U.S. NUCLEAR REGULATORY COMMISSION

# STANDARD REVIEW PLAN

OFFICE OF NUCLEAR REACTOR REGULATION

## 13.2.1 REACTOR OPERATOR TRAINING

REVIEW RESPONSIBILITIES

Primary - Operator Licensing Branch (OLB)

Secondary - None

I. AREAS OF REVIEW

The applicant's reactor operator training program, as described in his safety Analysis Report (SAR), is reviewed. This section of the SAR should contain the description and scheduling of the training program for reactor operators and senior reactor operators. The training program should also include upgrading in reactor operator and senior reactor operator qualification per the items I.A.2.1, I.A.2.3, I.A.3.1 and II.B.4 of the TMI Action Plan (NUREG-0737).

A. For the Preliminary Safety Analysis Report (PSAR):

1. The proposed subject matter of each course, the duration of the course (approximate number of weeks in full time attendance), the organization teaching the course or supervising instruction, and the position titles for whom the course is given. The subjects covered should include as a minimum, those contained in Sections 21 and 22 of 10 CFR Part 55 for reactor operators and senior reactor operators as appropriate. The subjects covered should also include those required by item I.A.2.1 of the TMI Action Plan (NUREG-0737), enclosures 2 and 3 of the Letter from H. R. Denton, NRC, to All Power Reactor Applicants and Licensees, dated March 28, 1980 (see NUREG-0737).

2. Reactor operations experience training by nuclear power plant simulator that complies with Regulatory Guide 1.149 or assignment to a similar plant, including length of time (weeks), and identity of simulator and plant. Applicants should describe their program for providing simulator capability for their plants. In addition, they should describe how they will assure that their proposed simulator will correctly model their control room. Applicants should provide sufficient information to verify that they will have the necessary simulator capability to carry

out the actions described in item I.A.3.1 of the TMI Action Plan (NUREG-0737) and I.A.4.2 of NUREG-0718. Applicants should submit, prior to issuance of construction permits, a general discussion of how the requirements will be met. Sufficient details should be presented to provide reasonable assurance that the requirements will be implemented properly prior to the issuance of operating license.

3. A commitment to conduct an onsite formal training program and on-the-job training before the initial fuel loading.

4. Any difference in the training programs for individuals who will be seeking licenses prior to criticality pursuant to Section 55.25 of 10 CFR Part 55 based on the extent of previous nuclear power plant experience. Experience groups should include the following:

   a. Individuals with no previous experience.

   b. Individuals who have had nuclear experience at facilities not subject to licensing.

   c. Individuals who hold, or have held, licenses for comparable facilities.

5. The means for evaluating the training program effectiveness for all reactor operators. This includes the means to be employed to certify that each precritical applicant has had extensive actual operating experience pursuant to Section 55.25(b) of 10 CFR Part 55.

6. This program description should also include a chart to show the schedule of the training program for the personnel to be licensed prior to criticality. The time should be relative to expected fuel loading and should also display the preoperational test period, and the expected time for examinations for licensed operators prior to plant criticality.

7. The training program should also include upgrading in reactor operator and senior reactor operator qualification per the item I.A.2.1 of the TMI Action Plan.

B. In the Final Safety Analysis Report (FSAR):

1. The proposed subject matter of each course, including a syllabus or equivalent course description, the duration of the course (approximate number of weeks in full-time attendance), the organization teaching the course or supervising instruction, and the position titles for which the course is given. The subjects covered should include as a minimum, those contained in Sections 21 and 22 of 10 CFR Part 55 for reactor operators and senior reactor operators as appropriate. The subjects covered should also include those required by item I.A.2.1 of the TMI Action Plan and Enclosures 2 and 3 of the Letter from H. R. Denton, NRC, to All Power Reactor Applicants and Licensees, dated March 28, 1980 (see NUREG-0737, item I.A.2.1).

2. Reactor operations experience training by nuclear power plant simulators that complies with Regulatory Guide 1.149 or assignment to a similar plant, including length of time (weeks), and identity of simulator and plant. The applicant should provide the details of the program for simulator training including length of time (weeks) and the identity of the simulator. If a nonplant specific simulator or no simulator training is to be provided adequate information should be given for this position.

3. The details of the onsite training program, including a syllabus or equivalent course description, the duration of the course (approximate number of weeks in full time attendance). The program should distinguish between classroom training and on-the-job training, before and after the initial fuel loading.

4. The organization teaching the course or supervising instruction and the qualification of the instructors in the training program should be provided including the requalification program administred to the instructor in order to have them remain certified as instructors as specified in H. R. Denton's letter of March 28, 1980 (see Enclosure 1, item 2d).

