



U.S. NUCLEAR REGULATORY COMMISSION  
**STANDARD REVIEW PLAN**  
OFFICE OF NUCLEAR REACTOR REGULATION

STANDARD REVIEW PLAN (NUREG-0800)  
CHAPTER 13, "CONDUCT OF OPERATIONS"  
SECTION 13.1.2-13.1.3, "OPERATING ORGANIZATION"

**13.1.2 – 13.1.3 OPERATING ORGANIZATION**

REVIEW RESPONSIBILITIES

Primary - Branch responsible for human performance  
Secondary- None

I. AREAS OF REVIEW

The applicant's operating organization, as described in its safety analysis report (SAR), is reviewed. This section of the SAR should describe the structure, functions, and responsibilities of the onsite organization established to operate and maintain the plant.

- A. Reviews of Initial Construction Permits (CPs), Early-Stage Combined Licenses (COLs), CP and Early-Stage COL Transfers

It is recognized that, during the early stages of plant design or construction, many details of the plant organization and staffing have not been finalized. The organizational information provided at this time should include the following elements:

1. The applicant's commitment to meet the guidelines of Regulatory Guide 1.33 for its operating organization

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**USNRC STANDARD REVIEW PLAN**

Standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for the review of applications to construct and operate nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. The standard review plan sections are keyed to the Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants. Not all sections of the Standard Format have a corresponding review plan.

Published standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, DC 20555.

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2. The applicant's commitment to meet the guidelines of Regulatory Guide 1.33 for onsite review and rules of practice
  3. The applicant's commitment to meet Branch Technical Position SPLB 9.5-1
  4. The applicant's commitment to meet the guidelines of Regulatory Guide 1.8 for its operating organization
  5. The applicant's commitment to be consistent with one of the options in the Commission Policy Statement on Engineering Expertise on Shift
  6. The applicant's commitment to meet TMI Action Plan items I.A.1.1 and I.A.1.3 of NUREG-0737 for shift technical advisor and shift manning
  7. A schedule, relative to fuel loading for each unit, for filling all positions
- B. Review of OLS and Late-Stage COLs

During the later stages of plant design, construction, and licensing, the applicant should provide evidence that the initial personnel selections conform to the commitments made in the early stages of licensing.

The applicant should provide the following organizational information:

1. An organization chart with—
  - a. the title of each position
  - b. the minimum number of persons to be assigned to duplicated positions
  - c. the number of operating shift crews
  - d. the positions for which reactor operator and senior reactor operator licenses are required

For multiunit stations, the organization chart (or supplemental charts) should clearly show changes and additions as new units are added to the station.

2. The personnel resumes for those selected for management and supervisory positions down through the shift supervisor
3. The functions, responsibilities, and authorities of the following plant positions or their equivalents:
  - a. Plant managers
  - b. Operations supervisors
  - c. Operating shift crew supervisors
  - d. Shift technical advisors
  - e. Licensed operators
  - f. Nonlicensed operators
  - g. Technical supervisors
  - h. Radiation protection supervisors
  - i. Instrumentation and controls maintenance supervisors
  - j. Equipment maintenance supervisors

- k. Fire protection supervisors
- l. Quality assurance supervisor (when part of the plant staff)

For each position, where applicable, required interfaces with offsite personnel or positions identified in SAR Section 13.1.1 should be described. Such interfaces include defined lines of reporting responsibilities (e.g., from the plant manager to the immediate superior), lines of authority, and communication channels.

- 4. The line of succession of authority and responsibility for overall station operation in the event of unexpected contingencies of a temporary nature, and the delegation of authority that may be granted to operations supervisors and to shift supervisors, including the authority to issue standing or special orders.
- 5. The extent and nature of the participation of the plant operating and technical staff in the initial test program.
- 6. If the station contains, or there are plans that it contain power generating facilities other than those specified in the application and including fossil-fueled units, this section should also describe interfaces with the organizations operating the other facilities. The description should include any proposed sharing of personnel between the units, a description of their duties, and the proportion of their time they will routinely be assigned to nonnuclear units.
- 7. The position titles, operator licensing requirements for each position, and the total number of personnel that will man each shift should be described for all combinations of units planned for the station in both operating and cold-shutdown modes. Shift crew staffing plans specific to refueling operations should be described. The proposed means of assigning shift responsibility for implementing the radiation protection and fire protection programs on a round-the-clock basis should also be described.
- 8. The education, training, and experience requirements (qualification requirements) established by the applicant for filling each management, operating, technical, and maintenance position category in the operating organization above should be described. This includes the personnel who will do the preoperational and startup tests. Consequently, the information should demonstrate an understanding of and commitment to the acceptance criteria below.

