NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Dresden Nuclear Power Station, Unit 3	05000249	1 OF 5

TITLE (4)
Isolation Condenser Spurious Group V Isolation Due To Steam Flash In Condensate Return Line Due to Design Deficiency

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 NAME	DOCKET NUMBER
03	29	97	97	004	01	11	14	97	None	
									FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	3
POWER LEVEL (10)	000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.2201(b)		20.2203(a)(3)(i)		50.73(a)(2)(iii)		73.71(b)
	20.2203(a)(1)		20.2203(a)(3)(ii)	X	50.73(a)(2)(iv)		73.71(c)
	20.2203(a)(2)(i)		20.2203(a)(4)		50.73(a)(2)(v)		OTHER
	20.2203(a)(2)(ii)		50.36(c)(1)		50.73(a)(2)(vii)		(Specify in Abstract below and in Text, NRC Form 366A)
	20.2203(a)(2)(iii)		50.36(c)(2)		50.73(a)(2)(viii)(A)		
	20.2203(a)(2)(iv)		50.73(a)(2)(i)		50.73(a)(2)(viii)(B)		
	20.2203(a)(2)(v)		50.73(a)(2)(ii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Gary Sipe, System Engineer Ext. 2554	(815) 942-2920

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
X	BD	RLY	GO80	Y						

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 15 single-spaced typewritten lines) (16)

On March 29, 1997, at approximately 0534, with Unit 3 in Mode 3, Shutdown for a refueling outage, a spurious Primary Containment Group V Isolation occurred after Operations Department performed a valve lineup in accordance with Dresden General Procedure (DGP) 02-03, "Reactor Scram" to secure the Isolation Condenser (ISCO)[BL] from Standby and prior to placing the Shutdown Cooling System (SDC) in service. The outboard ISCO reactor inlet isolation valve, 3-1301-3 went closed from the open position as designed. This was the only valve that moved during the isolation. All other ISCO isolation valves had already been closed in accordance with DGP 02-03. In addition, the Group V isolation signal [BD] could not be reset. The cause of the inability to reset the Group V isolation signal was an isolated case of a relay failure. The cause of the spurious Group V isolation is a design deficiency in the Group V isolation flow instrumentation. Corrective actions included: relay replacement, Operational enhancements and evaluation of a modification. The safety significance of this event was minimal.

PLANT AND SYSTEM IDENTIFICATION

General Electric - boiling water reactor - 2527 MWt rated core thermal power.

Energy Industry Identification System (EIIS) codes are identified in the text as [XX] and are obtained from IEEE Standard 805-1984, IEEE Recommended Practice for System Identification in Nuclear Power Plants and Related Facilities.

Isolation Condenser System [BL]

EVENT IDENTIFICATION:

Isolation Condenser Spurious Group V Isolation Due To Steam Flash In Condensate Return Line Due to Design Deficiency

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 3 Event Date: 03/29/97 Event Time: 0534

Reactor Mode: 3 Mode Name: Shutdown Power Level: 0%

Reactor Coolant System Pressure: 106 psig

B. DESCRIPTION OF EVENT:

This report is being submitted in accordance with 10CFR50.73(a)(2)(iv), which requires the reporting of any event that results in the manual or automatic actuation of any Engineered Safety Feature (ESF). Additionally, this LER supersedes the event reported in LER 96-008S1, docket number 05000249.

On March 29, 1997, at approximately 0534, with Unit 3 in the Shutdown Mode for a refueling outage (D3R14), a spurious Primary Containment Group V Isolation occurred after Operations Department performed a valve lineup in accordance with Dresden General Procedure (DGP) 02-03, "Reactor Scram" to secure the Isolation Condenser (ISCO) [BL] from Standby and prior to placing the Shutdown Cooling System (SDC) in service. At approximately 0532, the Nuclear Station Operator (NSO) [Licensed Reactor Operator] had completed closing valves 3-1301-1 and 3-1301-2, ISCO reactor outlet isolation valves, and valve 3-1301-4, ISCO reactor inlet isolation valve. Valve 3-1301-3, ISCO reactor inlet isolation valve, was already closed which is its normal position. Valve 3-1301-3 was then opened at approximately 0533. Valves 3-1301-17 and 3-1301-20, ISCO vent to main steam line inboard/outboard isolation valves, went closed after valve 3-1301-3 was opened. Opening valve 3-1301-3 and, the resultant interlocked automatic closure of valves 3-1301-17 and 3-1301-20, completed the process of securing the ISCO from Standby in preparation for placing the SDC System in service.

Approximately 20 seconds after valve 3-1301-3 was opened, a High Temperature (150 degrees F) alarm was received for the tube (reactor) side of the ISCO. This indicated that hot condensate was moving through the condensate line affecting the temperature elements at the ISCO tube inlet, upstream of valve 3-1301-3. This could be indicative of a potential water hammer in the condensate line.

The Group V isolation was received in the Unit 3 Control Room (CR), 65 seconds after the 3-1301-3 valve was opened. The outboard condensate return isolation valve, 3-1301-3 went closed from the open position as designed. This was the only valve that moved during the isolation. All other ISCO isolation valves had already been closed in accordance with DGP 02-03.

At 0804 an ENS notification was made. At 0851, an attempt was made to reset the Group V isolation signal [BD], but the signal would not reset. The ISCO was later taken Out-of-Service (OOS) to support refueling outage activity on March 29, 1997, at approximately 1223.