5. Training for mitigating core damage as described in Item II.B.4 of the TMI Action Plan (see NUREG-0737, item II.B.4).

6. Upgrading of reactor operator and senior reactor operator training qualification as described in item I.A.2.1 of the TMI Action Plan (see NUREG-0737, item II.A.2.1).

7. Any difference in the training programs for individuals who will be seeking licenses prior to criticality pursuant to Section 55.25 of 10 CFR Part 55 based on the extent of previous nuclear power plant experience. Experience groups should include the following:

   a. Individuals with no previous experience.

   b. Individuals who have had nuclear experience at facilities not subject to licensing.

   c. Individuals who hold, or have held, licenses for comparable facilities.

8. Means for evaluating the training program effectiveness for each operator in the program. For applicants for license examinations prior to criticality, the means to be employed to certify that each applicant has had extensive actual operating experience pursuant to Section 55.25(b) of 10 CFR Part 55.

The program description section should also include a chart to show the schedule of or each part of the reactor operator training program. The time scale should be relative to expected fuel loading and should also display the preoperational test period, expected time for examinations for licensed operators prior to criticality, and expected time for examinations for licensed operators after criticality.

The description should delineate clearly the extent to which the training program has been accomplished at the approximate time of submittal of the FSAR. Contingency plans for additional training for individuals to be licensed prior to criticality should be described in the event fuel loading is subsequently delayed from the date indicated in the FSAR.

The FSAR should describe the applicant's plans for requalification training for licensed operators and senior operators. Applicants should also describe the requalification program for plant instructors to assure they are cognizant of current operating history, problems, and changes to procedures and administrative limitations (See NUREG-0737, item I.A.2.3).

II. ACCEPTANCE CRITERIA

The SAR should demonstrate that the training provided, or to be provided, for reactor operators and senior reactor operators will be adequate to provide assurance that all reactor operator qualification requirements including TMI Action items will be met as of the time needed, i.e., prior to operator license examinations, prior to fuel loading, or prior to appointment or reappointment to the position.

Criteria for acceptability as they relate to training for reactor operators and senior reactor operators are:

1. The training requirements and guidance set forth in the following regulations and regulatory guides should be met or acceptable alternatives should be presented.

   a. 10 CFR Part 50, Section 50.54, items i through m

   b. 10 CFR Part 55, Sections 55.21, 55.22, 55.23, and Appendix A

   c. Regulatory Guide 1.8

   d. NRC Operator Licensing Guide, NUREG-0094

   e. TMI Action Plan Requirements items I.A.2.1, I.A.2.3, I.A.3.1, II.B.4 (NUREG-0737), and I.A.4.2 of NUREG-0718. Letter from H. R. Denton, NRC, to All Power Reactor Applicants and Licensees, dated March 28, 1980.

2. Simulators used for training plant personnel should meet the guidelines of Regulatory Guide 1.149.

3. Formal segments of the initial training program should be substantially completed when the preoperational test program begins, with the exception of a brief, formal refresher just prior to operator examinations.

4 The number of persons for whom training is planned in preparation for senior operator and operator examinations prior to criticality should be sufficient to assure that applicable technical specification conditions with respect to the number of licensed operators on shift crews can be met from the time of initial fuel loading of the first unit,

with due allowance given for examination contingencies and the need to avoid planned overtime for supervisory personnel during the startup phase in order to meet technical specification conditions.

5. The licensed operator requalification training program should adequately implement the requirements of 10 CFR Part 55, Appendix A and Letter from H. R. Denton, NRC, to All Power Reactor Applicants and Licensees, dated March 28, 1980.

## III. REVIEW PROCEDURES

Preparation for the review of Section 13.2.1 of the SAR should include familiarization with 10 CFR Part 50, Section 50.54 items i through m, 10 CFR Part 55 Sections 55.21, 55.22, 55.23 and Appendix A. Regulatory Guide 1.8 and 1.149, NUREG-0094, "NRC Operator Licensing Guide," NUREG-0718, "Licensing Requirements for Pending Applications for Construction Permits and Manufacturing License," and NUREG-0737, "Clarification of TMI Action Plan Requirements," including the H. R. Denton March 28 letter. The reviewer may use training course descriptions obtained independently from vendors.

The review procedure for this SRP section consists of:

1. A careful examination of the information submitted to determine that all subject matter identified in subsection I above has been addressed, and

2. A detailed comparison of the information with the acceptance criteria of subsection II above.

The reviewer should ensure that whenever the applicant has committed to follow the position of a regulatory guide, industry standard, or other reference document, the specific revision being referred to as identified. Similarly, whenever the reviewer is using a position in a reference document as a basis for acceptability, the revision being made should be identified.

