined in DOE Order 5480.18A and DOE Order 5480.20, which are referenced in Section 2, Applicable Documents.

4. INTRODUCTION

In recent years the Department of Energy (DOE) has given increased attention to the improvement of DOE nuclear facility operations. Internal and external reviews of DOE activities (e.g., National Academy of Sciences reviews, Technical Safety Appraisals, Tiger Team Assessments, Defense Nuclear Facility Safety Board reviews) have confirmed the need for this increased attention. These reviews have identified a need for improvement of DOE nuclear facility personnel training programs, strengthening DOE's role in training, and improved methods for the evaluation of DOE contractor training programs.

This standard initiates a framework for consistent, systematic evaluation of DOE nuclear facility training programs through the establishment and use of a uniform set of training program evaluation objectives and criteria. The performance objectives and criteria contained in the Appendix to this standard shall be used by DOE Headquarters and field organizations for the evaluation of nuclear facility training and qualification programs. DOE contractors should also use these objectives and criteria to perform internal training program evaluations to determine strengths and weaknesses and to form the basis for improvement action plans. Evaluations conducted in accordance with this standard should consider prior commitments or action items in implementation plans for DOE Orders or resulting from previous internal and external evaluations.

5. THE EVALUATION PROCESS

5.1 Benefits of Evaluations. Evaluations of training programs are conducted to provide reasonable assurance that programs are producing competent employees who are capable of performing their jobs safely and efficiently. This assurance benefits the Department through increased productivity, increased worker and facility safety, and decreased costs of operation.

Training and qualification programs require a significant investment in equipment, materials, and personnel resources. Evaluations of a training program's effectiveness in producing competent employees are conducted to ensure that training is being conducted in a consistent, cost effective, and efficient manner. Other reasons for training program evaluations include the need to determine:

- program strengths and weaknesses;
- if worker performance has improved;
- if program content matches current job needs; and
- if corrective actions are needed to improve program effectiveness.

This standard provides objectives and criteria that promote consistent evaluations and therefore consistent results. For many years, evaluations of DOE training programs have been conducted by various organizations and the results have not always been consistent primarily because either different criteria were used as the basis for each evaluation or the criteria that was used was unknown by the organization being evaluated. As a result, DOE Management and Operating contractors have been tasked with resolving findings and recommendations generated by these evaluations that, at times, were contradictory or untraceable to existing requirements. A major benefit of using the objectives and criteria in this standard is consistent evaluations, which will result in greater efficiency and consistency when improvements to training programs are implemented.

5.2 Evaluator Qualifications. DOE field organizations should establish implementing procedures for the evaluation of nuclear facility training and qualification programs. The implementing procedures should include standards for evaluator technical qualifications and clearly define responsibilities for the preparation, conduct, reporting, and tracking of training program evaluations. The field organization should establish a schedule for evaluating nuclear facility training programs that is consistent with DOE orders and directives.

The DOE organization (Headquarters or field) responsible for conducting evaluations should select the evaluator(s) using selection criteria that will maximize credibility, bring expertise to bear where needed, and increase the likelihood of fresh solutions to problems through new perspectives. Selection, training, and qualification requirements for personnel performing evaluations of technical training and qualification programs should be developed and promulgated in ancillary documents.

Each evaluator's experience should be commensurate with individually assigned objectives and criteria. Before beginning the evaluation the evaluator(s) should be trained in evaluation methodology, and should be familiar with the objectives and criteria which they are assigned to evaluate. The training program objectives and criteria contained herein are not a substitute for the evaluator's technical knowledge of the facility or program. The evaluation must be performed using personnel who have a technical background (e.g., nuclear facility operations, maintenance, and radiological protection personnel, and/or expertise in tritium, plutonium, or other subjects) in the subject area(s) being evaluated. If a group of individuals are performing the evaluation, the team should be made up of an appropriate balance of personnel with training and technical backgrounds. The optimum situation is to use personnel with a technical background <u>and</u> experience in training design, development, and management. If the evaluation is conducted by someone who does not have the specific technical qualifications, the results should be reviewed by a subject matter expert with expertise in the subject area(s) before it is forwarded to the Management and Operating contractor.

