THE CINCINNATI GAS & ELECTRIC COMPANY

CINCINNATI OHIO 45201

E. A. BORGMANN
SENIOR VICE PRESIDENT

Docket No. 50-358

September 4, 1981

Mr. Harold Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

RE: WM. H. ZIMMER NUCLEAR POWER STATION -
UNIT 1 - NUREG-0737, ITEM II.K.3.44

Dear Mr. Denton:

This is in response to the NRC letter of August 7, 1981 to all applicants/licensees referencing BWR Owners Group Response to NUREG-0737 Item II.K.3.44. Attached is a General Electric letter dated June 26, 1981 (CGE-1508) which encloses a General Electric writeup on the applicability of the BWR Owners' Group Evaluation of NUREG-0737, Item II.K.3.44 for the Wm. H. Zimmer Nuclear Power Station Unit 1.

Very truly yours,

THE CINCINNATI GAS & ELECTRIC COMPANY

By E. A. Borgmann
E. A. BORGMANN

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Enclosure

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GENERAL ELECTRIC

NUCLEAR POWER

SYSTEMS DIVISION

GENERAL ELECTRIC COMPANY, 175 CURTNER AVE., SAN JOSE, CALIFORNIA 95125
MC 394, (408) 925-3307

June 26, 1981
CGE-1508

RESPONDS TO: GEM-421

RESPONSE REQUESTED BY: N/A

Mr. E. A. Borgmann
Cincinnati Gas & Electric
139 East Fourth Street
Cincinnati, OH 45201

Dear Mr. Borgmann:

SUBJECT: Wm. H. ZIMMER NUCLEAR POWER STATION UNIT 1
NUREG-0737 ITEM II.K.3.44

Reference: Letter GEM-421, May 5, 1981

Enclosed, per the reference request, is the write-up on the applicability to the Zimmer plant of the conclusions of the BWR Owners Group evaluation of NUREG-0737 Item II.K.3.44.

If you have any questions, please give me a call.

Very truly yours,

I. L. Gray
Project Manager
Zimmer 1

ILG:rm/1974

Enclosure

cc: H. C. Brinkmann
S. W. Coulter
J. D. Flynn
R. J. Pruski

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APPLICABILITY OF THE BWR OWNERS' GROUP
EVALUATION OF NUREG-0737 ITEM II.K.3.44 FOR ZIMMER

This report presents the applicability to the Zimmer plant of the conclusions of the BWR Owners' Group evaluation of NUREG-0737 Item II.K.3.44 (Ref. 1). Also, the operator actions assumed in the study are identified for the transients described.

I. Conclusions of Owners' Group Report

The worst combination of a transient and single failure for a BWR/5, as described in the Owners' Group study, is the loss of feedwater (LOF) event plus a failure of HPCS. For this event, the RCIC system will provide inventory makeup while reactor pressure remains high. This event is the design basis for the RCIC system in plants so equipped. Analyses performed for a reference BWR/5 show that the RCIC system will maintain the water level at least 6 ft above the top of the active fuel.

For even more degraded conditions, that is, one stuck open relief valve (SORV) in addition to the worst case transient and single failure, the reference BWR/5 analyses show that the RCIC system can automatically maintain water level above the top of the active fuel. It should be noted that these degraded conditions go beyond the current BWR design basis and the specifications of Regulatory Guide 1.70, Rev. 3.

Therefore, for the events described, the core remains covered and adequate core cooling is assured for the reference BWR/5 plant without the need for operator actions to manually initiate any emergency core cooling system (ECCS) or other inventory makeup systems.

II. Applicability to Zimmer

For both events described, reference plant analyses were done to show that the core remains covered throughout the entire transient. These analyses were performed using the SAFE computer code. The following is a list of the key input assumptions for the reference BWR/5 plant and a comparison of the corresponding values for Zimmer:

1. Plant Size: A 218-BWR/5 plant, which is the same size and power level as Zimmer, was used in the reference plant analyses.
2. RCIC Capacity: For the limiting event combination, RCIC is the only high pressure makeup system assumed to be functioning and delivering inventory makeup. A RCIC flow rate of 400 GPM was used for the reference plant analyses. Zimmer has the same RCIC capacity.
3. SORV Flow: For the loss of feedwater transient, a SORV would deplete the RPV water inventory at high pressure. The standard Crosby SRV flow capacity (equivalent to 8.65×10^5 lbm/hr @ 1200 psia) was used for the BWR/5 reference plant analysis. The SRV flow for Zimmer is the same as this value.

Therefore, based on the comparison of the key variables, the results and conclusions of the reference plant analyses are applicable to Zimmer.

III. Operator Actions

The following is a discussion of the operator actions necessary to place the reactor in a cold shutdown condition following a loss of feedwater plus failure of HPCS, plus a stuck open relief valve. These operator actions are discussed in the Emergency Procedure Guidelines (Ref. 2).

As stated earlier, the RCIC system will maintain reactor water level above the top of the active fuel without any operator actions for this case. Therefore, the operator can proceed through the Level Control Guideline and into the Cooldown Guideline without any actions other than to confirm automatic system initiations and to control injection flow to maintain water level if it exceeds the maximum level specified in the Guidelines.

The purpose of the Cooldown Guideline is to depressurize and cool down the RPV to cold shutdown conditions while maintaining RPV water level within a satisfactory range. While maintaining RPV level, the operator must confirm that an adequate supply of water exists for the RCIC pump from either the condensate storage tank or the suppression pool. The

need to assure these conditions is provided in Caution #8 in the Guidelines. The SORV will continue to depressurize and cool down the reactor. Although RCIC is capable of maintaining reactor water level, the low pressure ECC systems are also available when reactor pressure falls below approximately 425 psig. To prevent potential vessel overfill, Caution #11 alerts the operator to the possibility of automatic low pressure ECCS injection during the depressurization. Caution #14 instructs the operator to have alternate injection sources available before the vessel is fully depressurized. When the RHR shutdown cooling interlocks clear, the operator is instructed to manually initiate the shutdown cooling mode of RHR. Cold shutdown is then achieved by following the cooldown to cold shutdown procedures.

The operator is concurrently instructed to control suppression pool temperature. The Containment Control Guideline, whose purpose is to control primary containment temperature, pressure, and suppression pool temperature and level, is followed for this case. It is expected that the suppression pool temperature would exceed 95^{o} due to the SORV. Therefore, the operator is instructed to close the SORV if possible, and to operate available suppression pool cooling. In the event the SORV could not be closed, the operator is instructed to maintain the suppression pool water temperature and reactor pressure below the heat capacity temperature limit.

In summary, the operator needs only to verify that the reactor water level does not become too high and to initiate RHR shutdown cooling and suppression pool cooling at the appropriate time.

IV. Conclusions

This report demonstrates that the results of the BWR Owners' Group evaluation of NUREG-0737 Item II.K.3.44 are applicable to Zimmer. Reference BWR/5 plant analyses adequately model the Zimmer plant for

the transients described. No operator actions are required to manually initiate any ECC system or other inventory makeup systems. The operator actions necessary to put the plant in a cold shutdown condition are specified in the Emergency Procedure Guidelines and are applicable to the Zimmer plant.

V. References

(1) Letter, D. B. Waters (BWROG) to D. G. Eisenhut (NRC), December 29, 1980, BWR Owners' Group Evaluation of NUREG-0737 Requirements.

(2) Emergency Procedure Guidelines, Rev. 1, January 30, 1981.