



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

November 7, 1979

Docket Nos.: 50-317, 318

Mr. A. E. Lundvall, Jr.
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Dear Mr. Lundvall:

We have reviewed the information provided by your letters dated April 26, May 8, June 5, and August 20, 1979 in response to IE Bulletin 79-06B for the Calvert Cliffs Nuclear Power Plant, Units 1 and 2. The enclosure provides our evaluation of your responses with respect to their specificity, completeness, and responsiveness to the intent of said bulletin. In this regard, we have found that you have taken the appropriate actions to meet the requirements of IE Bulletin 79-06B.

It should be noted that the staff review of the Three Mile Island, Unit No. 2 accident is continuing and other corrective actions may be required at a later date. For example, IE Bulletin 79-06C was issued on July 26, 1979 requiring new considerations for operation of the reactor coolant pumps following an accident. Our review of Combustion Engineering's response to Items 2 and 3 of Bulletin 79-06C (Report CEN-116-P) and your responses dated August 20 and 30, 1979, is continuing pending the submittal of the long-term actions required by the bulletin. In addition, new requirements may result from our generic review of procedures for operating C-E plants, our review of plant performance during feedwater incidents and small-break LOCAs, and from licensee's responses to the requirements delineated in NUREG-0578 and NUREG-0585.

Sincerely,

Morton B. Fairtilo for

Robert W. Reid, Chief
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Enclosure:
Evaluation of Licensee's Responses
to IE Bulletin 79-06B

cc w/enclosure: See next page

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EVALUATION OF LICENSEE'S RESPONSES TO IE BULLETIN 79-06B

BALTIMORE GAS AND ELECTRIC COMPANY

CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS NO. 1 & 2

DOCKET NOS: 50-317 & 318

Introduction

By letter dated April 14, 1979, we transmitted I&E Bulletin No. 79-06B to Baltimore Gas and Electric Company (BG&E or the licensee). This bulletin specified actions to be taken by the licensee to avoid occurrence of an event similar to that which occurred at Three Mile Island, Unit No. 2 (TMI-2) on March 28, 1979. By letters dated April 26 and May 8, 1979, BG&E provided their responses in conformance with the requirements of the bulletin for the Calvert Cliffs Nuclear Power Plant (CCNPP), Units No. 1 & 2. BG&E supplemented these responses by a letter dated June 5 and August 20, 1979 providing clarification and elaboration of certain of the items in response to our expressed concerns.

Our evaluation of these responses is given below.

Evaluation

In this evaluation, the paragraph numbers correspond to the bulletin action items and to the licensee's response to each action item.

1. BG&E states that all licensed operations personnel have been trained in the procedure changes made as a result of the TMI-2 accident. In addition, the requalification training lesson plans have been and will continue to be revised as a result of information from the accident.

BG&E has reserved simulator time at the Combustion Engineering (CE) simulator to be totally devoted to accident scenarios including small-break simulations. The briefing in regards to the TMI-2 accident was presented by the NRC staff team consisting of Office of Inspection and Enforcement (I&E) and Operator Licensing Branch (OLB) representatives on April 19, 1979. We find that the licensee has been responsive to the training requested by the reference bulletin.

2. BG&E states that procedures governing the routine operation of pressurizer pressure control, chemical and volume control system (CVCS) and degasification system were reviewed and found to be adequate. The plant emergency procedure for a loss of coolant accident (LOCA) has been revised and expanded to emphasize the recognition and prevention of void formation in the reactor coolant system (RCS) and the enhancement of core cooling subsequent to void formation should it occur.
 - 2.a BG&E states that recognition of voiding due to steam formation can be by the determination of saturation conditions in the RCS using hot and cold temperature, in-core thermocouples and pressurizer pressure instruments. The June 5, 1979 submittal provides the ranges of the available instruments and describes the procedures to be used for forced and natural circulation modes of operation. In addition, BG&E defines the "core boiling-steam generator condensation" mode of core cooling and indicated that new procedures are available to provide guidance to the operators. We find the licensee's response in regards to the recognition of possible void formation during forced or natural cooling mode

of operation acceptable.

- 2.b To assist the operators in taking appropriate actions to prevent void formation, BG&E states that procedures have been reviewed and procedure changes, where necessary, have been implemented. The revised procedures call for continued operation of the high pressure safety injection (HPSI) pumps to provide make-up water and a source of system pressure. Heat removal would be by forced or natural circulation or the reflux boiler mode previously mentioned. In all three modes the heat sink is the steam generator. As an aid to the operator, curves displaying the saturation line and a 50°F subcooling line have been added to the subject procedure. We find that the licensee has adequately addressed the operator actions required to prevent void formation.
- 2.c In the August 20, 1979 response, the licensee states that the appropriate operator action required to enhance core cooling in the event core voiding occurs is to restore pressurizer pressure and level and reinstate RCS cooling using the steam generators. Level is re-established using ECCS high pressure safety injection (HPSI) system pumps. Core cooling, provided by RCS flow through the steam generators, will normally be maintained by natural circulation according to the revised emergency procedures (See Section 6.c.). BG&E states that the recovery of RCS pressure and continued core cooling will assure void collapse. We find that the licensee has adequately addressed this concern of the bulletin.