5.3 <u>Evaluation Methods.</u> The objectives and criteria (Appendix A) may be used individually by a person or collectively by a team to evaluate a specific objective or criterion or as a package to evaluate the entire training program. The objectives and criteria were designed to accommodate either the single person approach or the team approach. Job aids (i.e., checklists and forms) that can be used by either a person or by a team to support training program evaluation will be developed and published separately.

Training program evaluations should be conducted through observation of the overall program and they should answer the question: *"Does the training program meet the objectives and criteria contained in this standard?"* The following resources should be used when conducting training program evaluations:

- Facility policies, procedures, program descriptions, and records;
- Training materials, such as lesson plans, guides, student handouts, and tests; and
- Cognizant facility personnel.

Evaluations should be conducted at the facility, at the training center, and at other locations where training activities occur. Evaluations should center around three major activities to determine the extent to which training programs are meeting the objectives and criteria. These activities include observation of training, personnel interviews, and document reviews.

Observation of training should focus on the people (both instructors and trainees), the instructional environment, and the instructional process. The key steps involved in the observation of training are:

- Select the training to be observed, obtain a copy of the lesson plan or guide, and review it prior to the observation;
- Explain the purpose of the observation to the instructor and attend training (do not participate in the discussion and minimize trainee attention to the observation);
- Take detailed notes during the observation and write only facts;
- Compare the facts observed with the desired behaviors or conditions; and
- Note any strengths and/or weaknesses.

Interviews require a different set of skills to acquire information about training. Successful interviewing is dependent on communication skills, both speaking and listening, and on good questioning techniques. Key considerations during the interviewing process include:

- Pre-Interview Activities -- decide on goals for the interview, determine the key personnel who would provide the most complete and accurate information, and develop a set of questions in advance.

- Interview Activities -- explain the interview purpose and answer any questions the interviewee may have, use open-ended questions to obtain detailed information, use closed questions to obtain short answer conclusions, assess throughout the interview, express appreciation for interviewee's time, and restate the purpose of the interview at its conclusion.

- Post-Interview Activities -- compare responses to the objectives and criteria, and assess once again whether the information provided helped to accomplish the original goal(s) of the interview.

Training records should be reviewed to verify that materials and activities are being properly documented, processed, and retained. Program-level records include task lists, lesson plans, instructor qualifications, and program evaluations. Trainee-level records include attendance records, test results, qualification cards, and certifications. When inconsistencies exist, further investigation should be conducted to determine the depth of the problem. Assess the system as a whole. Are the records properly validated and entered into the system in a timely manner? Is there an effective document control system? Are all the records in the system and are they readily retrievable?

5.4 Evaluation Frequency. Training program evaluations using the objectives and criteria specified in the Appendix should be conducted as part of the DOE field organization environment, safety, and health appraisal program and contractor internal review program. Training program evaluations should also be conducted by both the DOE field organization and the contractor when significant changes occur in training needs, personnel performance deficiencies are noted, or indicators show a significant performance degradation. Training program evaluations should be conducted every three years to determine the effectiveness and efficiency of the training system in providing a knowledgeable and skilled workforce to support safe and efficient facility operations. The evaluation can consist of one overall evaluation or a series of topical evaluations conducted over the three year period.

In addition to performing overall or topical training program evaluations, DOE field organizations should perform day-to-day evaluation of technical training and qualification activities. This includes activities such as monitoring classroom and on-the-job training (OJT) sessions, spot-checking training materials and individual training and qualification records, monitoring oral examinations, and reviewing examination results. The detail and frequency of the day-to-day evaluation activities is dependent upon the hazard, risk, and complexity associated with the operation of the facility.

5.5 Graded Approach. The graded approach must be considered when applying the criteria to a training program or activity. For example, the requirements and the level of detail and structure associated with establishing a systematic approach to training (SAT) should be consistent with the hazard potential and the complexity of the facility. Alternative approaches are acceptable and encouraged to streamline all phases of the systematic approach to training.