#### C. Review of OL and Late-Stage COL Transfers

The initial operating organization was found acceptable by the initial licensing review. Subsequent safety-related changes to the operating organization should have been evaluated with an appropriate methodology. Therefore, the existing organization remains acceptable. The review of a license transfer should focus on evaluating changes to the operating organization proposed as a result of the transfer.

#### D. Review Interfaces

The primary human performance review branch performs the following reviews under the Standard Review Plan (SRP) sections indicated:

- Organizational structure, personnel qualifications and experience under SRP Sections 13.1.1 through 13.1.3

- Training of licensed operators under SRP Section 13.2.1
- Organizational provisions for independent reviews and verifications under SRP Section 13.4
- Procedure adequacy under SRP Section 13.5.2
- Use of human factors engineering principles under SRP Section 18.0

The primary review branch will coordinate evaluations and reviews by other branches involved in the overall review of the operating organization, as follows:

1. With the branch responsible for emergency preparedness and radiation protection, as part of its primary review responsibility under SRP Section 13.3 for reviewing the emergency organization and under SRP Section 12.5 for reviewing the radiation protection organization.
2. With the branch responsible for safeguards which has primary responsibility under SRP Section 13.6 for reviewing the applicant's plans and provisions for security, including the security organization.
3. With the branch responsible for quality assurance, which has primary responsibility under SRP Chapter 17 for reviewing the quality assurance organization.

The referenced SRP sections for these areas give the acceptance criteria for the reviews and instructions on applying them.

## II. ACCEPTANCE CRITERIA

### A. General Criteria

This section of the SAR should demonstrate the applicant's commitment to and implementation of plans to staff the onsite operating organization and to define and delegate responsibilities to provide assurance that the plant can be operated safely.

In reviewing and evaluating the subject matter in this section of the SAR, the following points should be considered:

1. Plant staff organizational structures are not rigidly fixed. However, experience has shown that certain components are common to and necessary for all plants. Among these are operational, onsite technical support, and maintenance groups under the direction and supervision of a plant manager.
2. The operating organization should be free of ambiguous assignments of primary responsibility. Operating responsibilities should be reasonably well defined in both numbers and experience of persons required to implement the project.
3. The total on-shift manpower available should include enough full operating-shift crews that excessive overtime is not routinely scheduled.

The NRC staff acceptance criteria are designed to produce reasonable assurance of the applicant's compliance with the relevant requirements of the following regulations:

1. 10 CFR 50.40(b) as it relates to demonstrating (in conjunction with other reviews) that the applicant is technically qualified to engage in nuclear activities licensed under these regulations.
  2. 10 CFR 50.54(j), (k), (l), and (m) as they relate to operator requirements during the operation of the facility, the responsibility for directing activities of licensed operators, and the senior operator availability during reactor operations and other specific reactor conditions or modes of operation.
  3. 10 CFR 50.80 as it relates to demonstrating (in conjunction with other reviews) that the applicant for a license transfer is technically qualified to hold a license.
- B. Specific Criteria

Specific criteria to meet the relevant requirements of 10 CFR 50.40(b), 10 CFR 50.80, and 10 CFR 50.54(j), (k), (l), and (m) are as follows:

1. ANSI N18.7/ANS-3.2, Section 3.4, "Operating Organization," as endorsed by Regulatory Guide 1.33, should be met. In addition, the following criteria should be satisfied:
  - a. The reporting responsibility and authority of the functional areas of radiation protection, quality assurance, and training should ensure independence from operating pressures. In utilities with large commitments to nuclear power plants, overall management and technical direction in these areas may be concentrated at the home office.
  - b. There should be clear lines of authority to the plant manager.
  - c. Responsibility for all activities important to the safe operation of the facility should be clearly defined.
  - d. Distinct functional areas should be separately supervised and/or managed.
  - e. There should be sufficient managerial depth to provide qualified backup if the incumbent is absent.
2. Responsibilities and authorities of operating organization personnel should conform to the requirements of ANSI N18.7/ANS-3.2, Section 5.2, "Rules of Practice"; ANSI Section 4.4, "Onsite Review," as endorsed by Regulatory Guide 1.33; Branch Technical Position SPLB 9.5-1; and Regulatory Guide 1.8 for the operating organization. In addition, the organization should reflect the staff position in TMI Action Plan item I.C.3 of NUREG-0694 by clearly defining the command duties of the shift supervisor position and making top management responsibility for the safe operation of the plant.
3. Assignments of onsite shift operating crews shall be made in accordance with 10 CFR 50.54(j), (k), (l), and (m). In addition, the staffing should follow the staff positions of TMI Action Plan items I.A.1.1 and I.A.1.3 of NUREG-0737 as follows:
  - a. A shift supervisor with a senior reactor operator's license, who is also a member of the station supervisory staff, shall be on site at all times when at least one unit is loaded with fuel.
  - b. In addition to the licensed personnel specified in 10 CFR 50.54(m), as a minimum, an auxiliary operator (nonlicensed) shall be assigned to each reactor and an additional

