

Docket Nos. 50-317
and 50-318

August 7, 1985

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Mr. A. E. Lundvall, Jr.
Vice President - Supply
Baltimore Gas & Electric Company
P. O. Box 1475
Baltimore, Maryland 21203

Dear Mr. Lundvall:

We are presently reviewing the Calvert Cliffs Units 1 and 2 Procedures Generation Package (PGP) submitted by your letter dated March 14, 1984. The PGP, as specified in Generic Letter 82-33, consists of: (1) Plant-Specific Technical Guidelines, (2) Plant-Specific Writer's Guide, (3) Description of the Validation/Verification Program for EOPs, and (4) Description of the Training Program for Upgraded EOPs.

In the course of conducting our review of the PGP, we have found it necessary to request additional information. Accordingly, please respond to the enclosed questions within 60 days following receipt of this letter.

The reporting and/or recordkeeping requirements contained in this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P.L. 96-511.

Sincerely,

Edward J. Butcher, Acting Chief
Operating Reactors Branch No. 3
Division of Licensing

Enclosure:
As stated

cc w/enclosure:

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Mr. A. E. Lundvall, Jr.
Baltimore Gas & Electric Company

Calvert Cliffs Nuclear Power Plant

cc:

Mr. William T. Bowen, President
Calvert County Board of
Commissioners
Prince Frederick, Maryland 20768

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
Office of Executive Director
for Operations
631 Park Avenue
King of Prussia, Pennsylvania 19406

D. A. Brune, Esq.
General Counsel
Baltimore Gas and Electric Company
P. O. Box 1475
Baltimore, Maryland 21203

Mr. Charles B. Brinkman
Manager - Washington Nuclear Operations
Combustion Engineering, Inc.
7910 Woodmont Avenue
Bethesda, Maryland 20814

George F. Trowbridge, Esq.
Shaw, Pittman, Potts and Trowbridge
1800 M Street, NW
Washington, DC 20036

Mr. J. A. Tiernan, Manager
Nuclear Power Department
Calvert Cliffs Nuclear Power Plant
Maryland Routes 2 and 4
Lusby, Maryland 20657

Mr. R. C. L. Olson, Principal Engineer
Nuclear Licensing Analysis Unit
Baltimore Gas and Electric Company
Room 922 - G&E Building
P. O. Box 1475
Baltimore, Maryland 21203

Mr. R. E. Denton, General Supervisor
Training and Technical Services
Calvert Cliffs Nuclear Power Plant
Maryland Routes 2 and 4
Lusby, Maryland 20657

Resident Inspector
c/o U.S. Nuclear Regulatory Commission
P. O. Box 437
Lusby, Maryland 20657

Combustion Engineering, Inc.
ATTN: Mr. R. R. Mills, Manager
Engineering Services
P. O. Box 500
Windsor, Connecticut 06095

Mr. Leon B. Russell
Plant Superintendent
Calvert Cliffs Nuclear Power Plant
Maryland Routes 2 and 4
Lusby, Maryland 20657

Department of Natural Resources
Energy Administration, Power Plant
Siting Program
ATTN: Mr. T. Magette
Tawes State Office Building
Annapolis, Maryland 21204

Bechtel Power Corporation
ATTN: Mr. J. C. Ventura
Calvert Cliffs Project Engineer
15740 Shady Grove Road
Gaithersburg, Maryland 20760

Mr. R. M. Douglass, Manager
Quality Assurance Department
Baltimore Gas and Electric Company
Fort Smallwood Road Complex
P. O. Box 1475
Baltimore, Maryland 21203

Request for Additional Information
Procedures Generation Package (PGP)
Calvert Cliffs Units 1 and 2

A. Translation of Emergency Guidelines to Plant-Specific Emergency Operating Procedures (Plant-Specific Technical Guidelines - P-STG).

The P-STG program description was reviewed to determine if it provided acceptable methods to meet the objectives of NUREG-0899. The P-STG includes a discussion of the process of how the licensee plans to develop the EOPs from the generic technical guidelines (CEN-152). BG&E described a process where the source material listed in the writer's guide will be used to establish plant-specific entry conditions, precautions, immediate actions, recovery actions, and exit conditions (where appropriate) for each procedure. This plant-specific information is to be compared with the generic guidelines and any deviations are to be formally documented. Engineering analysis will be done as required. When a deviation is substantiated it will be incorporated into the plant-specific procedure. Our review of the Calvert Cliffs P-STG identified the following concerns:

1. Additional discussion and an outline of this process was included as Attachment 1 to a letter dated August 3, 1984, from Arthur E. Lundvall, Jr. (BG&E) to the Director of Nuclear Reactor Regulation (Attention: J. R. Miller). As indicated in this letter, a meeting was held on July 16, 1984, between representatives of the NRC and BG&E. It was agreed that: (a) deviations from the generic guidelines will be identified while writing the procedure drafts, (b) BG&E will submit information to the NRC and review any deviations that they determine to be safety-significant, (c) this submittal will include a description of the engineering assessment performed to support each deviation, and (d) this submittal will be made at least three months prior to the commencement of formal operator training on the affected procedures.
2. Any safety-significant additions or deviations identified during the drafting of the EOPs will need to be verified/validated. This verification/validation step can be accomplished separately or as part of the EOP verification/validation program. The PGP should include a discussion of how the licensee plans to verify/validate the additions and deviations.
3. A meeting was held between the staff and the Combustion Engineering Owners Group-Operations Subcommittee on August 29, 1984, to discuss the task analysis requirements of Supplement 1 to NUREG-0737 (Generic Letter 82-33). A summary of the meeting is contained in an NRC memorandum from H. Brent Clayton to Dennis L. Ziemann, dated September 7, 1984. At the meeting, the owners group presented an overview of the generic guidelines and their development and documentation. The processes used to determine operator information and control needs and instrumentation and control requirements were discussed in detail. Based on the owners group presentation and the ensuing discussion, the staff concluded that the basic parameters and control functions are identified in the generic guidelines. As a result of the above meeting, the staff has made the following additional comments that should be acted upon by BG&E and submitted as part of the PGP.

- a. The generic guidelines do not explicitly identify the information and control needs beyond the safety function level which are necessary for preparing EOPs and determining the adequacy of existing instrumentation and controls. Because these information and control needs are not included in the generic guidelines, further analysis and documentation is required. This analysis and documentation can be done by BG&E, or part of it can be done generically, if desired.
- b. BG&E should describe the process used to identify parameters and other information and control needs that are provided in, or are different from, those specified in the generic guidelines. The licensee should also describe how the characteristics of needed instruments and controls are determined. The processes for doing this may be described in either the PGP or the detailed control room design review documentation with appropriate cross-referencing. It should be noted that EOP steps frequently do not specify tasks to the specific operator action level. The task analysis should go to the level of actual operator actions that are required to perform the EOP steps, such that the information and control needs for each operator action or subtask are identified. For example, the EOP step, "start a reactor coolant pump," actually consists of several operator actions or subtasks.
- c. For each instrument and control used to perform the EOPs, there should be an auditable record that defines the necessary characteristics of the instrument or control and the bases for that determination. The necessary characteristics should be derived from analysis of the information and control needs where provided in the generic guidelines (or other generic information, if applicable) and from analysis of plant-specific information if not provided in, or different from, the generic guidelines or other generic information.

B. Emergency Operating Procedure 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. BG&E stated that the purpose of the writer's guide is to provide administrative guidance for the preparation and control of the EOPs and is to be used in conjunction with the EOP Verification/Validation plan and the EOP Training Plan to ensure technical correctness and operational correctness and validity of the EOPs. It is planned that the EOPs will consist of one function-oriented procedure and selected event-oriented procedures. Our review of BG&E's writer's guide identified the following concerns:

1. Information should be presented in procedures so that interruptions in the procedure's flow are minimal. To achieve this, each procedure should be written so that an action step is completed on the page where it began. This guidance should be included in the writer's guide.
2. Placekeeping aids can assist the operators in keeping track of their position within a procedure. They are of particular importance when performing concurrent steps or procedures and in situations where the user's attention may be diverted. The writer's guide should be revised to specify some type of placekeeping aid.
3. To minimize confusion, delay, and errors in execution of the EOP steps, the following concerns should be addressed in the writer's guide:
 - a. EOPs should be structured so that they can be executed by the minimum shift staffing and minimum control room staffing required by the facility's Technical Specifications.
 - b. Instructions for structuring the EOPs should be consistent with roles and responsibilities of the operators.
 - c. Action steps should be structured so as to minimize the movement of personnel around the control room while carrying out procedural steps.
 - d. Action steps should be structured to avoid unintentional duplication of tasks.

See NUREG-0899, Section 5.8, for additional guidance.
4. Action steps need to be written for a variety of situations. The writer's guide should address the format of the following types of action steps:
 - a. Verification steps which are used to determine 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.

