



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

13.5.2 OPERATING AND MAINTENANCE PROCEDURES

REVIEW RESPONSIBILITIES

Primary - Procedures and Systems Review Branch (PSRB)

Secondary - None

I. AREAS OF REVIEW

PSRB reviews the applicant's plan for development and implementation of operating and maintenance procedures as described in the applicant's Safety Analysis Report (SAR). This section of the SAR should describe the operating procedures that will be used by the operating organization (plant staff) to assure that routine operating, off-normal, and emergency activities are conducted in a safe manner. It is not expected that detailed written procedures will be included in the SAR. The Preliminary Safety Analysis Report (PSAR) should describe preliminary schedules for the preparation of procedures and the Final Safety Analysis Report (FSAR) should provide descriptions of the content and development process for procedures as detailed below.

- A. The FSAR or other submitted section should describe the different classifications of procedures the operators will use in the control room for plant operations. The group within the operating organization having the responsibility for maintaining the procedure should be identified and the general format and content of the different classifications should be described. It is not necessary that each applicant's procedures conform precisely to the same classification since the objective is to assure that procedures will be available to the plant staff to accomplish the functions contained in the listing of Regulatory Guide 1.33. For example, some licensees prefer a classification of abnormal operating procedures whereas others may use off-normal condition procedures. Examples of classifications follow:

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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, D.C. 20555.

1. **System Procedures.** Procedures that provide instructions for energizing, filling, venting, draining, starting up, shutting down, changing modes of operation, returning to service following testing (if not contained in the applicable testing procedure), and other instructions appropriate for operation of system important to safety.
2. **General Plant Procedures.** Procedures that provide instructions for the integrated operations of the plant, e.g., startup, shutting down, shutdown, power operation and load changing, process monitoring, and fuel handling.
3. **Off-normal Condition Procedures.** Procedures that specify operator actions for restoring an operating variable to its normal controlled value when it departs from its normal range or to restore normal operating conditions following a transient. Such actions are invoked following an operator observation or an annunciator alarm indicating a condition which, if not corrected, could degenerate into a condition requiring action under an emergency operating procedure (EOP).
4. **Emergency Operating Procedures.** Procedures that direct actions necessary for the operators to mitigate the consequences of transients and accidents that cause plant parameters to exceed reactor protection system or engineered safety features actuation setpoints.
5. **Alarm Procedures.** Procedures that guide operator actions for responding to plant alarms.

- B. The FSAR should describe how maintenance and other operating procedures are classified, what group or groups within the operating organization have the responsibility for maintaining and performing the duties prescribed in each class of procedures, and the general objectives and characteristics of each class. If their general objectives and characteristics are described elsewhere in the FSAR or application, these may be approximately referenced.

An acceptable procedures classification system for IB is contained in Regulatory Guide 1.33.

- C. The FSAR or other submittal should describe the applicant's program for emergency operating procedures (A.4 above) and provides a description of the required content of the applicant's submittal. PSRB will review the applicant's program for development and implementation of the EOPs.

A Procedures Generation Package (PGP) for EOPs should be submitted to NRC at least three months prior to the date the applicant plans to begin formal operator training on the EOPs. The PGP should include:

1. **Plant-Specific Technical Guidelines (P-STGs).** Guidelines based on analysis of transients and accidents that are specific to the applicant's plant design and operating philosophy. The submitted documentation of the P-STGs will provide the basis for and include a reference to generic guidelines if used.

For plants not referencing generic guidelines, this section should contain the action steps necessary to mitigate transients and accidents in a format that allows mitigation without first having diagnosed the specific event, along with all supporting analyses, to meet the requirements of TMI Action Plan Item I.C.1. (NUREG-0737 and Supplement 1 to NUREG-0737).

