Commonwealth Edison
Zion Generating Station
101 Shiloh Blvd.
Zion, Illinois 60099
Telephone 312/746-2084

August 7, 1989

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Dear Sir:

The enclosed Supplemental Licensee Event Report number 88-06-01, Docket No. 50-295/DPR-39 from Zion Generating Station is being transmitted to you to update you on proposed corrective actions.

Very truly yours

T. a Rusk

for T. P. Joyce
Station Manager
Zion Generating Station

TPJ/jlc

Enclosure: Licensee Event Report

cc: NRC Region III Administrator
NRC Resident Inspector
INPO Record Center
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LICENSEE EVENT REPORT (LER)

Facility Name (1)	Docket Number (2)	Page (3)
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Title (4): Service Water Pump Flowrate Below Required Dilution Flow During A Radioactive Liquid Waste Release

Event Date (5)			LER Number (6)				Report Date (7)			Other Facilities Involved (8)	
Month	Day	Year	Year	///	Sequential Number	Revision Number	Month	Day	Year	Facility Names	Docket Number(s)
										N/A	0 5 0 0 0	
0 3	2 5	8 8	8 8	---	0 0 6	--- 0 1	0 7	1 4	8 9		0 5 0 0 0	

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)			
		20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	5 0 0 0	20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	Other (Specify in Abstract below and in Text)
		20.405(a)(1)(iii)	X 50.73(a)(2)(i)(B)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

Name	TELEPHONE NUMBER
Charles E. Prymula, Assoc. Engr., Ext. 336	AREA CODE 3 1 2 7 4 6 - 2 0 8 4

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	
B	W D	N A	N A	N							

SUPPLEMENTAL REPORT EXPECTED (14)		Expected Submission Date (15)	Month	Day	Year
Yes (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e, approximately fifteen single-space typewritten lines) (16)

During the review of T.S.S.P. 16-88 (Service Water Pump Performance Test) it was noted that the measured capacity for 2 service water pumps was approximately 32,000 gallons per minute. This flowrate is insufficient to provide the minimum dilution flow of 44,000 gallons per minute (gpm) required during a radioactive liquid waste release, per Technical Specification 3.11.1.B.

The root cause was identified as an incorrect assumption about the actual flow output of two service water pumps. Technical Specification 3.11.1.B was added to Zion's Technical Specifications in 1978. At that time, it was assumed that the pumps were operating at rated flow (22,000 gpm each) but in reality they typically operate at a lower point on their pump curves. A search of all radioactive liquid release forms generated since 1978 resulted in only one occurrence where dilution flow was below Tech. Spec. minimum. Calculations performed by the Chemistry Department indicated that no 10CFR20 limits for isotope concentrations in the liquid waste stream were exceeded. A Tech Spec change deleting section 3.11 and transferring it to the Offsite Dose Calculation Manual will be pursued.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			Page (3)
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TEXT Energy Industry Identification System (EIIS) codes are identified in the text as [xx]

A. PLANT CONDITIONS PRIOR TO EVENT:

MODE 5 - Refueling RX Power 0% RCS [AB] Temperature/Pressure < 100 °F/ 0 psig

B. DESCRIPTION OF EVENT:

During the review of procedure TSSP 16-88 (Service Water Pump Performance Test), it was noted that the measured capacity for two service water (SW), [BI] pumps was approximately 32,000 gpm. This flow rate is insufficient to provide the Technical Specification 3.11.1.B minimum dilution flow of 44,000 gpm (gallons per minute) required for a radioactive liquid waste release. Dilution flow is provided by the combination of operating SW and circulating water pumps. The SW pumps are capable of providing 44,000 gpm, but only when system pressure is well below normal levels.

A subsequent review of radioactive liquid release forms generated since 1978 resulted in only one occurrence where the operating pump combination was such that dilution flow was below Tech. Spec. minimums. Calculations done by the Chemistry Department indicated that no 10CFR20 limits for isotope concentrations in the liquid waste stream were exceeded even when using a conservative low flow rate of 15,000 gpm.

C. CAUSE OF EVENT:

The event was caused by incorrect assumptions concerning the point where the Service Water (SW) pumps were operating on their characteristic pump curve. When this Technical Specification was proposed in 1978, manufacturer's rated flow of 22,000 gpm per pump was assumed in selecting the required dilution flow for inclusion in the Technical Specification. Preoperational tests performed prior to 1974 provided actual SW pump performance data, but this data was not adequately considered. Other than the preoperational tests, actual flow tests were not performed until 1988.

The service water pumps are Layne Bowler three stage submerged vertical turbine type pumps. Since these are centrifugal type pumps their flowrate is determined by the total developed head across the pump. Since inlet pressure is fairly constant (the static pressure head due to the forebay level above the pump suction) flow is typically determined by SW system pressure. A flow of 22,000 gpm per pump would occur at a system pressure of approximately 70 psig. This is based upon an assumed forebay level of 19 feet and the pump curves obtained in the preoperational test. Actual system pressure is normally greater than 75 psig.

D. ANALYSIS OF EVENT:

Technical Specifications require a minimum dilution flow of 44,000 gpm when discharging radioactive liquid waste to Lake Michigan. Since the actual measured flow was less (32,000 for two pumps) the potential for a Technical Specification violation was present. The single instance noted above in Section B was in fact a violation of Tech. Spec. However, no 10CFR20 limits were exceeded during the release.

D. ANALYSIS OF EVENT (continued):

It was noted that the Technical Specification requirement of 44,000 gpm of dilution flow for liquid effluent release is not part of the station's original Technical Specification, but was added to the Technical Specifications in 1978. Calculations by the Chemistry department indicate no radiological basis for selecting a minimum flow value of 44,000 gpm and that 10CFR20 Appendix B limits on liquid effluent can be met for many releases, even with less than the actual 32,000 gpm of flow measured during the performance test.

E. CORRECTIVE ACTIONS:

When actual pump capacities were determined and they were obviously below required Tech. Spec. minimums, a procedure change was written to prevent the reoccurrence of such an event. ZCP 421-1 was revised to ensure adequate dilution flow will be present when discharging radioactive liquid waste.

In accordance with NRC Generic Letter 89-01, a program has been initiated to delete the Radiological Effluent Technical Specifications by transferring them to the Offsite Dose Calculation Manual (ODCM). The appropriate dilution flow can then be evaluated for inclusion in the ODCM.

F. PREVIOUS OCCURRENCES:

This event is based on a previous single occurrence of a Tech. Spec. violation in 1980. Current pump performance data differing from previously published information prompted a record check to ensure past compliance with Tech. Spec.

G. COMPONENT FAILURE DATA:

None