auxiliary operator shall be assigned for each control room for an operating reactor. These operators shall be properly qualified to support the unit to which they are assigned. (The shift composition described above is shown in tabular form in Table 1.)

- c. To meet TMI Action Plan item I.A.1.1 of NUREG-0737, engineering expertise shall be onsite at all times a licensed pressurized water reactor (PWR) is being operated in Modes 1–4 or in Modes 1–3. This engineering expertise should be consistent with one of the options in the Commission Policy Statement on Engineering Expertise on Shift.
- d. A health physics technician shall be on site at all times when there is fuel in a reactor.
- e. A rad/chem technician shall be on site at all times when a PWR is being operated in Modes 1 through 4 or a BWR in Modes 1 through 3.

<u>TABLE 1</u>			
<u>SHIFT STAFFING**</u>			
	One Unit One Control Room	Two Units One Control Room	Two Units Two Control Rooms
One Unit Operating*	1 SS (SRO) 1 SRO 2 RO 2 AO	1 SS (SRO) 1 SRO 3 RO 3 AO	1 SS (SRO) 1 SRO 3 RO 3 AO
Two Units Operating*	NA	1 SS (SRO) 1 SRO 3 RO 3 AO	1 SS (SRO) 2 SRO 4 RO 4 AO
All Units Shutdown	1 SS (SRO) 1 RO 1 AO	1 SS (SRO) 2 RO 3 AO	1 SS (SRO) 2 RO 3 AO
SS - Shift Supervisor		RO - Licensed Reactor Operator	
SRO - Licensed Senior Reactor Operator		AO - Auxiliary Operator	
Notes: 1. To operate, or supervise the operation of, more than one unit, an operator (SRO or RO) must hold an appropriate, current license for each unit.			
2. In addition to the staffing requirements indicated in the table, a licensed senior operator will be required to directly supervise any core alteration activity.			
*Modes 1 through 4 for PWRs. Modes 1 through 3 for BWRs.			
**Shift staffing of unlicensed personnel for special cases such as three units, operating from one or two control rooms, etc., will be determined case by case, based on the principles defined in item II.B.3. of this SRP section. However, shift staffing of licensed personnel for special cases, including temporary deviations and staffing for three units must meet the requirements of 10 CFR 50.54(m).			

- f. Assignment, stationing, and relief of operators and senior operators within the control room shall be as described in Regulatory Guide 1.114.
4. The total complement of licensed personnel and unlicensed personnel for onsite shift operating crews should be sufficient to avoid the routine heavy use of overtime. (SRP Section 13.5.1 contains guidance on work hour limitations.) To meet this policy, staffing plans should provide for no less than the number required for five shift rotations.
5. The plant operating and technical staff should be used as much as possible in the initial test program for the facility.
6. Assignments of personnel to the fire brigade should follow the guideline of SRP Section 9.5.1, including the following:
  - a. The responsibilities of the fire brigade members under normal conditions should not conflict with their responsibilities during a fire emergency.
  - b. The minimum number of fire brigade members available on site for each shift operation crew should be consistent with the activities required to combat the most significant fire. The minimum size of the fire brigade shift should be five persons unless a site evaluation has been completed and some other number justified.
7. Regulatory Guide 1.8, "Qualification and Training of Personnel for Nuclear Power Plants," sets forth the staff position on plant personnel qualifications and training.

In addition, although the qualification levels of the standards are endorsed as acceptable minimums for each position, it is expected that the collective qualifications of the plant staff will be greater than the sum of the minimum individual requirements described in the standard, particularly in the area of nuclear power plant experience and in supervisory and managerial positions involved in operating the facility. If the collective qualifications do not exceed the sum of the minimums for individual positions, additional technical support for the plant staff may be required. This will be determined on a case-by-case basis.

