



**Commonwealth Edison**

Zion Generating Station  
Shiloh Blvd. & Lake Michigan  
Zion, Illinois 60099  
Telephone 708 / 746-2084

December 14, 1992

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

Dear Sir:

The enclosed Licensee Event Report number 92-005-00, Docket No. 50-304/DPR-48 from Zion Generating Station is being transmitted to you in accordance with the requirements of 10CFR50.73(a)(2)(iv), which requires a 30 day written report when any event or condition occurs that resulted in a manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS).

Very truly yours,

T. P. Joyce  
Station Manager  
Zion Generating Station

TPJ/VK/dmb

Enclosure: Licensee Event Report

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

170034

9212210036 921214  
PDR ADDCK 05000304  
S PDR

ZDVRLE-576(7)

JE22 1/1

ATTACHMENT B  
(Continued)

Tracking Number: 30455492180-046

\*\*\*\*\* Section 2 Regulatory Assurance Supervisor (Designee) \*\*\*\*\*

A. Verify appropriate immediate notification requirements as noted in Section B of page 1

Written Notification Determination Results:

10CFR50.9	<input type="checkbox"/>		LLIN	<input type="checkbox"/>
10CFR20.402	<input type="checkbox"/>	30 Day	T.S.	<input type="checkbox"/>
10CFR20.405	<input type="checkbox"/>	30 Day	10CFR21	<input type="checkbox"/>
10CFR20.403	<input type="checkbox"/>	30 Day	10CFR55	<input type="checkbox"/>
10CFR50.36	<input type="checkbox"/>	30 Day	None	<input type="checkbox"/>
10CFR50.73	<input checked="" type="checkbox"/>	30 Day		
10CFR73.71	<input type="checkbox"/>	30 Day		
Part 21	<input type="checkbox"/>	30 Day		

B. Determination of investigation level. Review the event description as well as the Reporting Requirements then refer to the SLM (Attachment F) to determine the impact category and significance level.

Impact Cat.	<input type="checkbox"/> A	Sig. Level	<input type="checkbox"/> 3	With Sensitivity Factors	<input type="checkbox"/> 2
Impact Cat.	<input type="checkbox"/>	Sig. Level	<input type="checkbox"/>	With Sensitivity Factors	<input type="checkbox"/>
Impact Cat.	<input type="checkbox"/>	Sig. Level	<input type="checkbox"/>	With Sensitivity Factors	<input type="checkbox"/>

C. Investigative techniques that should be used for this event.

Cause Determination Evaluation	<input type="checkbox"/>	Barrier Analysis	<input type="checkbox"/>
Event and Causal Factor Charting	<input checked="" type="checkbox"/>	Task Analysis	<input type="checkbox"/>
Change Analysis	<input type="checkbox"/>	Other	<input type="checkbox"/>

D. Type of Report Issuance: E. Type of Review and or Approval

LER	<input type="checkbox"/>	Level 1 - Onsite/Offsite Review
PIR	<input checked="" type="checkbox"/>	Level 2 - Onsite/Offsite Review
HPES	<input type="checkbox"/>	Level 3 - LER/NOV response/200 Type Invest.
NPRDS/PADS	<input type="checkbox"/>	Onsite/Offsite Review
CDE	<input type="checkbox"/>	Others; Station Review
OTHER	<input type="checkbox"/>	Level 4 - Department Head
Corrective	<input type="checkbox"/>	
Action	<input type="checkbox"/>	
Sufficient	<input type="checkbox"/>	

