NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), 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 4

TITLE (4)
Unit 3 C Condenser Low Vacuum Scram Switch Potentially Inoperable Due To Excessive Moisture In Sensing Line As A Result Of Improper Line Slope.

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
									N/A	N/A
05	25	98	98	006	00	07	15	98	FACILITY NAME N/A	DOCKET NUMBER N/A

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more) (11)					
POWER LEVEL (10)	099		20.2201(b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)
			20.2203(a)(2)(i)		20.2203(a)(3)(l)		50.73(a)(2)(ii)		50.73(a)(2)(x)
			20.405(a)(1)(ii)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
			20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER
			20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
K. W. Robbins, System Engineer	(815) 942-2920 ext 2314

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

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 June 16, 1998, an Engineering review of an anomaly in condenser vacuum identified a condition where one of the four pressure switches that provide condenser vacuum input into the reactor protection system may not have functioned prior to exceeding the technical specification limit of 21 in Hg. This condition was not recognized, therefore the required Technical Specification action statement was not implemented. The cause has been determined to be water collecting in the sensing line for the 'C' condenser due to improperly sloped sensing lines during initial installation. The sensing line slope will be corrected during the next refueling outage. In the interim, the sensing line will be blown down periodically to prevent excessive accumulation of moisture in the sensing line until final corrective actions are complete. Although the low vacuum scram reduces the severity of the loss of heat sink transient, it is not relied on to prevent exceeding safety limits. Therefore, the safety impact of this is minimal. This event is reportable under 10CFR 50.73(a)(2)(i), which requires the reporting of any operation or condition prohibited by the plant's Technical Specifications.

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.

EVENT IDENTIFICATION:

Unit 3 C Condenser Low Vacuum Scram Switch Potentially Inoperable Due To Excessive Moisture In Sensing Line As A Result Of Improper Line Slope.

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 3 Event Date: 5/25/98 Event Time: 1200 CDT

Reactor Mode: 1 Mode Name: Run Power Level: 099

Reactor Coolant System Pressure: 1000 psig

No systems or components were inoperable or out of service at the start of this event which contributed to the event.

B. DESCRIPTION OF EVENT:

This LER is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) which requires the reporting of any operation or condition prohibited by the plant's Technical Specifications.

On May 22, 1998, at 22:26, Unit 3 'C' Main Condenser [SG] Low Vacuum alarm was received in the Main Control Room. The computer recorded readings for vacuum in the 'C' condenser was 28.1 in Hg. The 3C Low Vacuum alarm is actuated by a pressure switch that has an alarm setpoint is 24.3 to 24.7 in Hg. On May 24, 1998, an Action Request (AR) was issued to have Instrument Maintenance Department (IMD) troubleshoot the discrepant condenser vacuum indications.

On May 25, 1998, the control board indications were 26.4 in Hg for the 'A' condenser, 26.1 in Hg for the 'B' condenser and 27.1 in Hg for the 'C' condenser. The local vacuum gauge readings were 27 in Hg, 26.5 in Hg and 28 in Hg respectively, consistent with the control board readings. IMD technicians performed a calibration check of the alarm pressure switch (found out of calibration and adjusted), the two pressure transmitters (both were found to be within expected tolerance) and the local gauge (found it to be out of calibration and unadjustable). During the process of checking the local vacuum gauge, the IMD technicians connected a piece of vacuum sensing test equipment to the connection for the local indicator in order to check the actual pressure in the sensing line. When the test equipment (internal pressure 29.92 in hg absolute) was unisolated, the control board indicator for 3C condenser vacuum returned to normal. This indicated that there was a water seal in the sensing line for the control board indicator, which was blown down into the condenser when the test equipment was unisolated.

Main Condenser Circulating Water [KE] Flow was from East to West. This means that the coolest circulating water entered the 'A' condenser first, then entered the 'B' condenser and the 'C' condenser last. The highest vacuum (lower pressure) should be in the coolest condenser and the lowest vacuum (highest pressure) in the warmest condenser.

The pressure switch that generates the low vacuum alarm uses a different sensing line than the sensing line shared by the reactor scram pressure switch, the local pressure indicator, and two pressure transmitters (one provides control board indication and one provides an analog input to the process computer.