#### C. Technical Rationale

The technical rationale for applying these acceptance criteria to the operating organization is as follows:

1. Compliance with the relevant requirements of 10 CFR 50.40(b) requires that the applicant be technically qualified to engage in the proposed activities in accordance with the regulations in Chapter 50. Similarly, 10 CFR 50.80 requires that an applicant for a license transfer be technically qualified to hold a license.

Reviewing the operating organization established by the applicant to oversee operation of a nuclear power plant reveals corporate management's understanding of its safety role in the operation and maintenance of the facility and helps show whether an applicant is technically qualified to engage in the proposed nuclear activities. Reviewing the operating organization shows whether the applicant considers safety first in establishing qualifications and staffing levels for all positions on which the safety of the facility will depend.

Meeting the requirements of 10 CFR 50.40(b) and 10 CFR 50.80, as applicable, provides assurance that the applicant is technically qualified to engage in the proposed activities and has established the necessary managerial and technical-support organizations to safely operate the proposed facility.

2. Compliance with 10 CFR 50.54(j), (k), (l), and (m) requires the applicant to demonstrate that its operating organization satisfies minimum requirements for operator supervision and the availability of licensed senior operators and licensed operators during reactor operations and other specific reactor conditions or modes of operation.

The key positions for ensuring the safe operation of the plant are in the operating organization. A staffing review of the operating organization shows whether an applicant is technically qualified to operate the facility.

### III. REVIEW PROCEDURES

In preparation to review the SAR and the license transfer application, the reviewer should familiarize himself or herself with the documents listed as references to this SRP section.

Each element of the SAR or transfer application is to be reviewed against this SRP section. The reviewer's judgment during the review is to be based on the material presented, whether items of special safety significance are involved, and the uniqueness of the facility. Any exceptions or alternatives are to be carefully examined to ensure that they are clearly defined and adequately justified.

The applicant should identify the applicable version of references, regulatory guides, and codes and standards used. The reviewer should identify the applicable version of references, regulatory guides, and codes and standards used in the review.

In reviewing information about the operating organization, the following points should be considered:

- A. During the early stages of construction or plant design, the applicant will generally not have made selections for plant staff positions. The reviewer, therefore, examines this section of the SAR for a commitment to conform to the stated acceptance criteria.
- B. The reviewer must recognize that there are many acceptable ways to define and delegate job responsibilities. Variations in staffing may also be expected between applicants with and without experience in nuclear plant operation. It is important that the reviewer verify that applicants lacking in experience do not underestimate the magnitude of the task and that all applicants adequately consider the potential effects of human error. Guidance on human error considerations may be found in NUREG-0711, Chapter 7, "Element 6 – Human Reliability Analysis." The reviewer should be alert to the possibility that too much work may be put on too few people.

The reviewer should also consider that the structure of onsite technical support and maintenance groups may depend somewhat on headquarters staffing and the division of effort between onsite and offsite personnel.

- C. During the later stages of plant design, construction, and licensing, the reviewer follows the same process as during the early stages of plant design and construction, and then examines each resume. The reviewer should compare the educational and experience information in each resume with the qualifications endorsed by Regulatory Guide 1.8, or other approved qualifications. "Applicable experience" should be judged according to the responsibility of the position. Credit for experience which may not be entirely applicable, should be weighed against the requirements of the position.

If the proposed plant staff positions are not comparable to those defined in the standards endorsed in Regulatory Guide 1.8, the applicant should list each position on its plant staff and designate the most closely corresponding position in these standards, or describe in detail the proposed qualification requirements for each position on its plant staff.

In addition, if the applicant has had experience in operating previously licensed nuclear power plants, the reviewer may seek independent information about plant staffing and qualifications from the appropriate regional office, e.g., by talking with inspection personnel or reviewing inspection reports.

- D. The reviewer should make sure the applicant has planned for enough full operating-shift crews so that they don't have to work excessive overtime. Additional staffing guidance may be found in NUREG-0711, Chapter 6, "Element 5 - Staffing." For multiunit sites, the reviewer should check that overall site responsibilities are clear for periods when senior level supervisors are not on site.

The review procedure for this SRP section, therefore, is as follows:

1. Examination the information submitted to determine that all items in subsection I, "Areas of Review," have been addressed.
2. Compare the information with the acceptance criteria of subsection II, "Acceptance Criteria".
3. Review the information provided by the NRC regional office on the organizational and administrative commitments in the applicant's SAR, as appropriate.
4. Verify the implementation of the management structure and the provision of technical support personnel by visiting the applicant's corporate headquarters and the site, as appropriate.