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3. In the design of the Calvert Cliffs Units, containment isolation signal (CIS) is automatically initiated only on high containment pressure (≤ 4.75 psig). A Safety Injection Actuation Signal (SIAS) is initiated by high containment pressure (≤ 4.75 psig) or low pressurizer pressure (≥ 1578 psia). CIS is not automatically initiated by SIAS. BG&E states that a step has been added to the plant emergency procedure for loss of reactor coolant requiring the containment penetrations of eight systems to be isolated manually from the control room upon receipt of a SIAS. We find this procedure modification meets the intent of the bulletin requirements.

In addition, BG&E has initiated a design review to determine the feasibility of automatic isolation of appropriate system penetrations upon a SIAS. The August 20, 1979 submittal indicates this design review is complete and seven isolation functions will be transferred from CIS to SIAS. In addition, a design is being developed to assure a cooling water flow to the RCPs based on a logic-actuation system.

4. BG&E states that even though the present Technical Specifications only require the presence of one licensed operator per unit in the control room, it is the management practice to augment this staffing with an extra licensed Reactor Operator per unit when the unit is at power operation. This extra operator, having no further responsibility for reactivity control after the receipt of a plant trip, shall immediately direct his sole attention to the maintenance and/or restoration of feedwater flow via the main or auxiliary feed pumps as required by the situation. In the event the manning level of the control room is altered such that the extra Reactor Operator is not available for each unit, a person specifically trained in the operation of the auxiliary feedwater system will be made available to assume these duties. The

operator assigned to this function will, at the time of a transient requiring such action, take immediate control of the main and auxiliary feedwater systems until the steam generator levels return to a stable condition. This extra operator will have no other concurrent responsibilities during such a transient. We find this response is in conformance with the bulletin.

5. This bulletin item relates to the operation of the power operated relief valves (PORV's) on the pressurizer.
 - 5.a BG&E states that plant operators may utilize the following control room indications to determine when a PORV is open. These indications consist of: (1) a temperature indicator on the PORV common discharge header and (2) quench tank level, temperature and pressure indications. We find such instrumentation satisfies the concern expressed in the bulletin and appropriate direction is provided by the emergency procedures.
 - 5.b BG&E states that the plant emergency procedure for loss of reactor coolant was changed to identify specific instructions to be used in identifying an open PORV and to direct that the appropriate block valve be closed should one of the PORV's remain stuck open. The licensee's responses indicate that appropriate procedural control of a possible leaking PORV have been implemented.
6. This bulletin item makes specific requests of licensees to ensure that procedures and training instructions prevent the overriding of engineered safety features during accident conditions.

6.a BG&E states that procedures which require the override of Engineered Safety Features (ESF) signals have been reviewed. They find that such overrides are deemed to be appropriate and not to cause any adverse effects on needed ESF needed to support core cooling. Of special interest is the overriding of the CIS, once the containment pressure decays below the setpoint, in order to re-establish cooling flow to the RCP's and inhibit containment spray.

Since the component cooling water for the RCPs is isolated by a CIS, BG&E finds it important to reset CIS and re-establish cooling flow to the RCP's in order to prevent failure of the pump seals and the thrust bearing as explained in their June 5, 1979 response. BG&E has initiated a design study to determine the feasibility of system modification to return component cooling flow to the RCP's in all post-accident situations or to provide for the rapid restoration of the system following a non-seismic accident scenario. Recent communications indicate this design review is complete and some modifications will be made.

The licensee places special emphasis on securing the containment spray pumps, when not needed, to prevent damage to equipment within containment. In recent communications with BG&E, we learned that the procedure allows these pumps to be secured by overriding an automatic action only if the containment pressure is below 5 psig. In the Calvert Cliffs design, containment air recirculation units, redundant to the spray pumps, are available during accident conditions to handle containment cooling requirements.

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The licensee's responses and the above example indicate that procedural controls, preventing the overriding of automatic actions of engineered safety features have been initiated in accordance with the bulletin.

- 6.b BG&E states that all of the criteria set forth in I&E Bulletin 79-06B, Item 6.b have been incorporated into the appropriate procedures. Although this adequately addresses the requirement of the bulletin, we are providing the following statement to clarify the intent of paragraph 6.b.(2):

"After 50°F of subcooling has been achieved, termination of HPI operation prior to 20 minutes is only permissible if it has been determined that continued operation would result in an unsafe plant condition, e.g., pressure/temperature considerations for the vessel integrity."

- 6.c BG&E's initial responses indicate that applicable emergency procedures have been revised to require continued operation of at least one RCP per loop during the HPSI phase following an accident. BG&E stated that they would leave the RCP's running or will restart the pumps as long as the pump is providing forced flow as indicated by control room indications. We find these statements responsive to the requirements of Item 6.c of IE Bulletin 79-06B. However, the requirements of Action 6.c in IE Bulletin 79-06B were modified by IE Bulletin 79-06C to trip the reactor coolant pumps, instead of keeping at least one pump running, after an initiation of high pressure injection. This action is to be taken by the licensee according to his August 20, 1979 response until the results of analyses defined in IE Bulletin 79-06C are used to develop new guidelines for operator action. BG&E has evaluated its commitment

in light of the requirements of IE Bulletin 79-06C and stated, in his August 20, 1979 letter, that the commitment as stated is consistent with the modified requirements. Our review of the licensee's responses is continuing pending the submittals of the long-term actions required by Bulletin 79-06C.

