



U.S. NUCLEAR REGULATORY COMMISSION  
**STANDARD REVIEW PLAN**

### 13.2.1 REACTOR OPERATOR REQUALIFICATION PROGRAM; REACTOR OPERATOR TRAINING

#### REVIEW RESPONSIBILITIES

**Primary** - Organization responsible for the review of human performance

**Secondary** - None

#### I. AREAS OF REVIEW

The applicant's licensed operator training program, as described in the 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 licensed operator training program also includes the requalification program as required in 10 CFR 50.54(i)(i-1) and 55.59.

The specific areas of review are as follows:

1. Construction Permit (CP) and Combined License (COL). The training program descriptions should contain the following elements:
  - A. A description of the proposed training program, including the subject matter of each initial licensed operator training course, the duration of the course (approximate number of weeks personnel are in full-time attendance), the organization teaching the course or supervising instruction, and the titles of the positions for which the course is given. The program descriptions should include

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#### USNRC STANDARD REVIEW PLAN

This Standard Review Plan, NUREG-0800, has been prepared to establish criteria that the U.S. Nuclear Regulatory Commission staff responsible for the review of applications to construct and operate nuclear power plants intends to use in evaluating whether an applicant/licensee meets the NRC's regulations. The Standard Review Plan is not a substitute for the NRC's regulations, and compliance with it is not required. However, an applicant is required to identify differences between the design features, analytical techniques, and procedural measures proposed for its facility and the SRP acceptance criteria and evaluate how the proposed alternatives to the SRP acceptance criteria provide an acceptable method of complying with the NRC regulations.

The standard review plan sections are numbered in accordance with corresponding sections in Regulatory Guide 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants (LWR Edition)." Not all sections of Regulatory Guide 1.70 have a corresponding review plan section. The SRP sections applicable to a combined license application for a new light-water reactor (LWR) are based on Regulatory Guide 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)."

These documents are made available to the public as part of the NRC's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Individual sections of NUREG-0800 will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience. Comments may be submitted electronically by email to [NRR\\_SRP@nrc.gov](mailto:NRR_SRP@nrc.gov).

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a chart showing the proposed schedule for licensing personnel prior to criticality. The schedule should be relative to expected fuel loading and should display the preoperational test period. The submittal should contain a commitment to conduct formal licensed operator, on-the-job training, and simulator training before initial fuel load.

- B. The subjects covered in the training programs should include, as a minimum, the subjects in 10 CFR 55.31, 55.41, 55.43, 55.45, and Regulatory Guide 1.8 for reactor operators and senior reactor operators as appropriate. The training program should also include provisions for upgrading reactor operator licenses and for licensing senior reactor operators who have not been licensed as reactor operators per Regulatory Guide 1.8. The training should be based on use of the systems approach to training (SAT) as defined in 10 CFR 55.4
  - C. The licensed operator requalification program should include the content described in 10 CFR 55.59 or should be based on the use of a systems approach to training as defined in 10 CFR 55.4.
  - D. Applicants should describe their program for providing simulator capability for their plants as described in 10 CFR 55.31, 55.45, 55.46, 50.34(f)(2)(i), and Regulatory Guide 1.149. In addition, the applicant should describe how it will ensure that its proposed simulator will correctly model its control room. Applicants should submit, prior to issuance of construction permits or other submittals, 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 prior to the issuance of a license.
  - E. The means for evaluating training program effectiveness for all licensed operators, in accordance with a systems approach to training.
  - F. For COL, applicants provide implementation milestones for the reactor operator training program.
2. Operating License (OL) or COL holder - verification through the Construction Inspection Program. The training program descriptions should include the following elements:
- A. The licensed operator training program descriptions should delineate clearly the extent to which the training program was accomplished at the approximate time of submittal of the SAR. Contingency plans for additional training for individuals to be licensed prior to criticality should be described in the event fuel loading is subsequently delayed until after the date indicated in the SAR.
  - B. Reactor operations training using nuclear power plant simulation facilities shall comply with Regulatory Guide 1.149. The applicant should provide the details of the program for simulator training, including length of time (weeks) and a description of the simulation facility as required by 10 CFR 55.45(b) and 55.46. The applicant should also provide details of the program to meet experience requirements for applicants for operator and senior operator licenses as required by 10 CFR 55.31 and 55.46.
  - C. The SAR should describe the applicant's plans for requalification training for licensed operators and senior operators.

