U.S. NUCLEAR REGULATORY COMMISSION

STANDARD REVIEW PLAN

13.5.2.1. OPERATING AND EMERGENCY OPERATING PROCEDURES

REVIEW RESPONSIBILITIES

Primary- Organization responsible for the review of human performance

Secondary- Organization responsible for the review of operator licensing

I. AREAS OF REVIEW

The organization responsible for human performance reviews applicant's plan for development and implementation of the operating procedures (e.g., for a construction permit (CP), an operating license (OL), a standard design certification (DC), or a combined license (COL)) as described in an applicant's Safety Analysis Report (SAR). This section of the SAR should describe the operating procedures that will be used by the organization to ensure that routine operating, off-normal, and emergency activities are conducted in a safe manner. The submittal should contain a target date for completion of operating and emergency operating procedures prior to fuel load to allow sufficient time to allow for plant staff familiarization and to allow U.S. Nuclear Regulatory Commission (NRC) staff adequate time to review the procedures. It is not expected that detailed written procedures will be included in the applicant's SAR.

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The objective of this review is to ensure that proposed operating and emergency operating procedures contain an adequate format, attributes, and level of detail, such that the operating and emergency operating procedures shall be able to provide qualified personnel to operate and to maintain the facility in a safe and efficient manner, as well as to keep the facility in compliance with its license, technical specifications, and applicable regulations. In addition, the review is to ensure that sufficient technical resources have been, are being, and will continue to be provided to adequately accomplish these objectives.

The areas of review, based on the type of application, are as follows.

1. Design Certification

   The DC review is focused on the evaluation of COL action items pertaining to operating and emergency operating procedures.

2. Construction Permit or Combined License

   The CP/COL review is focused on the applicant's operating and emergency operating procedures. It should be recognized that the application may be received prior to development of detailed procedures and associated training materials. The application should contain a target date for completion of the procedures to be established, implemented, and maintained by 6 months prior to fuel load to allow adequate time for plant staff familiarization and to allow NRC staff adequate time to develop operator-license examinations. Implementation of commitments made by the applicant may be evaluated after issuance of the COL as part of the Construction Inspection Program.

   a. Procedure Classification. The technical submittal should describe the different classifications of procedures that licensed operators will use in the control-room and locally in the plant for plant operations. The group within the operating organization responsible for maintaining the procedures 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 ensure that procedures will be available to the plant staff to accomplish the activities identified in the listing of Regulatory Guide (RG) 1.33, "Quality Assurance Program Requirements (Operation)." Examples of procedure classifications include:

      i. System Procedures. System procedures provide instructions for energizing, filling, venting, draining, starting up, shutting down, changing modes of operation, returning to service following testing (if not given in the applicable testing procedure), and other instructions appropriate for operation of systems important to safety.

      ii. General Plant Procedures. General plant procedures provide instructions for the integrated operations of the plant (e.g., startup, shutdown, power operation and load changing, process monitoring, and fuel handling).

      iii. Abnormal Operating Procedures. Abnormal operating procedures 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 that, if not corrected, could degenerate into a condition requiring action under an emergency operating procedure (EOP).

iv. Emergency Operating Procedures. Emergency operating procedures 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.

v. Alarm Procedures. Alarm procedures guide operator actions for responding to plant alarms.

b. Operating Procedure Program. The technical submittal should describe the applicant's program for developing the operating procedures (2.a.(1) – (5)). The staff will review the applicant's program for development and implementation of the operating procedures.

i. The operating procedures will be reviewed by the NRC. The procedures may be evaluated as part of the Construction Inspection Program. All operating procedures shall be verified and validated. The operating procedures should include the following:

1. Title and identifying information, (i.e., procedure number, revision, approval, and date)

2. Statement of procedure applicability and purpose

3. Prerequisites for successful completion of the procedure

4. Precautions, including warnings, cautions, and notes

5. Important actions

6. Limitations

7. Acceptance criteria

8. Checkoff lists

9. References l

ii. A plan for procedure maintenance and control of updates should be developed. Procedure modifications should be integrated across the full set of procedures. Alterations in one procedure should not be inconsistent with or conflict with other procedures.

c. Emergency Operating Procedure Program. The EOP program technical submittal, the procedures generation package (PGP), should describe the applicant's program for developing EOPs (2.a.(iv)) as well as the required content

of the EOPs. The staff will review the applicant's program for development and implementation of the EOPs.

