U.S. NUCLEAR REGULATORY COMMISSION

STANDARD REVIEW PLAN

OFFICE OF NUCLEAR REACTOR REGULATION

Appendix A to
SRP Section 13.5.2

REVIEW PROCEDURES FOR THE EVALUATION
OF PROCEDURES GENERATION PACKAGES

Review Responsibilities

Primary - Procedures and Systems Review Branch (PSRB)

Secondary - None

1.0 Background

In August of 1982, NUREG-0899, "Guidelines for the Preparation of Emergency Operating Procedures" was published. This document is designed to "identify the elements necessary for licensees and applicants to prepare and implement Emergency Operating Procedures (EOPs) that will provide the operator with directions to mitigate the consequences of a broad range of accidents and multiple equipment failures." In addition to identifying these elements, the document also outlines the process by which licensees and applicants should develop, implement, and maintain EOPs. To ensure that the elements are addressed in the new or upgraded procedures and that acceptable processes of development, implementation and maintenance are used, the staff identified a method of review that is intended to provide confidence that EOPs written or upgraded according to a given plant's program would be acceptable. The NRC staff believes that it is more important that they ensure that the process used to generate procedures and their technical basis is sound and well documented, than to perform a one-time review of EOPs, with no assurance that future EOP revisions are technically adequate and consistent with existing EOPs. With this approach, responsibility for the generation and review of the EOPs, as well as future revisions to EOPs, is retained by the licensee.

In NUREG-0899, four aspects of EOP development and implementation are identified as providing an adequate basis for review. These are (1) plant-specific technical guidelines (P-STG); (2) a plant-specific writer's guide; (3) a descrition of the

program for verification/validation of the EOPs; and (4) a description of the program for training operators on the EOPs. Information on each of these items are to be provided as the "Procedures Generation Package" (PGP). The PGP for each plant will provide the licensee with a technical and human factors basis for developing its EOPs and for making future revisions to its EOPs.

The formal requirement for submitting this package is provided in Supplement 1 to NUREG-0737, "Requirements for Emergency Response Capability" (Generic Letter No. 82-33). EOPs at all plants will eventually be audited as a part of routine regional inspections to ensure consistency with the PGP.

The purpose of this document is to provide guidance for reviewers during their evaluation of PGPs. The PGP is expected to contain specific information in each of its four parts. The review guidance below is divided into general objectives and specific review guidelines. The listing of review guidelines represents what the staff believes should be considered by reviewers in determining if the general objectives are met. Because each of the objectives can be adequately addressed in many ways and may be satisfied without addressing each of the review guidelines, it will often be necessary for reviewers to use their expert judgment in determining the acceptability of a particular submittal. The general objectives and supporting documents such as NUREG-0899 and NUREG-0799 should be used as guidance in making these judgments. The methods provided in NUREG-0799 are an acceptable approach for preparing EOPs. It should be recognized, however, that approaches other than those found in these documents may be acceptable, and reviewers will need to use their judgment in determining the adequacy of the PGP.

As described in the SRP, all PGPs will be reviewed by the staff. The review guidelines presented in Subsections 3 through 6 of this appendix provide additional assistance to the reviewers. All applicants have the option of providing a justification for their approach where they disagree with a staff position. When all issues are resolved or when the schedule dictates, the reviewer will prepare a Safety Evaluation Report (SER).

2.0 General Guidance to Reviewers

The guidance that follows is provided to assist the reviewer in using the criteria presented in Subsections 3 through 6 of this appendix.

2.1 Reviewers should be aware that different degrees of objectivity (and thus, subjectivity) may be required in reviewing each of the four parts of the PGP since the parts may differ in detail and approach.

2.2 Reviewers should become very familiar with the General Objectives associated with each section of a PGP. The specific review guidelines can serve as the basis for making the subjective evaluations of the general objectives.

2.3 When an objective is not met or a specific response cannot be judged acceptable because of missing information, the reviewer should identify the information that is missing and what is needed in the PGP to make it acceptable.

2.4 Some items included in a PGP may not be addressed either within the general objectives or the specific review guidelines. These items

must be evaluated carefully to ensure that unnecessary or possibly detrimental inclusions do not occur in the EOPs (e.g., an "EOP Deficiencies" section is not a desirable inclusion in an EOP).

