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ACCESSION NBR: 9108020216 DOC. DATE: 91/07/26 NOTARIZED: NO DOCKET #
 FACIL: 50-388 Susquehanna Steam Electric Station, Unit 2, Pennsylv 05000388
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 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 91-010-00: on 910628, RWCU isolated on two occasions due to actuations of steam leak detection instrumentation. Caused by design deficiency & elevated ambient penetration room temps. Temp modules replaced. W/910726 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 6
 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES: LPDR 1 cy Transcripts. 05000388 A

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July 26, 1991

U.S. Nuclear Regulatory Commission
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Washington, DC 20555

SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 91-010-00
FILE R41-2
PLAS - 493

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

Attached is Licensee Event Report 91-010-00. The two events described in this report were determined to be reportable per 10CFR50.73(a)(2)(iv), in that, in each case, an unplanned ESF actuation occurred when the RWCU outboard primary containment isolation valve automatically closed due to actuation of the system's steam leak detection instrumentation.

H.G. Stanley
Superintendent of Plant - Susquehanna

MLC/mjm

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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 RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) **Susquehanna Steam Electric Station - Unit 2** DOCKET NUMBER (2) **0 5 0 0 0 3 8 8 1** PAGE (3) **OF 0 5**

TITLE (4) **RWCU System Isolated on Two Occassions Due to Actuation of Steam Leak Detection Instrumentation**

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)										
0	6	2	8	9	1	9	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0

OPERATING MODE (9) **1**

POWER LEVEL (10) **1 0 0**

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)
<input type="checkbox"/> 20.406(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)
<input type="checkbox"/> 20.406(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
<input type="checkbox"/> 20.406(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
<input type="checkbox"/> 20.406(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
<input type="checkbox"/> 20.406(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME **Michael L. Crist - Compliance Evaluator** TELEPHONE NUMBER **7 1 1 7 5 4 1 2 1 - 1 3 1 2 1 8 1 9**

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) NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

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

On June 28, 1991, with Unit 2 operating in Condition 1 at 100% power, the Reactor Water Cleanup (RWCU) system isolated on two separate occasions due to actuations of the system's steam leak detection instrumentation. At 1450 hours the first isolation occurred when the Riley temperature module meter switch for RWCU penetration room temperature was positioned to "read" room temperature and the system isolated. At 1838 hours a second isolation occurred due to an actual Division II RWCU Penetration Room high ambient temperature signal. The system responded properly to both isolation signals. The root cause of the first RWCU isolation has been attributed to a design deficiency with the Riley temperature modules. The root cause of the second RWCU isolation has been attributed to elevated ambient penetration room temperatures due to unusually hot weather conditions. This also contributed to the first event. The two events described were determined to be reportable per 10CFR50.73(a)(2)(iv), in that, in each case, an unplanned ESF actuation occurred. On July 12, 1991 a Waiver of Compliance was granted by the NRC allowing the RWCU high ambient room temperature trip setpoints to be increased from 118.3 degrees F to 131 degrees F to prevent any future spurious isolations during the hot weather months. Operations personnel will also be trained on the design and use of the Riley modules. There were no safety consequences or compromise to public health or safety as a result of these events.

LICENSE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 80.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Unit 2 Susquehanna Steam Electric Station	DOCKET NUMBER (2) 0 5 0 0 0 3 8 8	LER NUMBER (6)			PAGE (3)	
		YEAR 9 1	SEQUENTIAL NUMBER - 0 1 0	REVISION NUMBER - 0 0	0 2 OF 0 5	

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

EVENT DESCRIPTION

At 1450 hours on June 28, 1991 with Unit 2 operating in Condition 1 at 100% power, an unplanned Engineered Safety Feature (ESF) actuation occurred when the Reactor Water Cleanup (RWCU, EIIS Code: CE) system isolated due to an inadvertent actuation of the system's steam leak detection system. At the time of the actuation, the Shift Technical Advisor (STA, utility/other) was monitoring RWCU area room temperatures using the Riley temperature modules located in the Control Room. When the STA placed the meter switch for RWCU Penetration Room temperature to the "read" position, a Division II RWCU system isolation signal was generated. The system responded properly to the isolation signal and the RWCU outboard primary containment isolation valve, HV-244-F004 automatically closed as designed. Following the isolation the STA rechecked the Riley temperature module to verify the RWCU Penetration Room ambient temperature and the instrument process trip setpoint. The module showed that the room temperature was 112 degrees F and the process trip setpoint was 115 degrees F. At 1605 hours the system was restored. At 1607 hours ENS notification was made in accordance with 10CFR50.72(b)(2)(ii).

At 1838 hours, on the same day, the RWCU system isolated due to an actual Division II RWCU Penetration Room high ambient temperature signal. The system responded properly to the isolation signal and HV-244-F004 automatically closed as designed. The penetration room ambient temperature was approximately 113 degrees F and the instrument process trip setpoint was 115 degrees F as indicated by the Riley temperature module in the control room. At 2040 hours ENS notification was made in accordance with 10CFR50.72(b)(2)(ii). Following an indepth investigation into the possible causes for the high ambient temperature condition, the system was returned service at 0046 hours on June 29, 1991.