The procedure development program, as described in the PGP should be submitted to the NRC at least three months prior to the date the applicant plans to begin formal operator training on the EOPs.

d. Procedures Generation Package. Reviewers should be aware while evaluating each part of the PGP that the individual parts may differ in detail and approach. Reviewers should become familiar with the general objectives of each part of the PGP. When an objective is not met or a specific response cannot be judged acceptable because of missing or incomplete information, the reviewer should identify the information and what is needed to make the PGP acceptable. The guidance that follows is provided to assist the reviewer in the evaluation of the PGP:

   i. Plant-Specific Technical Guidelines

      Plant-Specific Technical Guidelines (P-STG) are guidelines based on the analysis of transients and accidents that are specific to the applicant's plant design and operating philosophy. The P-STGs provide the basis for, and include a reference to, the generic technical guidelines (GTGs). For plants that do not reference the GTGs, this section should contain the steps necessary to mitigate transients and accidents in a sequence that allows mitigation without first having diagnosed the specific event, along with all supporting analyses.

      For plants referencing the GTGs, the documentation submitted should include (1) a description of the process used to develop the P-STGs from the GTGs, (2) identification of significant deviations from the GTGs (including identification of additional equipment beyond that identified in the GTGs) including all necessary engineering evaluations or analyses to support the adequacy determination of each deviation, and (3) a description of the process used for identifying operator information and control requirements.

   ii. A plant-specific writer’s guide (P-SWG) that details the methods to be used by the applicant in preparing EOPs based on P-STGs.

   iii. A description of the verification and validation (V & V) program for the EOPs.

   iv. A description of the program for training operators on EOPs.

3. Operating License or Combined License

For OL holders, during the later stages of plant design, construction, and licensing, the applicant should provide evidence that the operating and emergency operating procedures conform to the commitments made in the CP stage of licensing.

For COL holders, implementation of commitments made by the operating organization can be evaluated after issuance of the COL as part of the Construction Inspection Program.

4. Review Interfaces

Other Standard Review Plan (SRP) sections interface with this section as follows:

a. The structure, functions, and responsibilities of the onsite organizations to operate and maintain the plant are reviewed in SRP Section 13.1.2, "Operating Organization."

b. The licensed operator training program is reviewed in SRP Section 13.2.1, "Reactor Operator Requalification Program; Reactor Operator Training."

c. The non-licensed plant staff training program is reviewed in SRP Section 13.2.2, "Non-Licensed Plant Staff Training."

d. Additional guidance for identifying operational programs is provided in SRP, Section 13.4, "Operational Programs."

e. Human-factors engineering practices and guidelines are evaluated in SRP Section 18.0, "Human Factors Engineering."

II. REVIEW PROCEDURES

The review procedures described below are for the areas of review identified in SRP Section I. The staff should review the applicant's evaluation describing the proposed alternatives to the acceptance criteria and how the alternatives provide an acceptable method of complying with the relevant NRC requirements for any deviations from the acceptance criteria in Section III of this SRP.

In preparing to review the application, the reviewer should become familiar with the references for this SRP section.

The information submitted in the application is to be reviewed against this SRP section. The reviewer's evaluation is based on the material presented in the application, on whether items of special safety significance are involved, and on the magnitude and uniqueness of the project. Any exceptions or alternatives presented in the application should be carefully reviewed to ensure that they are clearly defined and that an adequate basis for acceptance is provided.

The applicant will identify the references, RGs, and codes and standards revision numbers used in the application. The reviewer should identify the version of the references, RGs, and codes and standards used in his review.

1. In reviewing and evaluating the information related to operating and emergency operating procedures, the following points should be considered:

   a. The applicant's plans for operating and emergency operating procedures may not be fully developed. It is acceptable if these plans are not fully developed, provided that the applicant either makes an FSAR commitment or includes a license condition to ensure that the responsibility will be met. Operating and emergency operating procedures can be verified during the Construction Inspection Program.

   b. If the applicant has experience in the operation of a previously licensed nuclear power plant, the reviewer may seek independent information about licensed operator training through the appropriate NRC regional office.

