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March 11, 1994

U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318
Response to Request for Additional Information; Proposed Revision to Calvert Cliffs Nuclear Power Plant Emergency Action Levels (TAC Nos. M87080; M87081)

REFERENCES:
(a) Letter from Mr. R. E. Denton (BG&E) to NRC Document Control Desk, dated July 20, 1993, Emergency Action Level Scheme

(b) Letter from Mr. D. G. McDonald, Jr. (NRC) to Mr. R. E. Denton (BG&E), dated November 17, 1993, Request for Additional Information Regarding Proposed Emergency Action Levels of the Site Emergency Plan, Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2 (TAC Nos. M87080; M87081)

Reference (a) provided you with our proposed changes to Emergency Action Levels (EALs) which reflect the guidance in NUMARC/NESP-007, Revision 2, "Methodology for Development of Emergency Action Levels," and Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Reactors." Reference (b) is the NRC Staff request for additional information that is necessary to complete the review of our proposed changes. Attached is our response to that request. It reflects both the questions posed in Reference (b) and clarification we received during a January 6, 1994 teleconference between NRC and Baltimore Gas and Electric Company Staff. Since the Reference (b) discussions of specific issues are often lengthy, only the essence of the NRC issue is repeated in Attachment (1).

Should you have any further questions regarding this matter, we will be pleased to discuss them with you.

Very truly yours,

150034

RED/JMO/dlm

Attachment

4 Encl

Add: NRR/DRSS/PEPB 1 1

A001 1/1

cc: D. A. Brune, Esquire
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ATTACHMENT (1)

Request for Additional Information Concerning the Proposed Revision to Calvert Cliffs Nuclear Power Plant Emergency Action Levels

I. INTRODUCTION

The following information is provided subsequent to NRC initial review of the proposed Emergency Action Levels (EALs) in Revision 0 to the Calvert Cliffs Nuclear Power Plant EAL Technical Basis Document, and a teleconference conducted on January 6, 1994, between NRC Staff and BG&E Staff.

II. GENERAL COMMENTS

A. NRC Issue

The licensee has referenced several Abnormal Operating Procedures (AOPs) and Emergency Operating Procedures (EOPs) that are not yet approved and implemented.

BG&E Response

All referenced AOPs and EOPs are approved and implemented.

B. NRC Issue

The licensee should define the term "implementation" or "implemented."

BG&E Response

The following will be added to part 6. Frequently used terms . . . of the General Notes For EAL Technical Basis section of the EAL Basis Document (page G:3):

Implementation/implemented: use of a procedure with the intention of executing the steps or action therein.

III. PLANT SPECIFIC EMERGENCY ACTION LEVELS - REV. 0

A. RADIOACTIVITY RELEASE

1. RU2 - Unexpected Increase in Plant Radiation

NRC Issue

The five-minute time requirement in EAL 2 is redundant and should be removed.

BG&E Response

EAL 2 will be revised to state:

Valid Unexpected Rad Monitor Reading Offscale High OR 1000 Times Normal Reading

Mention of five-minute duration will be deleted from page R:6 of the basis document.

2. RA1 - Unplanned Radioactive Release Exceeding 200 X Technical Specification Limits for AT LEAST 15 Minutes.

NRC Issue

NUMARC/NESP-007 Initiating Condition (IC) AA1, EAL #3, states:

A valid reading on perimeter radiation monitoring system greater than 10.0 mR/hr sustained for 15 minutes or longer.

Calvert Cliffs has excluded this EAL from its classification scheme based upon the lack of a perimeter radiation monitoring system. The licensee should determine if there are additional sources of information for evaluating entry into this IC and include them. This comment also applies to initiating condition RU1.

BG&E Response

EAL 3 will be added and will state:

Field Survey Dose Rate Readings of 10 mRem/hr or greater at Site Boundary

Page R:11 of the basis document will be revised to add this EAL and state that it was included to address confirmatory field survey readings.

Regarding initiating condition RU1:

A review of RU1 determined that no EAL changes are warranted for this initiating condition. The following is provided in support of this position. This information will be included in the basis document on page R:4 to document why field survey results are not included:

It is not practical to establish an EAL based on field survey readings of 0.1 mr/hr for greater that 60 minutes. Field instruments in use for emergency response do not have a threshold of detection to meet such criteria.

