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Mr. J. T. Beckham, Jr.  
Vice President - Nuclear Generation  
Georgia Power Company  
P. O. Box 4545  
Atlanta, Georgia 30302

Dear Mr. Beckham:

We have reviewed the Hatch Procedures Generation Package (PGP) for Emergency Operation Procedures (EOP's) submitted by your letter of May 1, 1984.

Our review of your PGP is being conducted in accordance with Generic Letter 82-33, Supplement 1 to NUREG-0737. NRC approval of the PGP is not necessary for operating reactors prior to implementing upgraded EOPs. Criteria for this review are not currently in the Standard Review Plan (SRP). Therefore, this review was based on NUREG-0899, "Guidelines for the Preparation of Emergency Operating Procedures," the reference document for the EOP upgrade portion of Supplement 1 to NUREG-0737 (Generic Letter 82-33).

Section 2 of the enclosed draft Safety Evaluation identifies items that must be addressed and additional information that must be provided in order for us to complete our review of the PGP. You are requested to revise the PGP to address the identified items and additional information and resubmit it within 90 days of receipt of this letter.

This request for additional information was approved by the Office of Management and Budget under clearance number 3150-0011 which expires June 30, 1985. Comments on burden and duplication may be directed to the Office of Management and Budget, Reports Management Room 3208, New Executive Office Building, Washington, D. C. 20503.

Sincerely,

\*ORIGINAL SIGNED BY  
JOHN F. STOLZ\*

John F. Stolz, Chief  
Operating Reactors Branch #4  
Division of Licensing

Enclosure:  
Draft Safety Evaluation

cc w/enclosure:  
See next page

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DRAFT SAFETY EVALUATION REPORT  
PROCEDURES GENERATION PACKAGE  
HATCH NUCLEAR PLANT UNITS 1/2

1. INTRODUCTION

Following the Three Mile Island (TMI) nuclear accident, the Office of Nuclear Reactor Regulation developed the "TMI Action Plan" (NUREG-0660 and NUREG-0737), which required licensees of operating reactors to reanalyze transients and accidents and upgrade emergency operating procedures (EOPs) (Item I.C.1). The plan also required the NRC staff to develop a long-term plan that integrated and expanded efforts in the writing, reviewing, and monitoring of plant procedures (Item I.C.9). NUREG-0899, "Guidelines for Preparation of Emergency Operating Procedures," represents the staff's long-term program for upgrading EOPs, and describes the use of a "Procedures Generation Package" (PGP) to prepare EOPs. Submittal of the PGP was made a requirement by "Supplement 1 to NUREG-0737 - Requirements for Emergency Response Capability (Generic Letter 82-33)." The Generic Letter requires each licensee to submit to the NRC a PGP which includes:

- (i) Plant-Specific Technical Guidelines
- (ii) A Writer's Guide
- (iii) A description of the program to be used for the validation of EOPs.
- (iv) A description of the training program for the upgraded EOPs.

This report describes the review of Georgia Power Company's (GPC's) response to the Generic Letter related to development and implementation of EOPs for the Hatch Nuclear Plant, Units 1 and 2 (HNP) (Section 7 of Generic Letter 82-33).

Our review was conducted to determine the adequacy of GPC's program for preparing and implementing upgraded EOPs. Criteria for the review of a PGP are not currently in the Standard Review Plan (SRP). Therefore, this review was based on NUREG-0899, the reference document for the EOP upgrade portion of Supplement 1 to NUREG-0737 (Generic Letter 82-33). Review criteria based on this guidance will be developed for the next SRP revision. Section 2 of this report briefly discusses the licensee's submittal, the staff review, and the acceptability of the submittal. Section 3 contains the conclusions of this review.

As indicated in the following sections, our review determined that the procedures generation program for HNP is acceptable with the exception of the items described in Section 2 of this report. GPC should address these items in a revision to the PGP or justify why such revisions are not necessary. Our review of GPC's response to these items will be included in a subsequent safety evaluation report (SER). The revision of the PGP, and subsequently of the EOPs, should not impact the schedule for the use of the EOPs. These revisions should be made in accordance with the licensee's administrative procedures and 10 CFR 50.59.