Screening Approval

R. Placko /11-13-92  
Regulatory Assurance Supervisor/Designee Date

Onsite Review  
Disciplines Required  
A, B, G

\*\*\*\*\* Investigative Report and Approval \*\*\*\*\*

Review: William J. McNamee ABCEG

Review: Paul F. Cantrell ABCEG

Approval: W. R. Kuehn 1/12/14/92

## LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1) Zion Unit 2										Docket Number (2) 0   5   0   0   0   3   0   4				Page (3) 1   of   0   4														
Title (4) Engineered Safety Feature Actuation During Maintenance Troubleshooting																												
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)														
1	1	1	3	9	2	9	2	---	0	0	5	---	0	0	1	2	1	4	9	2								
OPERATING MODE (9)			4			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)																						
POWER LEVEL (10) 0   0   0			20.402(b)			20.405(c)			<input checked="" type="checkbox"/> 50.73(a)(2)(iv)			<input type="checkbox"/> 73.71(b)																
			20.405(a)(1)(i)			50.36(c)(1)			<input type="checkbox"/> 50.73(a)(2)(v)			<input type="checkbox"/> 73.71(c)																
			20.405(a)(1)(ii)			50.36(c)(2)			<input type="checkbox"/> 50.73(a)(2)(vii)			Other (Specify in Abstract below and in Text)																
			20.405(a)(1)(iii)			50.73(a)(2)(i)			<input type="checkbox"/> 50.73(a)(2)(viii)(A)																			
			20.405(a)(1)(iv)			50.73(a)(2)(ii)			<input type="checkbox"/> 50.73(a)(2)(viii)(B)																			
20.405(a)(1)(v)			50.73(a)(2)(iii)			<input type="checkbox"/> 50.73(a)(2)(x)																						
LICENSEE CONTACT FOR THIS LER (12)																												
Name Vincent Kline, Technical Staff Engineer										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																		
A				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 11/12/92 at 2020, during the process of cooling down Unit 2 to mode 5 per General Operating Procedure (GOP)-4, "Plant Shutdown and Cooledown", Operating experienced difficulty in getting 2FCV-VC121 to go closed further than 18% demand from the manual/auto (M/A) pushbutton station. During troubleshooting, the Instrument Maintenance (IM) Department inadvertently bumped the cover plate on the terminal block and shorted the two terminal points. This caused a sag in Instrument Bus voltage and an Engineered Safety Features (ESF) actuation.

The cause of the ESF actuation was personnel error. The cause of 2FCV-VC121 failing to go closed further than 18% was procedural deficiency. This event did not jeopardize the integrity of the safety systems designed to mitigate the consequences of an accident. Even though Unit 2 reentered mode 3, all equipment required for the mode change was operable.

Corrective actions include, reviewing the event with the IM Department, wiring the controller correctly, and initiating a procedure change to IM procedure 1/2F-121, "Charging Flow Control Loop", to note the special wiring characteristics of 1/2FC-121.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION													Form Rev 2.0	
FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)										Page (3)		
		Year	///	Sequential Number	///	Revision Number								
Zion Unit 2	0   5   0   0   0   3   0   4	9   2	-	0   0   5	-	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 4 - Hot Shutdown RX Power 0% RCS [AB] Temperature/ Pressure 346 °F/ 590 psig

B. DESCRIPTION OF EVENT

On 11/12/92, Unit 2 was in process of cooling down to mode 5 using General Operating Procedure (GOP)-4, "Plant Shutdown and Cooldown". Per this procedure the Reactor Coolant System (RCS) [AB] pressurizer level is controlled by valve 2FCV-VC121, Centrifugal Charging [CB] Pump Discharge Flow Control Valve.

The position of this valve is controlled by the use of a Manual/Auto (M/A) push-button station (2FHC-121A) and a controller (2FC-121A). As the push-buttons on the M/A station are manipulated to open or close the valve, current to the controller changes. This change in current is sensed by the controller which outputs a current of an appropriate value to open or close the valve. When this particular M/A station is placed in the auto mode of operation, the valve is prevented from going fully closed. The purpose of this feature is to prevent the loss of seal water to the Reactor Coolant Pumps while the M/A station is in auto. This is accomplished by the use of a limiter circuit in the controller which locks in a minimum preset value when the controller attempts to close the valve beyond an established setpoint. When the M/A station is placed in the manual mode of operation, the valve is allowed to go fully closed because the limiter circuit is disabled in this mode of operation.

At 2020 on 11/12/92, Operating experienced difficulty in getting 2FCV-VC121 to go closed further than 18% demand from the M/A station. Work request Z24956 was written for the Instrument Maintenance (IM) Department to investigate and repair the problem. At 2035 Unit 2 entered Mode 4, Hot Shutdown.

At 0240 on 11/13/92, the IM's theorized that the problem may be within the M/A station. They proceeded to change out the existing M/A station under work request Z24956. Once the new M/A station was in place, Operating attempted to close 2FCV-VC121 below 18%, but it still would not close. Further investigation by the IM's revealed that the output of controller 2FC-121A was being limited to 0.841 volts when the demand signal was decreased below 18% at the M/A station.

The IM's informed the Operating Department that the limiter circuit was being activated with the M/A station in manual. The Operating Department instructed the IM's to lower the limiter setpoint so they could throttle the valve below 18% demand. At approximately 0334, the IM's began to remove the cover plate on the controller to dial the limiter out. The cover plate made contact with a terminal block that had voltage, and shorted two terminal points which were being fed from AC Instrument Inverter 212, causing it to momentarily saturate. When this happened the voltage began to sag on the instrument bus, while current momentarily increased. The sagging voltage caused the OA and OB Component Cooling [CC] Pumps to auto start, because a relay (PC673X) in 2CB35 which was being fed by Inverter 212 de-energized. This simulated a low header pressure in the component cooling system, which caused the pumps to auto start. In addition to the pumps auto starting, the Main Steam [SB] Isolation Valves (MSIV) closed. This was the result of the high steam flow bistable relays for loops 513, 523, 533, and 543 de-energizing because they are fed from Inverter 212. When these relays de-energized, a high steam flow logic was developed. High steam flow in any 2 out of 4 steam generator's, combined with low-low Tave will initiate a signal to close the MSIV's. Since the low-low Tave bistables were in the tripped state due to Unit 2 being in Mode 4 at 365° F in the RCS at the time of the event, the MSIV's closed due to the logic being made up.