When valve 3-1301-4 is closed, the reactor water between the valves 3-1301-3 & -4 is isolated at reactor pressure and temperature. Reactor pressure during this evolution was approximately 106 psig. When the 3-1301-3 valve was opened, the hotter condensate downstream of the 3-1301-3 valve came in contact with the cooler and lower pressure condensate upstream of valve 3-1301-3 valve resulting in the formation of water vapor in the line and convection flow. This resulted in a flow of water vapor/hot water through valve 3-1301-3 actuating the annubar flow element of the ISCO condensate return Differential Pressure Indicator Switches (DPIS) 3-1349-A and DPIS 3-1349-B. The annubar flow element experiences higher sensitivity in the reverse direction (from the Reactor) and at reduced temperature and pressure. This results in the flow switches being more susceptible to spurious actuation caused by the flow induced from convection and water vapor. The increased sensitivity of the DPIS under these conditions was documented in a 1992 and 1993 spurious Group V evaluation report.

Troubleshooting of the inability to reset the Group V actuation signal was performed. The failed relay was sent to the ComEd central testing facility for evaluation. The evaluation determined that it was an isolated case of a relay failure.

No other system or component inoperabilities have been identified which contributed to the event.

C. CAUSE OF EVENT:

The cause of the event is a design deficiency, NRC Cause Code B. The design for the instrumentation results in the switches being more sensitive to flow in the reverse direction and when the process media is at a reduced temperature and pressure. Additionally, the location of the switch near the elbow results in turbulent process media, which further reduces the margin of the switches. This can result in spurious Group V actuation when flow/ disturbance occurs in the condensate return line in the reverse direction. The sensitivity of the switch is also negatively impacted by the reverse slope in the piping which may lead to air in the line contributing to the instrument falsely actuating.

Contributing to this event is inadequate corrective actions. In the previous event, (LER 96-008S1, docket number 05000249) consideration of a modification was identified to correct the sensitivity of the switches and the reverse slope, however, sufficient corrective actions were not put in place to prevent a recurrence of the event, pending a formal Station decision on the need for a modification.

The cause of the inability to reset the Group V actuation signal was equipment failure, NRC cause code X. The failed relay was sent to the ComEd central testing facility for evaluation. The evaluation determined that the relay failure was an isolated case, resulting from degradation in the coil wire's structural integrity either by a nick in the wire prior to the winding operation or elongation of the wire as a result of structural fatigue related to expansion and contraction of the coil during normal operation.

D. SAFETY ANALYSIS:

The purpose of the Isolation Condenser (ISCO) is to control pressure and/or remove decay heat from the reactor inventory during periods when the normal heat sink is unavailable. The Isolation Condenser can be manually initiated. An automatic initiation occurs when reactor pressure is sustained at greater than or equal to 1070 psig for 15 seconds. Since Unit 3 was in the shutdown mode and reactor pressure was less than 150 psig, operability of the Isolation Condenser was not required. In addition, previous spurious Group V isolations occurred only at low pressures when the ISCO is not required for service, thus, the spurious Group V isolations have minimal impact on safety.

Had this event occurred at power, the consequences of a postulated accident would be mitigated by the HPCI system or the Automatic Depressurization [SB] system in conjunction with the Low Pressure Coolant Injection (LPCI) [BO] and Core Spray [BM] systems. All of the Isolation Condenser valves automatically responded as required. Therefore, the safety significance of the event is considered to be minimal.

E. CORRECTIVE ACTIONS:

Troubleshooting of the inability to reset the Group V actuation signal was performed, appropriate repairs were completed. (complete)

A modification to improve current annubar flow instrument performance and venting of the line high point will be evaluated for installation. (2371809600801A)

DGP 02-03 was revised to alert the Operator that a spurious Group V isolation can be expected following the opening of the 3-1301-3 valve. Further appropriate operating procedures revisions will be made to improve the ISCO system operation during configuration lineup. (2491809700401S1)

Operations Department will evaluate the feasibility of an electrical interlock to isolate the Group V isolation signal when the ISCO is not required for operation. (2491809700402S1)

No evidence of water hammer on the ISCO condensate lines were identified by engineering. (complete)

In March of 1997, a new corrections process was implemented at Dresden Station. The new process requires that personnel performing root cause investigations to have completed the applicable training. Having trained personnel perform the investigation helps assure that the required corrective actions are addressed. (complete)

Correspondence will be provided to the NRC updating the corrective actions. (248180970040 3S1)

F. PREVIOUS OCCURRENCES:

LER/Docket Number	Description
96-008S1/05000249	On June 21, 1996, at approximately 0941, with Unit 3 in the Shutdown Mode during a forced outage, a spurious Primary Containment Group V Isolation occurred after Operations Department performed a valve lineup to remove the ISOC from standby. The cause was an insufficient filling of the ISCO system due to inadequacies of Dresden Operating Procedure and the sensitivity of the annubar at reduced temperature and pressure. Consideration of a modification was identified to correct the sensitivity of the switches and the reverse slope, however, sufficient corrective actions were not put in place to prevent a recurrence of the event, pending a formal Station decision on the need for a modification.

G. COMPONENT FAILURE DATA:

General Electric Control Relay, catalog number 12HFA151A2H, 125 VDC.