- i. The subject matter of each course, including a syllabus or equivalent course description, the duration of the course (approximate number of weeks personnel are in full-time attendance), the organization teaching the course or supervising instruction, and the titles of the positions for which the course is given. The program should distinguish between classroom, on-the-job, and simulator training, before and after the initial fuel loading. It should include provisions for training on modifications to plant systems or functions. The organization teaching the course or supervising the instruction and the qualifications of the instructors in the training program should be provided.

The subjects covered should include, as a minimum, those contained in 10 CFR 55.41, 55.43, 55.45, and Regulatory Guide 1.8 for reactor operators and senior reactor operators as appropriate. The training program should also include provisions for upgrading reactor operator licenses and for licensing senior reactor operators who have not been licensed as reactor operators per Regulatory Guide 1.8. The training should be based on the use of SAT as defined in 10 CFR 55.4.

- ii. The licensed operator requalification program should include the content described in 10 CFR 55.59 or be based on the use of a systems approach to training as defined in 10 CFR 55.4.
- iii. The means for evaluating training program effectiveness for all licensed operators, in accordance with SAT as defined in 10 CFR 55.4.

3. Design Certification. The development of training programs will be designated as a COL action item.
4. COL Action Items and Certification Requirements and Restrictions. For a DC application, the review will also address COL action items and requirements and restrictions (e.g., interface requirements and site parameters).

For a COL application referencing a DC, a COL applicant must address COL action items (referred to as COL license information in certain DCs) included in the referenced DC. Additionally, a COL applicant must address requirements and restrictions (e.g., interface requirements and site parameters) included in the referenced DC.

5. Operational Program Description and Implementation. For a COL application, the staff reviews the Reactor Operator Requalification Program and the Reactor Operator Training Program program description and the proposed implementation milestones. The staff also reviews the final safety analysis report (FSAR) Table 13.x to ensure that the Reactor Operator Requalification Program and the Reactor Operator Training Program and associated milestones are included.

### Review Interfaces

Other SRP sections interface with this section as follows:

1. For COL reviews of operational programs, the review of the applicant's implementation plan is performed under SRP Section 13.4, "Operational Programs."

The specific acceptance criteria and review procedures are contained in the referenced SRP section.

## II. ACCEPTANCE CRITERIA

### Requirements

Acceptance criteria are based on meeting the relevant requirements of the following Commission regulations:

1. General Guidance. 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 requirement items will be met at 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 licensed operator training and retraining programs, are:

- A. The training and qualification requirements and guidance set forth in the following regulations and regulatory guides should be met or acceptable alternatives should be presented:
  - i. 10 CFR 50.54, items i through m
  - ii. 10 CFR 55.4, 55.31, 55.41, 55.43, 55.45, 55.46 and 55.59
  - iii. 10 CFR 50.34(f)(2)(i)
  - iv. Regulatory Guide 1.8, "Qualification and Training of Personnel for Nuclear Power Plants"
  - v. Regulatory Guide 1.149, "Nuclear Power Plant Simulation Facilities for Use in Operator Training and License Examinations"
  - vi. NUREG-0711, "Human Factors Engineering Program Review Model"
  - vii. NUREG-1021, "Operator Licensing Examination Standards for Power Reactors"
- B. Training programs shall be developed, established, implemented, and maintained using a systems approach to training as defined by 10 CFR 55.4. Training program development will be evaluated by the staff using the guidance in NUREG-0711 and training program content, and effectiveness will be evaluated using NUREG-1220.
- C. Formal segments of the initial licensed operator training program should be substantially completed when the preoperational test program begins.
- D. The number of persons trained in preparation for licensed operator and senior operator licensing examinations prior to criticality should be sufficient to ensure that applicable regulatory requirements for shift staffing can be met from the time

of initial fuel loading, with allowances for examination contingencies and the need to avoid planned overtime.

- E. The licensed operator requalification training program should adequately implement the requirements of 10 CFR 55.59.

