

NRC FORM 366 (5-92)		U.S. NUCLEAR REGULATORY COMMISSION				APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95								
<b>LICENSEE EVENT REPORT (LER)</b>										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 (MNB 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.				
FACILITY NAME (1) Dresden Nuclear Power Station, Unit 2						DOCKET NUMBER (2) 05000237			PAGE (3) 1 OF 7					
TITLE (4) Isolation Condenser Group V Isolation Due to Spurious Flow Spikes														
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 None	DOCKET NUMBER				
12	17	92	92	-- 045 --	03	05	30	95	FACILITY NAME	DOCKET NUMBER				
OPERATING MODE (9) N		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)												
POWER LEVEL (10) 000		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 Gerald Cooper						TELEPHONE NUMBER (Include Area Code) Ext. 2270 (815) 942-2920								
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)														
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS				
SUPPLEMENTAL REPORT EXPECTED (14)						EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR				
YES (If yes, complete EXPECTED SUBMISSION DATE).				NO										

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On December 17, 1992, at 1232 hours with Unit 2 in cold shutdown with all control rods inserted, an unplanned Primary Containment Group V Isolation occurred while opening the inboard Isolation Condenser isolation valve, MO2-1301-4, in preparation for reactor startup per Dresden Operating Procedure (DOP) 1300-1, Standby Operation of the Isolation Condenser System. No abnormalities, open fuses, or other electrical problems were found in the circuitry, and the isolation signal was reset after verification that the signal was spurious. Instrument Maintenance Department (IMD) personnel were also dispatched to the area of the differential pressure instrumentation which initiates the isolation. No personnel were identified as having inadvertently jarred the instruments. In addition, following the event, all of the Group V isolated initiation instrumentation setpoints were verified to be within their specified tolerances. Isolation Condenser operability is not required whenever reactor pressure is less than 150 psig; also, had this event occurred under power operation, the High Pressure Coolant Injection or Automatic Depressurization Systems could have been utilized for reactor pressure control. Therefore, the safety significance of this event is minimal.

On January 17, 1993 at 0111 hours, a similar event occurred on Unit 3 while the unit was in cold shutdown with all control rods inserted. The event was reported by LER 93-003/050249.

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**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]. Nuclear Tracking System (NTS) tracking code numbers are identified in the text as (XXX-XXX-XX-XXXXX)

**EVENT IDENTIFICATION:**

Isolation Condenser Group V Isolation Due to Spurious Flow Spikes

**A. PLANT CONDITIONS PRIOR TO EVENT:**

Unit: 2                                      Event Date: 12/17/92                                      Event Time: 1232  
 Reactor Mode: N                                      Mode Name: Shutdown                                      Power Level: 0%  
 Reactor Coolant System Pressure: 0 psig

**B. DESCRIPTION OF EVENT:**

On December 17, 1992 at 1232 hours, with Unit 2 shutdown, a spurious Primary Containment Group V Isolation occurred while opening the inboard Isolation Condenser [BL] condensate return line isolation valve in preparation for reactor startup per Dresden Operating Procedure (DOP) 1300-1, Standby Operation of The Isolation Condenser System. On receipt of Control Room Panel 902-5 alarm H-2, Isolation Condenser Line Break (Group V Isolation), and B-4, Isolation Condenser Valves Off Normal, the Nuclear Station Operator observed that Isolation Condenser Motor Operated (MO) Valve 2-1301-4 reclosed as designed upon occurrence of either a high Isolation Condenser condensate return line flow or steam line high flow condition. The reactor was in the shutdown mode with all control rods [AA] fully inserted at the time of the event. As an immediate corrective action the Primary Containment Group V Isolation signal was reset after verification that the signal was spurious. The differential pressure switches which initiate the isolation are located in the Reactor Building on the ground elevation near the drywell equipment hatch entrance. No personnel were identified as having inadvertently jarred the instruments in question. No other safety systems or components were inoperable at the time that could have contributed to the event.

On January 17, 1993, at 0111 hours, with Unit 3 in shutdown with all control rods inserted, an unplanned Primary Containment Group V isolation occurred. All of the Isolation Condenser isolation valves automatically responded as required. The system was walked down following the event, and no line breaks, open fuses, or electrical problems were found. Calibration checks were performed, and all setpoints were verified to be within tolerance. The Group V Primary Containment Isolation signal was reset after it was determined to be spurious.

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C. CAUSE OF EVENT:

This report is being submitted in accordance with 10CFR50.73(a)(2)(iv), which requires the reporting of any event or condition that results in the manual or automatic actuation of any Engineered Safety Feature (ESF).

