

15.0 MANAGEMENT MEASURES

15.4 TRAINING AND QUALIFICATION OF PLANT PERSONNEL

15.4.1 PURPOSE OF REVIEW

The purpose of this review is to establish that there is reasonable assurance that personnel who perform activities relied on for safety at the plant¹ will understand, recognize the importance of, and be qualified to perform these activities as required by the proposed 10 CFR Part 70 in a manner that adequately protects the public and worker health and safety and the environment.

15.4.2 RESPONSIBILITY FOR REVIEW

Primary: Training, Quality Assurance or Human Factors Engineer/Specialist

Secondary: Licensing Project Manager

Supporting: Fuel Cycle Facility Inspector

15.4.3 AREAS OF REVIEW

The regulation, 10 CFR Part 70, as proposed, requires that personnel who perform activities relied on for safety be trained, tested, and retested as necessary to ensure that they understand, recognize the importance of, and are qualified to perform these activities in a manner that adequately protects the public and worker health and safety and the environment. Personnel at the facility should have the knowledge and skills necessary to start-up, operate, maintain, modify, and decommission the facility in a safe manner. The applicant should address the training and qualification of plant personnel with the application for a construction approval and should submit updated information with the license application.

The training, testing, retesting, and qualification of these personnel as described in the application for construction approval should be reviewed. This should include the training, testing, retesting, and qualification of managers, supervisors, designers, technical staff, plant operators, technicians, maintenance personnel and other personnel whose level of knowledge is relied on for safety.

¹This SRP section provides guidance for the review of information on the training and qualification of plant personnel who perform activities relied on for safety. Section F2 of SRP Appendix F on quality assurance and Supplement 2S-4 of ASME NQA-1-1994 provide review guidance on the subject of training and qualification of other personnel (for example, construction personnel) who perform activities relied on for safety.

Management Measures

The following areas should be reviewed:

- A. Organization and management of training;
- B. Trainee selection;
- C. Conduct of needs/job analysis and identification of tasks for training;
- D. Development of learning objectives as the basis for training;
- E. Organization of instruction using lesson plans and other training guides;
- F. Evaluation of trainee mastery of learning objectives;
- G. Conduct of on-the-job training;
- H. Systematic evaluation of training effectiveness;
- I. Personnel qualification; and
- J. Applicant's provisions for continuing assurance.

15.4.4 ACCEPTANCE CRITERIA

15.4.4.1 Regulatory Requirements

The requirement for training and qualification is addressed in the following:

Nuclear Regulatory Commission (U.S.), Washington, D.C. "Domestic Licensing of Special Nuclear Material (10 CFR Part 70)." *Federal Register* : Vol. 64, No. 146. pp. 41338-41357. July 30, 1999.

Specific references are as follows:

- A. In §70.4, "Definitions," the term management measures is defined. Training and qualification are included as a management measure.
- B. In §70.62(d), the applicant is required to establish management measures to provide continuing assurance of compliance with the performance requirements.
- C. In §70.64(a)(1), the design of new facilities or the design of new processes at existing facilities is required to be developed and implemented in accordance with management measures.
- D. In §70.65(a), the application is required to include a description of the management measures.

An additional requirement for training and qualification is addressed in the following:

U.S. Code of Federal Regulations, "Notices, Instructions and Reports to Workers: Inspection and Investigations," Part 19, Title 10, "Energy." The specific reference is to §19.12, "Instructions to Workers."

15.4.4.2 Regulatory Guidance

NRC guidance applicable to training and qualification of personnel that provide guidance for implementing and satisfying the regulatory requirements and acceptance criteria is:

Nuclear Regulatory Commission (U.S.), Washington, D.C. "Training Review Criteria and Procedures," NUREG-1220, Rev.1, January 1993.

15.4.4.3 Regulatory Acceptance Criteria

With the application for construction approval, the applicant should commit to meet or exceed the acceptance criteria in Section 15.4.4 and to update the training and qualification of plant personnel description to reflect any changes between the applications for construction approval and for license.

