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ComEd

October 6, 1995

JSPLTR 95-0006

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

Licensee Event Report 95-016, Docket 50-249 is being submitted pursuant to 10CFR50.73(a)(2)(v)(D), any condition that could have prevented the fulfillment of a safety system needed to mitigate the consequences of an accident.

Sincerely,

J. Stephen Perry
Vice President
BWR Operations

JSP/JK:pt

Enclosure

cc: H. Miller, Regional Administrator, Region III
NRC Resident Inspector's Office
File/NRC
File/Numerical

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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)
Failure of High Pressure Coolant Injection Low Pressure Surveillance Due to Exhaust Drain Pot High Level Alarm Relay - Switch Failure

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
									None	
09	11	95	95	-- 016 --	00	10	06	95	FACILITY NAME	DOCKET NUMBER

		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
OPERATING MODE (9)	N		20.2201(b)		20.2203(a)(3)(i)		50.73(a)(2)(iii)		73.71(b)
POWER LEVEL (10)	06		20.2203(a)(1)		20.2203(a)(3)(ii)		50.73(a)(2)(iv)		73.71(c)
			20.2203(a)(2)(i)		20.2203(a)(4)	X	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)
John Kish, Plant Engineering Ext. 2360	(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	BJ	RLY74	G080	NO						
X	BJ	LS	M040	NO						

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 September 11, 1995, at 2355, with Unit 3 in the start-up mode at 6% rated core thermal power, annunciator C-11, High Pressure Coolant Injection (HPCI) Exhaust Drain Pot High was received during performance of the low pressure surveillance run. After ten minutes with the alarm still in, the HPCI turbine was tripped manually. Upon failure of the HPCI low pressure surveillance, an orderly shutdown was initiated at 0300 hours on September 12, 1995. The alarm remained up until the next day when, during the troubleshooting process, it cleared while taking voltage checks across the alarm relay and level switch contacts. Extensive troubleshooting was performed on the electrical and mechanical components of the exhaust drain pot system. The alarm relay and level switch were replaced and functionally tested. No abnormalities were found with the mechanical components.

EVENT IDENTIFICATION:

Failure of High Pressure Coolant Injection Low Pressure Surveillance Due to Exhaust Drain Pot High Level Alarm Relay - Switch Failure

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 3 Event Date: 09/11/95 Event Time: 2355

Reactor Mode: Startup Mode Name: N Power Level: 6%

Reactor Coolant System Pressure: 320 psig

B. DESCRIPTION OF EVENT:

On September 11, 1995, with Unit 3 in the start-up mode at 6% rated core thermal power, during performance of the low pressure High Pressure Coolant Injection (HPCI) [BJ] operability run, annunciator C-11, HPCI [BJ] Exhaust Drain Pot High Level, alarmed and did not clear in the expected time frame. After ten minutes with the alarm still in, the HPCI turbine was manually tripped.

An extensive investigation was immediately initiated to determine the cause. During the time the alarm was up, there were no indications that the drain pot level had backed up into the HPCI turbine. This would have been evident by oscillating turbine speed or the Gland Seal Leak Off Blower being off. Neither indication was observed.

During performance of the surveillance and prior to the HPCI turbine trip, the Nuclear Station Operator (NSO) (Licensed reactor operator) informed the Plant Engineer (PE) (non-licensed) that alarm C-11 had been received in the control room. This was not unexpected since during the low pressure surveillance, the quality of the steam to the turbine is low. The PE observed the level of the Gland Seal Hotwell Condenser increase via the sightglass. This was expected since there was not enough pressure at this point in the surveillance from the turbine exhaust to move the drain pot contents to the normal drain path, which is the torus. After ten minutes the alarm had still not cleared. At this point the NSO communicated to the PE that he was manually tripping the HPCI turbine. The PE acknowledged this decision and the HPCI turbine was manually tripped.

Due to not being able to complete the low pressure HPCI surveillance within the 12 hour start-up timeclock an orderly shutdown was initiated at 0300 on September 12, 1995. An inspection and evaluation of the drain pot components, both electrical and mechanical was conducted. During troubleshooting the alarm relay and level switch contacts, located in the Auxiliary Electric Room, cleared and was able to be reset in the Control Room. It is believed that the alarm was legitimate when it first came in, but failed to clear when the drain pot emptied into the Gland Seal Condenser Hotwell.

C. CAUSE OF EVENT:

This report is being submitted in accordance with 10CFR50.73 (a)(2)(v)(D), any condition that could have prevented the fulfillment of a safety system needed to mitigate the consequences of an accident. It should be noted that the HPCI

system still would have been able to operate in this condition since there were other indicators, (oscillating turbine speed and Gland Seal Exhauster fan still on) that could have been utilized to determine if water was actually backing up from the drain pot into the turbine. Based on the available indication, a conservative decision was made to trip the turbine.

The turbine exhaust drain pot system is designed to drain steam and condensate from the stop valve below seat drain, turbine first stage drain, exhaust casing drain and turbine exhaust line drain. The water is collected in the drain pot and drains to the torus when the exhaust pressure reaches a high enough level. Prior to this, the water will drain to the Gland Seal Condenser Hotwell via the HPCI Turbine Exhaust Drain Pot Condensate Drain to Condenser valve, the 3-2301-32 valve, opening upon a drain pot high level alarm.