### SRP Acceptance Criteria

Specific SRP acceptance criteria acceptable to meet the relevant requirements of the NRC's regulations are identified within the Requirements section. The SRP is not a substitute for the NRC's regulations, and compliance with it is not required. However, an applicant is required to identify differences between the design features, analytical techniques, and procedural measures proposed for its facility and the SRP acceptance criteria and evaluate how the proposed alternatives to the SRP acceptance criteria provide acceptable methods of compliance with the NRC regulations.

Operational Programs. For COL reviews, the description of the operational program and proposed implementation milestone for the Reactor Operator Requalification Program are reviewed in accordance with 10 CFR 50.34(b), 10 CFR 50.54(i), and 10 CFR 55.59. The implementation milestone is within 3 months after issuance of license or the date that the Commission makes the finding under 10 CFR 52.103(g) per 10 CFR 50.54(i-1). The description of the operational program for the Reactor Operator Training Program is reviewed in accordance with 10 CFR 55.13, 10 CFR 55.31, 10 CFR 55.41, 10 CFR 55.43, and 10 CFR 55.45. Its implementation is required by a license condition.

### Technical Rationale

The technical rationale for application of these acceptance criteria to the areas of review addressed by this SRP section is discussed in the following paragraphs:

1. Compliance with the relevant requirements of 10 CFR 50.54 items i through m requires the licensee to have licensed operators or senior operators present at the controls and responsible for manipulation of the controls or directing the licensed activities of other licensed operators, as appropriate.

The reactor operator and senior reactor operator training programs, including initial and requalification training, established by the applicant provide the means to train individuals in the knowledge, skills, and abilities needed to perform licensed operator duties.

Meeting these requirements provides assurance that only trained and qualified individuals will be licensed and assigned to carry out or direct operational activities, including manipulation of the controls and other activities affecting reactivity or power level.

2. Compliance with the relevant requirements of 10 CFR 55.4, 55.31, 55.41, 55.43, 55.45, 55.46, and 55.59 requires that the applicant for an operator's license and for requalification successfully complete written and operating examinations which demonstrate that the applicant possesses the knowledge, skills, and abilities needed to perform licensed activities.

The reactor operator and senior reactor operator training programs, including initial and requalification training, established by the applicant provide the means to train individuals in the knowledge, skills, and abilities needed to perform licensed operator duties.

Meeting these requirements provides assurance that only trained and qualified licensed individuals possessing the required knowledge, skills, and abilities will be assigned to, and will conduct, licensed activities.

### III. REVIEW PROCEDURES

The reviewer will select material from the procedures described below, as may be appropriate for a particular case.

These review procedures are based on the identified SRP acceptance criteria. For deviations from these acceptance criteria, the staff should review the applicant's evaluation of how the proposed alternatives provide an acceptable method of complying with the relevant NRC requirements identified in Subsection II.

1. Preparation for the review of Section 13.2.1 of the SAR should include familiarization with 10 CFR 50.54 items i through m; 10 CFR 55.4, 55.31, 55.41, 55.43, 55.45, 55.46, and 55.59; 10 CFR 50.34(f)(2)(i); Regulatory Guides 1.8 and 1.149; and NUREGs-0711 and -1021.
2. The reviewer then determines, based upon the foregoing, the overall acceptability of the applicant's licensed operator training plans.
3. Operational Programs. The reviewer verifies that the Reactor Operator Requalification Program and Reactor Operator Training Program are fully described and that implementation milestones have been identified. The reviewer verifies that the program and implementation milestones are included in FSAR Table 13.x. The implementation of the Reactor Operator Training Program is included in the license condition on operational programs and implementation.

Implementation of this program will be inspected in accordance with NRC Inspection Manual Chapter IMC-2504, "Construction Inspection Program - Non-ITAAC Inspections."

4. For review of a DC application, the reviewer should follow the above procedures to verify that the design, including requirements and restrictions (e.g., interface requirements and site parameters), set forth in the final safety analysis report (FSAR) meets the acceptance criteria. DCs have referred to the FSAR as the design control document (DCD). The reviewer should also consider the appropriateness of identified COL action items. The reviewer may identify additional COL action items; however, to ensure these COL action items are addressed during a COL application, they should be added to the DC FSAR.

For review of a COL application, the scope of the review is dependent on whether the COL applicant references a DC, an early site permit (ESP) or other NRC approvals (e.g., manufacturing license, site suitability report or topical report).