The NRC reviewers should find the applicant's submittal regarding training and qualification of plant personnel provides reasonable assurance that the regulatory acceptance criteria below are adequately addressed and satisfied.

In addition to the regulatory acceptance criteria given below, SRP Sections 9.1.5.4 and 9.1.5.6 provide criteria for training and qualification of plant personnel for radiation safety functions.

A. Organization and Management of Training

The organization and management of training of plant personnel should be acceptable if the start-up, operation, maintenance, and modification of the facility are organized, staffed, and managed to facilitate planning, directing, evaluating, and controlling a systematic training process that fulfills job-related training needs. Formal training should be provided for each position or activity for which the required performance is relied on for safety. The application should state what training will be conducted and which personnel will be provided this training. Training should include retraining of previously trained and qualified personnel based on specified criteria.

The following commitments should be in the application regarding organization and management of training:

- i. Line management should be responsible for the content and effective conduct of the training.
- ii. The job function, responsibility, authority, and accountability of personnel involved in managing, supervising, and implementing training should be clearly defined.
- iii. Performance-based training should be used as the primary management tool for analyzing, designing, developing, conducting, and evaluating training.

Management Measures

- iv. Training procedures should be documented and implemented to ensure that all phases of training are conducted reliably and consistently.
- v. Training documents should be linked to the configuration management system to ensure that design changes and plant modifications are accounted for in the training.
- vi. Exceptions from training may be granted to trainees and incumbents when justified, documented, and approved by management.
- vii. Auditable training records should be maintained. Training records, both programmatic and individual, should support management information needs and provide required data on each individual's training, job performance, and fitness for intended duty. (Refer to SRP Section 15.8 and Appendix H for detailed guidance on records management.)

B. Trainee Selection

Selection of trainees who will perform activities relied on for safety should be acceptable if minimum requirements for selection of trainees are specified. Trainees should meet entry-level criteria defined for the position including minimum educational, technical, experience, and (if necessary) physical fitness requirements.

C. Conduct of Needs/Job Analysis and Identification of Tasks for Training

The conduct of needs/job analysis and identification of tasks for training should be acceptable if the tasks required for competent and safe job performance are identified, documented, and included in the training.

Operations personnel, training staff, and other subject matter experts, as appropriate, should have conducted or should conduct a needs/job analysis to develop a valid task list for specific jobs. The jobs treated in this manner should include, as a minimum, those responsible for managing, supervising, performing, and verifying the activities specified in the Integrated Safety Analysis Summary (ISA - see SRP Chapter 5) that prevent or mitigate accidents. Each task selected for training (initial or continuing) from the facility-specific task list should be matrixed to supporting procedures and training materials. The facility-specific list of tasks selected for training and the comparison to training materials should be reviewed on an established schedule and updated as necessitated by changes in procedures, facility systems/equipment, or job scope.

D. Development of Learning Objectives as the Basis for Training

The development of learning objectives as the basis for training should be acceptable if learning objectives that identify training content and define satisfactory trainee performance are derived from job performance requirements and the needs/job analysis. Learning objectives should state the knowledge, skills, and abilities the trainee should demonstrate; the conditions under which required actions will take place; and the standards of

performance the trainee should achieve upon completion of the training activity. Learning objectives should be sequenced based on their relationship to each other.

E. Organization of Instruction Using Lesson Plans and Other Training Guides

The organization of instruction using lesson plans and other training guides should be acceptable if the plans/guides are based on the required learning objectives derived from specific job performance requirements and the needs/job analysis. Plans/guides should be used for in-class training and on-the-job training and should include standards for evaluating proper trainee performance. Review and approval requirements should be established for all plans/guides and other training materials before their issue and use.

F. Evaluation of Trainee Mastery of Learning Objectives

The evaluation of trainee mastery of learning objectives should be acceptable if trainees are evaluated periodically during training to determine their progress toward mastery of job performance requirements and at the completion of training to determine their mastery of job performance requirements.