Regardless of the approaches used to establish training programs, a strong evaluation process is essential to ensure effective implementation and regular improvements. When applying the objectives and criteria, evaluators should recognize that training programs for low-hazard nuclear facilities generally do not need to be as detailed as training programs for higher-hazard nuclear facilities. The evaluator should apply the objectives and criteria with consideration of the level of detail that has been set forth in facility policies and agreed to by DOE management. The DOE Handbook, *Alternative Systematic Approaches to Training*, provides additional guidance on alternative implementation methods.

6. APPLICATION OF OBJECTIVES AND CRITERIA

The objectives and criteria (Appendix) describe the expected results of an effective, well-managed training program. The objectives address:

- Management and administration of training and qualification programs;
- Development and qualification of training staff;

- Trainee entry-level requirements;
- Determination of training program content;
- Design and development of training programs;
- Conduct of training;
- Trainee examinations and evaluations; and
- Training program evaluation.

The criteria are principles or methods that support the objectives and are to be applied with judgement. The expectation is that all objectives will be met. However, some criteria may not be applicable to some programs. This situation would prevail when, for example, a particular method such as laboratory training is not used. The evaluator must choose the objective and associated criteria to accomplish the scope of the assessment that is to be performed. The method chosen to meet the objectives and criteria is determined by the contractor.

The amplifying statements associated with the criteria provide guidance to the evaluator in areas such as personnel to interview, documents to review, and standards to look for in determining if the criteria are satisfied. The amplifying statements are not meant to be all inclusive. The evaluator may need to look for methods not mentioned in the guidance to verify meeting the criteria. The DOE standards referenced in section 2.1.2 contain additional guidance that can be used. Conversely, not all of the items listed in the guidance may be necessary to meet a criterion. Considering the graded approach, some facilities may satisfactorily achieve criteria without considering all of the review guidance.

The evaluators must use their knowledge of the facility's policies and procedures to determine whether or not a specific criterion or review guidance is applicable to the training program being reviewed. The determination of applicability is a DOE management (e.g., field program or training office) responsibility.

7. REPORTING EVALUATION RESULTS

As stated previously, evaluations can be conducted as a comprehensive evaluation or as a series of topical evaluations. Therefore, the evaluation report may address a single objective or criterion (topical) or may be comprehensive depending on the type of evaluation conducted. The topical approach may be used over a period of time to evaluate the entire program. If this method is used, a report should be written for each segment of the evaluation. In this case, individual reports should be combined into a comprehensive report that addresses the entire program at the completion of all individual segments. This comprehensive report should include a section that draws conclusions from the results of the individual reports relative to the overall effectiveness of the entire training program.

As training program reviews are being performed, the evaluator should record field notes. In most cases these are briefly written notes that can be referred to at a later time. These notes do not have to contain a long narrative description of what is, or is not, being accomplished in support of the criteria. When all of the information related to the review has been obtained, the evaluator should document the results. The problem, reason, example, proposal (PREP) method is an effective means for recording findings. The evaluator(s) document a concern with the training program by briefly stating the problem, explaining the reason why it is a problem, giving specific examples of the problem's existence, and providing a proposal or recommendation for resolving the problem. Upon completion of the data gathering phase of the evaluation, the evaluator(s) should review all of the information and develop an evaluation report. A differentiation should be made in the evaluation report between a finding that requires specific corrective action and a finding that identifies a program strength or noteworthy practice. Programs or activities that are positive examples of effective training programs or methods or which are considered noteworthy should be made available to other DOE facilities, as appropriate.

There are several characteristics of an effective report that should be considered regardless of whether the single segment or total program evaluation approach is used. However, the person(s) writing the evaluation report should follow locally prescribed procedures or policies when compiling the report. Incorporating these characteristics into a report increases the probability that the report will be understood. An effective report must be organized, factual,

complete, objective, accurate, and should provide contractor management with findings and recommendations. The report should be reviewed with contractor management for factual accuracy prior to issuance. Findings and recommendations should be reported to contractor management in a timely manner. Any safety violations observed during the evaluation must be reported to contractor management immediately. The following is an example of the type of information that should be included in evaluation reports.

