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June 23, 1975

Mr. D. L. Ziemann, Chief
Operating Reactors - Branch 2
Division of Reactor Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Dresden Station Units 2 and 3
Quad-Cities Station Units 1 and 2
Undesirable Function of Motor Operated Valves,
NRC Dkts. 50-237, 50-249, 50-254, and 50-265

Dear Mr. Ziemann:

In response to your letter dated 4-21-75 concerning this matter, a study of the electrically operated valves in the ECCS systems for the subject facilities was initiated. Attached is a summary of the study and the conclusions. Your letter did not reference Quad-Cities Station Unit 2; however, the attached report is applicable to Quad-Cities Station Unit 2 as well as the other three units. The conclusion of the study is that the single failures, postulated in Dresden Station Special Report No. 40 and Quad Cities Station Special Report No. 15, are the most severe.

The interpretation of single failure criterion to manually-controlled electrically operated valves, discussed in your letter, is inconsistent with your past practice for the subject facilities. There is no apparent basis for applying this new interpretation to the Appendix K-ECCS evaluation report. Since this interpretation had not been made at the time the ECCS regulations were promulgated, it should not be considered an interpretation of 10 CFR 50 Appendix K, Section I.D.1. We urge that any further review of this matter proceed independently of the ECCS evaluation reports. Your authority to request at your discretion additional information concerning plant design is unchallenged. The proper procedure for determining the need for plant modifications and changes to the Technical Specification are established in 10 CFR 50.109. The means for requiring plant modifications and Technical Specification changes exists outside of 10 CFR 50.46 and 10 CFR 50 Appendix K. There is no basis or reason for including this matter as part of the Appendix K-ECCS evaluation review and approval.

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One (1) signed original and 59 copies of this information are provided for your review.

Very truly yours,

J. S. Abel
Nuclear Licensing Administrator
Boiling Water Reactors

Attachment

SINGLE FAILURE STUDY ON ECC SYSTEM MANUALLY CONTROLLED ELECTRICALLY OPERATED VALVES

The effects of a single failure or operator error that causes any manually controlled, electrically operated valve in the ECC System to move to a position that could adversely affect the ECCS has been studied. The purpose of this evaluation is to determine that any such maloperation does not affect the ECCS more than the results of the worst single failure which is reported in the LOCA calculations performed in accordance with 10CFR50 Appendix K.

The results of the break spectrum analysis show the single failure which results in the maximum calculated peak clad temperature (PCT). For any other single failure to be more significant, its effect on the ECCS must be greater than this single failure. Therefore, a study was made to determine if the malfunction of a manually controlled, electrically operated valve by some unknown cause or by an operator improperly positioning a control switch could affect the ECCS more severely than this failure.

In accordance with appropriate IEEE standards, the ECC System valves are electrically assigned to different divisions of power supply. The effect of an operator improperly actuating a single switch on the control panel is to cause only a single valve to move to an incorrect position. For the operator error of actuating a single switch of the ADS System, the system valves are not actuated. However, the consequences of a malfunction which causes one ADS valve to inadvertently open has been noted.

The summary of the ECCS Valve Single Failure Analysis is provided in the attached Table 1. Comparing the effects of the single valve failure noted in Table 1 with the results of the Appendix K LOCA analysis, it can be seen that these failures are not more severe than those reported. The single failures considered for the ECCS analysis are presented in Table II

TABLE I
BWR/3

ECCS SINGLE VALVE FAILURE ANALYSIS

SYSTEM	VALVE(S)	POSITION FOR NORMAL PLANT OPERATION CLOSED	POSITION FOR NORMAL PLANT OPERATION OPENED	AIR OPERATED CHECK VALVE	CONSEQUENCES OF VALVE FAILURE ASSUMED TOGETHER WITH DESIGN BASIS LOCA
Core Spray	Suction		X		Negate use of one core spray loop
	Injection(s)	X		X	Negate use of one core spray loop
	Isolation Test		X		Negate use of one core spray loop
High Pressure Coolant Injection	Condensate Inlet	X			Reduced water supply to condensate tank-no consequence
	Condensate Outlet		X		Utilize suppression pool water
	Suppression Pool Suction Valve	X			Utilize Condensate storage tank water
	Injection(s)	X	X	X	Negates HPCI
	Turbine Inlet(s)	X	X		Negates HPCI
Low Pressure Coolant Injection	Injection(s)	X		X	Negate use of LPCI
	Isolation Test		X		Negate use of LPCI
	Cross Tie		X		No LPCI Fix: Negate one LPCI loop (two pumps per loop)
	HX Bypass	X (Dresden Only)			Reduce flow due to HX pressure drop
	Inlet Pump		X		Negate one out of four pumps
Automatic Depressurization System	One Relief Valve	X			Vessel depressurizes faster, increases rate of HPCI injection (assuming the failure of a single ADS valve to open does not affect the results because the effects on small breaks is insignificant with HPCI in operation.

TABLE II

SINGLE FAILURES CONSIDERED

FOR ECCS ANALYSTS

PLANT	SINGLE FAILURE	REMAINING ECCS
BWR/3	LPCI Injection Valve	2 CS + HPCI + ADS
Quad Cities 1,2	HPCI	2 CS + 4 LPCI (1 loop) + ADS
Dresden 2,3		
(Suction Break)		