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Dresden Nuclear Power Station
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June 5, 1992

CWS LTR #92-322

U.S. Nuclear Regulatory Commission
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Licensee Event Report 92-15, Docket 050237 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10 CFR 50.73(a)(2)(iv).

Lawrence F. Hennen for 6/5/92
Charles W. Schroeder
Station Manager
Dresden Nuclear Power Station

CWS/cfq

Enclosure

cc: A. Bert Davis, Regional Administrator, Region III
NRC Resident Inspector's Office
File/NRC
File/Numerical

(ZDVR/631)

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LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1)	Docket Number (2)	Page (3)
Dresden Nuclear Power Station, Unit 2	0 5 0 0 0 2 3 7	1 of 0 4

Title (4) Unanticipated Valve Movement During 125 VDC Ground Checking Due to Management 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 Names	Docket Number(s)
										N/A	
0 5	0 8	9 2	9 2	---	0 1 5	0 0	0 6	0 5	9 2	N/A	

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)			
	N	___ 20.402(b)	___ 20.405(c)	X 50.73(a)(2)(iv)	___ 73.71(b)
POWER LEVEL (10)	0 9 9	___ 20.405(a)(1)(i)	___ 50.36(c)(1)	___ 50.73(a)(2)(v)	___ 73.71(c)
		___ 20.405(a)(1)(ii)	___ 50.36(c)(2)	___ 50.73(a)(2)(vii)	___ Other (Specify in Abstract below and in Text)
		___ 20.405(a)(1)(iii)	___ 50.73(a)(2)(i)	___ 50.73(a)(2)(viii)(A)	
		___ 20.405(a)(1)(iv)	___ 50.73(a)(2)(ii)	___ 50.73(a)(2)(viii)(B)	
		___ 20.405(a)(1)(v)	___ 50.73(a)(2)(iii)	___ 50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

Name	TELEPHONE NUMBER
Vikram Kanal, Technical Staff System Engineer Ext. 2349	AREA CODE 8 1 5 9 4 2 - 2 9 2 0

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	E F	7 4 #	A 3 4 8	Y	X	B J	L S V	D 2 1 2	Y
X	B J	F S V	C 6 3 5	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 fifteen single-space typewritten lines) (16)

On May 8, 1992, during the afternoon shift, with the Unit 2 reactor at 99% power, the Nuclear Station Operator (NSO) observed that the suppression pool level and temperature had increased unexpectedly. Suppression pool level was checked using the local sight glass, showing level at -1.25 inches. Consequently the Unit was placed in a 6 hour Limiting Condition of Operation (LCO) per Technical Specification 3.7.A.1.f. Suppression pool water level was restored at 1907 hours and the LCO was terminated. It was determined that during a search for a ground on the 125 VDC Turbine Building Reserve Bus 2B-1, High Pressure Coolant Injection (HPCI) System Turbine Inlet Drain Pot valve A02-2301-28 had opened causing a steam input to the Torus. Although the circuit design causes valve A02-2301-28 to open on de-energization, Dresden Operating Procedure (DOP) 6900-07 (125 VDC Ground Detection), did not state this would occur. The suppression pool Hi-level alarm failed to annunciate in the Main Control Room (MCR). The valve was restored to its normal position and the ground search was continued. A Temporary Procedure Change was implemented to DOP 6900-07 to caution the NSO of all valve movements which would be caused during ground checking. The cause of this event has been attributed to management deficiency. Safety Significance was minimal because the HPCI system was capable of initiation during the event, and suppression pool level was restored within the 6 hour LCO. A previous event involving unplanned valve movement during ground checking was reported by LER 91-026/050237.