- Cover page -- The cover page includes the report title, the evaluator(s) name(s), and the period of time over which the evaluation was conducted.

- Summary/Abstract -- An abstract explains the kind of information that is included in the evaluation report. Typical content would be the areas evaluated, purpose of the evaluation, and major findings and recommendations.

- Historical background regarding the program -- The depth of this section depends solely on the audience. For example, if the intended audience is unfamiliar with the program concerned, it is beneficial to provide a more comprehensive background. If the intended audience is familiar with the content of the program, the information should be brief and to the point. Regardless of the intended audience, the report should include the goals, objectives, and critical components of the program.

- Description of the evaluation -- This section introduces the strategy employed for the evaluation. It addresses three major areas, which include: 1) the purpose of the evaluation, 2) how the evaluation was conducted, and 3) the key personnel involved in the evaluation.

- Results and recommendations -- This section conveys the results of the evaluation and the proposal or recommendation for resolution. Before writing this section, all the information must be tabulated and analyzed. A clear explanation of the data improves the clarity and credibility of the report. It is vitally important to explain what the data actually mean. Often this is the section that is referred to most often; therefore, it must be prepared with detail and care. This section should list each

objective and criterion in order, indicate whether the objectives and criteria were met, and describe any reasons for not meeting the objectives or criteria.

- Conclusions -- This section contains a group of statements based on the evidence or observed findings. This section should also highlight noteworthy practices that are identified during the evaluation. It must reflect the purpose and objective of the evaluation.

8. TRACKING EVALUATION RESULTS

The DOE field organization should ensure that a formal process is in place to document the results of training evaluations, provide those results to contractor management, and track and monitor the successful completion of corrective actions to remedy deficiencies.

Recommendations should be referenced to specific criterion or other regulations or requirements and should be clearly communicated to the contractor. Contractor management should submit a written corrective action plan to the DOE organization responsible for the training program that was evaluated. This corrective action plan should address the schedule and actions that will be taken to resolve recommendations.

The responsible DOE organization(s) should review the corrective action plan to ensure that it adequately addresses the recommendations. Acceptance of corrective action plans should be formally communicated to the contractor. The DOE field organization should monitor progress and verify completion of all action items.

APPENDIX

OBJECTIVES AND CRITERIA

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MANAGEMENT AND ADMINISTRATION OF TRAINING AND QUALIFICATION PROGRAMS

OBJECTIVE 1

The facility is organized, staffed, and managed to facilitate planning, directing, evaluating, and controlling a systematic training process that supports the facility mission(s).

Criteria

1.1 Facility line management has overall responsibility and authority for the content and effective conduct of the training and qualification program(s).

Line management ownership, commitment, and accountability are the foundation for the training and qualification programs at the facility. Line management is responsible for ensuring that these programs will produce competent workers and supervisors. The commitment to the training of personnel at the facility includes participation of line management in all phases of the training program. Management ensures that resources are available to support the training effort, mandates attendance at training sessions, and is thoroughly knowledgeable of all aspects of the training and qualification program(s) in which that facility's personnel participate.

Management-approved policies and procedures are implemented that promote a systematic approach to training. They adequately describe the duties, responsibilities, and authorities of line and training management, and detail the interfaces involved in implementing the training and qualification programs for both training staff and facility personnel. They also describe the process for the analysis, design, development, implementation, and evaluation of the training programs.

1.2 An organization/person within line management is responsible for the implementation of the training and qualification program(s).

A training group is established as part of the line organization. If a training group is not separately established, then personnel within the line organization are assigned responsibilities for implementing the training and qualification program(s). At facilities with small staffs and/or training programs, the training group may consist of only one individual, either full- or part-time. However, the job function, responsibilities, authority, and accountability of personnel involved in managing, supervising, and/or implementing training are clearly defined in the incumbent's job description, procedure, or similar document.