## 2. EVALUATION AND FINDINGS

In a letter dated May 1, 1984, from L. T. Gucwa (GPC) to the Director of Nuclear Reactor Regulation (NRC) Attention: John F. Stolz, GPC submitted its PGP. The PGP contained the following:

EOP Implementation Plan for Emergency Response Capability, which includes:

- o EOP Verification Program
- o EOP Validation Program
- o EOP Training Program

and the following attachments:

Plant-Specific Emergency Procedure Guidelines - Units 1 and 2

Plant-Specific Writer's Guide

A discussion of the PGP, with the Verification Program and Validation Program comments combined, follows:

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

The P-STG program description was reviewed to determine if it provided acceptable methods to meet the objectives of NUREG-0899. GPC described a process that will take the General Electric Boiling Water Reactor Owners Group Emergency Procedure Guidelines (EPGs) for GE-BWR 1 through 6 designs (Rev. 3) and with appropriate changes, develop P-STGs for HNP. The licensee identified the following plant-specific technical and source documents for use in generating GPC's EOPs:

- o GE-BWR Owners Group EPGs, Revision 3
- o HNP Procedure series 1000, 1100-1700, 1900 and 2000
- o EOPIA Review Group elements (INP082-013)
- o NUREG-0899
- o Supplement 1 to NUREG-0737.

GPC stated that the P-STG will be identical to the generic EPGs except that HNP specific data will be used in the various limits,

tables, and graphs. References to systems not found at HNP will be deleted. Except for the items listed below, the process described for converting the generic guidelines into EOPs appears adequate. Our review of HNP's P-STG identified the following concerns:

1. Deviations from and additions to the generic guidelines that are of safety significance must be identified in the P-STG. In addition, analyses or other technical justification supporting these deviations and additions must be provided for both Units 1 and 2.
2. Any additions to or deviations from the generic guidelines should be verified/validated. This verification/validation step can be accomplished separately or as a part of the EOP verification/validation program. The PGP should discuss how the additions and deviations are to be verified/validated.
3. A meeting was held between the staff (NRC) and the Boiling Water Reactor Owners Group Emergency Procedure Guidelines and Control Room Design Review (CRDR) Committees on May 4, 1984, to discuss the task analysis requirements of Supplement 1 to NUREG-0737 (Generic Letter 82-33). The summary of the meeting is contained in an NRC memorandum from S. H. Weiss to Voss A. Moore dated May 14, 1984. At the meeting, the owners group EPG committee made a presentation on the background of the EPG program, as it relates to the issue of the technical bases and scope of the EPGs. The owners group CRDR committee provided a discussion of the CRDR program as it related to task analysis. Based on the presentations, the staff commented that it appears that Revision 3 of the EPG provides a functional analysis that identifies, on a high level, generic information and control needs. As a result of the above meeting, the staff had made the following additional comments that should be acted upon by GPC and submitted as part of the PGP.

- a. GPC should explicitly identify the plant-specific information and control needs, which are necessary for preparing EOPs and determining the adequacy of existing instrumentation and controls. Because detailed plant-specific information and control needs cannot be extracted directly from the EPGs, plant-specific analysis is required.
- b. GPC must describe the process used to identify plant-specific parameters and other plant-specific information and control capability needs and must describe how the characteristics of needed instruments and controls will be determined. These processes may be described in either the PGP or the DCRDR Program Plan with appropriate cross-referencing.
- c. For each instrument and control used to implement the EOPs, there should be an auditable record of how the needed characteristics of the instrument and controls were determined. These needed characteristics should be derived from the information and control needs identified in NRC-approved EPGs and from analysis of plant-specific information.

With adequate resolution of the above items, GPC's P-STG program should meet the objectives of NUREG-0899 and should provide adequate guidance for translating the generic guidelines into HNP's P-STGs. The staff will confirm that GPC adequately addresses these items and will report its review in a subsequent SER.