2. The reviewer will determine the overall acceptability of the applicant's operating and emergency operating procedures by performing:

   a. An examination of the information submitted to determine that all areas identified in Section I, "Areas of Review," have been addressed.

   b. An evaluation of the information submitted using the specific review guidance to determine that all areas identified in this section have been addressed.

   b. A comparison of the information submitted with the acceptance criteria of Section III "Acceptance Criteria."

   c. A review of the information provided by the NRC regional office position statement on the applicant's operating and emergency operating procedures, if applicable.

   d. Verification, through the Construction Inspection Program, of the implementation of the operating and emergency operating procedures by the operating organization.

III. ACCEPTANCE CRITERIA

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

- 10 CFR 50.34(a)(6)
- 10 CFR 50.34(b)(6)(i) – (b)(6)(vii)
- 10 CFR 50.34(f)(2)(ii)
- 10 CFR 50.34(f)(3)(i)
- 10 CFR 50.40(a)
- 10 CFR Part 50, Appendix B
- 10 CFR 52.47(8)
- 10 CFR 52.79(a)(14), (25), (27), (28), (33), and (34)

The SRP is not a substitute for the NRC's regulations, and compliance with the SRP 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 to evaluate how the proposed alternatives to the SRP acceptance criteria provide acceptable methods of compliance with the NRC regulations.

The acceptance criteria are designed to meet 10 CFR 50.40(a) for all OL and COL reviews. Implementation of methods designed to meet the acceptance criteria may be verified through the Construction Inspection Program.

Acceptance criteria are as follows:

1. The applicant has committed to RG 1.33. RG 1.33 endorses American National Standards Institute (ANSI)/American Nuclear Society (ANS)-3.2-2012, "Managerial, Administrative, and Quality Assurance Controls for the Operational Phase of Nuclear Power Plants."

2. The applicant has committed to RG 1.114, "Guidance to Operators at the Controls and to Senior Operators in the Control Room of a Nuclear Power Plant."

3. Specific acceptance criteria are as follows:

    a. The applicant's procedure-development program should include the following:

        i. Generic Guidelines (GTGs) for the EOPs

        ii. General plant procedures (including startup, power, and shutdown operations)

        iii. System operating procedures (instructions for energizing, filling, venting, draining, starting up, and shutting down, changing modes of operation, and returning to service following testing)

        iv. Test and maintenance procedures

        v. Surveillance testing procedures

        vi. Abnormal and emergency operations procedures

        vii. Alarm-response procedures

        viii. Mode-specific procedures, (e.g., refueling activities, etc.)

    b. The applicant should identify the basis for developing the operating procedures. Bases include the following:

        i. Plant-design bases

        ii. System-based technical requirements and specifications

iii. Results of task analyses

iv. Important human activities (HAs)

v. Initiating events to be considered in the EOPs, including those initiating events in the design bases

vi. The GTGs for the EOPs

vii. Appropriate human factors engineering (HFE) of procedures

c. The applicant should develop a site writer's guide (SWG) to establish the process for developing technical procedures that are complete, accurate, consistent, and easy to understand and follow. The applicant should use the guide for all procedures within the scope of this program. The guide should contain:

i. Objective criteria so that the procedures developed in accordance with the SWG are consistent in organization, style, and content.

ii. Instructions for procedure, content and format, including writing of the action steps specifying acceptable lists of abbreviations/acronyms, and terms to be used.

d. The applicant's procedures should contain the following elements:

i. Title and identifying information such as number, revision, and date

ii. Statement of applicability and purpose

iii. Prerequisites

iv. Clearly defined entry conditions

v. Precautions (including warnings, cautions, and notes)

vi. Important human actions

vii. Limitations and actions

viii. Acceptance criteria

ix. Checkoff lists

x. References

e. As part of the procedure development program, the applicant should commit to perform the following:

i. Verify that the procedures are technically correct and can be completed satisfactorily by plant staff. The verification should include a walkdown of

the procedure either on a plant-referenced simulator or in the facility itself. Where a walkdown is not possible, a tabletop verification of the procedure may be used.

ii. Validate the use of procedures by conducting an integrated system validation using the plant simulator. Additional information is described in NUREG-0711, "Human Factors Engineering Program Review Model," Section 11, "Human Factors Verification and Validation."

iii. When procedures are modified, the applicant should verify the adequacy of the content, format, and integration. The applicant should also validate procedures when a modification substantially changes personnel tasks significant to plant safety. The validation should assure that the procedures correctly reflect the characteristics of the modified plant and can be used effectively to operate or maintain the plant.

f. The applicant should prepare a procedures-generation package (PGP) which includes:

i. Plant-Specific Technical Guidelines (P-STGs).