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FACILITY NAME (1)		DOCKET NUMBER (2)						LER NUMBER (6)						Page (3)									
								Year		Sequential Number		Revision Number											
Zion Unit 2		0	5	0	0	0	3	0	4	9	2	-	0	0	5	-	0	0	0	3	OF	0	4
TEXT Energy Industry Identification System (EIIS) codes are identified in the text as [XX]																							

#### B. DESCRIPTION OF EVENT (Continued)

At 0402 Unit 2 inadvertently reentered mode 3, hot shutdown, when RCS temperature increased six degrees. At 0405 the IM's removed the controller for troubleshooting purposes. When the IM's compared the removed controller with a new controller, they determined that the removed controller manual override limiter jumper was wired when it should not have been. The IM's then installed the properly wired controller at 0445. Operating verified that the controller was functioning properly by placing the M/A station in manual and verifying that 2FCV-VC121 was able to be closed below 18% demand. Also during this time the MSIV's were de-energized per System Operation Instruction (SOI)-31F, "MSIV Actuator System Shutdown", and the bypass valves were opened. This allowed the steam dumps to be used to continue to cool down Unit 2 to mode 5 cold shutdown.

#### C. APPARENT CAUSE OF EVENT

The cause of the ESF actuation was personnel error. The IM technician inadvertently bumped the cover plate on the terminal block and shorted the two terminal points causing the sag in Instrument Bus voltage.

The cause of the controller being miswired is procedural deficiency. Investigation found that in May of 1992, work request Z22482 was written because 2FCV-121 would not go below 60 gpm in manual. Review of the work package found that during IM troubleshooting, a broken wire was found in the controller and repaired. When controllers are initially installed, the manual override limiter jumper is disconnected and the wire is cut back. It is believed that the IM technician performing work request Z22482 mistakenly reconnected the manual override limiter jumper. IM procedure 1/2F-121, "Charging Flow Control Loop", did not contain explicit instructions for special jumper configurations.

#### D. SAFETY ANALYSIS OF EVENT

This event did not jeopardize the integrity of the safety systems designed to mitigate the consequences of an accident. Even though Unit 2 reentered mode 3, all equipment required for the mode change was operable.

There is no safety significance of the MSIV's closing in this event. The steam dumps were temporarily isolated because they are downstream of the MSIV's. The Main Steam Safety valves and the Atmospheric Relief valves were operable during this event. If pressure in the Steam Generators had increased, the valves would have performed their designed function.

2FCV-VC121 has no designed safety function in the event of an accident. Since the valve was not functioning, Pressurizer level was maintained by throttling 2VCB483B, Charging Header 2FCV-VC121 Upstream Isolation Valve.

The saturation of Inverter 212 caused voltage to sag on the instrument bus. Various loads on the bus failed to their fail safe condition and were left there until Operating determined the cause of the spurious actuation. Once this was done the equipment was returned to normal.

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

#### E. CORRECTIVE ACTIONS

1. The immediate corrective actions were to throttle 2VC8483B to maintain Pressurizer level with 2FCV-VC121 not controlling.
2. This event will be reviewed with all IM Department personnel to stress the care that should be taken when working around energized equipment and removing covers.
3. The controller for 2FCV-VC121 was restored to its normal functioning capacity by rewiring the limiter circuit so that it would not interfere with the manual mode of operation of 2FCV-VC121.
4. The IM Department will initiate a procedure change to 1/2F-121, to include notification to the technician that 2FC-121A is a unique controller with special jumper configurations.

#### F. PREVIOUS EVENTS

LER 1-92-007 documented an event where a Quality Control Inspector caused an Engineered Safety Features (ESF) actuation when he accidentally dropped a jumper on a terminal board. The corrective actions from LER 1-92-007 would not have prevented LER 2-92-005.

LER 1-92-002 documented an event where a momentary loss of power to an Instrument Inverter caused an ESF actuation. LER 1-92-002 was not caused by a personnel error, and the corrective actions would not have prevented LER 2-92-005.

#### G. COMPONENT FAILURE DATA

None