1.3 Goals, objectives, and plans are in place to describe the implementation of the training and qualification programs.

Written goals and objectives related to the implementation of the training and qualification processes are in place and stated in documents such as strategic plans, award fee criteria, policies, and mission statements. The goals and objectives adequately address the current issues that are important to both contractor management and DOE. Facility line management and the training organization implement specific plans as appropriate to ensure adequate management of the training program.

1.4 Training records are maintained to support management information needs and to provide required historical data.

Training records are maintained in an auditable manner. Training records support management information needs and provide required data on each individual's training participation, performance, and qualification/certification. Training records are also maintained to support verification of the accuracy of training program content.

1.5 Training developed and/or implemented by personnel or organizations other than the operating contractor's staff is monitored and controlled to ensure that it meets applicable facility requirements.

Training provided by an outside organization (e.g., sub-contractor, vendor, site central training) in support of the qualification or certification of facility personnel meets the same basic requirements for development, implementation, testing, and documentation as training provided by the facility staff.

1.6 Training facilities, equipment, and materials effectively support training activities.

Adequate facilities are available to support safe and consistent training. Sufficient facilities and proper tools, equipment, and materials are available to support applicable training content and performance activities (e.g., hands-on training for maintenance personnel and technicians). Instructional support materials and equipment such as audio-visual equipment, flip charts, and marker boards are adequate to support the training activities. In addition to facilities to support the implementation of training, staff facilities and equipment are available to support analysis, design, development, and evaluation of training. Technical reference materials such as procedures, technical manuals, and drawings are readily available to instructors and trainees on all shifts.

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DEVELOPMENT AND QUALIFICATION OF TRAINING STAFF

OBJECTIVE 2

Training staff (contractor and subcontractor) possess the technical knowledge, experience, and the developmental and instructional skills required to fulfill their assigned duties.

Criteria

2.1 The training staff have and maintain the education, experience, and technical qualifications for their respective positions.

Instructors have the technical qualifications, including theory, practical knowledge, and experience for the subject matter that they are assigned to teach. Methods are implemented to ensure that individual instructors meet and maintain instructional and technical position qualification requirements. Developmental and instructional qualifications of instructors include theory, practical knowledge, and work experience in analyzing, designing, developing, conducting, and evaluating training, as appropriate to their job assignments.

2.2 A training program is implemented to ensure that training staff gain the knowledge and skills required for their position.

A training program is in place to develop the necessary instructor capabilities to fulfill training program requirements in all applicable training settings. Training staff and instructors who have not met the qualifications required for an assignment are under the supervision and guidance of a qualified individual. Subject matter experts used occasionally as instructors are provided assistance and are periodically monitored. The instructional skills training program is conducted using approved instructional materials that are based on learning objectives derived from job performance requirements and which provide for effective and consistent presentations.

2.3 A continuing instructional skills training program is implemented to maintain, improve, and update the knowledge and skills of incumbent training staff based, in part, on the results of instructor evaluations.

Continuing training includes improvements needed in technical and instructional knowledge and skills, the correction of identified instructional deficiencies, and training on new methods and equipment.

TRAINEE ENTRY-LEVEL REQUIREMENTS

OBJECTIVE 3

Trainees meet the minimum requirements for entry into the training program.

Criteria

3.1 Entry-level requirements are established for each position and include as applicable the minimum education, experience, technical, and medical requirements.

Procedures or policies describe the personnel selection and entry-level requirements. Line management, working with Human Resources personnel, identify the entry-level criteria for personnel working in a particular operating organization and/or assigned to specific duties or tasks. Entry-level requirements address the minimum physical attributes a trainee must possess, as well as the minimum educational, technical, and experience requirements necessary for the employee to meet job requirements.

3.2 Personnel selected for and/or assigned to the operating organization meet the prescribed entry-level requirements prior to being assigned to a position.

Line management is responsible for the hiring or transfer of personnel into positions for which entry-level requirements are established. Applicable education, experience, technical, and medical requirements are verified and documented for personnel who are required to meet entry-level requirements.

3.3 Training program entry-level requirements are reviewed and revised as necessary on the basis of evaluation of trainee performance.