2.5 As stated in the Background, most of the review guidelines are subjective in nature. The reviewer will have to jduge whether the discussion of an item is sufficiently clear, complete and technically acceptable to achieve the objectives.

2.6 In some instances the language (i.e., names, titles, etc.) used in the PGPs may be different from that used in this document, although the same subjects or items are being discussed. For example, format of "decision aids" may be covered under a PGP section entitled "job performance aids." Reviewers should be careful that identified PGP deficiencies are not based on semantics.

2.7 In some instances a particular subject may not appear to be addressed in the PGP, when in fact it is addressed in another part of the PGP. For example, the determination of the adequacy of control room instrumentation and controls may not be addressed in the P-STG, but included as a part of the validation/verification program. Reviewers msut therefore become familiar with the general objectives and specific review guidelines as a whole so that these situations can be readily identified.

3.0 Plant-Specific Technical Guidelines

3.1 General Discussion

All licensees and applicants are required to submit P-STGs. These guidelines may be based on (1) generic technical guidelines (prepared by the owner's group), or (2) a plant-specific reanalysis of transients and accidents as described in TMI Action Plan Item I.C.1. In either case, the P-STG should be based on the identification of plant systems and functions, and be supported by an analysis of operator tasks to identify operator information and control needs. Among the four approved generic technical guidelines, operator task information is provided using different levels of detail. If generic technical guidelines are referenced, the need for additional task specification will be different depending upon the level of task information provided by the generic technical guidelines, and the nature of deviations from the guidelines.

The information to be submitted in the PGP as P-STG is dependent on whether or not generic technical guidelines are used, as well as the degree to which plant specific characteristics (e.g., equipment) are consistent with the plant on which the generic technical guidance is based.

Some of the "deviations" that must be addressed as part of the P-STG submittal are differences between the generic technical guidelines and the P-STG. This includes differences due to plant initiatives and those identified in the generic guidelines as "plant-specific" items. Only differences that are safety significant, e.g., related to systems functions, or methods, should be reviewed. Subsection 3.3.2 provides examples of other deviations that must also be addressed. Where an applicant does reference NRC approved generic technical

guidelines, they should not submit those guidelines. However, safety significant deviations from the mitigative strategy should be described. Furthermore, applicants using generic guidelines need not submit the detailed action steps. The process for developing the action steps from the generic guidelines should be described. Applicants not using generic guidelines should submit, as a part of the P-STG, the action steps necessary to mitigate transients and accidents, and supporting technical analysis and bases. The P-STG should have an orientation that allows mitigation without event diagnosis. In either case, the applicant should submit a description of how operator information and control needs were derived and used to specify instrumentation and control requirements. This description may be in the PGP or in the Section of the FSAR addressed by SRP Section 18.1, Control Room.

The guidance presented below identifies elements reviewers should consider in determining acceptability of P-STG.

3.2 General Technical Objectives

The purpose of the review of the technical guidelines submittal is to determine that the following general objectives are adequately addressed. A listing of specific evaluation elements are identified in Subsections 3.3 and 3.4.

3.2.1 The EOPs will be based on acceptable technical guidelines derived from approved analyses of transients and accidents as described in NUREG-0660, Item I.C.1 and I.C.9, as clarified by NUREG-0737 and Supplement 1 to it, Item I.C.1. The P-STG along with the generic guidelines (if referenced) and supporting documentation provide EOP writers with all the technical information necessary for preparing EOPs which direct operators' actions to mitigate the consequences of transients and accidents without a need to first diagnose an event to maintain the plant in a safe condition (function orientation).

Part of the acceptability of the P-STG is that the P-STG are validated by the applicant using methods acceptable to the reviewer (see NUREG-0899, Sections 2.6 and 4.2).

3.2.2 The PGP describes an adequate method to identify information and control needs to be used as a basis for identifying control room instrumentation and controls necessary to perform the tasks specified in the technical guidelines.

