



Commonwealth Edison

Zion Generating Station
101 Shiloh Blvd.
Zion, Illinois 61099
Telephone 708 / 746-2084

February 22, 1993

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

Dear Sir:

The enclosed Licensee Event Report number 93-003-00, Docket No. 50-295/DPR-39 from Zion Generating Station is being transmitted to you in accordance with the requirements of 10CFR50.73(a)(2)(ii)(B), which requires a 30 day written report when any event or condition resulted in the nuclear power plant being in a condition that was outside the design basis of the plant.

Very truly yours,

T. P. Joyce
Station Manager
Zion Generating Station

TPJ/

Enclosure: Licensee Event Report

cc: NRC Region III Administrator
NRC Resident Inspector
INPO Record Center
CECo Distribution List

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PDR ADOCK 05000295
S PDR

LICENSEE EVENT REPORT (LER)															Form Rev 2.0										
Facility Name (1) Zion Unit 1										Docket Number (2) 0 5 0 0 0 2 9 5					Page (3) 1 of 0 4										
Title (4) Unconservative Low Temperature Overpressure Protection Setpoint																									
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)										
											Zion Unit 2				0 5 0 0 0 3 0 4										
0	1	2	1	9	3	9	3	---	0	0	3	---	0	0	0	2	2	9	3						
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)																						
POWER LEVEL (10) 0 9 4			<input type="checkbox"/> 20.402(b)				<input type="checkbox"/> 20.405(c)				<input type="checkbox"/> 50.73(a)(2)(iv)				<input type="checkbox"/> 73.71(b)										
			<input type="checkbox"/> 20.405(a)(1)(i)				<input type="checkbox"/> 50.36(c)(1)				<input type="checkbox"/> 50.73(a)(2)(v)				<input type="checkbox"/> 73.71(c)										
			<input type="checkbox"/> 20.405(a)(1)(ii)				<input type="checkbox"/> 50.36(c)(2)				<input type="checkbox"/> 50.73(a)(2)(vii)				Other (Specify in Abstract below and in Text)										
			<input type="checkbox"/> 20.405(a)(1)(iii)				<input type="checkbox"/> 50.73(a)(2)(i)				<input type="checkbox"/> 50.73(a)(2)(viii)(A)														
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<input type="checkbox"/> 20.405(a)(1)(v)				<input type="checkbox"/> 50.73(a)(2)(iii)				<input type="checkbox"/> 50.73(a)(2)(x)																	
LICENSEE CONTACT FOR THIS LER (12)																									
Name Ken Norris, Engineering										TELEPHONE NUMBER AREA CODE 7 0 8 7 4 6 - 2 0 8 4															
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																									
CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS															
B				N																					
SUPPLEMENTAL REPORT EXPECTED (14)											Expected Submission Date (15)	Month	Day	Year											
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)											<input checked="" type="checkbox"/> NO														
ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)																									

On January 21, 1993 senior station management was informed of a potential violation of the design basis and it was determined that ENS notification was required per 10CFR50.72.B.2.i. On January 28, 1993, a letter requesting a Temporary Waiver of Compliance was submitted to the NRC requesting permission to set the low temperature overpressure protection (LTOP) system below the currently specified 435 psig at 402 and 407 psig. The different setpoints are due to the different locations of the pressure sensor instrument taps on the hot leg piping. Zion Station determined these more conservative LTOP setpoints, using correction factors appropriate for the number of pumps in operation and the RCS pressure sensor instrument tap location, to ensure compliance with the fracture toughness requirements specified by 10 CFR Part 50, Appendix G, in the event of an analyzed low temperature overpressure event. The Temporary Waiver of Compliance was granted on January 29, 1993.

The cause of this event is design. This event had minimal safety significance.

Corrective Actions include adjusting the setpoints per the Temporary Waiver, performing calculations to determine more precise setpoints and operational limitations, submitting a Technical Specification amendment, and changing appropriate operating procedures.

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Zion Unit 1		0	5	0	0	0	2	9	5	9	3	-	0	0	3	-	0	0	0	2	OF	0	4
TEXT Energy Industry Identification System (EIIIS) codes are identified in the text as [XX]																							

A. CONDITION PRIOR TO EVENT

MODE 1 - Power Operations RX Power 94% RCS [AB] Temperature/ Pressure 558/2235 psig

B. DESCRIPTION OF EVENT

Licensee Event Report (LER) 92-19 from the Houston Lighting & Power Company dated December 31, 1992, indicated that some facilities may be setting their low temperature overpressure protection (LTOP) power operated relief valves (PORVs) without considering the pressure drop due to the location of the PORV pressure sensor instrument taps. When reactor coolant pumps (RCPs) are running the delta-P induced by the resulting flow between the beltline of the reactor vessel and the point at which pressure is sensed was not included in the 435 psig setpoint analysis. Based on this information, Zion Station commenced an investigation into the operability of Zion Station's LTOP PORVs. On January 15, 1993, Zion Station completed a preliminary operability assessment that concluded that the RCP and residual heat removal (RHR) pump correction factors could not be accommodated within the current Technical Specification (TS) Section 3.3.2.G.1.a., "Low Temperature Overpressure Protection", setpoint of 435 psig without imposing significant restrictions on RCP operation.

