

BALTIMORE GAS AND ELECTRIC COMPANY

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NUCLEAR POWER DEPARTMENT
CALVERT CLIFFS NUCLEAR POWER PLANT
LUSBY, MARYLAND 20657

December 17, 1982

Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

ATTENTION: MR. R. A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing

SUBJECT: Calvert Cliffs Nuclear Power Plant
Units No. 1 and 2 Docket Nos. 50-317 and 50-318
Response to NRC Questions on Pressurizer Level
LCO Technical Specification

REFERENCE: (A) A. E. Lundvall to R. A. Clark letter
dated 9-22-82, "Amendment to
Operating License DPR-53 Fifth Cycle
License Application."

Gentlemen:

The staff posed a verbal question on our request for modification of the Technical Specification on pressurizer level LCO. The attachment to this letter is our response.

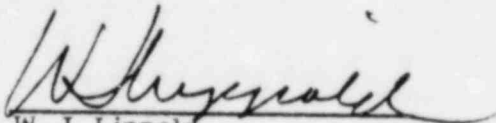
In the course of research to respond to the question an error in Reference (A) was identified. The whole body dose resulting from the Steam Generator Tube Rupture Event in Unit 1, Cycle 5 had been reported erroneously by Combustion Engineering to BG&E. Instead of .08 REM to the whole body, the dose should have been .17 REM to the whole body. The error was subsequently identified and documented by Combustion Engineering during normal QA audit procedures. Since the error was so small and the absolute number was still two orders of magnitude below the 10CFR100 guidelines BG&E was not notified at that time.

A001

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Should you have any questions, please contact us.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'W. J. Lippold', written over a horizontal line.

W. J. Lippold
Nuclear Fuel Management

WJL:fld

Attachment (40 copies)

cc: J. A. Biddison, Esquire
G. F. Trowbridge, Esquire
D. H. Jaffe - NRC
R. R. Mills - CE
R. E. Architzel - NRC/CC

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bcc: R. E. Denton
A. E. Lundvall, Jr.
R. C. I. Olson
J. A. Tiernan

ATTACHMENT

Question

Relative to the proposed pressurizer level LCO, document the review process which lead to selection of the most limiting events for further analyses.

Response

The following is the result of a review to select those Design Basis Events which were analyzed for the Calvert Cliffs Unit I and Unit II pressurizer water level Technical Specification limits modification. The objective of the evaluation was to ensure that pressure limits were not exceeded (as a result of the change in pressurizer high-level Technical Specification) by DBEs which result in increased RCS pressure. Also, DBEs which reduce pressurizer level were evaluated to ensure that reactor coolant circulation is not adversely affected (as a result of the change in pressurizer low-level Technical Specification). The evaluation was accomplished by reviewing all DBEs to determine which events result in the largest increase or decrease in pressurizer level/pressure. These limiting events were then reanalyzed to ensure that the applicable criteria were not exceeded.

This evaluation shows that the limiting DBEs sensitive to the proposed T.S. change are the Loss of Load, Excess Load and Steam Generator Tube Rupture event. Therefore, these events were analyzed to assure that a change in pressurizer water level does not lead to exceeding the criteria for these transients. The Excess Charging event was determined to be the event having the maximum potential for filling the pressurizer. Therefore, it was analyzed as part of the process to set the pressurizer water level upper Technical Specification LCO limit.

Table 1 presents a summary of the evaluation of the impact of changing the pressurizer water level for each Design Basis Event. Details of the events reanalyzed are provided in Reference 1.

Reference

1. Letter, A. G. Lundvall (BG&E) to R. A. Clark (NRC), "Calvert Cliffs Unit No. 1 and Unit No. 2 Docket Nos. 50-317 and 50-318 Request for Amendment to Pressurizer Level LCO Technical Specification," dated 9/29/82.

TABLE I

IMPACT OF THE NEW PRESSURIZER WATER LEVEL BAND ON DBE ANALYSES

Design Basis Event	Event Criteria	The Impact of the Change in Pressurizer Level on DBE
CEA Withdrawal	SAFDLs not to be exceeded.	During a CEAW event, the approach to SAFDL is driven by a reactivity and power distribution transient. The event is not sensitive to pressurizer conditions and consequently was not reanalyzed. This is due to the fact that for the limiting CEA withdrawals, the transient is terminated by the Variable High Power Trip before the pressurizer pressure rises significantly. For slow withdrawals, the transient is terminated by the High Pressurizer Pressure Trip. However, the post trip pressure increase is less limiting than in the Loss of Load event.
Boron Dilution	To assure sufficient time for the operator to take action before shutdown margin is lost.	There is no impact on the analysis of this event since credit is not taken for the pressurizer water volume.
Excess Load	SAFDLs not to be exceeded.	Reanalyzed for new pressurizer level band (see Reference 1).
Loss of Load	1) SAFDLs not to be exceeded, 2) RCS upset pressure limit not to be exceeded.	Reanalyzed for new pressurizer level band (see Reference 1).