3.3 Specific Review Guidelines - Plants Using NRC Approved Generic Technical Guidelines

To determine that the applicant's PGP adequately accomplishes the above objectives, the reviewer should consider the following:

3.3.1 P-STG Development

3.3.1.1 Approved version of generic technical guidelines indicated.

3.3.1.2 A description of the process used to translate the generic technical guidelines into the P-STG.

3.3.2 Deviations and Additions

3.3.2.1 Identification of safety significant deviations from the NRC approved generic technical guidelines. Examples of deviations that should be considered are as follows:

a. any modification to the mitigative strategy of the generic technical guidelines (e.g., for a Westinghouse plant, initial depressurizing the RCS following a steam generator tube rupture without first having conducted a limited cooldown in accordance with the guidelines to establish a margin to saturation).

b. differences in equipment operating criteria (e.g., RCP trip criteria, SI injection termination criteria).

c. differences in equipment operating characteristics (i.e., between the plant-specific equipment and that assumed in the generic analyses, such as SI that can be throttled vs. only on/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 the manner other than specified in the generic technical guidelines.

NOTE: Plant-specific setpoints (e.g., setpoints associated with automatic initiation of ECCS) called for by the generic guidelines need not be included in the P-STG submittal.

f. actions that are taken in addition to those specified in the generic guidelines and that affect the mitigative strategy.

1. differences that affect the equipment's ability to adequately provide the necessary mitigative function.

2. use of different instruments or control parameters than those specified in the generic technical guidelines or determining instrumentation and control characteristics in a manner different than, or with a different basis than, that specified in the generic technical guidelines.

3.3.2.2 Identification of items not covered by the NRC approved generic technical guidelines (e.g., plant specific conditions, equipment, operations, or bracketed [ ] information from the generic technical guidelines that relate to systems, functions or methods).

3.3.2.3 Indication that the safety significant deviations and additions have been identified and technically justified.

NOTE: The reviewer has the option of either reviewing the complete P-STG with associated technical justification, or reviewing only the identified deviations from generic technical guidelines, including technical justification consistent with the Generic Letter 82-33 requirements.

3.3.3 Technical Adequacy of Operator Actions (not covered by, or deviations from, the generic technical guidelines)

NOTE: The evaluation of the technical adequacy of operator actions (i.e., that the procedures will work) may be addressed in the validation/verification sections of the PGP (i.e., at the completion of EOP development rather than during EOP development). The P-STG portion of the PGP should describe how the licensee will determine if the approach taken is effective in mitigating transients and accidents.

3.3.3.1 Description of the validation/verification of operator actions (to determine their technical adequacy)

3.3.4 Applicant's determination of the Need For and the Adequacy of Control Room Instrumentation and Controls for Emergency Operations

3.3.4.1 Description of the method used to determine information and control needs of the operators (function and task analysis)

NOTE: The determination of the adequacy of control instrumentation and controls may be addressed in the validation/verification sections of the PGP (i.e., at the conclusion of EOP development rather than during EOP development). For the P-STGs, adequacy of control room instrumentation and controls means that the available instrumentation and controls have been evaluated against the information and control needs of the operators and it has been determined that the parameters are correct and that the instrument and control characteristics (e.g., instrument range, units, precision, rate and setpoints; control type, function, rate, gain and response) meets the needs identified. This may be in the PGP or the section of the FSAR addressed by SRP Section 18.1.

3.3.4.2 Description of the method used to determine if the control room instrumentation and controls meet the information and control needs of the operators.

3.4 Specific Review Guidelines - Plants Not Using Generic Guidelines

The review of the P-STGs for plants not referencing generic guidelines will be performed using a methodology similar to that used to evaluate the acceptability

of the owner's group guidelines. The reviewer should evaluate analyses submitted to support proposed accident recovery strategies. When necessary, the reviewer should request DSI (or other cognizant division) to evaluate analytical models. Improvements in accident recovery techniques should be encouraged; however, in the review of alternate strategies the reviewer should obtain from the applicant sufficient technical bases to demonstrate that the plant remains within its FSAR licensing basis envelope (for licensing basis events).

The reviewer evaluates the effects of and resulting recovery strategies for transients and accidents, using the guidance available in NUREG-0737. The P-STG reviewer should consider the following:

3.4.1 Analysis of transients and accidents (consistent with requirements of NUREG-0660 and NUREG-0737).

NOTE: The steps to be taken for this review are contained in the Review Procedures, SRP Section 13.5.2.