Entry-level requirements for a training program are reviewed as part of the overall evaluation process. Entry-level requirements are at the proper level to ensure that

personnel can achieve the established learning objectives at the completion of training. Individual training course prerequisites are also established and reviewed periodically.

DETERMINATION OF TRAINING PROGRAM CONTENT

OBJECTIVE 4

Program content for competent job performance is identified, documented, and included in the training programs, as appropriate.

Criteria

4.1 The tasks required for competent job performance are identified and documented through a systematic analysis of job requirements. The training program is based on the results of this analysis.

A systematic analysis of job requirements is conducted to provide reasonable assurance that all tasks that are essential to safe and efficient operation are addressed by the training program. Subject matter experts, line management, and training staff develop and maintain a valid facility-specific task list as the basis for the training program. The facility-specific list of tasks selected for training is reviewed periodically and updated as necessary by changes in procedures, facility systems/equipment, job scope, and advances in technology.

4.2 Current facility safety analysis report, procedures, technical and professional references, DOE Guidelines and Orders, and industry operating experience are referenced as applicable to establish both initial and continuing training.

DOE and other appropriate training guidelines are used as a guide for selecting, sequencing, and verifying training program structure and content. Current facility safety analysis report, operating procedures, technical and professional references, and facility/industry operating experience are used to identify facility specific training content and information for use in developing training materials.

4.3 Training for Technical Staff personnel is based on an assessment of position duties and responsibilities.

A detailed analysis is not necessary to determine training program content for technical staff personnel. Consensus-based content guides (i.e., Guides to Good Practices), broad-based assessments of training needs, and regulatory requirements can be used to assist with the determination of training program content.

This method may also be sufficient to determine training program content for positions at many low-hazard nuclear facilities.

DESIGN AND DEVELOPMENT OF TRAINING PROGRAMS

OBJECTIVE 5

Training program materials identify and support the knowledge and skills needed by trainees to perform tasks associated with the position for which training is being conducted. The content of initial training prepares the trainee to perform the job for which the candidate is being trained. The content of continuing training maintains and improves incumbent job performance.

Criteria

5.1 Learning objectives are derived from tasks selected for training. Learning objectives describe knowledge and skills required for successful job performance and are specified in observable and measurable terms.

Learning objectives are written to reflect task performance and consider the associated knowledge and skills. Training settings are considered when writing learning objectives. Learning objectives include the actions the trainee must demonstrate, conditions under which the action will take place, and standards of performance. The minimum trainee entry-level knowledge, skills, and experience for the position are considered when developing learning objectives. If conditions and standards for knowledge and/or skill objectives are implied, they must be clearly understood.

5.2 Lesson plans and other training materials used in the selected training setting (e.g., classroom, laboratory, simulator, individualized instruction, on-the-job training, etc.) are accurate, support the learning objectives, and promote effective delivery of training.

Lesson plans are developed or modified using learning objectives derived from job performance requirements. The content of lesson plans and other training materials adequately addresses the learning objectives. The lesson plans contain sufficient detail to ensure consistent and repeatable training. Information contained in the lesson plans is sufficient to ensure that personnel are trained to a level required and expected by facility management.

Lesson plans or equivalent training guides are used for laboratory training, on-the-job training, and simulator training and include standards for evaluating trainee performance. Training materials for these non-classroom training settings provide for effective and consistent instruction. The training materials provide sufficient information to guide the trainee and the instructor in the performance of the task.

The training materials used to guide discussions with technical staff trainees normally are not in lesson plan format; rather training materials include key points that support the learning objectives, taking into account the job position and the experience of the designated instructor. This approach may also be sufficient for much of the training that is conducted at low-hazard nuclear facilities.

5.3 Review, approval, and control requirements are established and utilized for all training materials.

Subject matter experts and training management review and concur on training materials. The cognizant line manager approves them prior to use. Training materials are controlled in a manner that ensures that the latest approved version of the material is used.

5.4 A continuing training program is in place and maintains and improves the knowledge and skills of job incumbents.

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

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CONDUCT OF TRAINING

OBJECTIVE 6

Training is conducted in the setting most suitable for the particular training content. Training is consistently and effectively presented using approved lesson plans and other training guides.

