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ComEd

November 30, 1994

JSPLTR 94-0025

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

Licensee Event Report 94-021, Docket 50-249 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10CFR50.73(a)(2)(v).

Sincerely,

J. Stephen Perry
Vice President
BWR Operations

JSP/LJ:cfq

Enclosure

cc: J. Martin, 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

LICENSEE EVENT REPORT (LER)

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.

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Dresden Nuclear Power Station, Unit 3	05000249	1 OF 4

TITLE (4)
Failure to SCRAM of CRD E-10 due to Spring Disengaged From the Core Assembly of a SCRAM Solenoid Pilot Valve

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
11	08	94	94	-- 021 --	00	11	29	94	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	N
POWER LEVEL (10)	025

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)		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)	X	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)
Lance E. Jacobsen, CRD System Engineer Ext. 2363	(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
B	AA	PSV	A610	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)

At 0445 hours on November 8, 1994 with Unit 3 at 25% rated power while performing SCRAM Testing per Dresden Technical Surveillance (DTS) 300-2, Control Rod Drive (CRD) [AA] E-10 failed to SCRAM from the control room. The CRD was inserted to position "00" and taken out-of-service (OOS). The failure to SCRAM was attributed to failure of the V118 SCRAM Pilot Solenoid Valve (SSPV) to operate. Both SSPVs were removed from the hydraulic control unit (HCU) and sent to the manufacturer (ASCO) for autopsy. Upon disassembly of the V118 pilot head assembly, the spring was found disengaged from the core assembly. When the SSPV is de-energized, the absence of the spring force, caused by the detached spring, prevented proper retraction of the core assembly to discharge the pilot head air. Both SSPVs were replaced on HCU E-10 and the CRD was successfully SCRAM Tested and returned to service. Both Dresden and the industry have had previous similar failures. G.E. and ASCO have stated that this was an isolated incident.

EVENT IDENTIFICATION:

Failure to SCRAM of CRD E-10 Due to Spring Disengaged From the Core Assembly of a SCRAM Solenoid Pilot Valve.

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 3 Event Date: 11/8/94 Event Time: 0445

Reactor Mode: N Mode Name: Run Power Level: 25%

Reactor Coolant System Pressure: 950 psig

B. DESCRIPTION OF EVENT:

At 0445 hours on November 8, 1994 with Unit 3 at 25% rated power, CRD E-10 failed to SCRAM from the control room. This failure was discovered while performing Full Core SCRAM Testing per Dresden Technical Surveillance (DTS) 300-2 following startup from refuel outage D3R13. The CRD was inserted per Qualified Nuclear Engineer (QNE) instructions to position "00" and taken out-of-service (OOS). While hanging the OOS, the system engineer noted that the SCRAM valves did not open when the fuses were pulled for the SSPVs. This indicated that one or both of the SSPVs had failed to operate. A work request was written to inspect and replace both SSPVs. Once removed, both SSPVs were sent to the valve manufacturer (Automatic Switch Co.) for autopsy.

C. CAUSE OF EVENT:

This LER is submitted in accordance with 10 CFR 50.73(a)(2)(i)and 10 CFR 50.73(a)(2)(v), which requires the reporting of an event or condition that resulted in any operation or condition prohibited by the plants Technical Specifications and any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to shutdown the reactor and maintain it in a safe shutdown condition.

A maintenance history review was performed for these SSPVs which indicated that both SSPVs for HCU E-10 were refurbished on April 13, 1994 per work request D19253. After refurbishment, these valves were subjected to two independent functional tests prior to start-up. These tests were performed per Dresden Electrical Procedure (DEP) 300-16, "Rebuilding Unit 2/3 ASCO SCRAM Pilot Solenoid Valves" and per DTS 300-10, "Control Rod Drive Functional Scram Valve Testing". Both of these tests verified proper operation of the SSPVs.

Prior to disassembly, the failed valves were functionally tested and it was determined that the 118 valve was not operating properly. Upon disassembly of the 118 valve pilot head assembly, the spring was found disengaged from its core assembly. The absence of the spring force caused by the detached spring prevented proper retraction of the core assembly to discharge the pilot head air. Subsequently, the 118 exhaust diaphragm could not properly (i.e. open) discharge the scram air to open the scram valves.

Dimensional measurement of the spring and core assembly was performed by ASCO. The inner diameter (ID) of the coil spring was approximately 0.003 inch over drawing allowable. According to ASCO, the oversized spring ID would not cause separation if it was properly assembled to the core. The cause of the spring separation is most probably due to improper assembly of the pilot head. The pilot head in question was supplied to Dresden as a pre-assembled pilot head subassembly. Dresden Electrical Maintenance personnel did disassemble a few of the pilot head sub-assemblies prior to refurbishment to verify proper assembly of the core springs; however, based on reviews of the work package, the failed valve was refurbished with a pre-assembled pilot head assembly supplied directly from ASCO. ASCO prefers that utilities do not disassemble the pilot head assemblies because of previous failures to SCRAM due to detached springs.

As a result of previous core spring separation incidents, a detailed inspection plan was implemented at ASCO to perform 100% inspection of the core assembly and spring critical dimensions. This also included confirmation of proper installation of the spring to its core assembly by functionally testing (approximately 25 cycles) before shipment. General Electric and ASCO have stated that the failure to SCRAM caused by the separated core spring is most likely an isolated incident.

D. SAFETY ANALYSIS:

Full core SCRAM testing per DTS 300-2 was completed on Unit 3 which verified the ability of all other CRDs to SCRAM within technical specification requirements. Therefore, all other CRDs would have performed their safety function and shutdown the reactor in the event of an actual reactor SCRAM. In addition, the back-up scram valves and the Alternate Rod Insertion system were available to depressurize the scram air header to allow the SCRAM valves to open and SCRAM this CRD. Based on the above, the safety significance of this event is considered to be minimal.

E. CORRECTIVE ACTIONS:

The immediate corrective actions were to insert the affected CRD to position "00" and take it OOS. Both SSPVs for CRD E-10 were replaced and the CRD was successfully SCRAM tested and returned to service. In addition, the remainder of the core was successfully SCRAM tested which verified operability of all CRDs.

The failed valve was sent to ASCO to be disassembled and inspected to determine the root cause of the failure. A ComEd employee was present during these inspections. Because this failure was identified during testing, because such extensive testing is performed by both ASCO and Dresden, and because ASCO and General Electric have determined that this was an isolated incident, no further corrective actions are planned for this event.

F. PREVIOUS OCCURRENCES:

There were no other LERs identified which document a similar failure of the SSPVs at Dresden Station. However, Problem Investigation Report 237-200-94-14100 does describe a similar event in which a spring was found separated from a core assembly. This event was attributed to failure to follow procedures when

verifying proper installation of the spring onto the core. The corrective action for this event was to enhance the procedure with a figure that shows proper spring installation. The differences between this previous event and our current event are that the pilot head kit utilized was not pre-assembled by ASCO and the affected CRD was not operable at the time of the failure.

G. COMPONENT FAILURE DATA:

This failed component was manufactured by ASCO.

Manufacturer	Nomenclature	Model Number	MFG Part Number
ASCO	Solenoid Valve	HVA 90 405 2J	

An NPRD's search was performed with no similar occurrences in the industry. However, in 1986, a similar event did occur at Vermont Yankee Nuclear Power Station.