P-STG are guidelines based on the analysis of transients and accidents that are specific to the applicant's plant design and operating philosophy. The P-STGs provide the basis for, and include a reference to, the generic technical guidelines (GTGs). For plants that do not reference the GTGs, this section should contain the steps necessary to mitigate transients and accidents in a sequence that allows mitigation without first having diagnosed the specific event, along with all supporting analyses.

For plants referencing the GTGs, the documentation submitted should include (1) a description of the process used to develop the P-STGs from the GTGs, (2) identification of significant deviations from the GTGs (including identification of additional equipment beyond that identified in the GTGs) including all necessary engineering evaluations or analyses to support the adequacy determination of each deviation, and (3) a description of the process used for identifying operator information and control requirements.

ii. A SWG that details the methods to be used by the applicant in preparing EOPs based on P-STGs.

iii. A description of the verification and validation (V&V) program for the EOPs.

iv. A description of the program for training operators on EOPs.

g. The P-STG should conform to the following guidance:

The EOPs are based on acceptable technical guidelines derived from approved analyses of transients and accidents.

i. If GTGs are not referenced, the reviewer should (1) become familiar with the integrated performance of the NSSS and balance-of-plant systems, (2) evaluate the completeness of the accident and transient analyses, (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) and, evaluate the applicant's V&V of the guidelines, and (7) evaluate the information and control needs of the operators to execute the P-STGs.

If GTGs are referenced but significant design changes have been incorporated that are beyond the scope of published SERs, an assessment should be performed to determine if the new designs introduce sufficient change to warrant additional review of the GTGs. The reviewer should be aware that:

a. There are four GTGs approved by the staff as part of the post-Three Mile Island actions. These GTGs apply to the operating plants designed by Westinghouse, Combustion Engineering, Babcock and Wilcox, and General Electric.

b. New reactor designs being approved using the 10 CFR Part 52 licensing process use these approved GTGs to some degree. Passive plants introduce new mitigative strategies that may warrant staff review.

If approved GTGs are referenced and the proposed design is within the scope of the GTG, additional review of the GTG is not needed. The reviewer should reference the SER that approved the GTG to demonstrate conformance.

ii. GTGs should be function-based to ensure that plant-specific EOPs written based on their guidance can be used by operators to mitigate the consequences of an emergency without having to diagnose the event causing the emergency.

iii. GTGs should be based on the identification of plant systems and functions and be supported by an analysis of operator tasks to identify operators' information and control needs.

iv. The process used to develop the GTGs should be documented in sufficient detail to show the flow of information from its analytical base to its use in the development of technical guidelines, including:

1. Documentation of the assumptions used in the analysis

2. The results of the analysis

3. A description of the process used to generate the technical guidelines

h. For P-STGs that reference a GTG, the applicant should include the following information:

i. The version of the GTG used to develop the P-STGs.

ii. Any deviations between the GTG and the P-STGs are identified and the basis for the deviation is documented. The review of safety-significant deviations from the GTGs will be conducted to the same level of detail as the GTGs. Assistance from other technical review branches will be necessary to perform a thorough review of the deviations. It is only necessary to review the safety-significant deviation, not the entire GTG. Deviations include:

a. Any modification to the mitigative strategy of the GTGs. For example, for a Westinghouse plant, depressurizing the RCS following a steam generator tube rupture without first conducting a limited cooldown in accordance with the guidelines to establish a margin to saturation.

b. Differences in equipment operating criteria. For example, RCP trip criteria, safety injection termination criteria.

c. Differences in equipment operating characteristics. For example, differences between the plant-specific equipment and the equipment assumed in the generic analyses (SI that can be throttled vs. SI that is either on or off).

d. Identification of methods and equipment used to address the technical areas of the generic guidelines that are specified as "plant-specific."

e. Plant-specific setpoints or action levels that are calculated or determined in a manner other than specified in the GTGs.