CAUSE OF EVENT

The root cause of the first RWCU isolation has been attributed to a design deficiency with the Riley temperature modules. The design is such that whenever the meter switch on the module is positioned to read the temperature or the process trip setpoint of the associated instrument a voltage perturbation occurs. If the actual ambient temperature in the room is close to the instrument's process trip setpoint and the meter switch is positioned to read either of the two parameters, the resultant voltage perturbation may cause a trip signal to be generated. Contributing to the event was the elevated ambient penetration room temperatures due to the unusually hot weather conditions. As stated in the event description, the actual room temperature was 112 degrees F and the process trip setpoint was 115 degrees F.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Unit 2 Susquehanna Steam Electric Station	DOCKET NUMBER (2) 0 5 0 0 0 3 8 8	LER NUMBER (6)			PAGE (3)	
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TEXT (If more space is required, use additional NRC Form 368A's) (17)

The root cause of the second RWCU isolation has been attributed to elevated ambient penetration room temperatures due to unusually hot weather conditions. This room typically can operate at 115 degrees F during the summer when extremes in outdoor temperature occur. The process trip setpoint for the RWCU high ambient temperature instrumentation is 116 degrees F. As such, the margin for operation is minimal.

REPORTABILITY/ANALYSIS

The two events described in this report were determined to be reportable per 10CFR50.73(a)(2)(iv), in that, in each case, an unplanned ESF actuation occurred when the RWCU outboard primary containment isolation valve automatically closed due to actuation of the system's steam leak detection instrumentation.

There were no safety consequences or compromise to public health or safety as a result of these events. This assessment is based on the fact that the HV-244-F004 performed its designed function of containment isolation upon receipt of a high ambient room temperature. This function would have occurred regardless of reactor power level.

In accordance with 10CFR50.4(d) the required submission date for this report was determined to be July 29, 1991.

CORRECTIVE ACTIONS

Immediate corrective actions for both events consisted of verifying proper RWCU system response to the isolation signals and verifying there were no breaks or abnormal conditions in the RWCU penetration room. Additional corrective actions taken after the second isolation are outlined below:

1. Penetration room temperature was confirmed locally with a hand held thermometer.
2. The process trip setpoint for TSH-G33-2N600F was confirmed to be within calibration tolerances. The process trip setpoint is 116 degrees F plus or minus 2 degrees. The setpoint was then adjusted to the upper end of the allowable tolerance.
3. A temporary digital temperature indicator was installed off of TSH-G33-2N600E to provide continuous RWCU penetration temperature in the control room. This action eliminated the need to read the Riley module to monitor RWCU penetration room temperature.

LICENSEE REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Unit 2 Susquehanna Steam Electric Station	DOCKET NUMBER (2) 0 5 0 0 0 3 8 8	LER NUMBER (6)			PAGE (3)		
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Actions to prevent recurrence include the following:

1. The Riley temperature modules for all Unit 2 RWCU Area ambient steam leak detection circuits were replaced with a new model that permits placing the meter switch to read temperature without the risk of spurious isolations. However, the new Riley modules are still susceptible to voltage perturbations when placing the meter switch to the setpoint position. This is an inherent design problem that cannot be remedied by modifying the Riley module. The remaining Riley modules for the station's steam leak detection systems will be replaced with the new models. These actions are acceptable since items 4 and 5 below will prevent recurrence.
2. On July 8, 1991 a Waiver of Compliance from the requirements of Technical Specification Table 3.3.2-2 Item 4.b was requested. This requirement provides a trip setpoint of 118.3 degrees F and an allowable value of 125.3 degrees F to isolate the RWCU system on a high RWCU ambient room temperature. The requested relief would increase the Technical Specification trip setpoint from 118.3 to 131 degrees F and the allowable value from 125.3 to 137 degrees F. The waiver is based on supporting technical information in an earlier request for a license amendment to permanently change the affected Technical Specifications. The license amendment was previously submitted on January 9, 1991. The Waiver of Compliance was granted on July 12, 1991 by the NRC and will remain in effect until October 15, 1991 or until the NRC completes its review of the license amendment and related PP&L submittals.
3. On July 16, 1991 Unit 1 and Unit 2 temporary setpoint changes were issued to increase the RWCU penetration room ambient temperature process trip setpoints from 116 degrees F to 128 degrees F.
4. Operations personnel will be given training on the design and use of the Riley modules.
5. The Alarm Response procedures will be revised to precaution the operator regarding proper use of the Riley modules and thereby minimize the risk of spurious actuation.
6. The station has been and will continue to evaluate alternate vendor designs to determine if there is a replacement module with a better design.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Unit 2 Susquehanna Steam Electric Station	DOCKET NUMBER (2) 0 5 0 0 0 3 8 8	LER NUMBER (6)			PAGE (3)		
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

ADDITIONAL INFORMATION

Failed components: Not applicable.

Past Similar Reportable Events: A review was conducted on past License Event Reports to identify any previous RWCU system isolations resulting from high ambient temperature signals. Listed below are the LERs that were determined to be similar:

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

LER 88-013

LER 89-025

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

LER 87-008

LER 88-012

LER 88-013