3. RA3 - Radiation Increases that Impede Safe Plant Operation

NRC Issue

The 250 R/hr threshold in this EAL is non-conservative. The licensee should re-evaluate this EAL for an exposure rate threshold that corresponds to administrative limits for worker exposure control.

BG&E Response

EAL 2 will be revised to state:

Exposure Rate of 10 Rem/hr or greater in Areas Required to Achieve or Maintain Safe Shutdown

This value is consistent with the administrative limits for worker exposure control at Calvert Cliffs. Pages R:16 and R:17 of the basis document will be revised to delete references to ERPIP-832, Emergency Work Permits.

B. FISSION PRODUCT BARRIER DEGRADATION

1. BU2 - Reactor Coolant System (RCS) Leakage

NRC Issue

The licensee should eliminate the requirement for a reactor shutdown in this EAL or provide further justification for its inclusion. The licensee should also provide information on how their EALs address identified leakage.

BG&E Response

The following is provided to justify the requirement for a reactor shutdown in this EAL and show how the EAL addresses identified leakage.

Calvert Cliffs Units 1 and 2 are Combustion Engineering designed reactors. These reactors use a programmed pressurizer water level that varies as a function of T_{avg} and load. The Chemical Volume Control System includes three fixed flow positive displacement charging pumps and a variable letdown system. Each charging pump has a capacity of 44 gpm. The letdown system valves regulate letdown flow from 28 gpm to 128 gpm. The nominal configuration is one charging pump with ~40 GPM letdown flow. The letdown flow is varied as necessary to maintain programmed pressurizer level. Additional charging pumps are automatically started when necessary to maintain pressurizer level.

AOP-2A, Excessive Reactor Coolant Leakage, is implemented if any entry conditions are met; this includes the results of STP-O-27-1/2, Reactor Coolant Leakage Evaluation. STP-O-27-1/2 will indicate leakage in excess of Technical Specification 3.4.6.2 allowable limits. Control Room personnel require approximately 5 to 15 minutes to implement AOP-2A if RCS leakage exceeds the capacity of one charging pump. In general, Calvert Cliffs does not distinguish between identified or unidentified leakage when AOP-2A is implemented. Per AOP-2A, if leakage exceeds the capacity of one charging pump (i.e., 11 gpm leakage with minimum letdown flow or 39 gpm with letdown isolated), then the reactor must be shut down (tripped).

If RCS leakage is less than the capacity of one charging pump with minimum letdown, AOP-2A and/or STP-O-27-1/2 would be performed to determine the leak rate and the isolation required, if any. If the leak rate is determined to be outside of Technical Specification limits, then a normal reactor shut down will be performed. Otherwise, the reactor would be maintained at power. STP-O-27-1/2 requires approximately three to six hours to determine the amount of unidentified leakage when the leak rate is small (i.e., 11 gpm or less).

This information will be added to the basis document on pages B:2 and B:3.

2. BU3 - Fuel Clad Degradation

NRC Issue

The licensee addresses the limit in Part B of the technical specifications, however, no EALs were developed for Parts A and C. The licensee should develop EALs that address all the applicable Technical Specification limits or provide justification for their omission.

BG&E Response

EAL 2 will be added to address Technical Specification 3/4.4.8, Specific Activity. The EAL will state:

> *Fuel Clad Degradation Indicated by RCS Sample Activity GREATER THAN Technical Specification 3.4.8 Allowable Limits*

This EAL will be added to page B:4 of the basis document.

3. FCB-3 Radiation

NRC Issue

The licensee should reevaluate this dose-rate threshold based upon an I-131 equivalent activity level of 300 μCi/cc or provide further justification for the EAL as written.

BG&E Response

An evaluation was done and the following is provided to justify keeping the EAL as written:

In order to eliminate any confusion between Technical Specification limits and the basis for determining clad damage appropriate for this EAL, the first three sentences of the "Plant-Specific Information" found on page B:15 of the basis document will be deleted. The section will begin, "The site specific value was determined by calculating various coolant radionuclide concentrations postulated to result from 5% gap release . . . ." This will assure that the basis information is properly interpreted.