NOTE: Plant-specific setpoints that are identified in the GTGs do not need to be included in the P-STG submittal.

f. Actions taken in addition to those specified in the GTGs that affect the mitigative strategy:

g. Differences that affect the ability of equipment to adequately provide the necessary mitigative function.

h. The use of different instruments or control parameters than specified in the GTGs or determination of instrumentation and control characteristics in a manner different or with a different basis than specified in the GTGs.

iii. The applicant should provide a description of the process used to convert the GTG into the P-STGs.

iv. The applicant should ensure items not covered by the GTG are identified. For example, plant-specific conditions, equipment, operations, or [bracketed] information.

i. The writer's guide should conform to the following:

i. The writer's guide provides sufficient information to develop EOPs that are useable, accurate, complete, readable, convenient to use, and acceptable to control- room personnel.

ii. The writer's guide supports long-term consistency within and between procedures in the areas of organization, format, style, and content.

iii. The writer's guide should contain the necessary information and guidance for translating the technical information of the GTG into the plant's EOPs.

iv. The writer's guide should consolidate in one place the information necessary to perform a task. When cross-referencing is necessary, a method should be used that is quick, creates the least amount of disruption or chance of error, describes why the operator is leaving one part and going to another, and indicates when to return to the original procedure.

v. The writer's guide should contain direction that results in procedures with the following characteristics:

a. Procedures that are easy to read

b. Procedures that can be read rapidly without interruption

c. Procedures that can be precisely understood

d. Procedures that can be understood without the aid of additional material

e. The reader accepts the information presented in the procedure

f. Procedures that can be easily learned

g. Procedures that can be retained

h. Procedures that can be used easily for instruction

i. Procedures are simple, ordered, and pertinent

vi. The writer's guide should describe the organization, content, and format of major sections of the EOPs. This may include the following:

a. Cover page

b. Table of contents

c. Scope statement

d. Entry conditions

e. Automatic actions

f. The content and format of operator action steps, including (a) simple action steps, (b) steps that verify an action, (c) steps of continuous or periodic concern or applicability, (d) steps for which a number of alternative actions are equally acceptable, (e) steps performed concurrently with other steps, and (f) steps that lead the operator to the appropriate subsection of the EOPs.

g. Figures and tables

h. Flowcharts and decision aids

i. EOP page identifying information including title, procedure number, revision number, revision date, number of pages, unit designation (if applicable), facility designation, and location of identifying information in the EOP.

j. Page layout including margins, line spacing, and the requirement that steps be given on one page.

k. Warnings (or cautions) and notes, including placement, definitions, emphasis and format, and the complete step-on-one-page requirement.

l. Placekeeping aids

m. Emphasis techniques

n. Divisions, headings, and numbering of pages and steps

vii. The writer's guide should provide direction on writing style. This may include the following:

a. A vocabulary list of words to use (with definitions) and words to avoid.

b. A list of abbreviations, acronyms, and symbols that should be used in the procedures and in the control-room.

c. Sentence structure and limit on actions per step.

d. Rules of punctuation.

e. Rules of capitalization.

f. Units of measure in the action steps, the tables, and the figures should be consistent with the presentation of information in the control room.

g. The format of numerals, including type, use of decimals, and significant digits.

h. Tolerances.

i. Formulas and calculations.

j. Nomenclature for instrumentation and controls, what information to provide in the procedure and in what format the information should be provided.

k. Conditional and logic statements, including format, style, emphasis; definition of logic terms, use of logic terms; and logic terms and sequences to avoid.

l. How to reference other procedures, sections of procedures, and specific steps of procedures.

m. Content and format of references.

n. In order to minimize cross-referencing, the criteria used to determine when steps of a referenced procedure are to be included in an EOP.

o. Method for identifying sections or subsections with a procedure. For example, tabbing.

p. When and how to present information related to the location of equipment, controls, and displays.

viii. The writer's guide should address how EOPs interface with control-room staffing and division of responsibilities. This should include:

a. Structuring of EOPs to ensure that minimum staffing can execute the EOPs.

b. Designating the operators' responsibilities when implementing EOPs.

c. Sequencing action steps to minimize physical interference between operators.

d. Sequencing action steps to avoid their unintentional duplication of steps by operators.

j. Many aspects of EOP V & V can be conducted during licensed operator training. It is expected that applicants may combine V & V and training to more efficiently use the control-room simulator. When V & V is tied to training, applicants must also address V & V through a formal V & V process that documents the results and provides the information back into the EOP development program. The submittal should describe this process.

