

August 28, 1997

Ms. Irene Johnson, Acting Manager
Nuclear Regulatory Services
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: BRAIDWOOD NUCLEAR POWER STATION, UNITS 1 AND 2 - GENERIC LETTER
87-12 (TAC NOS. M97877 AND M97878)

Dear Ms. Johnson:

By letter dated October 19, 1996, Commonwealth Edison Company (ComEd) submitted a supplemental response to Generic Letter (GL) 87-12, "Loss of Residual Heat Removal While The Reactor Coolant System is Partially Filled." In the supplemental response, ComEd informed the NRC of a revision to its commitments for Braidwood Nuclear Power Station, Units 1 and 2. The revision changes the allowable residual heat removal loop flow rate from "approximately 1000 gpm" to "between 1000-3300 gpm" during draining and mid-loop operation.

The staff has reviewed the change to ComEd's commitments and has determined that the change is acceptable. The staff's evaluation is enclosed.

Sincerely,

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George F. Dick, Jr., Senior Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. STN-50-456, STN 50-457

Enclosure: Evaluation

cc w/encl: see next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
CONCERNING CHANGE TO RESIDUAL HEAT REMOVAL FLOW RATES
DURING DRAINING AND MID-LOOP OPERATION
COMMONWEALTH EDISON COMPANY
BRAIDWOOD STATION, UNITS 1 AND 2
DOCKET NOS. STN 50-456 AND STN 50-457

1.0 INTRODUCTION

In response to Generic Letter (GL) 87-12, Item 8, regarding the potential vortexing and air ingestion in the residual heat removal (RHR) pumps during draining and mid-loop operation, the Commonwealth Edison Company (ComEd, the licensee) responded that the RHR loop flow rate will be reduced to approximately 1000 gpm prior to draining and mid-loop operation. This proposed RHR flow limitation was supported by a Westinghouse analysis documented in its letter dated July 12, 1989 (Reference 1). The NRC staff reviewed and approved this commitment.

In order to facilitate reactor coolant system cooldown with increased decay heat removal capability, by letter dated October 19, 1996 (Reference 2), ComEd informed the NRC of a change to the above commitment. ComEd's revised commitment is to maintain the RHR loop flow rate between 1000-3300 gpm during reduced inventory operating conditions when the reactor vessel water level is maintained at 2.25 inches above mid-loop of the hot legs.

2.0 EVALUATION

The current RHR loop flow limit of 1000 gpm was supported by a Westinghouse evaluation performed for Braidwood Station documented in a Westinghouse letter dated July 12, 1989. In this evaluation, all relevant concerns regarding the minimum RHR flow rate including decay heat removal, reactor vessel internals delta T limits, boron mixing and stratification, control valve cavitation, inadvertent boron dilution, and RHR pump bearing evaluations were considered. Based on this evaluation, Westinghouse has concluded that the minimum RHR flow rate of 1000 gpm will satisfy the RHR design function and this flow rate is low enough to preclude potential vortexing and air ingestion in the RHR pumps during reduced inventory operating conditions.

To support the licensee's increase of the RHR loop flow rate during reduced inventory conditions, Westinghouse performed a bounding reanalyses which

ENCLOSURE

confirmed that the operation of an RHR train from 1000 gpm to 3300 gpm with the reactor vessel water level at 2.25 inches above mid-loop of the hot legs would preclude the potential vortexing and air ingestion in the RHR pumps. The results of the Westinghouse evaluation also confirm that all design functions affected by the minimum RHR loop flow rate are either improved or remain satisfactory. The results of the reanalysis are documented in a Westinghouse letter dated October 18, 1996 (Reference 3) which is attached to the licensee's letter dated October 19, 1997.

3.0 CONCLUSION

Based on the consideration discussed in Section 2.0 above, the staff has concluded that the change to the RHR loop flow rate during reduced inventory operating conditions is acceptable.

4.0 REFERENCES

- 4.1 Letter from G. P. Toth (Westinghouse Electric Corporation) to Commonwealth Edison Company, "Byron and Braidwood Stations, Mid-Loop (GL 88-17) Task B Report," dated July 12, 1989.
- 4.2 Letter from Harold Gene Stanley (Commonwealth Edison Company) to NRC, "Supplemental Responses to Generic Letter 87-12," dated October 19, 1997.
- 4.3 Letter from B. S. Humphries (Westinghouse Electric Corporation) to Commonwealth Edison Company, "Braidwood Units 1 & 2, RHR Operation During Reduced Inventory Conditions," dated October 18, 1996.