3.4.2 Validation of Technical Adequacy of Operator Actions

NOTE: The evaluation of the technical adequacy of operator actions (i.e., that the procedures will work) may be addressed in the validation/verification sections of the PGP (i.e., at the completion of EOP development rather than after P-STG development). The P-STG portion of the PCP should describe how the applicant will determine if the approach taken is effective in mitigating transient and accidents.

3.4.2.1 Description of the validation/verification of operator actions

3.4.3 Determination of the need for and the adequacy of Control Room Instrumentation and Controls for emergency operation

3.4.3.1 Description of the method used to determine information and control needs of the operators

NOTE: The determination of the adequacy of control room instrumentation and controls may be addressed in the validation/verification sections of the PGP (i.e., at the conclusion of EOP development rather than after P-STG development) or in the part of the FSAR addressed by SRP Section 18.1, Control Room. For the P-STGs, adquacy of control room instrumentation and controls means that the available instrumentation and controls have been evaluated against the information and control needs of the operators and it has been determined that the parameters are correct and that the instrument and control characteristics (e.g., instrument range, units, precision, rate and setpoints; control type, function, rate, gain and response) meet the needs identified.

3.4.3.2 Description of the method used to determine if the control room instrumentation and controls meet the information and control needs of the operators

4.0 Writer's Guide (Plant Specific) Review

4.1 General Discussion

Applicants are required to submit a writer's guide that details the specific methods to be used in preparing EOPs which are based on the P-STGs. NUREG-0899 provides objectives and intent for the writer's guide. Because of the variety of available technical writing style guides and other references pertaining to the presentation of information, the specific information found in the writer's guide is expected to vary considerably among plants. To supplement the human factors expertise of the reviewer, review guidelines are provided that address instructions and guidance expected to be found in writer's guides. In addition, the writer's guide should contain general, philosophical standards and information which would assist the writers in preparing the EOPs.

4.2 General Writer's Guide Objectives

The purpose of the evaluation is to determine if acceptable methods are described for accomplishing the following general objectives.

4.2.1 The writer's guide provides sufficient information for developing EOPs from the P-STG, which are useable, accurate, complete, readable, convenient to use, and acceptable to control room personnel.

4.2.2 The writer's guide supports upgrading of the procedures and long term consistency within and between procedures.

4.3 Specific Review Guidelines

NOTE: Following each element, the number in parentheses designates the specific section within NUREG-0899 where the element is addressed.

Asterisked items are those which may appear in a procedure at the discretion of the applicant. If they are used in the EOPs, they should be addressed in the writer's guide and considered in the review. Where a sample procedure is submitted as a part of the writer's guide, the reviewer should verify that any non-required element included in the procedure is addressed in the writer's guide.

To determine that the applicant's PGP includes methods which appear adequate to accomplish the above objectives, the reviewer should consider the following:

4.3.1 Organization, Content, and Format of Major Sections of the EOPs (5.5)

4.3.1.1 Cover page (5.4.1)

4.3.1.2 Table of contents* (5.4.2)

4.3.1.3 Scope statement (5.4.3)

4.3.1.4 Entry conditions (5.4.4)

4.3.1.5 Automatic actions* (5.4.5)

4.3.1.6 Content and Format of Operator Action Steps including (a) simple action steps, (b) steps which verify an action, (c) steps of continuous or periodic concern/applicability, (d) steps for which a number of alternative actions are equally acceptable, and (e) steps performed concurrently with other steps, and (f) steps which lead the operator to the appropriate subsection of the EOPs (5.4.6, 5.4.7, 5.7, 5.8).

4.3.1.7 Figures and tables* (5.4.8 and 5.5.8)

4.3.1.8 Flowcharts and decision aids* (5.4.8 and 5.5.9)

4.3.1.9 EOP page identifying information including title, procedure number, revision number and date, number of pages, unit designation (if applicable), facility designation, and location of identifying information in the EOP (5.5.1)

4.3.1.10 Page Layout including margins, line spacing, and steps complete on page (5.5.2)

4.3.1.11 Warnings (or Cautions) and Notes including placement, definitions, emphasis and format, and warnings (Cautions) and notes complete on one page (5.3, 5.7.9, 5.7.10)