k. For multiunit sites, that portion of the V & V process using control-room walkthroughs and use of operators should be carried out for each unit of a multiunit site to the extent that the units differ in terms of instrumentation, controls, equipment, or any other aspect that may impact plant safety. The procedure V&V should demonstrate the following:

i. EOPs are technically correct and accurately reflect the GTGs. The following methods, or a combination of these methods, are recommended for validating this criterion:

a. Desktop review

b. Seminars, workshops, and operating-team review

c. Computer modeling/analysis

ii. EOPs are written following the guidance in the P-SWG.

iii. EOPs are useable and can be understood and followed without confusion, delays, or errors. The following methods, or combination of methods, are recommended for validating this criterion:

a. Seminars, workshops, and operating team review

b. Dynamic simulator exercises

c. Dynamic control-room walkthroughs

iv. The controls, equipment, and indications referenced in the EOPs are available, use the same designations, same units of measurement, and operate as specified in the procedures. The following methods, or combination of methods, are recommended for validating this criterion:

a. Seminars, workshops, and operating team review

b. Static control-room walkthroughs

c. Static simulator exercises

v. EOP language and level of information is compatible with the number, qualifications, training, and experience of the operating staff. The following methods, or combination of methods, are recommended for validating this criterion:

a. Desktop review

b. Seminars, workshops, and operating-team review

c. Simulator exercises

d. Dynamic control-room walkthroughs

vi. The EOPs will guide the operator in mitigating transients and accidents. The following methods, or combination of methods, are recommended for validating this criterion:

a. Desktop review

b. Seminars, workshops, and operating team review

c. Simulator exercises

d. Dynamic control-room walkthroughs

vii. The EOPs will demonstrate that plant operators, subject matter experts, and procedure writers are involved and participate in the V & V. How the roles performed by the participants will be demonstrated. The roles should be based on the specific V & V activity being evaluated.

viii. A commitment to include the criteria for selecting scenarios for the V & V and to exercise the full complement of EOPs, including multiple failures (simultaneous and sequential).

ix. A description of the plan for correcting and revising EOPs based on the results of the V & V and feedback from simulator exercises, control-room walkthrough, desktop reviews, operating team reviews, and operator training.

x. A commitment to validate and verify revisions to EOPs and the conditions under which revisions should be validated and verified.

xi. A description of the method by which multiple units will be handled in the V & V process to account for differences between units.

xii. An indication that the EOPs can be effectively employed with minimum control-room staffing.

xiii. A description of the plan for determining EOP adequacy (availability, readability, and usability) and correspondence of the EOPs and control-room instrumentation and controls. When instrumentation and controls have not been evaluated against the needs of the operators as a part of the P-STGs, the information and control needs of the operators should be evaluated as part of the V & V program. The description of the V & V program should include the method that will be used to determine the adequacy of control-room instrumentation and controls.

l. The procedure training program should demonstrate the following:

1. Trainees understand the philosophy behind the design of the EOPs. For example, EOP structure and approach to transient and accident mitigation, including control of safety functions; accident evaluation and diagnosis; and the achievement of safe, stable, or shutdown conditions.

2. Trainees understand the mitigation strategy and technical bases of the EOPs. For example, EOP function and use of plant systems, subsystems, and components in mitigating transients and accidents.

3. Trainees should have a working knowledge of the technical content of the EOPs. For example, trainees understand and know how to perform each step in the EOPs to achieve objectives of the EOP.

4. Trainees are capable of executing the EOPs as individuals and as teams under operational conditions.

5. In their submittal, the applicant should specify whether plant-referenced or limited scope simulation is used for training. When a limited scope simulator is used for training, it may not be possible to fully exercise all parts of the EOPs. In those cases, the PGP should describe the method that the applicant will use to ensure that the V & V program will cover those areas missed.

6. In their submittal, the applicant should describe the extent to which all EOPs will be exercised by all operators.

7. The applicant should describe the method for training in areas not covered by simulator scenarios.

8. The applicant should describe the use of other training methods. Other training methods include lectures, discussion sessions, seminars, and simulator/control-room walkthroughs.

