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ACCESSION NBR: 8904240069 DOC. DATE: 89/04/14 NOTARIZED: NO DOCKET #
 FACIL: 50-388 Susquehanna Steam Electric Station, Unit 2, Pennsylvania 05000388
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SUBJECT: LER 89-004-00: on 890315, reactor water sys isolation on high differential flow signal. W/890414 ltr.

W/8 ltr.

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Susquehanna Steam Electric Station - Unit 2	DOCKET NUMBER (2) 0 5 0 0 0 3 8 8	PAGE (3) 1 OF 03
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TITLE (4)
Reactor Water Cleanup System Isolation on High Differential Flow Signal

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)
03	15	89	89	004	00	04	14	89		05000

OPERATING MODE (9) 3	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)					
POWER LEVEL (10) 000	20.402(b)	20.405(c)	<input checked="" type="checkbox"/>	60.73(a)(2)(iv)	73.71(b)	
	20.405(a)(1)(i)	60.36(c)(1)		60.73(a)(2)(v)	73.71(c)	
	20.405(a)(1)(ii)	60.36(c)(2)		60.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)	
	20.405(a)(1)(iii)	60.73(a)(2)(i)		60.73(a)(2)(viii)(A)		
	20.405(a)(1)(iv)	60.73(a)(2)(ii)		60.73(a)(2)(viii)(B)		
	20.405(a)(1)(v)	60.73(a)(2)(iii)		60.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)	
NAME Michael L. Crist - Compliance Evaluator	TELEPHONE NUMBER AREA CODE 717 542-3289

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)	YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On March 15, 1989 at 1510 hours with Unit 2 in Hot Shutdown, the Reactor Water Cleanup (RWCU) System isolated due to a high differential flow signal. The isolation occurred when Operations personnel reduced RWCU letdown flow in order to raise Reactor Vessel water level. The need to raise Reactor water level was caused when Residual Heat Removal Min Flow valve opened, following the initiation of Shutdown Cooling.

The isolation signal caused the RWCU inboard and outboard containment isolation valves to close automatically and the in-service RWCU pump to trip. After verifying no system leakage existed. The system was returned to service at 1709 hours.

Review of historical data indicates that when letdown flow was reduced, indicated differential flow increased causing the RWCU system isolate. Proper operation of the RWCU high differential flow instrumentation was verified. In addition, this event will be reviewed by Operations personnel to alert them to the potential of RWCU high differential flow isolations when making rapid changes in system flow.

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		YEAR 8 9	SEQUENTIAL NUMBER - 0 0 4	REVISION NUMBER - 0 0			

TEXT (If more space is required, use additional NRC Form 368A's) (17)

EVENT DESCRIPTION

At 1510 hours on March 15, 1989 with Unit 2 in Hot Shutdown, Condition 3, the Reactor Water Cleanup (RWCU, EIIS Code: CE) System automatically isolated. Prior to the isolation 'B' RWCU Recirculation Pump was in-service through the 'A' Filter/Demineralizer. At 1503 hours, Operations personnel (utility/licensed) placed 'A' loop of the Residual Heat Removal (RHR, EIIS Code: BO) system in Shutdown Cooling (SDC). The operating sequence associated with the initiation of RHR SDC included starting one RHR pump, the automatic opening of RHR Minimum Flow valve (HV-251-F007A) when system flow did not exceed the flow setpoint, operator action to increase RHR flow above the setpoint for Min Flow valve opening, and restoration of Reactor Vessel level. Reactor Vessel level dropped approximately four inches (104" to 100") during this evolution. In order to restore vessel level Operations personnel slightly opened Feedwater (EIIS Code: SJ) Startup Bypass Valve (HV-20640) and began to throttle close the RWCU Letdown Flow Regulator (HV-244-F033). As letdown flow was reduced from approximately 130 gpm to 0 gpm the RWCU inboard (HV-244-F001) and outboard (HV-244-F004) containment isolation valves automatically closed on a high differential flow signal. As a result the 'B' RWCU Pump tripped and the 'A' Filter/Demineralizer went into hold, per design. A walkdown of the RWCU system was performed, no leaks were identified. Chemistry samples of the demineralizer influent and effluent lines showed no loss of precoat. The system was returned to service at 1709 hours.

CAUSE OF EVENT

The RWCU system isolated due to a high differential flow signal. The high differential flow logic compares the system influent and effluent flows as a system leak detection method. One flow element measures influent flow while two flow elements measure effluent flow. The two effluent flows are summed and compared with influent flow. Any differential is then compared with the differential flow setpoint. A review of measured differential flow showed a maximum recorded value of 58.4 gpm. The trip setpoint is 59 gpm. It appears that measured differential flow may have exceeded 59 gpm even though the recorded data did not reflect this.

The isolation occurred when letdown flow was reduced to zero as described. Letdown flow is one of the effluent flow elements. System response time was such that before the other effluent flow element could respond to this change in flow path and record a corresponding increase, thus keeping differential flow at zero, the trip point was reached.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

In addition, Instrument & Control personnel (utility/non-licensed) verified the proper operation of the RWCU instrumentation, including performance of a field calibration on flow summer FY-G33-2K604. This instrument provides the signal to the high differential flow switch. No problems were found during the investigation.

The opening of the RHR Min Flow Valve F007A, when SDC is initiated, is a recognized problem at Susquehanna. The problem appears to be related to the response time of the flow switch which provides the open signal to the F007A valve. Changes have been made to operating procedures to alert the operator of this problem and provide required actions should the valve open. Long term corrective actions are being aggressively pursued by Nuclear Plant Engineering.

REPORTABILITY/ANALYSIS

The event was determined to be reportable per 10CFR50.73(A)(2)(iv) in that Unit 2 experienced an unanticipated Engineered Safety Feature actuation when the Reactor Water Cleanup System isolated due to a high differential flow signal.

There were no safety consequences resulting from this event. This assessment is based on the fact that the RWCU system performed its intended function of containment isolation upon receipt of a high differential flow signal. The intended function would have been performed regardless of power level.

CORRECTIVE ACTIONS

Proper operation of the differential high flow instrumentation was verified. A field calibration was also performed on the flow summer FY-G33-2K604. The instrument was found to be within the 'as-found' tolerance. This event will be reviewed by Operations personnel with emphasis on making RWCU system flow changes in a controlled manor to ensure high differential flow isolations do not occur.

ADDITIONAL INFORMATION

Failed Components: None

Previous Similar Events: Several previous RWCU isolations have occurred, however, only Licensee Event Report 86-006 documents a RWCU isolation due to a high differential flow signal.



Pennsylvania Power & Light Company

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April 14, 1989

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

SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 89-004-00
FILE R41-2
PLAS - 361

Docket No. 50-388
License No. NPF-22

Attached is Licensee Event Report 89-004-00. This event was determined reportable per 10CFR50.73(a)(2)(iv) in that an unplanned Engineered Safety Feature actuation occurred when the Reactor Water Cleanup System isolated.


R.G. Eyrann
Superintendent of Plant - Susquehanna

MLC/mjm

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