PLANT AND SYSTEM IDENTIFICATION:

General Electric - Boiling Water Reactor - 2527 MWt rated core thermal power

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

EVENT IDENTIFICATION:

Unanticipated Valve Movement During 125 VDC [EJ] Ground Checking Due to Management Deficiency

A. CONDITIONS PRIOR TO EVENT:

Unit: 2 Event Date: May 8, 1992 Event Time: 1615 Hours

Reactor Mode: N Mode Name: Run Power Level: 99%

Reactor Coolant System (RCS) Pressure: 1006 psig

B. DESCRIPTION OF EVENT:

At 1545 hours on May 8, 1992, with the reactor at 99% rated core thermal power, while performing a shift turnover review, the Nuclear Station Operator (NSO) observed that suppression pool level had unexpectedly increased from -2.9 inches to -2.0 inches, and suppression pool temperature had increased from 74 to 80 degrees Farenheit. A review of the Main Control Panels (MCPs) indicated that High Pressure Coolant Injection [BJ] (HPCI) System valve A02-2301-28 was open. Concurrent with this event, the Torus "Hi-Level" alarm had failed to annunciate at MCP 902-4. Work Request (WR) 09033 was initiated to investigate and repair this annunciator. Dresden Operating Surveillance (DOS) 1600-02, Torus Level Indication Using Local Sight Glass, was then performed. The level was observed to be -1.25 inches which exceeded the Technical Specification limit of 115,655 cu.ft. of water which corresponds to -1.5 inches. Consequently, the Unit was placed in a 6 hour Limiting Condition of Operation (LCO) per Technical Specification 3.7.A.1.f. Operations personnel then proceeded to restore suppression pool level to within normal operating band of -2.5 to -4.0 inches using Dresden Operating Procedure (DOP) 6900-02, Torus Water Level Control, and Dresden Emergency Operating Procedure (DEOP) 200-1, Primary Containment Control. Acceptable suppression pool level was achieved at 1907 hours and the LCO was terminated.

C. APARARENT 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 an Engineered Safety Feature (ESF). An Emergency Notification System (ENS) call was also made concerning the event.

During standby conditions, the HPCI system inlet drain pot removes condensate from the HPCI steam inlet piping upstream of normally closed M02-2301-3 and routes it to the main condenser. (Refer to Figure 1 for a HPCI drain system diagram.) Valves A02-2301-64 and A02-2301-65 remove entrapped condensate between M02-2301-3 and the HPCI Turbine Stop Valve, and the condensate is routed to the HPCI sump. Upon HPCI initiation, the inlet drain pot is isolated from the main condenser by the closure of valves A02-2302-29 and A02-2301-30. Valves A02-2301-64 and A02-2301-65 close to prevent steam from entering the HPCI room through the sump. The inlet drain pot is then aligned to the suppression pool (normally closed valve A02-2301-28 opens).

It was determined that the solenoid for valve A02-2301-28 had been de-energized during the afternoon shift on May 7, when a portion of the HPCI control logic was temporarily de-energized per Dresden Operating Procedure (DOP) 6900-7, 125 Volt Ground Detection. The solenoids for valves A02-2301-29,30,64, and 65 were also de-energized at this time. DOP 6900-07 requires circuit #14 of 125 VDC Turbine Building Reserve Bus 2B-1 to be de-energized and isolated from the battery in order to determine if the ground is located in that circuit. The procedure identified the de-energization of valves A02-2301-64 and A02-2301-65, but did not identify the de-energization of valves A02-2301-28, A02-2301-29, and A02-2301-30. The solenoids for these valves are normally energized, with valve A02-2301-28 being designed to fail open upon loss of DC power or instrument air. De-energzation of the solenoids for these valves requires manual resetting of each valve to return them to the normal position. Valves A02-2301-29,30,64, and 65 responded correctly to the de-energization, and were restored to their normal position. The solenoid for A02-2301-28 was de-energized; however, the main valve did not initially open. A02-2301-28 remained closed until about 0400 hours on May 8. A review of suppression pool temperature and level revealed that both parameters were constant until 0400, when both began increasing. Even with valve A02-2301-28 being open, the increase in pool temperature and level was greater than expected. A review of the HPCI system revealed that the HPCI steam inlet drain pot steam trap bypass valve, A02-2301-31, was leaking through. This resulted in reactor steam pressure being applied to a restricting orifice upstream of A02-2301-28, and providing the increased steam load to the suppression pool.