On June 16, 1998, an Engineering review of the event revealed that one of the Reactor Protection System (RPS) [JC] low vacuum trip input pressure switch, the 'C' condenser local vacuum indicator and the pressure transmitter for the control board indicator all share a common sensing line. Since the seal had caused the erroneous control room indication, a potential nonconforming condition existed where the RPS low vacuum input may not have functioned within the required technical specifications setpoint. The technical specifications action required for inoperable switch requires tripping the associated channel/trip system within one hour. However, this action was not taken because the condition was not recognized.

On June 30, 1998, Operations Department shift personnel identified indications that were similar to those observed on May 22, 1998. An Operability determination was started in accordance with Dresden Administration Procedure (DAP) 07-31, Operability Determinations. IMD personnel blew down the sensing line with normal atmosphere by opening a test connection for approximately 30 seconds. Indications returned to expected values when the blow down was complete.

A review of historical trend data for condenser vacuum indication revealed that the observed Unit 3 vacuum indication anomaly is an historical discrepancy. The anomalous indication had been accepted as normal.

C. CAUSE OF EVENT:

During the course of this investigation, it was determined that the slope of the 3C condenser vacuum sensing line is approximately a negative 0.25 inch over five feet of pipe. The negative slope of the pipe results in condensation collecting at the low point, creating a water seal which effectively isolates the 3C condenser vacuum instrumentation from the process.

The cause of the vacuum anomaly is inadequate sloping of sensing lines during original installation/construction (NRC Cause Code: B).

D. SAFETY ANALYSIS

A loss of condenser vacuum initiates a closure of the turbine stop valves and turbine bypass valves. This action eliminates the heat input to the condenser. Closure of the turbine stop and bypass valves causes a pressure transient, neutron flux increase and an increase in fuel surface heat flux. To prevent the fuel cladding integrity Safety Limit from being exceeded if this occurs, a reactor scram occurs on turbine stop valve closure. The turbine stop valve closure scram function alone is adequate to prevent the fuel cladding integrity Safety Limit from being exceeded, in the event of a turbine trip transient with bypass valve closure. The condenser low vacuum scram is anticipatory to the stop valve closure scram and causes a scram before the stop valves (and bypass valves) are closed. Therefore, the resulting transient is less severe. Pressure switch 3-503-B is one of four pressure switches that provide the one-out-of-two-twice trip logic for condenser low vacuum scram.

Although the low vacuum scram may not occur prior to vacuum decreasing below the LSSS value, the safety analysis shows that the turbine stop valve closure scram alone is sufficient to prevent exceeding the fuel cladding integrity limit. Since the low vacuum scram function is not relied on to prevent exceeding the safety limit, the safety impact is minimal.

E. CORRECTIVE ACTIONS:

Operability Determination 98-032 was completed concluding that the pressure switch is in an operable but degraded condition. The switch will perform its intended design function as long as the sensing line is kept clear of excessive moisture. (Complete)

The sensing line was blown down. This will continue in accordance with Operability Determination 98-032 until corrective actions are complete. (Complete)

Straighten 'C' condenser vacuum sensing line so that it is properly sloped. (249-180-98-00601)

Review sensing line slopes for other similar application sensing lines to ensure proper line sloping. (249-180-98-00603 Unit 2, 249-180-98-006-04 Unit 3)

Each Operating Team has been briefed on the importance of this event and the need to identify abnormal indications. (Complete)

F. PREVIOUS OCCURRENCES:

A search of the INPO Plant Operating Experience Event Database was performed using Event Causal Factor Code CST (Construction). Three events were identified as being caused by improperly sloped sensing lines. They are:

249-950905-1, Dresden Unit 3: Improperly sloped instrument line prevented inadequate venting, resulting in spurious primary containment isolation actuations. The slope of the sensing line was corrected. Although this action was effective in preventing spurious isolation actuation signals, the scope of the corrective actions did not include the condenser vacuum sensing lines. Therefore, they would not have corrected the incorrect line slope of the 'C' condenser vacuum sensing line.

445-941129-1, Commanche Peak Unit 1: Improperly sloped sensing line resulted in false low stator water cooling flow causing a turbine trip and reactor scram. The sensing line slope was corrected and additional sensing lines were installed.

366-920515-1, Hatch Unit 2: Improperly sloped sensing lines resulted in drywell pressure instrumentation reading low by as much as 0.18 psig due to an accumulation of water in the instrument lines. The sensing line slope was corrected.

G. COMPONENT FAILURE DATA:

None.