An engineering evaluation of the instrumentation and isolation logic for the Isolation Condenser was performed to determine the root cause of the spurious Group V isolations that have been occurring on Dresden Units 2 and 3

During a unit shutdown and start-up, process pressure transients are present at the location of the condensate return side flow element due to the operation of other systems that interconnect with the Isolation Condenser condensate return piping. As the reactor proceeds into the shutdown condition, the Recirculation pumps are set to minimum speed (28%). Then, when the Recirculation loop temperature drops below 350 degree F, the Shutdown Cooling pump interlocks clear and the pump(s) may be started. Finally, as reactor pressure drops below 90 psig, the Auxiliary Reactor Water Cleanup pump is started and the Main Reactor Water Cleanup Pump is secured. This sequence of operations continually adds more and more induced pressure transients at the location of the condensate return side flow element. In effect, with each system that is added, the process noise that is being sensed by the flow instrumentation approaches the value of the instrument trip setpoint. Based on the engineering evaluation, it was concluded that the root cause of the Group V isolations is that the combination of the instrument errors in the conservative direction along with the transient pressure effects of the interconnected systems produce an undesirable small steady state operating margin. This significantly increases the likelihood of generating a spurious Group V isolation signal.

D. SAFETY ANALYSIS:

The purpose of the Isolation Condenser is to control reactor 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 or automatically initiated. An automatic initiation occurs when reactor pressure is sustained at greater than or equal to 1070 psig for 15 seconds. Technical Specification Table 3.5.E.2 allows the Isolation Condenser to be inoperable for up to seven days provided that all active components of the High Pressure Coolant Injection (HPCI) [BJ] system remain operable. Since Units 2 and 3 were in the cold shutdown mode and reactor pressure was less than 150 psig, operability of the Isolation Condenser was not required. Had this event occurred at power, the consequences of a postulated accident would have been mitigated by the HPCI system or Automatic Depressurization [SB] system in conjunction with the Low Pressure Coolant Injection [BO] and Core Spray [BM] systems.

Initiation of the Primary Containment Group V Isolation demonstrated proper operation of the Containment Isolation valves when challenged by the spurious signal. Therefore, the safety significance of this event was considered to be minimal.

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E. CORRECTIVE ACTIONS:

Nuclear Fuel Services (NFS) identified that certain operations and accident conditions can be envisioned where it would be possible for the annubar to experience temperatures on the order of 575 degrees F and recommended that no changes be made to the use of a conservative assumption of the annubar calibration temperature (575 degrees F). This recommendation was transmitted to site system engineering by letter to Mr. Frank Spangenberg dated March 22, 1995, NFS-BSA:95-019, Subject: Dresden Isolation Condenser Temperature and Group V Isolation Time Delay Concerns. To improve the performance of the Group V isolation system on both Units 2 and 3, procedural changes were made identifying the specific isolation condenser isolation valve opening/closing sequence in procedures DGP 1-1, "Unit 2(3) Normal Startup", DGP 1-S1, "Unit 2(3) Master Startup Checklist", and DGP 2-1, "Unit 2(3) Normal Unit Shutdown" for startup/shutdown to minimize any pressure spikes sensed by the isolation condenser high flow isolation of the condensate return side flow transmitter. In addition, the System Engineer, with assistance from the Mechanical Maintenance Department, will inspect and tighten any loose U-bolts that connect the Isolation Condenser instrument lines to their supports during the next refuel outage on each unit, D3R13 and D2R14 (237-225-90-00302).

F. PREVIOUS OCCURRENCES:

<u>LER/Docket Numbers</u>	<u>Title</u>
91-040/050237	<p>Isolation Condenser Group V Isolation Due to Spurious Flow Spikes</p> <p>On November 19, 1992 at 2355 hours, with Unit 2 shutdown, an unplanned Primary Containment Group V Isolation occurred while starting the 2B Shutdown Cooling pump. The 2A and 2B Shutdown Cooling pumps tripped and the Control Room received alarm H-2 on Panel 902-5, "Isolation Condenser Line Break (Group V Isol)".</p>
91-006/050237	<p>Unplanned Primary Containment Group V Isolation Due to Unknown Cause</p> <p>On March 13, 1991 at 0615 hours with Unit 2 in the refueling mode with all control rods fully inserted, an unplanned Primary Containment Group V Isolation occurred, causing spurious closure of the Isolation Condenser isolation valves. The isolation signal was reset after verification that the signal was spurious. Operations personnel were also dispatched to the area of the differential pressure instrumentation which initiates the isolation. No personnel were identified as having inadvertently jarred the instruments in question; subsequent vibration testing at the instrument rack also could not duplicate the event. There was no affect on plant operation because Isolation Condenser operability was not required under the current plant</p>

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conditions; the Primary Containment Group V circuitry functioned properly when challenged by the spurious signal.