After further review of the electrical schematic control diagrams, it was concluded that the circuits reacted according to design; however, DOP 6900-07 was deficient in not clearly identifying the anticipated actions resulting from momentarily repositioning the circuit breakers of the associated DC circuit. A previous DOP 6900-07 revision resulting from a previous event (LER 91-026/050237) had identified that valves A02-2301-64 and A02-2301-65 reposition due to de-energization of circuit # 14; however, this review did not identify the movement of valves A02-2301-28, A02-2301-29, and A02-2301-30. Consequently, the root cause is attributed to management deficiency. Improved Operator attention to detail during the previous shift could also have resulted in earlier diagnosis of the problem.

Contributing to this event was the A02-2301-28 solenoid being de-energized, but not initially opening. The cause has been attributed to binding of the valve stem, thereby preventing this valve from going fully open. A maintenance history review revealed that this valve had previously exhibited binding problems. The entire valve was replaced in December 1990. WR 08593 had previously been written on April 16, 1992 to investigate a failure of the valve to cycle from the Control Room. The valve stem was lubricated and the valve was stroked 3 times to verify operability.

Also, the suppression pool high level annunciator failed to annunciate at the setpoint of -2.5 inches. This alarm is initiated through the Analog Trip System (ATS). The ATS for this alarm consists of a differential pressure transmitter which supplies a current signal to a Master Trip Unit (MTU). The MTU processes the signal and if the signal exceeds a predetermined setpoint, then the MTU will energize the Master Trip Relay (MTR). The MTR has a contact which then initiates the annunciator alarm. Troubleshooting of the annunciator circuit, under WR 09033, determined that upon applying a simulated trip signal to MTU 2-1626-10, the MTU would sense the high level condition, but MTR 2-1626-11 would not energize. The relay was then adjusted in its base and it energized. The relay was replaced; however the relay still would not energize. The relay was then further adjusted in the relay socket and then was energized. The relay was removed from the socket and inspection of the socket found a damaged pin, which connects to the relay coil. No previous instances of failure have been recorded for this relay socket.

D. SAFETY ANALYSIS OF EVENT:

During standby conditions, the HPCI system inlet drain pot removes condensate from the HPCI steam inlet piping upstream of normally closed valve MO2-2301-3 and routes it to the main condenser. Valves AO2-2301-64 and AO2-2301-65 remove any entrapped condensate between MO2-2301-3 and the HPCI Turbine Stop Valve, and the condensate is routed to the HPCI sump. Upon HPCI initiation, the inlet drain pot is isolated from the main condenser by the closure of AO2-2302-29 and AO2-2301-30. AO2-2301-64 and AO2-2301-65 close to prevent steam from entering the HPCI room through the sump. Valve AO2-2301-28 opens to align the inlet drain pot to the suppression pool. In this event all valves were repositioned except for AO2-2301-28 which was stuck closed.

If HPCI were to initiate with AO2-2301-28 closed, the inlet drain pot would be prevented from draining. During HPCI operation, however, the condensate level inside the drain pot would remain approximately the same since a lower drain path is provided in the inlet piping with MO2-2301-3 open. However, if the system was shutdown with MO2-2301-3 closed, condensate would begin to collect upstream of MO2-2301-3 at a condensing rate of approximately 200 lb/hr. As the condensate level increased, the level alarms in the drain pot would notify the operator of a drain problem, at which time the operator would cycle AO2-2301-28 to open the valve.

During HPCI operation, all condensate from the inlet steam piping is routed to the lower drain paths of the exhaust drain pot. The inlet drain pot level would remain approximately unchanged since only the condensing of the steam in the drain pot would add to the level. However, following HPCI operation condensate would begin to acculmulate in the steam inlet piping upstream of MO2-2301-3 with AO2-2301-28 closed. If the HPCI system were to re-start, any condensate in the steam inlet piping would be entrained in the steam flow. The Updated Final Safety Report (UFSAR) section 6.2.5 has analyzed the possibility of this type of moisture being ingested by the HPCI turbine. The analysis showed that failure of the turbine casing would not occur by this mechanism. The turbine was specified for operation with dry, saturated steam. The turbine is of a class normally used in extraction steam applications where continuous operation with moisture content as high as 5-10% is encountered.