4.3.1.12 Placekeeping aids (5.5.4)

4.3.1.13 Emphasis techniques (5.5.6)

4.3.1.14 Divisions, Headings and Numbering of Pages and Steps (5.5.5)

4.3.2 Writing Style (5.6)

4.3.2.1 A vocabulary list - words to use, their definition, and words to avoid (5.6.1)

4.3.2.2 A list of abbreviations, acronyms and symbols, and label consistency between procedures and control room (5.6.2)

4.3.2.3 Sentence structure and limit on actions per step (5.6.3)

4.3.2.4 Punctuation (5.6.4)

4.3.2.5 Capitalization (5.6.5)

4.3.2.6 Units of measure in the action steps and in the tables and figures should be consistent with presentation of information in the control room (5.6.6)

4.3.2.7 Numerals including type, use of decimals and significant digits (5.6.7)

4.3.2.8 Tolerances (5.6.8)

4.3.2.9 Formulas and calculations* (5.6.9)

4.3.2.10 Titles/nomenclature of instrumentation and controls (what information to provide in the procedure and in what format) (5.6.2)

4.3.3 Conditional and Logic Statements including format, style, emphasis; definition and use of logic terms; and logic terms and sequences to avoid (5.6.10 and Appendix B)

4.3.4 Referencing Other Procedures, Sections of Procedures or Subprocedures and Specific Steps Within a Procedure (5.2.2 and 5.5.7)

4.3.4.1 Content and format of reference (5.2.2)

4.3.4.2 The criteria used to determine when steps of a referenced procedure are to be included in an EOP (to minimize cross-referencing) (5.2.2)

4.3.4.3 Method for identifying sections or subsections (e.g., use of tabbing) (5.5.7 and 6.1.4)

4.3.5 When and how to present location Information (equipment, controls and displays) (5.7.11)

4.3.6 Control Room Staffing and Division of Responsibilities (5.8)

NOTE: This section addresses the need to consider operating crew staffing and responsibilities during the process of developing EOPs to help ensure efficient and effective implementation of EOPs during an emergency. Deficiencies in this regard may be identified by the applicant during validation/verification of the EOPs. Subsection items 4.3.6.1 through 4.3.6.4 may therefore be addressed under validation/verification.

4.3.6.1 Structuring of EOPs to ensure that minimum staffing can execute the EOPs

4.3.6.2 Designating the operators' responsibilities in implementing EOPs (i.e., each operator will know what they have to do during an emergency; it is not necessary to specify roles in PGP or EOPs)

4.3.6.3 Sequencing action steps to minimize physical interference between operators

4.3.6.4 Sequencing action steps to avoid their unintentional duplication by operators

4.3.7 Use and Maintenance of EOPs including accessibility and quality of copies (6.0)

4.3.8 Statement of commitment to use Writer's Guide in developing and revising the EOPs

5.0 Program for Validation/Verification

5.1 General Discussion

All applicants must submit a description of their programs for validating and verifying their EOPs. Because of the lack of a consistent and clearcut distinction between "validation" and "verification" within the nuclear industry, the staff has elected to bypass the semantic ambiguity by leaving their definition up to the individual applicants; only the desired outcomes are specified (independent of terminology). As a result, it is anticipated that there will be considerable variation in the nature of the submittals, particularly with regard to the guidelines addressed under each item below (if distinguished), and the amount of detail provided. Furthermore, both technical and human factors aspects of the EOPs are addressed by validation/verification activities, and submittals may integrate the two aspects under a given evaluation scheme. For these reasons reviewers will have to exercise considerable judgment in their review of the submittals. The evaluation elements for validation/verification were drawn from the six objectives identified in NUREG-0899 (subsection 3.3.5.1) which are repeated below. These objectives should serve as the general basis for determining the acceptability of the validation/verification programs reviewed.

5.2 General Objectives

The purpose of evaluating the validation/verification program is to ensure that the following general objectives are met. A listing of specific evluation elements is provided in Subsection 5.3.