Criteria

6.1 Training is conducted using approved and current training materials.

Lesson plans that meet criterion 5.2 are used to deliver training. Training in all settings is sequenced effectively to provide completion of prerequisite knowledge and skills prior to receiving training on more advanced knowledge and skills.

Individualized instruction, when used, provides the trainees with sufficient guidance and supporting materials for achieving the learning objectives.

6.2 Training replicates actual job conditions to the extent practical, and allows for direct participation by the trainees.

Instructors use the references, tools, equipment, and conditions of task performance that reflect actual job conditions to the extent practicable. Trainee demonstration of task performance is evaluated on actual plant equipment whenever feasible.

6.3 On-the-job training is conducted and evaluated by designated personnel who have been instructed in program standards and methods.

Line management implements standards and policies pertaining to the conduct of on-the-job training (OJT). Personnel who are designated by line management and are trained in the instructional techniques peculiar to OJT conduct and evaluate it. OJT is conducted using valid methods, approved materials, and a planned and logical

instructional sequence. Part time OJT instructors and/or evaluators are trained in OJT instructional methods.

Completion of OJT and task qualification is by actual task performance whenever possible. When the task cannot be performed, but is simulated or walked-through, the conditions of task performance, references, tools, and equipment reflect actual performance of the task to the extent feasible. Task performance evaluation is conducted using valid methods and consists of evaluating trainee performance using established standards prior to task or job qualification.

Structured on-the-job familiarization is normally used in lieu of formal on-the-job training and evaluation for managers, non-certified supervisors, and technical staff. During this phase, the candidate works closely with supervisors and managers in their day-to-day job functions, including decision-making.

6.4 Laboratory training is effectively and consistently presented.

Laboratory training provides hands-on application of principles conveyed during the classroom training and encourages analytical skills development. The training program content is implemented as outlined by approved training materials and is structured to provide practical experience. Laboratory training activities encourage direct trainee participation in the learning process. Conditions of task performance, references, tools, and equipment reflect actual job performance requirements to the extent possible. Evaluation of trainee performance verifies that the trainee has obtained the essential knowledge and performance skills associated with the job.

6.5 Simulator training is effectively and consistently presented, where appropriate.

Training on a facility control room or process simulator is used to build operating team skills and/or enhance the effectiveness of hands-on skill training. 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.

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TRAINEE EXAMINATIONS AND EVALUATIONS

OBJECTIVE 7

Individual trainees are examined and/or evaluated on a consistent and regular basis to ensure that learning is taking place and that trainees are acquiring the knowledge and skills required to work efficiently and safely at their jobs.

Criteria

7.1 Trainees are evaluated regularly using written, oral, and/or performance examinations and quizzes.

Trainees are evaluated on a regular basis. Examinations/evaluations are administered at the conclusion of structured segments of the training program. A sufficient sampling of the knowledge and skill learning objectives is evaluated prior to awarding qualification or certification.

Much of the training for managers, non-certified supervisors, and technical staff personnel occurs in nontraditional settings such as discussions with individual managers. Monitoring and evaluating training in these nontraditional settings are unnecessary. In addition, since many learning objectives for managers, non-certified supervisors, and technical staff personnel do not readily adapt to prescribed standards or quantitative testing, qualitative evaluations are acceptable in many cases. For example, trainees qualification could be assessed from responses during discussions, behavior during role-playing, or material developed during training exercises. Qualitative evaluations may also be used to assess trainee qualification at low-hazard nuclear facilities.

7.2 Examinations (both written and oral) and OJT, laboratory, or simulator performance evaluations are based on learning objectives, administered consistently, controlled, and documented.

Test items are reviewed by subject matter experts for technical content, meaning, and correct answer. The results of the review process are documented. Examination questions are at the proper depth and detail to ensure adequate evaluation of the trainees' knowledge and skills. Examinations and performance evaluations contain a representative cross-section of knowledge, skills, and abilities required for the position. All examination questions relate to one or more learning objectives.