For plants referencing generic guidelines, the submitted documentation should include: 1) a description of the process used to develop plant-specific guidelines from the generic guidelines, 2) identification of significant deviations from the generic guidelines including identification of additional equipment beyond that identified in the generic guidelines, along with all necessary engineering evaluation or analyses to support the adequacy of each deviation, and 3) a description of the process used for identifying operator information and control requirements. Examples of significant safety deviations are provided in Appendix A to this SRP section, Subsection 3.3.2.

2. A plant-specific writers guide (P-SWG) that details the specific methods to be used by the applicant in preparing EOPs based on P-STGs.
3. A description of the program for verification/validation (V/V) of EOPs.
4. A description of the program for training operators on EOPs.

PSRB coordinates evaluations by other branches that involve the review of operating and maintenance procedures. If an applicant references or provides unreviewed technical guidelines as the basis for the plant-specific EOPs, PSRB will conduct an initial review of the guidelines. If the unapproved guidelines incorporate significant technical changes from approved guidelines, then the PSRB may request technical review by RSB. RSB will provide requests for additional information, if necessary, and will provide SER input to PSRB.

II. ACCEPTANCE CRITERIA

Section 13.5.2 of the SAR constitutes additional evidence of the applicant's technical qualifications, and forms a basis for a key part of the regulatory inspection program. Acceptance is based on meeting the relevant requirements of 10 CFR Part 50.34 as indicated below. Additional guidelines listed in this subsection provide guidance to applicants for meeting basic requirements.

- A. Completion of operating and maintenance procedures. A generally acceptable target date for completion of operating and maintenance procedures is about six months before fuel loading to allow adequate time for plant staff familiarization and to allow NRC staff adequate time to develop operator license examinations. The PGP for EOPs must be submitted not later than three months prior to the date formal operator training on EOPs is to begin.

- B. Operating Procedures to be used by licensed operators in the control room. The regulations and staff guidelines applicable to this subsection are as follows:
1. 10 CFR Part 50, §50.34(a)(6) and (10) and §50.34(b)(6)(iv) and (v).
 2. NUREG-0737, Clarification of TMI Action Plan, Item I.C.1, Guidance for the Evaluation and Development of Procedures for Transients and Accidents. (Emergency Operating Procedures Only)
 3. Supplement 1 to NUREG-0737, TMI Action Plan Items I.C.1 and I.C.9 Requirements for Emergency Response Capability, Item 7, Subsection 7.1 and 7.2, Upgrade of Emergency Operating Procedures. (Emergency Operating Procedures Only)
 4. The guidelines in the Regulatory Position Section of Regulatory Guide 1.33.
 5. The guidelines of ANSI/ANS 3.2 - 1982, Section 5.3.
 6. Appendix A to Standard Review Plan, Section 13.5.2, Guidelines for the Evaluation of Procedures Generation Packages. (Emergency Operating Procedures Only)
- C. Other Operating and Maintenance Procedures. The regulations and staff guidelines applicable to this section are as follows:
1. 10 CFR Part 50, §50.34(a)(6) and §50.34(b)(6)(iv).
 2. The guidelines in the Regulatory Position Section of Regulatory Guide 1.33.
 3. The guidelines of ANSI/ANS 3.2 - 1982, Section 5.3.

III. REVIEW PROCEDURES

Review of the FSAR in accordance with this section consists of a detailed comparison of the information submitted with the acceptance criteria of subsection II above. The PSAR review should encompass only the schedules for procedures development and determination that the applicant commits to follow the applicable Regulatory Guides and Standards.

To supplement the expertise of the reviewer especially in the human factors area and to promote consistency among the PGP reviews, Appendix A identifies the subjects which should be considered by the reviewer in the evaluation. However, Appendix A is not a "checklist" and each item of Appendix A need not be addressed in the PGP to be acceptable.

Normally the PGP review should be conducted prior to the date the applicant plans to begin formal operator training on the EOPs. If this is not possible because of a delayed submittal, perform an acceptance review of the PGP. Specifically, audit the four parts of the PGP to determine if there are any major deficiencies in the EOP program that warrant postponing operator training. If

major deficiencies are found, identify the additional information necessary to conduct the complete PGP review to the Licensing Project Manager so that the applicant can be notified prior to the initiation of training on the EOPs.