5.2.1 EOPs are technically correct, i.e., they accurately reflect the technical guidelines

5.2.2 EOPs are written correctly, i.e., they accurately reflect the plant-specific writer's guide

5.2.3 EOPs are useable, i.e, they can be understood and followed without confusion, delays, errors, etc.

5.2.4 There is a correspondence between the procedures and the control room/plant hardware, i.e., controls, equipment, and indications that are referenced, are available (inside and outside of the control room), use the same designations, use the same units of measurement, and operate as specified in the procedures

5.2.5 The language and level of information presentation in the EOPs are compatible with the minimum number, qualifications, training and experience of the operating staff

5.2.6 There is a high level of assurance that the procedures will work, i.e., the procedures guide the operator in mitigating transients and accidents

5.3 Specific Validation/Verification Review Guidelines

To aid the reviewer in the evaluation of the validation/verification program, the reviewer should consider the following review guidelines:

5.3.1 Indication of the methods that will be used to meet each of the objectives (as specified in Subsection 5.2 above) of the validation/verification program; the specific combination of methods for meeting each objective should be identified by the applicant so that the reviewer has assurance that the objectives of the overall validation/verification program are met. In the staff's judgment, the following combination of methods should be used to meet each of the objectives:

5.3.1.1 Whether the EOPs are technically correct, (i.e., whether they accurately reflect the technical guidelines), is expected to be evaluated by a combination of the following methods: (a) desk-top review, (b) seminars, workshops, operating team review, and computer modeling/analysis.

5.3.1.2 Whether the EOPs are written correctly [i.e., whether they accurately reflect the (approved) plant-specific writer's guide], is expect to be evaluated by a combination of the following methods: (a) desk-top review, and (b) seminars, workshops, operating team review.

5.3.1.3 Whether there is a correspondence between the procedures and the control room/plant hardware, [i.e., controls, equipment, and indications that are referenced are available (inside and outside the control room), use the same designations, use the same units of measurement, and operate as specified in the procedures] is expected to be evaluated by a combination of the following methods: (a) seminars, workshops, operating team review, (b) control room walk-throughs (static), and (c) simulation (if plant-specific) (static).

5.3.1.4 Whether the EOPs are usable [i.e., they can be understood and followed without confusion, delays, errors, etc.] for the given level of qualifications, training, and experience of the control room staff, is expected to be evaluated by a combination of the following methods: (a) seminars, workshops, operating team review, (b) simulator exercises, and (c) control room walkthroughs (dynamic).

5.3.1.5 Whether the language and level of information presentation in the EOPs are compatible with the minimum control room staffing and the qualifications, training, and experience of the control room staff is expected to be evaluated by a combination of the following methods: (a) desk-top review,

(b) seminars, workshops, operating team review, (c) simulator exercises, and (d) control room walkthroughs (dynamic).

5.3.1.6 Whether there is a high level of assurance that the procedures will work [i.e., the procedures guide the operator in mitigating transients and accidents] is expected to be evaluated by a combination of the following methods: (a) desk-top review, (b) seminars, workshops, operating team review, (c) simulator exercises, and (d) control room walkthroughs (dynamic).

5.3.2 Indication that plant operators, subject matter experts, and procedures writers are involved

5.3.3 Identification of the roles played by the participants (i.e., how will operators, subject matter experts, etc., participate in the validation/verification process) (roles should be based on specific validation/verification objective being addressed)

5.3.4 Use of Scenarios

Indication that the full complement of EOPs are exercised, including multiple failures (simultaneous and sequential), and inclusion of criteria for selecting scenarios

NOTE: Where a generic simulator is used, and to some extent, where a plant reference simulator is used, it will not be possible to fully exercise all parts of the EOPs. In these instances, the PGP should describe the method that the licensee will use to ensure that the validation/verification program will cover areas missed in the simulator exercises. The following element is included to address this issue.

5.3.5 Indication that areas not covered by simulator exercises will undergo validation/verification

5.3.6 Description of the plan for correcting and revising EOPs as a result of the validation/verification and for feedback from simulator exercises, control room walkthrough, desk-top reviews, operating team reviews and operator training to address accuracy, readability, useability, and completeness of the EOPs

5.3.7 Statement of commitment to validate/verify revisions to EOPs, when appropriate, and the conditions under which revisions should be validated/verified

5.3.8 Description of the method by which multiple units will be handled in the validation/verification process to account for unit differences

NOTE: For multi-unit sites, the part of the validation/verification process involving control room walk-throughs and use of operators should be carried out for each unit of a multi-unit site to the extent that the units differ in terms of instrumentation, controls, equipment (including availability

of, design of, labeling of, or location of) or any other aspect that may impact plant safety.