G. Conduct of On-the-Job Training

The conduct of on-the-job training should be acceptable if on-the-job training used for activities identified in the ISA Summary is fully described. On-the-job training should be conducted using well-organized and current performance-based training materials. On-the-job training should be conducted by designated personnel who are competent in the program standards and methods of conducting the training. Completion of on-the-job training should be by actual task performance. When the actual task cannot be performed by the trainee and is therefore "walked-down," the conditions of task performance, references, tools, and equipment should reflect the actual task to the extent possible.

H. Systematic Evaluation of Training Effectiveness

A systematic evaluation of training effectiveness and its relation to on-the-job performance should be acceptable if it ensures that the training program conveys all required skills and knowledge and is used to revise the training, where necessary, based on the performance of trained personnel in the job setting. A comprehensive evaluation of individual training programs should be conducted periodically by qualified individuals to identify program strengths and weaknesses. Feedback from trainee performance during training and from former trainees and their supervisors should be used to evaluate and refine the training. Change actions (for example, procedure changes, equipment changes, facility modifications) should be monitored and evaluated for their impact on the development or modification of initial and continuing training and should be incorporated in a timely manner. Change actions should be accomplished through the configuration management system (see SRP Section 15.2). Improvements and changes to initial and continuing training should be systematically initiated, evaluated, tracked, and incorporated to correct training deficiencies and performance problems.

Management Measures

I. Personnel Qualification

The following commitments should be in the application regarding personnel qualification for managers, supervisors, designers, technical staff, plant operators, technicians, maintenance personnel, and other plant staff required to meet NRC regulations:

- i. Managers should have a minimum of a B.S./B.A. or equivalent. Each manager should have either management experience or technical experience in facilities similar to the MOX facility.
- ii. Supervisors should have at least the qualifications required of personnel being supervised with either one additional year experience supervising the technical area at a similar facility or should have completed the supervisor training.
- iii. Technical staff identified in the ISA Summary whose activities are relied on for safety to satisfy the performance requirements identified in 10 CFR Part 70, as proposed, should have a B.S. in the appropriate technical field and three years experience.
- iv. Facility operators, technicians, maintenance personnel, and other staff whose actions are required to comply with NRC regulations should have completed the applicant's training process or have equivalent experience or training.
- v. Candidates for process operators should be required to meet minimum qualifications described in the application. Candidates for job functions other than process operators should also be required to meet minimum qualifications, but these minimum qualifications need not be described in the application.

J. Applicant's Provisions for Continuing Assurance

The applicant's provisions for continuing assurance of training and qualification of plant personnel should be acceptable if the applicant's submittal addresses periodic retesting of personnel as necessary to ensure that the personnel continue to understand, recognize the importance of, and are qualified to perform their activities that are relied on for safety.

15.4.5 REVIEW PROCEDURES

15.4.5.1 Acceptance Review

The primary reviewer should perform an acceptance review to determine if the application (construction or license) adequately addresses the specific items in Section 15.4.3, "Areas of Review."

Guidance specific to the application for construction approval and the license application is provided below.

A. Application for Construction Approval

Specifically, the safety assessment of the design basis should address Section 15.4.3 consistent with the level of design. Where information is under development or not yet available, the applicant may use a commitment to provide the material with the license application in lieu of the actual material. The primary reviewer should also verify that the applicant has committed to meeting or exceeding the acceptance criteria of Section 15.4.4.

B. License Application for Operations

Specifically, the license application should address Section 15.4.3 in full. The applicant is expected to have developed a program for the training and qualification of plant personnel prior to facility licensing for operations.

If the primary reviewer verifies that the training and qualification of plant personnel is adequately addressed, the primary reviewer should accept the application for the safety evaluation in Section 15.4.5.2. If the primary reviewer identifies significant deficiencies in the material provided, the primary reviewer should request that the applicant submit additional information prior to the start of the safety evaluation.