Review the PGPs for operating license applicants to determine if the applicant's program meets the requirements of Generic Letter 82-33. The review consists of the evaluation of the four parts of the PGP: The P-STGs, the P-SWG, the description of the program for V&V of the EOPs, and the description of the training program for EOPs necessary to support the conclusions described in Section IV below. To support this review, Appendix A provides additional review guidance.

Review the P-STGs to determine if acceptable analyses of accidents and transients and development of technical guidelines for operator actions applicable to the plant have been completed, and to determine if an acceptable process for identifying operator information and control needs has been described. Instead of being included in the PGP, this process may be described by the applicant in the documentation submitted for staff review in accordance with SRP 18.1, in support of the Detailed Control Room Design Review (DCRDR). The reviewer should coordinate review of this material with the Human Factors Engineering Branch (HFEB). It is expected that most applicants will reference generic technical guidelines.

For an applicant using approved generic technical guidelines as the basis for its P-STG, the major portion of the review of the technical guidelines has been accomplished generically. Staff SERs approving each of the four owners groups' generic technical guidelines for use have been published and may be supplemented as guidelines are revised. To review this type of P-STG, review the process described for converting generic technical guidelines into plant-specific procedures to ensure that the safety significant deviations from the generic guidelines are controlled. Evaluate the technical adequacy of the identified plant-specific deviations. Finally, evaluate the process for development of the plant-specific information and control requirements necessary to use the EOPs.

The review of identified safety-significant deviations from generic technical guidelines will be conducted to the same level of detail as the generic technical guidelines. Examples of safety-significant deviations are given in Appendix A, Subsection 3.3.2. Assistance from other technical review branches will be obtained as necessary to perform a thorough review of the safety-significant deviations. Only safety-significant deviations need to be reviewed. However, the reviewer will determine that the applicant's program will control this process so that the work is auditable. It is expected that most applicants will control the process by documenting all deviations.

Since B&W plant owners elected to use a lead plant concept rather than generic technical guidelines, each B&W applicant's identified deviations from the lead plant's (Oconee) guidelines will be reviewed.

For applicants not referencing generic technical guidelines, ensure that the submittal includes analysis of accidents and transients in accordance with the guidance of NUREG-0660 and NUREG-0737 Items I.C.1 and I.C.9. To do this, (1) become familiar with the integrated performance of the NSSS and balance of plant systems, (2) evaluate the completeness of the accidents and transients analyzed, (3) evaluate the use of appropriate models, calculational methods,

and plant data, (4) consider audit calculations of selected accidents and transients, (assistance from other technical review branches required), (5) evaluate the adequacy of the applicant's program to develop guidelines from the analysis of accidents and transients, (6) test the guidelines against scenarios including multiple failures, and (7) evaluate the information and control needs of the operators to execute the instructions of the guidelines.

The P-SWG review will consider the adequacy of the methods of presentation of the technical information as EOPs for the intended users of the EOPs (e.g., control room operators, shift supervisors, and auxiliary operators). Review the P-SWG by evaluating the applicant's methods for meeting the overall writer's guide objectives stated in NUREG-0899. Appendix A provides guidance to assist the reviewer in making this evaluation. This guidance is not to be used as strict criteria, but is to be used as an aid in the overall evaluation of the P-SWG. Because strict criteria do not exist for the human factors evaluation, the reviewer must make a professional judgment regarding the adequacy of the applicant's methods as described in the P-SWG.

Review the V/V and training programs by comparing the program descriptions with the objectives of NUREG-0899.

The level of effort for these reviews will vary significantly. For example, the effort necessary to review the P-STG will vary depending on the number, complexity and significance of the plant-specific deviations from the approved generic technical guidelines.

