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 FACIL: 50-387 Susquehanna Steam Electric Station, Unit 1, Pennsylv 05000387
 AUTH. NAME AUTHOR AFFILIATION
 RYDER, T.S. Pennsylvania Power & Light Co.
 HIRT, J.A. Pennsylvania Power & Light Co.
 BYRAM, R.G. Pennsylvania Power & Light Co.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 88-017-01: on 880807, RWCU penetration room high differential temp RWCU Div I isolation occurred.

W/8 ltr.

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Susquehanna Steam Electric Station - Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 8 7	PAGE (3) 1 OF 0 4
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TITLE (4)
RWCU Penetration Room High Differential Temperature RWCU Division I Isolation

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)																																									
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<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;">OPERATING MODE (9) 1</td> <td colspan="11">THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)</td> </tr> <tr> <td rowspan="5">POWER LEVEL (10) 1 0 0</td> <td>20.402(b)</td> <td>20.405(c)</td> <td><input checked="" type="checkbox"/></td> <td>50.73(a)(2)(iv)</td> <td>73.71(b)</td> </tr> <tr> <td>20.405(a)(1)(i)</td> <td>50.38(e)(1)</td> <td><input type="checkbox"/></td> <td>50.73(a)(2)(v)</td> <td>73.71(c)</td> </tr> <tr> <td>20.405(a)(1)(ii)</td> <td>50.38(e)(2)</td> <td><input type="checkbox"/></td> <td>50.73(a)(2)(vii)</td> <td rowspan="3">OTHER (Specify in Abstract below and in Text, NRC Form 366A)</td> </tr> <tr> <td>20.405(a)(1)(iii)</td> <td>50.73(a)(2)(i)</td> <td><input checked="" type="checkbox"/></td> <td>50.73(a)(2)(viii)(A)</td> </tr> <tr> <td>20.405(a)(1)(iv)</td> <td>50.73(a)(2)(ii)</td> <td><input type="checkbox"/></td> <td>50.73(a)(2)(viii)(B)</td> </tr> <tr> <td>20.405(a)(1)(v)</td> <td>50.73(a)(2)(iii)</td> <td><input type="checkbox"/></td> <td>50.73(a)(2)(ix)</td> <td></td> </tr> </table>												OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)											POWER LEVEL (10) 1 0 0	20.402(b)	20.405(c)	<input checked="" type="checkbox"/>	50.73(a)(2)(iv)	73.71(b)	20.405(a)(1)(i)	50.38(e)(1)	<input type="checkbox"/>	50.73(a)(2)(v)	73.71(c)	20.405(a)(1)(ii)	50.38(e)(2)	<input type="checkbox"/>	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)	20.405(a)(1)(iii)	50.73(a)(2)(i)	<input checked="" type="checkbox"/>	50.73(a)(2)(viii)(A)	20.405(a)(1)(iv)	50.73(a)(2)(ii)	<input type="checkbox"/>	50.73(a)(2)(viii)(B)	20.405(a)(1)(v)	50.73(a)(2)(iii)	<input type="checkbox"/>	50.73(a)(2)(ix)	
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LICENSEE CONTACT FOR THIS LER (12)

NAME		TELEPHONE NUMBER
T. S. Ryder - Power Production Engineer J. A. Hirt - Engineer Level II		7 1 7 5 4 2 - 3 2 3 5

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)

<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) <input type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)
	MONTH DAY YEAR 0 1 3 0 8 9

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

At 0640 hours, on August 7, 1988, with Unit 1 operating in Condition 1, at 100% power, a RWCU system Division I isolation occurred (an ESF actuation) when a penetration room high DT trip signal was actuated. The RWCU system responded as designed with the exception that the A RWCU F/D Hold pump failed to auto-start. There was no compromise to the health or safety of the public and no safety consequences occurred. In addition, the operability of trip logic channels for the RWCU penetration room and the HPCI/RCIC leak detection DT system had been indeterminate prior to August 5, 1988, and September 30, 1988, respectively. The supply temperature elements had been reading essentially ambient temperatures in the RWCU penetration room and the HPCI/RCIC pipe routing area. As such, the trip channels may not have been able to perform their design function. Redundant/diverse isolation instrumentation which would be able to isolate RWCU, HPCI, and RCIC, was not affected by this condition. A task team had been previously formulated to review the subject of leak detection. An in-depth review of all leak detection systems will be performed, including the RWCU, RHR, HPCI, and MSL Leak Detection Systems. Calculations and design bases will be reviewed for adequacy and determination of the root cause(s), and appropriate long-term corrective actions will be performed. The findings of this task force will be reported in a followup to this LER.