4. RCB3 - Radiation

NRC Issue

The licensee does not reference any calculation as a basis for the 5 R/hr threshold in their site-specific EAL. Additional information should be provided by the licensee to support the 5 R/hr threshold.

BG&E Response

The following information is provided to support the 5 R/hr threshold. This monitor reading is based on a site-specific study which forms the basis for ERPIP 801, Core Damage Assessment Using Containment Radiation Dose Rates. The value was determined using Calvert Cliffs normal RCS activity as the source term. Typical values of these monitors are 1 to 1.2 R/hr (bottom of the scale) during 100% power operation. The alarm setpoint for these monitors is 6 R/hr.

This information will be added to page B:24 of the basis document.

5. CNB1 - Safety Functions Status/Functional Recovery

NRC Issue

These acceptance criteria do not appear to be equivalent to the Westinghouse Containment RED path which defines a potential loss of the containment at containment pressures exceeding design pressure. The licensee should revise or delete this IC or provide additional information to justify it as written.

BG&E Response

Closer review shows that no direct equivalent to Westinghouse EOP Containment - RED path exists for Calvert Cliffs. This EAL will be deleted . The remaining Containment Barrier EALs will be renumbered. The basis information will be revised under renumbered CNB4, Pressure, (present CNB5) to include the generic information. The plant-specific information will be revised to state that there is no direct equivalent to the Westinghouse EOP RED path Critical Safety Function Status Tree, and thus, it is not included for Calvert Cliffs.

6. CNB4 - Coolant Leakage

NRC Issue

The licensee should provide additional information on how they addressed the different release pathways from the secondary systems and define the threshold for a steam generator (SG) tube rupture.

BG&E Response

The following information is provided on how different release pathways are addressed and to define the threshold for a SG tube rupture.

The basis document page B:7, initiating condition BS1, Loss Or Potential Loss of ANY Two Barriers, Item 3 discusses the effect of the simplified fission barrier logic on escalation of tube rupture sequences. Small spectrum SG tube ruptures greater than about 11 gpm are addressed by IC BU2, RCS Leakage. Tube ruptures that are somewhat larger than normal charging capacity of one charging pump, but readily controlled in

accordance with the EOPs, are addressed by fission barrier EAL RCB4, Coolant Leakage. Using the simplified logic, the primary purpose of CNB4, Coolant Leakage is to provide escalation to Site Emergency. Additional review of this EAL revealed that it may exclude tube rupture steam line break sequences. Thus, the EAL will be reworded to state:

Steam Generator Tube Rupture In Progress and Release to the Environment GREATER THAN 15 Minutes.

The basis document (present pages B:34 and B:35) will be revised to state:

Smaller spectrum or uncomplicated SG tube ruptures are addressed by BU2, RCS Leakage and Fission Barrier EAL RCB4, Coolant Leakage. These are not expected to result in prolonged releases to the environment as the operations Staff perform the actions required by AOP-2A or EOP-6. Of chief concern for this EAL are SG tube rupture sequences resulting in prolonged releases to the environment. Prolonged releases could be the result of:

- a large primary-to-secondary flow rapidly increasing the ruptured SG water level;
- the inability to close the ruptured SG's main steam isolation valve;
- the ruptured SG's main steam safety or atmospheric dump valves sticking open;
- the operators not isolating the auxiliary feedwater pump turbine steam supply from the ruptured SG; or
- a SG rupture coincident with secondary line breaks.

C. EQUIPMENT FAILURES

QA3 - Unplanned Loss of Safety System Annunciators With Transient in Progress

NRC Issue

If at least one computer-based information system is available, an Alert declaration is neither required nor desired. The licensee should revise the logic applied to the compensatory indications or provide additional information on the EAL as written.

BG&E Response

The EAL will be revised to state:

Unplanned Loss of 75% of Main Control Board Annunciators for GREATER THAN 15 Minutes And EITHER of the Following:

- *Significant Transient in Progress*
- *SPDS And Plant Computer NOT Available*

The basis document (page Q:13) will be revised to delete the discussion of the term "transient" since the generic information on page Q:12 already defines the term "significant transient."

D. ELECTRICAL

EA1 - Station Blackout While On Shutdown Cooling

NRC Issue

The licensee should provide additional information for incorporating the reference to AOP-3B.

BG&E Response

The following information explains why AOP-3B is referenced in this EAL.