On January 21, 1993 senior station management was informed of a potential violation of the design basis and it was determined that ENS notification was required per 10CFR50.72.B.2.i. On January 26, 1993, after reviewing the means available to raise and maintain reactor coolant system (RCS) temperature, Zion Station concluded that RHR pump heat and reactor decay heat were inadequate and opened dialogue with the NRC staff to obtain relief from the existing TS setpoint to allow heatup of Unit 2 from the current refueling outage utilizing the RCPs.

In a telephone call on January 28, 1993, the need for a Temporary Waiver of Compliance (TWOC) was discussed with the NRC staff. This conversation was followed by a letter dated January 28, 1993, in which Zion Station formally requested to set the LTOP system below the currently specified 435 psig, at 402 and 407 psig, and gave the basis for the reduced setpoints of the valves. The different setpoints are due to the different locations of the pressure sensor instrument taps on the hot leg piping. Zion Station determined these more conservative LTOP setpoints, using correction factors appropriate for the number of pumps in operation and the RCS pressure sensor instrument tap location, to ensure compliance with the fracture toughness requirements specified by 10 CFR Part 50, Appendix G, in the event of an analyzed low temperature overpressure event.

By letter, dated January 29, 1993, the NRC granted a Temporary Waiver of Compliance to set the LTOP system at less than or equal to 435 psig, setting one PORV at 402 psig, and the other at 407 psig.

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C. APPARENT CAUSE OF EVENT

The cause of this event is design. Historically, Commonwealth Edison (and the other Westinghouse Owners Group (WOG) utilities) has relied on Westinghouse to perform the LTOP computer code analyses to validate/determine acceptable values for the LTOP setpoints. The analysis evaluates plant response to two design basis transients (mass injection and heat injection). The intent of the analysis is to determine/validate setpoints that will prevent the plant from exceeding its steady-state 10CFR Part 50 Appendix G curve during the assumed events. The Appendix G curves are based on a fracture mechanics approach to brittle fracture which assumes that a limiting flaw exists in a most limiting orientation at the vessel location. The specific location of interest for Zion Station is the vessel beltline. Typically, the LTOP systems in Westinghouse PWRs utilize wide range RCS pressure as sensed on the Hot Legs to determine pressure relative to the LTOP setpoints. When RCPs are operating, the head loss from the vessel downcomer region to the Hot Legs results in a flow-induced pressure difference between the location of interest (the vessel beltline) and the location at which pressure is sensed (Hot Legs). This pressure difference results in pressure at the vessel beltline exceeding the pressure sensed at the Hot Legs by an amount that is dependent on the number of RCPs and/or RHR pumps in operation. The pressure difference was not included in previous Westinghouse LTOP analyses for the CECOs PWRs.

D. SAFETY ANALYSIS OF EVENT

As a result of the nonconservatism in the Westinghouse analysis, past operation of the reactor vessel may have caused the 10CFR50 Appendix G limits to be exceeded by as much as 50 psig (for 4 RCPs in simultaneous operation) during a design basis transient (mass or heat injection), and/or during heatup/cool-down operations. Per a telecon between the Commonwealth Edison Co. Nuclear Engineering Dept. and Westinghouse on January 28, 1993, Westinghouse indicated that a recent analysis determined that past operation of a reactor vessel with an overshoot of the Appendix G limits of 100 psig had no adverse effects on the integrity of the reactor vessel. This result will be published in the Westinghouse Potential Issue letter to be issued on this subject.

Based on the above discussion, the safety significance of this event is minimal.

E. CORRECTIVE ACTIONS

1. The immediate corrective action was to utilize available information for similar plants to adjust setpoints to conservative values as was approved in the Temporary Waiver of Compliance dated 01/29/93.
2. Site Engineering will perform calculations to determine the plant-specific delta-P that is induced by RCP operation (or other system operations such as RHR) to determine more precise setpoints and operational limitations. (295-180-93-00301)
3. An amendment to Technical Specification 3.3.2.G.1.a. will be submitted prior to the expiration of the Temporary Waiver of Compliance to relocate the LTOP setpoint to Zion Station controlled Pressure and Temperature Limits Report. (295-180-93-00302)
4. Permanent procedure changes to General Operating Procedure (GOP)-1, "Plant Heatup", and temporary procedure changes to GOP-4 "Plant Shutdown and Cooledown", and the annunciator response manual were completed after the TWOC was verbally approved on 01/28/93.

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Zion Unit 1	0 5 0 0 0 2 9 5	9 3	-	0 0 3	-	0 0	0 4	OF	0 4		

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F. PREVIOUS EVENTS

None

G. COMPONENT FAILURE DATA

None