The acceptance criteria used to grade examinations and performance evaluations are defined in advance of the examination or performance evaluation.

7.3 The content of written and oral examinations is changed at intervals sufficient to prevent compromise.

A policy or procedure is implemented to provide direction for how often and how much examinations are changed to prevent compromise. Examination changes may be based on how often the course of instruction is used and whether the test data is controlled or shared with the trainees as a part of the learning process.

7.4 Development, approval, security, administration, and maintenance of written and oral examinations, and performance evaluations are formally controlled.

A procedure or policy is implemented that controls the development, approval, security, administration, and maintenance of all types of examinations. Access to examinations is physically controlled and limited to designated personnel.

7.5 Remedial training and reevaluation are provided when examination or performance standards are not met.

Remedial training programs are provided as necessary to prepare the trainee to meet the identified training program entry-level requirements for areas where he/she may be deficient. In cases where a trainee fails an examination, remedial training is based upon the weaknesses identified in the examination. Remedial training plans are specified in advance, acknowledged by the trainee and approved by supervision. Completion of remedial training is documented.

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TRAINING PROGRAM EVALUATION

OBJECTIVE 8

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

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

A policy or procedure describes the long- and short-term requirements for performing program evaluations and provides guidance relative to who does the evaluation, how often evaluations are conducted, and how evaluations are conducted. The results of training program evaluations, including program strengths and weaknesses, are identified, documented, and used as a basis for training program revision on a periodic basis.

8.2 Instructional skills and technical competencies of instructors are evaluated regularly.

Instructors are evaluated regularly in all settings in which they instruct by training management, line organization supervision, and peers. The instructors are evaluated against an established set of criteria and the results are used to improve performance.

8.3 Feedback from trainee performance during training is used to evaluate and refine the training program. Feedback from former trainees and their supervisors is used to evaluate and refine the training program.

Examination results (written and performance) are analyzed to determine weaknesses in the development or delivery of instruction. Changes to the program content and/or design are made as appropriate. After the trainee has had an opportunity to use the information gained during training, feedback from the trainee and his/her supervisor is used to determine the effectiveness of training. Improvements to the program are based in part on collective trainee/supervisor input as to how well the trainee can perform the tasks for which he/she was trained.

8.4 Change actions (e.g., procedure changes, equipment changes, facility-specific and operating experience) are monitored and evaluated for their applicability to initial and continuing training programs and are incorporated in a timely manner. Changes in job scope are evaluated to determine the need for revision of initial and continuing training programs.

Changes that impact training program accuracy are incorporated into the training program in a timely manner and training is provided as necessary to inform facility personnel of changes that have an impact on facility operation. Clear responsibility is assigned for providing facility modification and procedure change information to the training organization.

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

A policy or procedure identifies the requirements and provides the guidance for documenting, evaluating, tracking, and incorporating changes to training programs. Data from criteria 8.1, 8.3, and 8.4 evaluations form the basis for making program improvements and modifications.

8.6 Training materials are maintained current, based upon the results of training program evaluations.

A procedure or policy is developed and implemented that describes the process for revising and documenting training material updates based upon the results of training program evaluation.

8.7 Training facilities are evaluated to determine their effect on the training process.

Training facilities are evaluated to determine if they are conducive to the learning process. Classrooms and training settings are free from excessive disturbances and distractions. Trainees have adequate space to work and learn individually and in groups, as appropriate. Conditions related to comfort (e.g., heat, lighting, noise level, desk space, etc.) meet standards for good learning environments. The training staff's office and working spaces are adequate to support the training being developed and presented.

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CONCLUDING MATERIAL

Review Activity:

DOE	Operations Offices
AD	AL
BPA	CH
CE	FN
DP	ID
EH	NV
EM	OR
ER	RL
FE	SF
GC	SR
IE	
IG	National Laboratories
NE	ANL
RW	BNL
SA	FNAL
WAPA	INEL
	LBL
	LANL
	LLNL
	NREL
	ORNL
	PNL
	SNL

Preparing Activity:

DOE-EH-63

Project Number:

6910-0043