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 2	05000237	1 of 4

TITLE (4)

Main Turbine Trip and Reactor Scram from Stop Valve Closure due to Momentary Electro-Hydraulic Control Fluid Low Pressure caused by Air-bleed Valve 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
									N/A	N/A
06	20	98	98	010	01	10	09	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)		50.73(a)(2)(i)		50.73(a)(2)(viii)
			20.2203(a)(2)(i)		20.2203(a)(3)(i)		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)	X	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)
Eric Steckhan, System Engineering	(815) 942-2920 ext. 2357

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
E	TG	VTV	V105	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)

On June 20, 1998, at 1206 hours, while performing Dresden Operation Procedure (DOP) 5650-01, Electro-Hydraulic Control (EHC) System Startup and Shutdown, a Main Turbine trip with subsequent reactor scram was experienced. Upon review of the event, it was identified that the Main Turbine trip was the result of a low pressure spike in the Main Turbine EHC supply system. An air-bleed valve was found stuck shut, unable to operate, preventing the release of accumulated air from the system upon start of the 2A EHC pump. . The immediate cause for the event was failure of the air-bleed valve. The System Materials Analysis Department determined the root cause for the air-bleed valve failure to be the component had reached the end of its useful service life. Corrective actions included the replacement of the failed air-bleed valve and the addition of the air-bleed valve component to the preventive maintenance program. The overall safety significance of this event was minimal because Emergency Core Cooling Systems (ECCS) were operable.

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:

Main Turbine Trip and Reactor Scram From Stop Valve Closure due to Momentary Electro-Hydraulic Control Fluid Low Pressure caused by Air-bleed Valve Failure

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 2 Event Date: 6/20/98 Event Time: 1206 CDT
Reactor Mode: 1 Mode Name: Run Power Level: 099
Reactor Coolant System Pressure: 1002 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)(iv), which requires the reporting of any event or condition that results in manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS) [JC].

On June 20, 1998, at 1206 hours, while performing Dresden Operation Procedure (DOP) 5650-01, Electro-Hydraulic Control (EHC) [TG] System Startup and Shutdown, a Main Turbine [TA] trip with subsequent reactor scram was experienced. Upon review of the event, it was identified that the Main Turbine trip was the result a low pressure spike in the Main Turbine EHC supply system.

Sequence of Events

On June 19, 1998, planned preventive maintenance was performed on the 2A EHC pump consisting of coupling alignment and (priming pump) chain adjustment. On June 20, 1998, at approximately 1140 hours, preparations were in progress to perform a post maintenance test run of the 2A EHC pump. The 2B EHC pump was in service and Unit 2 was at full power with no other major plant evolutions in progress. The Unit 2 Unit Supervisor held a briefing with the Unit and Auxiliary Nuclear Station Operators (NSO) covering the activity to be performed, and the need to dispatch an Equipment Attendant (EA) to the 2A EHC pump to support the engineer.

At approximately 1203 hours, with the engineer and an EA at the EHC skid, the Unit NSO started the 2A EHC pump from the Control Room. Locally, the EA recognized that the pump start was abnormal. The EHC pump started and ran quietly, rather than exhibiting sounds of normal fluid motion. The operator looked at the discharge pressure for the 2A EHC pump and found the pressure to be low, approximately 340 psig, rather than the greater than 1500 psig normally seen. The EA contacted the Control Room regarding his observations. The 2A EHC pump was left running to allow for further data collection, after which the Control Room would secure the pump.

Concurrently, in the Control Room, the NSO monitored the pump start, first verifying that system pressure remained normal, and then checking that pump normal pressure light illuminated. He recognized that the pump normal pressure light was not lit and requested a new bulb for replacement (assuming that the bulb was burned out). After about 10 to 15 seconds lapsed since the pump start, he verified that the pump amps were approximately equal for both EHC pumps, which they were. The NSO replaced the pump normal pressure bulb, and again failed to receive the indication.

The NSO received the call from the field regarding the low pressure indication of 340 psig and notified the Unit Supervisor of the problem. The Unit Supervisor, being aware of the evolution, acknowledged the low pressure problem and phoned the Shift Manager to inform him of the indications and to inquire if maintenance should be contacted to inspect the pump prior to securing it. During this discussion, the Main Turbine tripped with a subsequent reactor scram at 1206 hours.