During the surveillance the turbine is first run at 2500 revolutions per minute (RPM). The exhaust pressure at this point is 8 psig. This is not high enough to push the drain pot water into the torus. Based on a review of the piping and elevation, at least 10 psig is needed to accomplish this. Further on in the surveillance the turbine is run up to 4000 RPM. This results in a turbine exhaust pressure of 28 psig and the water being drained to the torus.

During the investigation after the event, all aspects of the exhaust drain pot system were checked. This included 1) Removal and inspection of the downstream trap to the torus. It was found in good condition. 2) Performance of a flush of the line from the drain pot to the torus through the HPCI Turbine Exhaust Drain Line to Suppression Pool Check valves, the 3-2301-34 and 3-2301-71 valves. It was verified that there was no blockage in the line. 3) The drain path to the Gland Seal Condenser Hotwell was flushed and it was verified there was no blockage in this line. After this verification, it was decided to replace the 3-2301-32 valve due to the cycling imposed on it during the time the alarm was up. 4) The 3/16" orifice downstream of the 3-2301-32 valve was removed and inspected. It was found to be in good condition. Per Original Equipment Manufacturer (OEM) (GE) recommendation, the orifice was drilled to 7/16" and re-installed. Based on the results of these evolutions, it was determined that all mechanical aspects of the exhaust drain pot system functioned correctly and did not contribute to the event.

During investigation of the alarm relay and level switch, the alarm was able to be cleared when voltage readings were being taken on the level switch in the Auxiliary Electric Room. It was attempted to re-create the condition again via functional testing of the level switch, but with no success. The alarm relay and level switch were removed and examined to determine a cause for the alarm not clearing. This included a visual inspection of both components and testing of the relay. This testing included overall general appearance, coil resistance, coil pickup and dropout voltage and contact resistance both open and closed. There were no abnormalities found with these components. The level switch and alarm relay were both replaced and all wiring was examined for correctness and tightness. No abnormalities were found. The newly installed components were functionally tested prior to re-performance of the surveillance.

In addition to the above, an investigation was done to determine the length of time a legitimate exhaust drain pot high level alarm could exist. This was done to give the NSO more guidance when performing the surveillance and took into

account the exhaust line pressure and the newly sized orifice. This information was placed into the annunciator procedure. A functional check was also performed on the Gland Seal Condenser Hotwell level switches. No abnormalities were found.

Based on the above, the root cause of the event was a spurious malfunction of the alarm relay/level switch for the exhaust drain pot high level alarm. All inspections and tests performed on the piping, valves, traps and other mechanical components found them in acceptable condition and eliminates them as possible contributors to this event. All the electrical and instrumentation components associated with this event were replaced and functionally tested. Other than the exhaust drain pot high level alarm that wouldn't clear all system parameters observed during the surveillance were found to be consistent with operating conditions.

D. SAFETY ANALYSIS:

In this event, it is believed that the HPCI turbine would have operated as designed. This is based on observations made during the surveillance. These observations are 1) actual draining of the drain pot into the Gland Seal Leakoff Condenser after receiving annunciator alarm C-11, HPCI Exhaust Drain Pot High Level, in the Control Room and 2) no indications that water was actually backing up into the turbine casing i.e. oscillating turbine RPM and the Gland Seal Exhauster Fan was still on. Other than the sticking alarm, there were no other abnormalities observed during the surveillance run and after the HPCI turbine trip.

Upon determining that the alarm was in for an abnormal length of time, a conservative decision was made to manually trip the turbine to prevent any unnecessary challenges to the system. The surveillance was re-performed during the subsequent start-up at both low and rated pressure and passed both times with no observed abnormalities. Based on the above and the fact that all other Emergency Core Cooling Systems required by Technical Specification 3.5.C.2.a were operable throughout this event the safety significance is minimal.

E. CORRECTIVE ACTIONS:

Immediate corrective actions were to trip the HPCI turbine and initiate an orderly shutdown of the unit.

An investigation was commenced immediately on the mechanical components of the drain pot system which included temperatures of the drain line piping to the torus, drain line piping to the Gland Seal Condenser Hotwell which included upstream and downstream of the 3-2301-32 valve and orifice, steam trap temperatures and Gland Seal Leakoff Condenser level.

Action Requests were written to troubleshoot the exhaust drain pot level switch, and internally examine the drain line piping, steam trap, and 3-2301-32 valve. The level switch, alarm relay and 3-2301-32 valve were replaced.

Additional guidance was provided in annunciator procedure 902-3 C-11, HPCI Exhaust Drain Pot High Level, on the length of time a legitimate exhaust drain pot high level alarm could exist.

The orifice downstream of the 3-2301-32 valve was enlarged from 3/16" to 7/16" per OEM recommendation to enhance the drain capability of the exhaust drain pot.

All the components of the exhaust drain pot were functionally tested prior to re-performance of the surveillance and found satisfactory.

F. PREVIOUS OCCURRENCES:

None.

G. COMPONENT FAILURE DATA:

Manufacturer	Nomenclature	Model Number	Manufacturer Part Number
Magnetrol	Level Switch	402	402
General Electric	Relay	12HFA151A2H	12HFA151A2H

An industry wide Nuclear Plant Reliability Data System (NPRDS) database search revealed numerous occurrences of failures of the level switch and relay. Dresden reported two failures of the level switch and three failures of the relay, related to the HPCI System. None of these failures were determined to be related to this event.