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

Description of Event

On August 5, 1988, while task team investigation of the Reactor Water Cleanup (RWCU, EIIS code:CE) steam leak detection system were underway, in response to a recent on-going effort to review and document the plant's design basis on steam leak detection (reference LER 88-016, Docket No. 50-387), it was observed that the RWCU penetration room differential temperature (DT) readings on Riley instruments TDSH-G33-1N602E & F indicated little or no DT. Adjustments were made to the face diverter blades on the Zone I ventilation supply register to the penetration room in order to direct more inlet air flow onto TE-G33-1N022E & F, in order to achieve a representative DT reading for the area. DT readings rose to approximately 25 F after adjusting the register diverter blades.

At 0640 hours, on August 7, 1988, with Unit 1 operating in Condition 1 at 100% power, a RWCU system Division I isolation occurred when a penetration room high DT trip signal was actuated from the RWCU containment Penetration Room Differential Temperature Element TDSH-G33-1N602E. The RWCU Inboard Isolation Valve (HV-144-1F001) auto-closed. The RWCU system responded as designed, with the exception that the A RWCU Filter/Demineralizer (F/D) Hold pump failed to auto-start.

Since discovery of the discrepancies with the DT instrumentation of RWCU and the MSL systems, plant personnel attention to DT indication has increased. As a result of this heightened scrutiny, on September 30, 1988, the Unit One Shift Supervisor questioned a delta-temperature variance between the two channels of DT indications for the High Pressure Coolant Injection/Reactor Core Isolation Cooling (HPCI/RCIC. EIIS Code: BJ/BN) pipe routing area. One channel (Division I) indicated approximately 5 F to 10 F, while the other (Division II) read between 25 F and 35 F. Technical Staff personnel investigated and found that the Division I temperature sensors, TE-E51-1N026A & C, were not being exposed to a representative sample of the Zone I supply air. The louvers, directing the inlet air, were not positioned to blow the air over the sensors. The effects of such a condition was not known; therefore, the condition was corrected. The louvers of the supply register were repositioned to direct inlet air flow over the temperature elements .

Cause of the Isolation

The cause of the above RWCU isolation has been attributed to adjustments made on August 5, 1988, to the face diverter blades on the Zone I Ventilation supply register for the penetration room. It was observed, at that time, that little or no DT was being indicated on the

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steam leak detection modules, in the control room, for the penetration room DT instrumentation. Further inspection revealed that the supply air temperature elements, TE-G33-1N022E & F were not in the air stream coming from the supply register. The adjustments were made in an attempt to direct the inlet air onto TE-G33-1N022E & F. After the diverter blades had been readjusted, a DT of about 25 F was indicated. Colder outside air on August 7, 1988, led to a larger DT which reached the as-found setpoint of 31 F.

Reportability/Analysis

The event described in this report was determined to be reportable per 10CFR50.73 (a)(2)(iv), in that, an ESF actuation occurred when the RWCU Inboard Isolation Valve, HV-144-1F001, auto-closed. The isolation occurred when RWCU penetration room DT exceeded the trip setpoint intended to detect a steam leak in the penetration room. There was no compromise to the health and safety of the public, and no safety consequences occurred. The event has also been determined to be reportable per 10CFR50.73 (a)(2)(i), in that, in violation of plant Technical Specifications, leak detection trip logic channels for the RWCU penetration room, and the HPCI/RCIC pipe routing area, were considered inoperable prior to August 5, 1988, and September 30, 1988, respectively. The supply temperature elements for both the RWCU penetration room (TE-G33-1N022E & F) and the HPCI/RCIC pipe routing area (TE-E51-1N026A & C) had been sensing essentially ambient temperatures.