If the review of the PGP does not provide sufficient information to support the conclusions of the Evaluation Findings section, the reviewer should obtain at least one EOP for review. As a product of the EOP program, the EOP(s) would then be additional information for judging the program's acceptability and will provide additional information as to how the applicant's program for development and implementation of EOPs should be modified to ensure that it contains sufficient information to assure acceptability of the resulting EOPs.

When the reviewer has determined that each of the criteria of Section II have been satisfied based upon the statements made by the applicant in the SAR, the review of Section 13.5.2 is complete.

When the review has determined that each of these criteria has been satisfied based upon the statements made by the applicant in the SAR, the review of this SRP section is complete.

IV. EVALUATION FINDINGS

The reviewer verifies that the information presented and his review support the following type of conclusion, to be used in the staff's safety evaluation report:

The applicant's program for operating and maintenance procedures as described in the SAR is in accordance with 10 CFR 50.34, Regulatory Guide 1.33, and ANSI/ANS 3.2-1982 Section 5.3 and is acceptable. The applicant's program for development of EOPs has been reviewed and the staff concludes that:

1. In the area of the technical guidelines:
 - (a) The EOPs will be based upon acceptable technical guidelines derived from approved analyses of transients and accidents.
 - (b) Implementation of the applicant's described methods for conducting an analysis of the operator's tasks should result in the identification of the instrumentation and controls necessary to perform the tasks specified in the P-STGs.
2. In the area of writer's guidance:
 - (a) The writer's guide provides sufficient information to help ensure that EOPs developed using P-STGs will be useable, accurate, complete, readable, convenient to use, and acceptable to control room personnel.
 - (b) The methods described by the writer's guide appear sufficient to support upgrading of the procedures and to ensure long-term consistency within and among procedures.
3. Implementation of the described V/V program provides adequate assurance that EOPs are technically correct and useable, follow the writer's guide, correspond to the control room/plant hardware, and are compatible with the minimum number, qualifications, training, and experience of the operating staff.
4. Implementation of the described training program should result in the operator understanding the philosophy behind the approach to the EOPs, understanding the mitigative strategy and technical basis of the EOPs, having a working knowledge of the technical content of the EOPs, and having the capability to execute the EOPs under operational conditions.

The evaluation findings for this section should also include the following:

1. A statement that the applicant has committed to operate the plant in accordance with written and approved procedures.
2. A brief description of the categories of procedures to be included.
3. A description of the review conducted to ensure that Supplement 1 to NUREG-0737 Item 7, "Upgrade of Emergency Operating Procedures" has been implemented.

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.

Implementation schedules for conformance to parts of the methods discussed herein are contained in the referenced regulatory guides, NUREGS and in accordance with the following:

- a. This SRP revision is applicable to construction permit applicants. Only the guidance pertaining to PSAR contents, i.e., schedules and commitments to follow guidance in appropriate published documents, will be used as review guidance.
- b. This SRP revision will be used by the staff for judging the acceptability of Operating Reactor licensees and operating license applicant emergency operating procedure program submittals made in accordance with Supplement 1 to NUREG-0737 - Requirements for Emergency Response Capability (Generic Letter 82-33). The review guidance in this SRP Section replaces the review guidance contained in Generic Letter 82-33.

VI. REFERENCES

1. ANSI/ANS 3.2 1982, "Standard for Administrative Controls for Nuclear Power Plants," American National Standards Institute.
2. Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)."
3. 10 CFR Part 50, § 50.34, "Contents of Applications; Technical Information."
4. Regulatory Guide 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants."
5. NUREG-0737, Clarification of TMI Action Plan Requirements.
6. Supplement 1 to NUREG-0737, Requirements for Emergency Response Capability (Generic Letter 82-33, December, 1982).
7. NUREG-0899, Guidelines for Preparation of Emergency Operating Procedures.
8. Generic Letters 83-05, 83-22, 83-23, and 83-31, Staff Safety Evaluation Reports for Generic Technical Guidelines for GE, CE, W, and B&W plants, respectively.