9. The applicant should use of a wide variety of scenarios in the EOP training program.

10. The applicant should state that operators will be trained prior to implementation of EOPs.

11. The applicant should state how operators will be evaluated as part of the training program.

m. The applicant should submit a procedure development program schedule that includes the milestones for:

1. PGP submittal at least three months prior to the beginning of formal operator training on EOPs.

2. Completion of operating procedures prior to fuel load to allow adequate time for plant staff familiarization and to allow NRC staff adequate time to develop operator license examinations.

3. Availability of procedures to support preoperational testing and initial operations.

n. The applicant should have a plan for procedure maintenance and control of procedure updates. Procedure modifications should be integrated across the full set of procedures. Changes in a procedure should not conflict with other procedures nor be inconsistent the other procedures.

o. The applicant should evaluate the means by which personnel access and use procedures, especially during operational events. This criterion applies to both hardcopy and computer-based procedures, although the issues differ depending on implementation of the procedures. For example, the applicant should address the storage of procedures, ease of the operator's access to the correct procedures, and laydown of hard-copy procedures for use in the main control-room, the remote shutdown facility, and local control stations.

4. Technical Rationale

Compliance with the relevant requirements of 10 CFR Part 26, "Fitness for Duty Programs"; 10 CFR 50.34, "Contents of Applications; Technical Information"; 10 CFR 50.40(a) 10 CFR Part 50, Appendix B; and 10 CFR Part 55, "Operators' Licenses," require the applicant to be technically qualified in order to engage in the activities associated with the design, construction, and operation of a nuclear power plant, in accordance with the regulations in 10 CFR Part 50. Meeting the requirements of 10 CFR Part 26, 10 CFR 50.34, 10 CFR 50.40(a), 10 CFR Part 50, Appendix B, provides reasonable assurance that the applicant is technically qualified to engage in the proposed activities and can develop and implement the procedures necessary to safely design, construct, operate, and maintain the facility.

Compliance with the requirements of 10 CFR 52.47, "Contents of Applications; Technical Information," and 10 CFR 52.79, "Contents of Applications; Technical Information in a Final Safety Analysis Report" require the applicant to be technically qualified in order to engage activities associated with the design, construction, and operation of a nuclear power plant, in accordance with the regulations in 10 CFR Part 52. Meeting the requirements of 10 CFR 52.47, and 10 CFR 52.79, provides reasonable assurance that the applicant is technically qualified to engage in the proposed activities and can develop and implement the procedures necessary to safely design, construct, operate, and maintain the facility.

IV. EVALUATION FINDINGS

The reviewer verifies that the applicant has provided sufficient information and that the staff's technical review and analysis 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 staff concludes that the operating and emergency operating procedures are acceptable and meet the requirements of 10 CFR 50.34, 10 CFR 50.40, , "Common Standards"; 10 CFR Part 50, Appendix B, 10 CFR 52.47, 10 CFR 52.79, as applicable. This conclusion is based on the following:

1. With respect to the technical guidelines:

    a. The operating procedures will be based upon acceptable technical guidance - derived plant design bases, system-based technical requirements and specifications, task analysis results, and critical human actions identified in the HRA/PRA.

    b. The EOPs will be based upon acceptable technical guidelines derived from approved analyses of transients and accidents.

    c. 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 technical guidelines.

2. With respect to the writer's guide:

    a. The writer's guide or guides provide sufficient information to help ensure that operating procedures, including EOPs, developed using technical guidelines will be complete, accurate, consistent, and easy to understand and follow.

    b. The writer's guide or guides provide sufficient information to help ensure that operating procedures, including EOPs, developed using technical guidelines will be complete, accurate, consistent, and easy to understand and follow.

3. Implementation of the described V & V program provides adequate assurance that the operating procedures, including EOPs, are technically correct and useable, follow the applicable writer's guide, correspond to the control-room and plant hardware, and are compatible with the minimum number, qualifications, training, and experience of the operating staff.

4. After the implementation of the described training program, the operator should understand the philosophy of the operating procedures, including EOPs, understand the mitigative strategy of the EOPs and the technical basis of the operating procedures, have a working knowledge of the technical content of the operating procedures, including EOPs, and have the capability to execute the operating procedures, including EOPs, under operational conditions.

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

5. Design Certification

For DC reviews, the findings will summarize, to the extent that the review is not discussed in other SER sections, the staff’s evaluation of interface requirements and COL action items relevant to this SRP section.