5. It is important that an operator be able to quickly access the relevant EOPs or portions of the EOPs. The writer's guide should address the accessibility of the EOPs and their various parts and sections. See NUREG-0899, Subsection 6.1.4, for additional guidance.
6. Since copies of the EOPs should be complete (contain all of the information from the original) and legible, criteria regarding completeness and legibility of the reproduced copies should also be addressed in the writer's guide. See NUREG-0899, Subsection 6.2.2, for additional guidance.
7. The step numbering system discussed in Subsection D.3.a (page 23) of the writer's guide may require operators to review the EOP to obtain the entire step identifier, and does not provide the operators with a good perspective of where they are in relation to the entire document. The writer's guide should specify a numbering system that allows the operator to get this perspective without searching through the procedure. For example, substep "A" of step "I" would be written I.A. See NUREG-0899, Subsection 5.5.5, for additional guidance.
8. The following inconsistencies or errors in the writer's guide should be corrected:
 - a. Subsection 3.e (page 14) specifies that the antecedent phrase and the consequent phrase should be separated by a comma. Some of the examples in Subsections B.3.f and g (pages 14 and 15) are inconsistent with this guidance.
 - b. Subsection C.5.a (page 21) refers to abbreviations and acronyms listed in attachment (5). This should be changed to Attachment (4).
 - c. Subsection C.5.c (page 22) should be completed by listing the symbols in the sentence "Common mathematical symbols should be spelled out."
 - d. Subsection D.5.b (page 24) refers to "specified page margins" which are not specified elsewhere. Subsection D.1.c (page 22) specifies the page length, but not the margins. Page margins should be specified.

C. EOP Verification/Validation

The verification and validation program descriptions were reviewed to determine if adequate methods are described to meet the objectives of NUREG-0899. BG&E states that the objective of the verification program is to ensure the written correctness and technical adequacy of the EOPs. The guidelines provided in INPO 83-004 were to be used to accomplish that objective. The verification program includes both individual and group reviews. BG&E states that the objective of the validation program is to ensure the useability and operational correctness

of each EOP. The validation program uses the guidelines from INPO 83-006 to accomplish that objective. The validation program includes the following three phases: (1) step-by-step walkthrough on a control room mockup, (2) simulator performance (on a plant-reference simulator when it is available), and (3) feedback from actual performance of the EOPs. Our review of BG&E's verification and validation programs identified the following concerns:

1. The PGP should specify that step-by-step walkthroughs in the control room mockup will include scenarios that contain multiple (simultaneous and sequential) failures.
2. The portion of the validation program to be run on the plant-reference simulator should include a description of the criteria that will be used to select the scenarios. The criteria should be developed on the basis of what is needed to validate the full complement of procedures. The criteria should ensure that single, sequential and concurrent failures are included. A review of the capabilities and the limitations of the simulator will then identify what can be validated on the simulator. For the parts of the EOPs that cannot be validated on the simulator, the criteria for deciding if any additional validation is needed should be described in the PGP.
3. The documentation section (Section IV) of the verification/validation program states that the procedure writer will determine the proper corrective action for the comments made during the verification and validation process, and document the response. However, this section of the verification and validation program should also include the criteria or methods that will be used for determining the need to reverify and revalidate changes to the EOPs that result from this feedback system.
4. 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.
5. The validation/verification program must determine if the instruments and controls that were identified during the task analysis are the ones that are referred to in the EOPs, and are available in the control room. A discussion of this item should be included in the PGP. (This task may be done in conjunction with the Control Room Design Review.)
6. Although the participants for the validation program are identified in Section III.B (page 2), the individual responsibilities of the participants should be described in the PGP. For the verification program, both the participants and their responsibilities should be discussed. To ensure that the human factors aspects of the EOPs are adequately reviewed, the review team should be expanded to include a member trained in human factors.

D. Training Program

The licensee's description of the operators' training plan on the EOPs was reviewed to determine if adequate methods are described to meet the objectives of NUREG-0889. The training program as described in the PGP consists of classroom instruction (which consists of an overview of the revised procedures and discussions of the safety function concepts as they apply to the EOPs), simulator exercises (on a plant-reference simulator) and training on revisions to EOPs. Our review of BG&E's training program for EOPs identified the following concerns:

1. The PGP should state training objectives and describe how these objectives will be accomplished by the training program.
2. Without the use of a plant-reference simulator (not expected to be operational until after the new EOPs are implemented, as stated in Section III.B), the abbreviated training in the classroom is not adequate preparation for the use of a completely new set of procedures. The EOP Training Plan should be expanded to include either training on a generic simulator or to include control room or mockup walkthroughs prior to EOP implementation.
3. The criteria for scenario selection for the simulator exercise or the walkthroughs, required in (2) above, should be included. These scenarios should include multiple (simultaneous and sequential) failures to fully exercise the EOPs.
4. All operators must be trained on all EOPs before the EOPs are implemented. This should be explicitly stated in the training program description.
5. The discussion of the training program should be expanded to include a description of how the operators will be trained to use the EOPs as a team and that each operator is trained in the role that he would be expected to take in case of an actual emergency.