Prior to the dates specified above, little or no differential temperatures have been indicated and the trip channels may not have been able to perform their design function. Section 7.3.1a.2.4.1.9 & 10 of the FSAR provide a discussion on the various methods of leak detection available to detect a steam leak associated with the RWCU system. "Diversity of trip initiation signals for RWCU system line break is provided by high differential flow, high flow, ambient and differential temperature, and Reactor Vessel low, low water level, Level 2. An increase in differential flow, space temperature, differential temperature, or low Reactor Vessel water level will initiate a RWCU isolation." With exception of the penetration room DT detection, the remaining safety systems were in tact to detect a breach in the reactor coolant system boundary for the RWCU system. Because of the availability of these remaining leak detection trip initiation logics, ample redundancy existed to initiate a RWCU system isolation in the case of a significant RWCU leak outside containment.

Similarly, the condition of the Division I HPCI/RCIC Pipe Routing Area DT trip channel would not have prevented the isolation of the HPCI or RCIC systems, in the event of a significant leak. Only Division I was affected by the condition. Division II temperature sensors were

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subjected to inlet air flow and were sensing the correct temperature. In addition, the HPCI/RCIC pipe routing area is equipped with separate ambient temperature sensors which can actuate an isolation of the HPCI and RCIC systems. In the event of a high DT or high ambient temperature in the pipe routing area, this isolation logic would have isolated the RCIC and HPCI systems.

Corrective Actions

Immediate corrective actions for the RWCU isolation were to verify that no steam leak existed. The Zone I supply register diverter blades were readjusted to lower the RWCU penetration room nominal DT readings to about 10-13 F. The failure of the A RWCU F/D Hold pump to auto-start was attributed to an instrument drift problem associated with both the pneumatic flow transmitter and the low flow switch which are integral to the hold pump auto-start logic. These instruments were calibrated to within final tolerances on August 12, 1988. A task team had previously been formulated to review the subject of steam leak detection. An in-depth review of all leak detection systems will be performed including the RWCU, Residual Heat Removal (RHR, EIIS Code: BO), RCIC, HPCI, and MSL Leak Detection Systems. Calculations and design bases will be reviewed for adequacy and determination of the root cause(s) and appropriate long-term corrective actions will be performed. The findings of this task team will be reported in a follow-up to this LER.

Corrective actions currently planned for the HPCI/RCIC pipe routing area include the installation of warning labels on the dampers to the pipe routing area. The labels will state that the louvers to the dampers should not be repositioned. Further enhancements may include repositioning the sensors inside the ductwork so that positioning of the louvers would not be a factor.

Additional Information

Failed Component Identification: Not applicable.

Previous Similar Events:

LER 87-016-00 (Docket 50-387, LER 87-009-00 (Docket 50-388), LER 87-005-00 (Docket 50-388).



Pennsylvania Power & Light Company

Two North Ninth Street • Allentown, PA 18101 • 215/770-5151


October 31, 1988

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

Susquehanna Steam Electric Station
Licensee Event Report 88-017-01
File R41-2
PLAS- 343

Docket No. 50-387
License No. NPF-14

Attached is Licensee Event Report 88-017-01, which is an update to LER 88-017-00 filed with the Commission on September 6, 1988. This event was determined to be reportable per 10CFR50.73(a)(2)(iv), in that, an unplanned engineered safety feature actuation occurred when the Unit 1 Reactor Water Cleanup System isolated on a high room differential temperature trip signal. This event has also been determined to be reportable per 10CFR50.73(a)(2)(i), in that, the trip logic channels for the RWCU penetration room and HPCI/RCIC pipe routing area differential temperature leak detection systems were considered inoperable prior to August 5, 1988, and September 30, 1988, respectively.


R. G. Byram
Superintendent of Plant-Susquehanna

JAH/jah

cc: Mr. William T. Russell
Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. Frank Young
Sr. Resident Inspector
U.S. Nuclear Regulatory Commission
P. O. Box 52
Shickshinny, PA 18655

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