- 6.d The BG&E response states that the applicable emergency procedures have been revised to further minimize operator dependence on pressurizer level. We find that the licensee has adequately addressed this item of the bulletin.
7. The licensee states that all safety related valve positions, positioning requirements and procedural controls, which ensure that the valves remain properly positioned, have been reviewed and are adequate to ensure proper operation of engineered safety features. The administrative procedures for control of maintenance on safety related equipment were reviewed to specifically assure correct positioning of valves which were worked on or were used for isolation purposes. BG&E's letter of April 26, 1979 describes these procedural controls and provides three actions taken to improve valve position control as a result of Bulletin 79-06B. We find the BG&E statements to be an acceptable response to this item of the bulletin.
8. BG&E identified all systems designed to transfer potentially radioactive gases and liquids out of the primary containment and states that all of these systems are automatically isolated by a CIS and manually isolated upon receipt of a SIAS (Item 3). In addition, the containment purge valves are closed upon detection of high

radiation in the containment. To open an isolation valve following automatic closure by CIS, the initiating signal (high containment pressure) must have cleared, the operator must manually reset the CIS signal and then position the valve hand switch to open. Containment isolation signals cannot be blocked before or after initiation and there are no process control systems which will automatically open a containment isolation system valve. Once the containment isolation system is initiated the operator cannot override. Therefore, inadvertent transfer of radioactive fluids and/or gases will not occur during an incident.

We find that the licensee has acceptably addressed the bulletin concerns regarding possible release of radioactive gases or liquids from the containment.

9. Bulletin Item 9 relates to the safety-related system maintenance and test procedures.
- 9.a BG&E states that the administrative procedures specify that prior to removal of safety-related systems from service the redundant system will be verified operable by the shift supervisor. We find this concern of the bulletin has been properly addressed.
- 9.b The licensee states that when equipment (system or component) is returned to service after maintenance, it is the responsibility of the Senior Control Room Operator to verify the restoration of the equipment to service. Subsequent communication with BG&E has indicated that a

physical check of the equipment being returned to service is made as the operator removes the tags on this equipment. Upon completion of surveillance testing, the Shift Supervisor takes the steps necessary to return the system to normal. We find this to be an adequate response to the bulletin request.

- 9.c BG&E states that whenever a safety-related system or component is taken out of service, the appropriate Technical Specification action statement is logged in the control room and shift supervisor's logs. Each succeeding shift must then enter a summary of these action statements as the first entry of each shift. This practice is carried on until the actions statement is cleared. We find this procedure ensures explicit notification of involved reactor operational personnel in regards to the status of safety-related systems and, therefore, is in conformance with this item of the bulletin.
10. BG&E stated, in their August 20, 1979 response, that they have adopted a policy of reporting to the NRC within one hour any plant transient which causes the use of a plant Emergency Operating Procedure. We find this revision satisfies the concern of the bulletin, in that notification should be received when the plant enters a condition which is not controlled or expected. The BG&E response requests more specific guidance on the installation of a "hot line" between the plant and Region I headquarters. This line has been installed and agreement in regards to operation and testing has been worked out with I&E Region I. Subsequent communication with the licensee indicates that this item has been satisfactorily resolved.

11. BG&E states that the present "degas" procedure using the volume control tank is effective during the routine operations and could also be used in a post-accident situation. They also indicate that two alternate methods are available and subsequent communications indicate that appropriate procedures for these alternate methods are available.

The BG&E response describes the hydrogen recombiners and the gas analyzing systems used to reduce and determine the hydrogen concentration in the containment following an accident. They state that operation of the recombiners is governed by administrative control and procedures.

BG&E's response indicates an understanding of the concern expressed by this item of the bulletin. We therefore find BG&E's response to this item acceptable.

CONCLUSIONS

Based on our review of the information provided by the licensee to date, we conclude that the licensee has correctly interpreted IE Bulletin No. 79-06B. The actions taken demonstrate his understanding of the concerns arising from the Three Mile Island, Unit No. 2 accident in relation to their implications on his own operations, and provide added assurance for the protection of the public health and safety during plant operation.

This conclusion notwithstanding, it should be recognized that further actions may result from the staff's ongoing review of operating plants using nuclear steam supply systems designed by Combustion Engineering. For example, the actions being taken for Item 2 of IE Bulletin 79-06B regarding emergency procedures for a LOCA may require changes as a result of our generic review of procedures for C-E operating plants. Additional changes may result from the requirements contained in NUREG-0578, e.g., the actions being taken for Item 5 of Bulletin 79-06B regarding the PORV's. Our evaluations of these matters will be covered in other reports.