6. Construction Permit or Combined License

The staff concludes that the operating and emergency operating procedures are acceptable and meet the requirements of 10 CFR 50.34, 10 CFR 50.40, 10 CFR Part 50, Appendix B, 10 CFR 52.47, 10 CFR 52.79, as applicable. This conclusion is based on the following:

The applicant states that operating and emergency operating procedures will be established to provide licensed operators with sufficient knowledge and operating experience to start up, operate, and maintain the plant in a safe manner. The operating and emergency operating procedures are to be developed by the applicant and will meet the regulatory guidance of Regulatory Guide 1.33.

7. Operating License or Combined License

Verification of the operating and emergency operating procedures is accomplished through the Construction Inspection Program. The staff concludes that the operating and emergency operating procedures are acceptable and meet the requirements of 10 CFR 50.34, 10 CFR 50.40, 10 CFR Part 50, Appendix B, 10 CFR 52.47, 10 CFR 52.79, as applicable. This conclusion is based on the following:

The applicant states that the operating and emergency operating procedures will provide reasonable assurance that decisions and actions by licensed 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 operating and emergency operating procedures have been designed to meet the individual needs of the licensed operators, depending upon their backgrounds, previous training, and expected job assignments. The operating and emergency operating procedures will meet the guidelines of RG 1.33.

In addition to the finding based on the type of application, the safety evaluation report should also state the following:

These findings contribute to the judgment that the applicant complies with the requirements of 10 CFR 50.34, 10 CFR Part 50, Appendix B, 10 CFR 52.79, as applicable, as evidenced by the following:

a. The applicant is technically qualified, as specified in 10 CFR 50.40(b) and 10 CFR 52.47(a), as applicable.

b. The operating and emergency operating procedures comply with the guidance of RG 1.33, “Quality Assurance Program Requirements (Operation).”

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.

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

The staff will use this SRP for judging the acceptability of an applicant’s operating procedure program, including the EOP (PGP) program, as described in submittals made in accordance with Supplement 1, NUREG-0737, “Requirements for Emergency Response Capability”

(Generic Letter (GL) 82-33). The review guidance in this SRP section replaces the review guidance in GL 82-33.

It is recognized that development of detailed procedures and associated training materials may be beyond the scope of DC and therefore will be the responsibility of an applicant referencing the certified design.

VI. REFERENCES

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

2. 10 CFR Part 50, Appendix B, “Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants.”

3. 10 CFR Part 52, “Licenses, Certifications, and Approvals for Nuclear Power Plants.”

4. 10 CFR Part 55, “Operators’ Licenses.”

5. RG 1.33, "Quality Assurance Program Requirements (Operation).”

6. RG 1.70, “Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants.”

7. RG 1.114, “Guidance to Operators at the Controls and to Senior Operators in the Control Room of a Nuclear Power Unit."

8. RG 1.206, “Combined License Applications for Nuclear Power Plants.”

9. NUREG-0660, “NRC Action Plan Developed as a Result of the TMI-2 Accident.”

10. NUREG-0711, “Human Factors Engineering Program Review Model.”

11. NUREG-0737 and Supplement 1, “Clarification of TMI Action Plan Requirements.”

12. NUREG-0899, “Guidelines for Preparation of Emergency Operating Procedures.”

13. NUREG-1358 and Supplement 1, “Lessons Learned from the Special inspection Program for Emergency Operating Procedures.”

14. Generic Letters 83-05, 83-22, 83-23, and 83-31, “Staff Safety Evaluation Reports for Generic Technical Guidelines” for General Electric, Combustion Engineering, Westinghouse, and Babcock & Wilcox plants.

15. NRC Inspection Manual Chapter (IMC)-2504, “Construction Inspection Program – Inspection of Construction and Operational Programs.”

16. ANSI/ANS 3.2, “Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants.”

PAPERWORK REDUCTION ACT STATEMENT

The information collections contained in the draft 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.

SRP Section 13.5.2.1
Description of Changes

Section 13.5.2.1 - operating and emergency operating procedures

This revision of SRP Section 13.5.2.1 has been restructured and reorganized to clarify staff guidance. To this end, while this guidance has been significantly revised, it does not contain newstaff positions. A listing of detailed changes to this section from its previous revision has thus been omitted.