Based on the foregoing, the reviewer then determines the overall acceptability of the applicant's operating organizations and plant staffing plans.

For OL or late-stage COL transfers under 10 CFR 50.80, the operating organization was found acceptable as part of the initial licensing of the plant. Subsequent changes to the operating organization should have been made in accordance with an appropriate evaluation methodology. Therefore, the existing organization should still be acceptable. License transfer reviews should focus on the changes proposed to the operating organization as a result of the transfer.

For standard design certification reviews under 10 CFR Part 52, the procedures above should be followed, as modified by the procedures in SRP Section 14.3, to verify that the design described in the standard safety analysis report, including inspections, tests, analysis, and acceptance criteria (ITAAC),

site interface requirements, and COL action items, meets the acceptance criteria in subsection II, "Acceptance Criteria." SRP Section 14.3 contains procedures for reviewing certified design material (CDM) for the standard design, including the site parameters, interface criteria, and ITAAC.

#### IV. EVALUATION FINDINGS

The reviewer verifies that the information submitted supports conclusions of the following type to be used in the staff's safety evaluation report:

##### For a Safety Evaluation Report For an Initial CP, an Early-Stage COL, CP, and Early-Stage COL Transfer

The staff concludes that the applicant's operating organization is acceptable and meets the relevant requirements of 10 CFR 50.40(b) or 10 CFR 50.80, as applicable, and 10 CFR 50.54(j) through (m). This conclusion is based on the following: The applicant has described the assignment of plant operating responsibilities; the reporting chain up through the chief executive office of the applicant; the proposed size of the regular plant staff; the functions and responsibilities of each major plant staff group; the proposed shift crew complement for single-unit or multiple-unit operation; the qualification requirements for members of its plant staff; and staff qualifications (through personnel resumes for management and principal supervisory and technical positions as submitted during the later stages of plant design, construction, and licensing). This information has been reviewed, and it is the conclusion of the staff that the proposed operating organization is acceptable.

The applicant's operating organization is characterized as follows:

1. The applicant is technically qualified, as specified in 10 CFR 50.40(b) and 10 CFR 50.80, as applicable;
2. An adequate number of licensed operators will be available at all required times to satisfy the minimum staffing requirements of 10 CFR 50.54(j) through (m);
3. Onshift personnel are able to provide initial facility response in the event of an emergency;
4. Organizational requirements for the plant manager and radiation protection manager have been satisfied;
5. Qualification requirements and qualifications of plant personnel conform with the guidance of Regulatory Guide 1.8; and
6. Organizational requirements conform with the guidance of Regulatory Guide 1.33.

In addition, the applicant has complied with TMI Action Plan items I.A.1.1 and I.A.1.3.

For a safety evaluation report on a transfer of an OL or late-stage COL, the findings will summarize the staff's evaluation of the applicant's proposed changes to the operating organization.

For design certification reviews, to the extent that the review is not discussed in other safety evaluation report sections, the findings will also summarize the staff's evaluation of inspections, tests, analyses,

and acceptance criteria (ITAAC), including design acceptance criteria (DAC), site interface requirements, and COL action items that are relevant to this SRP section.

## V. IMPLEMENTATION

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

This SRP section will be used by the staff in performing safety evaluations of license applications or license transfer 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 method described herein will be used by the staff in evaluating conformance with Commission regulations.

The provisions of this SRP section apply to reviews of applications docketed 6 months or more after the date of issuance of this SRP section.

Implementation schedules for conformance to parts of the method discussed herein are contained in the referenced guides and NUREGs.

## VI. REFERENCES

1. 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities."
2. Regulatory Guide 1.8, "Qualification and Training of Personnel for Nuclear Power Plants."
3. Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)" (endorses ANSI N18.7-1976/ANS-3.2, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants," as supplemented by its regulatory positions).
4. Regulatory Guide 1.114, "Guidance to Operators at the Controls and to Senior Operators in the Control Room of a Nuclear Power Unit."
5. NUREG-0694, "TMI-Related Requirements for Operating Licenses."
6. NUREG-0711, "Human Factors Engineering Program Review Mode."
7. NUREG-0737, "Clarification of TMI Action Plan Requirements."
8. The Commission Policy Statement on Engineering Expertise on Shift (50 FR 43621).