5.3.9 Indication that the EOPs will be compatible with minimum control room staffing

5.3.10 Description of the plan by which adequacy (in terms of availability, readability and usability) of control room instrumentation and controls will be determined

5.3.11 Description of the plan by which correspondence between EOPs and control room instrumentation and controls will be determined

5.3.12 Where available instrumentation and controls have <u>not</u> been evaluated against the information and control needs of the operators as a part of the P-STG (see Subsection 3.3.4.2 and 3.4.3.2), they should be evaluated as a part of the validation/verification program. The description of the validation/verification program should include the method that will be used to determine the adequacy of control room instrumentation and controls in meeting the information and control needs of the operators [i.e., it has been determined that the parameters are correct and that the instrument and control characteristics (e.g., accuracy, scaling, etc.) meet the needs identified].

NOTE: Since many aspects of validation/verification can be addressed during operator training, it is anticipated that applicants will combine these activities to make more efficient use of simulator time. Where validation/verification is tied to the EOP training program it is necessary for applicants to distinctly address validation/verification through a formal process which documents results and provides for feeding this information back into the EOP development process. The PGP should describe this process.

NOTE: Where EOPs are partially validated/verified on a generic simulator, licensees should commit to performing the dynamic portion of the validation/verification of the EOPs if a plant reference simulator becomes available.

6.0 <u>Program for Operator Training on EOPs</u>

6.1 General Discussion

Applicants are to submit descriptions of their planned programs for training operators on EOPs. The intent of reviewing the EOP training program is to ensure that operators will be trained prior to implementation of the EOPs, and that there is a reasonable assurance that the methods to be used in training are adequate. This determination can be made by verifying that the training program meets the general training objectives identified in Subsection 6.2. To determine that these general objectives are met, the reviewer should consider the specific review guidelines of Subsection 6.3.

6.2 General EOP Training Program Objectives

The purpose of the evaluation is to determine that the following general objectives are adequately addressed in the training program described by considering the specific review guidelines provided. These guidelines are not intended to represent all the necessary components of an adequate training program, but rather to serve as a basis for assuring the staff that the operators have been trained prior to EOP implementation and that they will be capable of using the EOPs.

6.2.1 Trainees should understand the philosophy behind the approach to the EOPs, i.e., their 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.

6.2.2 Trainees should understand the mitigation strategy and technical bases of the EOPs, i.e., the function and use of plant systems, subsystems, components, in mitigating transients and accidents.

6.2.3 Trainees should have a working knowledge of the technical content of the EOPs, i.e., they must understand and know how to perform each step in all EOPs to achieve EOP objectives.

6.2.4 Trainees should be capable of executing the EOPs)as indivduals and teams) under operational conditions, i.e., they must be able to carry out an EOP successfully during transients and accidents.

6.3 Specific EOP Training Review Guidelines

The reviewer should consider the following specific review guidelines in evaluating the description of the EOP training program:

6.3.1 Inclusion of training objectives consistent with Subsection 6.2 above

6.3.2 Use of Simulator Exercises

6.3.2.1 Specification of plant-specific or generic simulation

6.3.2.2 Indication that all EOPs will be exercised by all operators

NOTE: Where a generic simulator is used, and to some extent, where a plant reference simulator is used, it will not be possible to fully exercise all parts of the EOPs. In these instances, the PGP should describe the method that the applicant will use to ensure that the validation/verification program will cover areas missed in the simulator exercises. The following element is included to address this issue.

6.3.2.3 A description of the method for training in areas not covered by simulator exercises

6.3.2.4 Indication of planned operator roles and team work

6.3.2.5 Indication of the use of a wide variety of scenarios (i.e., incorporating multiple, simultaneous and sequential, failures)

6.3.3 Use of Control Room Walk-through

6.3.3.1 Indication of walk-through of all EOPs by all operators

6.3.3.2 Indication of planned operator roles and team work

6.3.3.3 Indication of use of a wide variety of scenarios (i.e., incorporating multiple failures, simultaneous and sequential)

6.3.4 Use of lectures, discussion sessions, and seminars

6.4 Indication that operators will be trained prior to implementation of EOPs

6.5 Indication that operators will be evaluated as part of the training program