#### IV. EVALUATION FINDINGS

The reviewer verifies that the applicant has provided sufficient information and that the review and calculations (if applicable) support conclusions of the following type to be included in the staff's safety evaluation report. The reviewer also states the bases for those conclusions.

The applicant described the Reactor Operator Requalification Program and its implementation in conformance with 10 CFR 50.34(b), 10 CFR 50.54(i), and 10 CFR 55.59. The applicant also described the Reactor Operator Requalification Program and its implementation is addressed through a license condition.

The staff concludes that the training program for licensed operators and senior operators is acceptable and meets the requirements of 10 CFR 50.54 items i through m and 10 CFR Sections 55.4, 55.31, 55.41, 55.43, 55.45, 55.46, and 55.59. This conclusion is based on the following:

1. For CP or COL. The overall conduct and administration of the licensed operator training programs is the responsibility of the Plant Manager. The Training Manager is responsible for development, implementation, evaluation, and documentation of the licensed operator training programs.

The applicant states that a training program will be established [for COL add: in accordance with the implementation milestones] to provide licensed operators with sufficient knowledge and operating experience to start up, operate, and maintain the plant in a safe manner. The licensed operator training program, derived from a systems approach to training, is to be developed by the applicant and will meet the regulatory guidance of Regulatory Guide 1.8. Licensed operators and senior operators will receive training in security procedures, radiological emergency plans, administrative procedures, and radiation protection. Simulation facilities used for the licensed operator training program should meet the guidance of Regulatory Guide 1.149.

The information submitted relative to these subjects is satisfactory for the preoperational test program, for operator licensing, and for fuel loading.

2. For OL or COL holder - verification through the Construction Inspection Program. The overall conduct and administration of the licensed operator training program is the responsibility of the Plant Manager. The Training Manager is responsible for administering the licensed operator training program and monitoring program effectiveness. The applicant states that the licensed operator training program will provide reasonable assurance that decisions and actions by licensed operators and senior 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 licensed operator training program has been designed 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 10 CFR Part 55. Simulation facilities used in the training program shall meet the requirements of 10 CFR 55.31, 55.45(b), 55.46, and 50.34(f)(2)(1), and the guidelines of Regulatory Guide 1.149. Over [state specific number provided by the licensee] 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 requirements of 10 CFR 50.54.

The licensed operator requalification training program conforms to the requirements of 10 CFR Part 50 and 10 CFR 55.59 and follows the guidance in Regulatory Guide 1.8.

3. For Design Certification. For DC reviews, the findings will also summarize the staff's evaluation of COL action items relevant to this SRP section.

## V. IMPLEMENTATION

The staff will use this SRP section in performing safety evaluations of DC applications and license applications submitted by applicants pursuant to 10 CFR Part 50 or 10 CFR Part 52. Except when the applicant proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the staff will use the method described herein to evaluate conformance with Commission regulations.

The provisions of this SRP section apply to reviews of applications submitted six months or more after the date of issuance of this SRP section, unless superseded by a later revision.

Implementation schedules for conformance to parts of the review plan discussed herein are contained in the referenced regulatory guides and NUREGS.

## VI. REFERENCES

1. 10 CFR Part 50, "Licensing of Production and Utilization Facilities."
2. 10 CFR Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."
3. 10 CFR Part 55, "Operators' Licenses."
4. Regulatory Guide 1.8, "Qualification and Training of Personnel for Nuclear Power Plants."
5. Regulatory Guide 1.149, "Nuclear Power Plant Simulation Facilities for Use in Operator Training and License Examinations."
6. NUREG-0711, "Human Factors Engineering Program Review Model."
7. NUREG-1021, "Operator Licensing Examination Standards for Power Reactors."
8. NUREG-1220, "Training Review Criteria and Procedures."
9. NRC Inspection Manual Chapter IMC-2504, "Construction Inspection Program - Non-ITAAC Inspections."

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### **PAPERWORK REDUCTION ACT STATEMENT**

The information collections contained in the Standard Review Plan are covered by the requirements of 10 CFR Part 50 and 10 CFR Part 52, and were approved by the Office of Management and Budget, approval number 3150-0011 and 3150-0151.

### **PUBLIC PROTECTION NOTIFICATION**

The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid OMB control number.

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