B. Plant-Specific Writer's Guide (writer's guide)

The writer's guide was reviewed to determine if it provided acceptable methods to meet the objectives of NUREG-0899. The licensee described a process that will use the technical guidelines and writer's guide to develop the EOPs. The writer's guide provides

detailed instructions on how to prepare text and visual aids for EOPs. The writer's guide addresses many aspects of writing procedures from a human factors standpoint. The EOPs will consist of Flow Charts, Cover Procedures, and End Path Manuals. Flow Charts consist of decision tree action paths depicted graphically. The Cover Procedures contain the objective and introduction to the Flow Charts and describe how the Flow Charts are to be used by plant operators. The End Path Manuals include subsequent action steps that an operator takes to return the plant to a normal steady state condition or to provide for a safe shutdown. Our review of the writer's guide identified the following concerns relative to the Flow Charts, Cover Procedures, and End Path Manuals:

1. It is unclear how the flow charts, discussed in Section 8.2, or the end-path manuals, discussed in Section 8.3, are derived from the P-STG. The writer's guide should be revised to include all the necessary information and guidance for translating the P-STGs into EOPs (e.g., what actions steps identified in the P-STG will be included in the flow charts and which ones will be included in the end-path manual).
2. The following items of concern related to flow charts were identified:
  - a. The cover procedures are to contain general cautions, an introduction to the flow chart methodology, an explanation of how the flow charts tie to the end-path-manuals, and an overall method of how to use the flow charts with the end-path-manual. However, the cover procedure is to be attached to the end-path-manual and will not be available to the operator until the plant is through the emergency and they are ready to exit the flow charts. The writer's guide should be revised to clarify how the information in the cover procedures can be available to the operator early in an emergency.

- b. Section 8.2, which is the section that addresses flow charts, should be expanded to include the following:
    - 1. If written material is to be in capital letters, as shown in the example on page 63, then instructions to this effect should be provided in Section 8.2.
    - 2. If cautions are to be highlighted with asterisks, as shown in the example on page 63, then instructions to this effect should be provided in Section 8.2.
  - c. To ensure that the EOPs are easily accessible in an emergency, the accessibility and availability of the flow charts should be addressed in the writer's guide.
  - d. To ensure the legibility of reduced copies of the flow charts, the minimum size for symbols, lines, and type should be specified in the writer's guide.
  - e. Several reproduction methods for flow charts are discussed in Subsection 8.2.19, on page 22 of 70. This subsection should be revised to specify that any flow charts intended for use by the operators in an emergency must be of the same quality as a legible original. The same color coding, as specified in Subsection 8.2.21 on page 22 of 70, must be preserved.
3. Action steps need to be written for a variety of situations. The writer's guide should address the formatting for the following types of action steps for both the flow charts and end-path-manuals:

- a. Steps used to verify whether the objective of a task or sequence of actions has been achieved.
- b. Steps which are repeatedly performed.
- c. Steps for which a number of alternative actions are equally acceptable.
- d. Steps performed concurrently with other steps.

See NUREG-0899, Section 5.7, for additional guidance.

4. The manner in which the text is organized and divided should be evident through the use of headings and a numbering system. Several sections of the end-path-manuals are described in Subsection 8.1.6.3, on page 13 of 70. However, the following additional information should be provided:
  - a. The intended sequencing of the sections listed in Subsection 8.1.6.3 should be stated and should include a description of the content and format of headings and an example.
  - b. A method to permit rapid access to the various sections should be specified.
5. Subsection 8.3.10.8, on page 56 of 70, states that reverse page printing may be used to keep certain curves associated with the procedural text in the same area of view. This subsection should be revised to include guidance on the location of curves and tables that will not be placed on the reverse page.