AOP-3B is the procedure entered in Modes 5 and 6 for a loss of shutdown cooling regardless of the initiating fault. This procedure is implemented concurrent with problem recognition. Section IX of AOP-3B provides the procedural steps for restoration of electrical power to the 4 kV power supplies. These are the safety related buses that provide power to the pumps used for shutdown cooling.

The information will be added to page E:7 of the basis document.

E. SECURITY

TA1 - Security Event in the Plant Protected Area

NRC Issue

The licensee has defined EAL thresholds for IC TA1 that are inconsistent with the level of risk associated with an Alert classification and inconsistent with the guidance in NESP-007. The licensee should revise their EALs under ICs TU1, TA1, and TS1 to be consistent with NESP-007 or provide justification for the departure.

BG&E Response

Security TA1 Security Event in the Plant Protected Area

EAL 1 will be revised to state:

Forced Entry of Unauthorized Personnel into the Protected Area

EAL 2 will be deleted. This EAL is already addressed at the Site Emergency classification under initiating condition TS1.

The basis information (pages T:2 and T:3) will be revised to delete the reference to plant areas associated with safe shutdown.

Security TS1 Security Event in the Plant Vital Area

No change is required to the EAL wording, however, the basis information (present page T:5) will be revised to include the following statement:

Security threats of concern also include sabotage of vital equipment affecting the ability to achieve or maintain safe shutdown.

F. FIRE

IA1 - Fire or Explosion Affecting Safe Shutdown

NRC Issue

Raising the threshold of this EAL such that a declaration would not be made until redundant trains/equipment were affected defeats the anticipating intent of the IC. The licensee should revise their plant-specific information supporting this EAL so that operators will appropriately evaluate this IC in the context that was intended.

BG&E Response

The basis document (i.e., plant-specific information that supports the EAL; present page I:3) will be revised to delete the second sentence concerning damage to more than one train of equipment. This information will be replaced with:

Observation of damage to systems should be used to discriminate between a major fire and minor fires or fires in areas having a low probability of affecting safe shutdown. For example, this EAL is not expected to be entered for isolated breaker or motor fires. Operability determinations are not expected prior to declaration of this event-based EAL.

G. OTHER HAZARDS

1. OA3 - Destructive Phenomena Affecting Safe Shutdown

NRC Issue

Raising the threshold of these EALs such that a declaration would not be made until redundant trains/equipment were affected defeats the anticipatory intent of the IC. The licensee should revise their plant-specific information supporting these EALs so that operators will appropriately evaluate this IC in the context that was intended.

BG&E Response

The basis document (i.e., plant-specific information that supports the EAL; present page O:11) will be revised to delete the second sentence concerning damage to more than one train of equipment. This information will be replaced with:

Observation of damage to systems should be used to discriminate between major damage and minor damage or damage in areas having a low probability of affecting safe shutdown. Operability determinations are not expected prior to declaration of this event-based EAL.

2. OS2 - Control Room Has Been Evacuated AND Timely Plant Control Can NOT Be Established

NRC Issue

The guidance in NUMARC/NESP-007 states that the site-specific time for verifying control of the plant should not exceed 15 minutes. The Q&As on NESP-007 clarify this time limit by allowing maximum times greater than 15 minutes with additional justification. The licensee has provided some justification for the additional time allowed but it is insufficient to evaluate the validity of the EAL as written. The licensee should provide additional information.

BG&E Response

This EAL is established based on previous analyses and actual procedure walkthroughs. Licensee Event Report (LER) 50-317/89-009, Revision 2 was provided to the NRC on July 7, 1989 to document the analysis performed to demonstrate the ability to safely shutdown Unit 1 in accordance with AOP-9.

Three NRC inspections documented in Inspection Reports 50-317/90-05, 90-13 & 90-34 and 50-318/90-05, 90-13 & 90-34 reviewed the issue and concluded that BG&E's actions to develop and implement Alternative Safe Shutdown Procedure were adequate. One specific issue reviewed by the NRC was the procedure technical basis document. Additionally, the NRC observed portions of our procedure validation process. This included a walkdown of AOP-9A, "Control Room Evacuation and Safe Shutdown Due to a Severe Control Room Fire."

This information will be added to page O:14 of the basis document.