The reviewer then determines, based upon the foregoing, the overall acceptability of the applicant's plant staff training plans.

## IV. EVALUATION FINDINGS

The reviewer should verify that the information presented and his review support an evaluation findings statement of the following type, to be used in the staff's safety evaluation report.

The staff concludes that the training for reactor operators and senior reactor operators is acceptable and meets the requirements of 10 CFR Part 50, K50.54 (i through m) and 10 CFR Part 55, KK55.21 through 55.23, and Appendix A. This conclusion is ~~based on~~ the following:

For Construction Permit

The overall conduct and administration of the plant training program is the responsibility of the Plant Manager. The Training Coordinator, reporting to the Plant Manager, is responsible for development, implementation, and documentation of the training program.

The applicant states that a training program will be established to provide plant personnel with sufficient knowledge and operating experience to start up, operate, and maintain the plant in a safe and efficient manner. The training program is to be developed by the applicant with principal assistance from the vendor training staff. Training for the personnel to be licensed will meet the guidance of Regulatory Guide 1.8 and include: Basic Nuclear Training; Research Reactor Training and Operation; Practical Reactor Operation at an operating PWR or BWR; a Plant System lecture series; Simulator Training; and practical on-the-job training and TMI Action Plan items I.A.4.2 and II.B.4 of NUREG-0718. Reactor operators will also receive training in security emergency plans, administrative procedures, and radiation protection, as appropriate. Simulators used for training the personnel to be licensed should meet the guidance of Regulatory Guide 1.149.

The information submitted relative to these subjects is satisfactory at the construction permit stage of review, for the preoperational test program, for operator licensing, and for fuel loading.

For Operating License

The overall conduct and administration of the plant training program is the responsibility of the Plant Superintendent. He may designate the training supervisor to be responsible for administering the training program and monitoring the program effectiveness. The applicant states that the training program will provide reasonable assurance that decisions and actions by reactor operators and senior reactor operators during all plant conditions will be made consistent with plant safety procedures and operational limits established to protect the public health and safety. The program for formal education and training of the reactor operator has been designated to meet the individual needs of the participants, depending upon their backgrounds, previous training and expected job assignment. The program will meet the guidelines of Regulatory Guide 1.8 and meet the requirements set forth in ANSI N18.1-1971, 10 CFR Part 55, and item I.A.2.1, I.A.3.3 and I.A.3.1 of the TMI Action Plan of NUREG-0737. Simulators used in the training program should meet the guidelines of Regulatory Guide 1.149. Over ____ candidates will have completed the entire training program prior to the fuel loading so that a sufficient number of licensed operators should be available to meet the technical specification requirements.

The training program for personnel who will be licensed consists of the following discrete segments: Courses in Nuclear Power Plant Steam and Mechanical Fundamentals, Power Plant Electrical Fundamentals and Mathematics and General Physics Review, PWR or BWR Technology, System Description, Heat Transfer, Fluid Flow and Thermodynamics, Mitigating Core Damage, Reactor System Simulator Training, Research Reactor Training, and Refresher Training.

Plans for requalification and replacement training conform to the requirements of 10 CFR Part 50, Appendix A of 10 CFR Part 55 and follow the guidance given in ANSI N18.1 - 1971. In addition, applicants' requalification and replacement training conform to the requirements outlined in a letter from H. R. Denton, NRC, to All Power Reactor Applicants and Licensees, dated March 1980.

## V. IMPLEMENTATION

The following is intended to provide guidance to applicants and licensees regarding the NRC staff's plans for using this SRP section.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations.

## VI. REFERENCES


1. 10 CFR Part 50, "Licensing of Production and Utilization Facilities."

2. 10 CFR Part 55, "Operators' Licenses."

3. Regulatory Guide 1.8, "Personnel Selection and Training."

4. NUREG-0094, "NRC Operator Licensing Guide," July 1976.

5. "Utility Staffing and Training for Nuclear Power," WASH-1130, USAEC, Revised June 1973.

6. NUREG-0737, "Clarification of TMI Action Plan Requirements."

7. Letter from H. R. Denton, NRC, to All Power Reactor Applicants and Licensees, dated March 28, 1980.

8. NUREG-0718, " Licensing Requirements for Pending Applications for Construction Permits and Manufacturing License."

9. ANSI/ANS 3.1-1978, "American National Standards for Selection and Training of Nuclear Power Plant Personnel."

10. Regulatory Guide 1.149, "Nuclear Power Plant Simulator for use in Operator Training."