15.4.5.2 Safety Evaluation

After determining that the application is acceptable for review in accordance with Section 15.4.5.1(A) (construction) or 15.4.5.1(B) (license), the primary reviewer should perform a safety evaluation against the acceptance criteria described in Section 15.4.4. On the basis of its review, the staff may request that the applicant provide additional information or modify the application to meet the acceptance criteria in SRP Section 15.4.4.

Management Measures

Guidance specific to the application for construction approval and the license application is provided below.

A. Application for Construction Approval

The primary reviewer should verify that the applicant's commitments and goals as they relate to the training and qualification of plant personnel are adequate to meet or exceed the acceptance criteria in Section 15.4.3.

B. License Application for Operations

The primary reviewer should focus the review on any new or changed material covering the training and qualification of plant personnel which the applicant updated with the license application. The primary reviewer should also confirm that the material remains consistent with the material provided in the license application in support of other chapters of this SRP.

The primary reviewer should recognize that the rigor and formality of a systematic approach to training and the required qualification of plant personnel may be graded to correspond to the hazard potential of the facility and to the complexity of the training needed. The primary reviewer should determine whether the applicant has adequately planned for the training and qualification of plant personnel to be accomplished and whether necessary policies, procedures, and instructions will be in place and appropriate training and qualification will be accomplished before these personnel begin activities relied on for safety. Some of the information may be referenced to other sections of the application, or incorporated by reference, provided that these references are clear and specific.

The secondary reviewer should confirm that the applicant's commitments regarding the training and qualification of plant personnel are consistent with other sections of the applicant's submittal.

The supporting reviewer (Fuel Cycle Facility Inspector) should become familiar with the applicant's commitments for the training and qualification of plant personnel and determine whether ongoing activities are in agreement with them.

The review should result in a determination that there is reasonable assurance that the applicant's training and qualification of plant personnel will ensure that only properly trained and qualified personnel will perform activities relied on for safety.

15.4.6 EVALUATION FINDINGS

The primary reviewer should document the safety evaluation by preparing material suitable for inclusion in the Safety Evaluation Report (SER). The primary reviewer should describe the review, explain the basis for the findings, and state the conclusions.

The staff could document a safety evaluation for the application for construction approval as follows:

[Here the primary reviewer provides a summary statement of what was evaluated (including a applicant commitments) and why the reviewer finds the applicant's submittal acceptable.] Continued with: Based on its review of the license application, the NRC staff concludes that the applicant adequately described its training and qualification of plant personnel (or made commitments to meet the acceptance criteria of Section 15.4.4 of NUREG-1718) and that the applicant's training and qualification of plant personnel (will, based on commitments) meet the requirements of 10 CFR Part 70 and provide reasonable assurance of protection of public health and safety and of the environment.

The staff could document a safety evaluation for the license application using a similar paragraph as that used for the construction approval, but encompassing any new or updated material (and possible fulfilled commitments) when compared to the safety evaluation for the construction approval.

15.4.7 REFERENCES

- A. Code of Federal Regulations, Title 10, Part 70, Domestic Licensing of Special Nuclear Material, U.S. Government Printing Office, Washington, D.C., 1999.
- B. Nuclear Regulatory Commission (U.S.), Washington, D.C. "Domestic Licensing of Special Nuclear Material, (10 CFR Part 70)." *Federal Register*: Vol. 64, No. 146. pp. 41338-41357. July 30, 1999.
- C. Nuclear Regulatory Commission (U.S.), Washington, D.C. "Training Review Criteria and Procedures," NUREG-1220, Rev. 1, January 1993.
- D. American Society of Mechanical Engineers (ASME), "Quality Assurance Requirements for Nuclear Facility Applications," (An American National Standard). ASME NQA-1-1994, New York. 1994.
- E. U.S. Code of Federal Regulations, "Notices, Instructions and Reports to Workers: Inspection and Investigations," Part 19, Title 10, "Energy."