90-004/050249

Spurious Group V Primary Containment Isolation While Shutdown Due to Design Deficiency.

On February 12, 1990 with Unit 3 in cold shutdown, the Control Room received alarm H-2 on Panel 903-3, Isolation Condenser Line Break (Group V Isolation). The root cause of this event is unknown.

89-003/050249

Spurious Group V Primary Containment Isolation While Shutdown Due to Design Deficiency

On May 6, 1989, at 1443 hours, with Unit 3 in cold shutdown and reactor water level at 35 inches, a Group V Primary Containment Isolation occurred. The cause of the event was believed to be differential pressure spikes and/or noise generated by an annubar flow instrument that was installed on the Isolation Condenser condensate return line during the 1985 Unit 3 refueling outage. As corrective action, a modification to install a time delay with a more accurate time delay scale was initiated.

87-013/050249

Manual Reactor Scram Due to Reactor Feedwater System Oscillations During Unit Shutdown Due to Failure of Air Operated Containment Isolation Valve A03-1601-63 to Close During Surveillance Testing.

On August 7, 1987, a spurious Group V Primary Containment Isolation occurred while the Isolation Condenser was in use following a manual scram. The spurious isolation was reset and the Isolation Condenser was restarted satisfactorily.

87-014/050249

Plant Shutdown Due to Inoperable High Pressure Coolant Injection and Isolation Condenser Systems.

On September 5, 1987, with Unit 3 at 6% rated thermal power, a special test of the isolation condenser was being performed in order to pinpoint the cause of a previous spurious isolation condenser isolation as reported by LER #87-13 on Docket #050249. While performing this testing at 0320 hours, the isolation condenser spuriously isolated due to differential pressure signals generated by an annubar flow sensing instrument located on the isolation condenser condensate return line.

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86-018/050249

On October 14, 1986, Unit 3 was shutdown and the reactor vessel was depressurized several hours after a reactor scram. At 2050 hours, a Group V (isolation condenser) containment isolation signal was received in the Control Room. The cause of the spurious isolation condenser isolation was determined by testing in 1987 to be differential pressure spikes and/or noise generated by an annubar flow instrument installed on the isolation condenser condensate return line during the 1985 refueling outage.

86-020/050249

Spurious Group V Containment Isolation Due to Design Deficiency.

On November 13, 1986, Unit 3 was shutdown and the reactor vessel was depressurized several hours after a reactor scram. At 2140 hours, a Group V (isolation condenser) containment isolation signal was received. The cause of the spurious isolation condenser isolation was determined by testing in 1987 to be differential pressure spikes and/or noise generated by an annubar flow instrument installed on the isolation condenser condensate return line during the 1985 refueling outage.

93-003/050249

Spurious Group V Primary Containment Isolation While Shutdown Due to Spurious Flow Spikes.

On January 17, 1993 with Unit 3 in cold shutdown, the Control Room received alarm H-2 on Panel 903-3, Isolation Condenser Line Break (Group V isolation). The root cause of this event was a spurious flow spike.

93-011/050249

Spurious Group V Primary Containment Isolation While Shutdown Due to Spurious Flow Spikes.

On April 21, 1993 with Unit 3 in cold shutdown, a spurious Group V Primary Containment isolation occurred during the MO3-1301-3 valve VOTES testing. The root cause appears to be a flow spike in the Isolation Condenser condensate return line when the MO3-1301-3 valve was manually cracked open for VOTES testing.

93-012/050249

Spurious Group V Primary Containment Isolation While Shutdown Due to Spurious Flow Spikes.

On July 10, 1993 with Unit 3 in the shutdown mode, a spurious Group V (Isolation Condenser Line Break) Primary Containment Isolation occurred. A preliminary engineering evaluation determined the root cause to be a spurious flow spike caused by operation of systems required to bring the unit to cold shutdown and over-conservatism in the flow switch setpoint.

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94-029/050237

Spurious Group V Isolation Due to Pressure Spike When Opening the Isolation Condenser Reactor Inlet Isolation Valve.

On November 26, 1994 with Unit 2 in the startup mode at 2% rated power, a spurious Group V isolation signal was received when Motor Operated Valve (MOV) 2-1301-4 was being opened per Dresden General Procedure (DGP) 1-1, Unit 2(3) Normal Unit Startup. The cause of the spurious isolation was attributed to a pressure transient which occurred when the MOV 2-1301-4 valve was opened.

G. COMPONENT FAILURE DATA:

This section is not applicable.