After the Turbine Trip and reactor scram, all nine bypass valves opened to control reactor pressure, the Stand-By Gas Treatment system [BH] automatically started as expected, and a Group II and III isolation occurred as expected. The Unit Supervisor took command of the event. Dresden General Procedure (DGP) 02-03, Reactor Scram, was entered, as well as Dresden Emergency Operating Procedure (DEOP) 100 for Reactor Level Control. Task assignments were made, with one operator assigned to monitor the turbine parameters and RPV pressure, a second to monitor feedwater level control, and a third to establish a Reactor Water Cleanup [CE] blowdown path for reactor level control. The plant was stabilized and the ENS notification was performed at 1356 hours.

At 1500 hours on June 20, 1998, an Event Response Team was chartered in accordance with Nuclear Generation Group (NGG) procedure.

A review of event data indicated that the immediate cause of the scram was a turbine trip caused by low EHC oil pressure as sensed by the EHC pressure switch, PS 101. Initial data did not provide sufficient detail to determine if an actual low EHC oil pressure condition existed.

The results of troubleshooting indicated that the most probable cause of the event was a hydraulic transient as a result of starting the 2A EHC pump. At the time this pump was started, it is believed that the insufficient suction pressure was present. After pump start, the internal priming pump slowly restored suction pressure over the course of approximately two minutes. When sufficient pressure was achieved, the pump discharge check valve opened. Since the pump discharge piping was not filled with oil at the time the discharge check valve opened, two phase flow and subsequent pressure spikes in both the positive and negative direction resulted. It is believed that the low peak value of these spikes was sufficient to actuate the turbine trip from PS 101, but were not of sufficient duration to seal in the control room annunciator.

Efforts at troubleshooting have not been able to recreate the event. The reason for the loss of suction pressure to the 2A EHC pump while in standby is believed to be that the pump drained to the EHC fluid tank reservoir. When the pump is in the secured condition, if a piston is aligned across the suction and discharge ports, it allows easier drain down of the pump. The design of the system recognizes this potential and includes a priming pump and an air-bleed valve (Vickers valve). During the event, the priming pump was observed to be operational. However, during trouble shooting, an air-bleed valve for the 2A EHC pump was found not to be functioning. Inspection of the air-bleed valve found the valve stuck shut, unable to operate. Additionally, a portion of o-ring was found in the valve's port, suspected to be part of the air-bleed valve's o-ring. A review of recent operations and maintenance activities revealed no probable instances when air could have been introduced into the system. Also no preventive maintenance activity was identified to be in-place for the valve. The 2A EHC pump was last in operation on June 18, 1998, with no indication of degradation.

C. CAUSE OF EVENT:

The root cause of this event is the failure of the 2A EHC air bleed valve due to the component reaching its end of useful life (NRC cause code "E") and not being included in the Preventative Maintenance program. ComEd's Central Testing Facility System Materials Analysis Department performed an evaluation of the failed air bleed valve from the 2A EHC pump which included a visual examination, X-ray fluorescence spectrometry, qualitative pressure test, and destructive cutting of the valve in half for internal inspection. Their evaluation determined the valve malfunction was the result of the component reaching the end of its useful life. No maintenance activities were identified as being performed on the 2A EHC pump's air-bleed valve in the past.

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TEXT *(If more space is required, use additional copies of NRC Form 366A) (17)*

D. SAFETY ANALYSIS

No safety systems were required nor utilized in stabilizing the plant during scram recovery or cool down to cold shutdown conditions. All safety systems were operable during the event. The plant safety systems performed as designed. There were no radiation releases to the site or public. The health and safety of the public were not compromised as a result of this event. Therefore, safety significance is minimal.

E. CORRECTIVE ACTIONS:

The 2A EHC pump air-bleed valve was replaced and tested satisfactory. (Complete)

Preventive maintenance activities have been created for the periodic replacement of the EHC pump air-bleed valves for each EHC pump. (Complete)

The EHC pump air-bleed valves will be replaced on the 2B, 3A, and 3B EHC pumps. (237-180-98-01001A, 01B, & 01C)

The failed air-bleed valve was sent to ComEd's Central Testing Facility for examination where the root cause was confirmed. (Complete)

A project team was implemented to review the material condition of systems important to reliability (including EHC). This review determines the potential failure modes, required maintenance, and changes in preventative maintenance. (Complete)

An accelerated plan for site implementation of the Performance Centered Maintenance (PCM) program was put in place in accordance with improvement initiative NGG-3. This accelerated the Dresden PCM implementation from November 16, 2000, to August 30, 1998. (Complete)

F. PREVIOUS OCCURRENCES:

No previous occurrences were identified.

G. COMPONENT FAILURE DATA:

Manufacturer	Nomenclature	Model/ Part Number
Vickers	Air-bleed valve	ABS-09-10