In addition,the amount of condensate that would accumulate in the piping would more than likey flash when MO2-2301-3 was opened during a subsequent re-start. Any remaining condensate would be drained to the exhaust drain pot. It is believed that a pressure transient caused by condensate flashing to steam would not effect the turbine since the turbine is isolated from the steam supply for approximately the first 8 seconds during the initiation sequence. Safety significance was therefore minimal because the HPCI system was capable of initiation and performance of its intended function during the event.

The suppression pool provides the heat sink for the reactor primary system energy release following a Loss of Coolant Accident. The pool water volume absorbs the associated decay and sensible heat during primary system blow down from 1000 psig. During this event the pool water temperature was below the maximum allowable temperature of 95 °F with the pool water level at -1.25 inches of water, and a 6 hour LCO was entered. Water level was restored to within the normal operating range of -2.5 to -4.0 inches and the LCO was terminated. The safety significance of the suppression pool level increase was minimal because the total reduction in free air volume in the suppression chamber was relatively small. Conservative approximations show a level increase of 0.25 inches of water corresponds to a reduction in free volume of 214 cu.ft. This reduction of free air space would have minimal impact in the peak accident pressure in the suppression chamber, in the event of a drywell blowdown into the suppression chamber during a Loss of Coolant Accident. Additionally, the suppression pool temperature increase did not approach Technical Specification limits.

E. CORRECTIVE ACTIONS:

Temporary Procedure Changes (TPC) 92-216 and 92-217 to ground checking procedures DOP 6900-06 and DOP 6900-07 were implemented. The TPC's will be in place until appropriate permanent changes are implemented by the Operations Staff. Although completion of the ground checking activity did not result in any further unplanned actuations, a review of all 125 VDC circuits has been completed by the Technical Staff and the results of this review will be provided to the Operations Staff for inclusion into the ground checking procedures by August 15, 1992 (237-200-91-14101).

This event was reviewed in Station tailgates on May 28, 1992. Upper station management will also review this event with the cognizant Technical Staff System Engineer by June 30, 1992 (237-200-92-08801).

Mechanical Maintenence Department (MMD) personnel investigated the cause of valve A02-2301-28 failure to open. Lack of lubrication on the valve stem contributed to this valve's failure to cycle. The valve stem was lubricated and verified operable by cycling the valve three times. This valve is included in a preventive maintenance program to lubricate once every refuel outage.

Troubleshooting of the annunciator circuit for the suppression pool level determined that the the failure to receive the alarm was caused by a damaged pin in the relay socket for MTR 2-1626-11. Due to the sensitivity of the panel and circuitry connected to the relay socket, the socket will be replaced by the Instrument Maintenance Department during the next outage of sufficient length under WR 08593. As an interim action pending completion of these repairs, the suppression pool high level condition is being annunciated on MCP 902-4 through the operator select alarm feature of the process computer.

F. PREVIOUS OCCURENCES:

LER/Docket Numbers	Title
91-026/050237	Unanticipated Valve Closures During 125 VDC Ground Checking Due to Procedure Deficiency

The response of the DC circuit upon de-energization of the of the circuit resulted in valves A02-2301-64 and A02-2301-65 opening. Corrective actions were to review the circuit logic and implement a procedure change.