6. Since copies of the end-path-manuals should be complete (contain all of the information from the original) and legible, the criteria regarding completeness and legibility of the reproduced copies should be addressed in the writer's guide.
7. The following errors or inconsistencies were identified:
  - a. The verification step number 3.0, in Attachment 7, directs the operators to verify that all control rods are fully inserted, whereas the contingency step specifies an action only if two or more rods are not fully inserted. No guidance is given for the situation in which only one control rod is not fully inserted. This discrepancy should be corrected.
  - b. The place-keeping aids that are specified in Subsection 8.3.6.3, on page 30 of 70, are not included in the example in Attachment 7. This discrepancy should be corrected.
  - c. The logic terms that are used in the flow chart example in Attachment 4 and the example in Subsection 8.2.12, on page 20 of 70, are not underlined for emphasis as specified in Subsection 8.3.7.4.1, on page 45 of 70. The examples should be corrected.
  - d. The guidance on when to list conditions or objects of action words differs between Subsection 8.3.6.9.4, on page 35 of 70, and 8.3.7.4.4, on page 45 of 70. This difference should be corrected.
  - e. The "GO TO PATH 3" action step at the bottom right of path 1 (Attachment 4) should be a PATH TO PATH arrow.

- f. The entry point, "ANY SCRAM," into the Flow Path 1 (Attachment 4) at the bottom right appears to be in error and should be removed.
- g. The example Caution in Attachment 7 is not consistent with the guidance provided for Cautions in Subsection 8.3.6.5.2, and the information in the example should be a Note not a Caution. These errors should be corrected.

8. For consistency and clarity:

- a. The sample list of acceptable verbs and definitions (Attachment 8) should be finalized to include all acceptable terms.
- b. The list, from (a) above, should be expanded to include words to avoid (e.g., frequently, quickly, slowly).
- c. Abbreviations, symbols, and acronyms are discussed in Subsection 8.3.6.12, on page 38 and 39 of 70. To ensure that abbreviations, symbols, and acronyms are recognizable by the operators, an acceptable list of these items should be included in the writer's guide.
- d. Two types of page format, for the end-path-manual, are discussed in Subsection 8.3.6.2, on page 29 of 70. However, a single format should be specified so multiple writers will produce consistent procedures.
- e. Encouraging variations in the writer's guide can lead to procedures that are inconsistent and may be confusing to the operators, therefore Section 8.6, on page 57 of 70, should be deleted.

- f. Unit identification is specified for the flow charts in Subsection 8.2.3, on page 17 of 70. Similar guidance should be specified for the end-path-manuals.
9. The numbering of instructional steps is discussed in Subsection 8.3.6.3, on page 30 of 70. This subsection should be revised to address the following items:
- a. Substep numbering down to the level of 1.1.1.1.1 may be greater than can adequately handled in the dual column format. Consideration should be given to limiting the substeps to the 1.1.1 level.
  - b. The step numbering in Attachment 7 uses the format 1.a, for substeps, rather than 1.1 format specified in Subsection 8.3.6.3. The example should be changed to be consistent with system specified.
  - c. Guidance should be provided, in the text, on the numbering of the contingency steps.

With adequate resolution of the above items, the writer's guide for HNP should meet the requirements of NUREG-0899 and should provide adequate guidance for translating the P-STGs into EOPs that will be useable, accurate, complete, readable, convenient to use, and acceptable to control room operators. The staff will confirm that GPC adequately addresses these items and will report its review in a subsequent SER.

#### C. EOP Verification/Validation

The verification and validation program portions of the EOP Implementation Plan for Emergency Response Capability Project were

reviewed to determine if they met the objectives of NUREG-0899. The objectives of the verification program are: (1) to ensure that the EOPs are technically correct (they accurately reflect the P-STG), (2) to ensure that the EOPs have been written correctly (they accurately reflect the writer's guide), and (3) that the controls and instrumentation called out in the EOPs actually exist and that verbatim nomenclature has been used. The objectives of the validation program are: (1) to ensure that the language and level of information presented in the EOPs are compatible with the qualifications, training, and experience of the operating staff, and (2) that there is a high level of assurance that the procedures will guide the operator in mitigating transients and accidents. Our review of the verification and validation programs identified the following concerns:

1. In Section 3.6, on pages 15 and 16 of the Implementation Plan, GPC states that "EOP verification (validation) will be performed in accordance with Supplement 1 of NUREG-0737, NUREG-0899 and INPO guidelines as they apply." Since this is the plan of what will be done, the Implementation Plan should be revised to describe the specific methods that will be used to verify and validate the EOPs.
2. GPC states in Sections 3.6 and 3.7, on page 15 and 16 of the Implementation Plan, that only STAs will perform the verification and that only control room operators and STAs will be involved in validation process. To provide adequate evaluation of the EOPs, it is important that a team of experts be used in the verification/validation of the procedures. The verification/validation program should be expanded to include the criteria for selection of the team and to clearly identify their roles and responsibilities. As a minimum, the team should include technical writers and subject matter experts in addition to the operators and personnel specified.

3. In Section 3.7, on page 16, GPC states that "multiple-event scenarios" will be used to exercise the EOPs. This section should be expanded to state that multiple (simultaneous and sequential) failures shall be used to validate the EOPs.
4. The validation program should include a description of the criteria that will be used to select the scenarios to be run during the validation process. The criteria should be developed on the basis of what is needed to validate the procedures. Then, a review of the capabilities and the limitations of the simulator will identify what parts of the EOPs can be validated on the simulator. For those parts of the EOPs that cannot be validated on the simulator, the criteria for selecting additional validation that may be needed and the methods to be used, such as a control room walkthrough, should be described.
5. The use of the verification/validation process for revisions should be discussed in the Implementation Plan. This should include the criteria to determine when verification/validation is required.
6. A description should be provided of the method by which multiple units will be handled in the verification/validation process to account for unit differences, if the differences are significant.

With adequate resolution of the above items, GPC's verification/validation programs should meet the objectives of NUREG-0899 and should provide assurance that the EOPs adequately incorporate the guidance of the writer's guide and the P-STG, and will guide the operator in mitigating emergency situations. The staff will confirm that GPC adequately addresses these items and will report its review in a subsequent SER.

D. EOP Training Program

GPC's description of its plan for training operators on the EOPs was reviewed to determine if adequate methods are described to meet the objectives of NUREG-0899. The objectives of the training course are to ensure that the operators are able to: (1) explain the background that led up to the new EOPs, (2) demonstrate an acceptable level of skill in the use of the new EOPs, and (3) understand the basis for and be able to use the various new graphs and limits in the new EOPs. The training program will consist of self-study, classroom work, and simulator training on the plant-reference simulator. Our review of GPC's training program for EOPs identified the following concerns:

1. The training program description should indicate that all EOPs will be exercised by each operator.
2. The training program description should state that the objectives of Section 3.2 (Crew and Shift Policy Characteristics) of the Implementation Plan will be included in the training program.
3. GPC states in Section 3.7, on page 16 of 29 of the Implementation Plan, that validation will be performed in parallel with operator training. If major changes are made in the EOPs as a result of the training feedback, the training program should include a description of how GPC will ensure that the needed retraining will be controlled and performed.
4. GPC indicates, in Subsection 3.8.8 on page 26 of 29, that single and multiple events will be used during simulator training. This should be revised to state that the multiple events will include simultaneous and sequential failures.

With adequate resolution of the above items, GPC's training program should meet the objectives of NUREG-0899 and should provide assurance that the operators are adequately trained on the EOPs prior to implementation. The staff will confirm that GPC adequately addresses these items and will report its review in a subsequent SER.

3. CONCLUSIONS

Based on our review, we conclude that when the exceptions noted in Section 2 of this DSER are adequately resolved, GPC's PGP for the HNP will meet the requirements of Supplement 1 to NUREG-0737 and will provide acceptable methods for accomplishing the objectives of NUREG-0899. The PGP should be revised to address the items described in Section 2 and resubmitted.

This evaluation was performed with the assistance of Battelle Pacific Northwest Laboratories' personnel.