TABLE I
(Continued)

Design Basis Event	Event Criteria	The Impact of the Change in Pressurizer Level on DBE
Loss of Feedwater Flow	1) SAFDLs not to be exceeded, 2) RCS upset pressure limit not to be exceeded.	Loss of Load event is more limiting than Loss of Feedwater. Therefore, the impact of the pressurizer level change on this event is bounded by the results of the Loss of Load event. There is no impact on the approach to SAFDLs during this transient since no credit was taken for pressure increase.
Excess Feedwater Heat Removal Due To Feedwater Malfunction	SAFDLs not to be exceeded.	This event has a similar (but less severe) effect on the primary system as does the Excess Load event. The Excess Load event reanalyzed assumed an increase in turbine demand of approximately 45%. The equivalent turbine demand for the Excess Feedwater Heat Removal event is less. Therefore, approaching the SAFDLs is less severe than for the Excess Load event analyzed and the results of the Excess Load analysis is bounding.
Reactor Coolant System Depressurization	SAFDLs not to be exceeded.	SAFDL protection for this event is provided by the TM/LP trip. The TM/LP coefficients are determined by the Excess Load Event. Since the coefficients established by the Excess Load event are conservative for the RCS Depressurization event, protection against exceeding SAFDLs during this event is assured by the Excess Load analysis.
Loss of Coolant Flow	SAFDLs not to be exceeded.	There is no impact of a change of initial pressurizer water level on the Loss of Coolant Flow event, since credit is not taken for the RCS pressure rise.

TABLE 1
(Continued)

Design Basis Event	Event Criteria	The Impact of the Change in Pressurizer Level on DBE
Loss of Non-Emergency AC Power	1) SAFDLs not to be exceeded, 2) Site boundary doses not to exceed 10CFR100 guideline limits.	The Loss of Non-Emergency AC Power transient behaves like a Loss of Flow event. Therefore, the discussion on the Loss of Flow event also applies here. Pressurizer level has no impact on the site boundary dose calculated for this event.
Control Element Assembly Drop	SAFDLs not to be exceeded.	The impact of a change of the initial pressurizer water level on this analysis is insignificant. The transient approach to SAFDLs during this transient are driven by the post drop power recovery and redistribution. Initial pressurizer level has no effect on LHR and has negligible effect on the transient DNBR.
Asymmetric Steam Generator Events	SAFDLs not to be exceeded.	The limiting ASGT event margin degradation is driven by the temperature induced power distribution tilt. Because of the relatively stable pressurizer conditions through the time of MDNBR, pressurizer level has no impact on this event.
CEA Ejection	1) Maintain coolable geometry, 2) Site boundary doses not to exceed 10CFR100 guideline limits.	The effect of a change in pressurizer water level on the behavior of this event is negligible. The transient is driven by the reactivity insertion and power distribution effects of the ejected rod and is insensitive to pressurizer level.
Steam Line Break	1) Maintain coolable geometry, 2) Site boundary doses not to exceed 10CFR100 guideline limits.	During the SLB event, the time of maximum degradation in DNBR occurs well after emptying of the pressurizer. Consequently, there is no effect of a change in pressurizer water level on the behavior of this event.

TABLE 1
(Continued)

Design Basis Event	Event Criteria	The Impact of the Change in Pressurizer Level on DBE
Steam Generator Tube Rupture	1) Site boundary doses not to exceed 10CFR100 guideline limits.	Reanalyzed for new pressurizer level band (see Reference 1).
Seized Rotor Event	1) Maintain coolable geometry, 2) Site boundary doses not to exceed 10FCR100 guideline limits.	The effect of a change in pressurizer water level on the behavior of this event is negligible. Since credit is not taken for an increase in RCS pressure, the relationship between pressurizer level and degradation in DNBR is similar to that of the LOF event.
Loss of Coolant Accident	Criteria of 19CFR50.46.	Increasing (decreasing) the initial pressurizer level will result in prolonging (shortening) the blowdown period of a LOCA transient. It will have negligible impact on the refill/reflood hydraulic transient. It is estimated that a change in the initial pressurizer level of 200 ft ³ will change the time of end of blowdown by approximately 0.2 sec. The resultant effect of such a small change to the time of end of blowdown on peak cladding temperature (PCT) is insignificant because the PCT occurs during reflood (at approximately 250 seconds) and is determined by such reflood parameters as steam cooling heat transfer and thermal radiation. For this reason it is concluded that the change in pressurizer level will have an insignificant impact on ECCS performance.