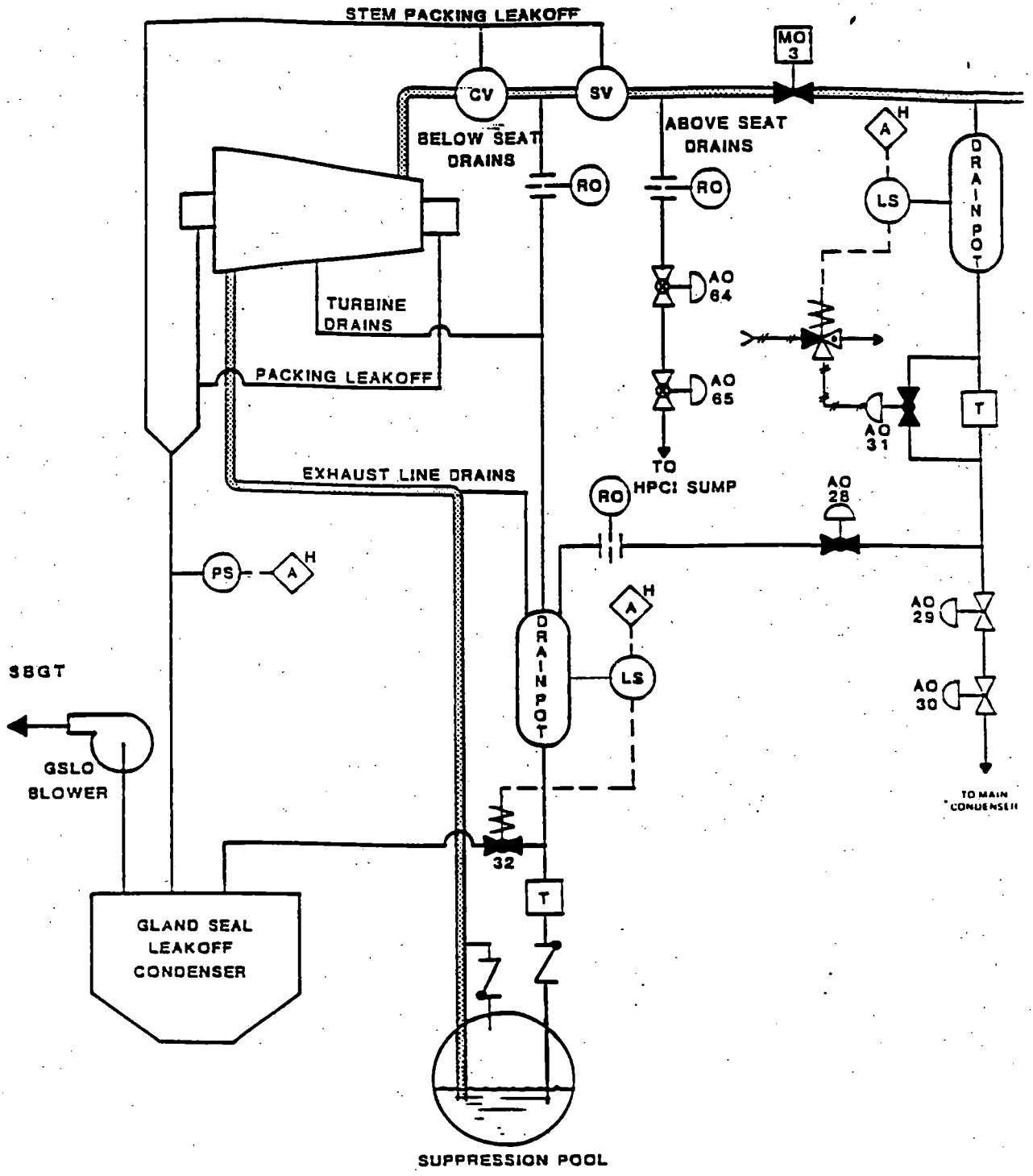
G. COMPONENT FAILURE DATA:

Manufacturer	Nomenclature	Model Number	Mfg. Part Number
Agastat	Relay socket	ECR 0095001	N/A
Copes Vulcan	Air Operated Soleniod Valve	N/A	S-132264
Dover Corp Norris	Air Operated Soleniod Valve	810	61293A

An industry wide NPRDS data base search revealed no adverse trend of previous events involving failures of this type of relay socket.

An industry wide NPRDS data base search revealed no adverse trend of previous events involving failures of these type of Air Operated Valves.

Figure 1



HPCI Drain System (Simplified)