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ACCESSION NBR:9104010233 DOC.DATE: 91/03/22 NOTARIZED: NO DOCKET #
FACIL:50-388 Susquehanna Steam Electric Station, Unit 2, Pennsylva 05000388
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RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 89-001-01:on 890118,MSIV-LCS Valves inoperable.Caused by environmental qualification deficiencies.Environmentally qualified splices installed on HV-239F001F,HV-239F006 & HV-239F009.W/910322 ltr.

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TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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March 22, 1991

U.S. Nuclear Regulatory Commission
Document Control Desk
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SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 89-001-01
FILE R41-2
PLAS -475

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

Attached is Licensee Event Report 89-001-01. This is an update to LER 89-001-00 which was made pursuant to 10CFR50.73(a)(2)(i) and 10CFR50.73(a)(2)(v) in that three MSIV-LCS valves were found to contain environmentally non-qualified splice configurations.

H.G.Stanley
Superintendent of Plant - Susquehanna

TSR/mjm

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NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

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.

LICENSEE EVENT REPORT (LER)

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

TITLE (4)

MSIV - LCS Valves Inoperable Due to Environmental Qualification Deficiencies

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 5 0 0 0
0 1	1 8	8 9	8 9	— 0 0 1	— 0 1	0 3	2 2	9 1		0 5 0 0 0

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)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	X 50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
T.S. Ryder - Power Production Engineer	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	MANUFAC-TURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	

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 fifteen single-space typewritten lines) (16)

During the inspection of various MOV's, it was discovered that motor splices utilized on three valves on the MSIV-LCS system were not environmentally qualified. The following connections were installed on the internal winding connections of the dual voltage motors for these valves: an amp butt splice connection on HV-239F001F and lug and bolt connections on both HV-239F006 and HV-239F009. All three connections were immediately replaced with qualified Raychem NPKV Kit connections. At the time of installation, the lug and bolt type and amp butt type splices were considered procedurally acceptable. It was later recognized that EQ documentation on these type splices did not exist and that plant procedures did not adequately reflect EQ requirements. On January 18, 1989 following engineering review of the as-found connections, this event was determined to be reportable per 10CFR50.73(a)(2)(i) and per 10CFR50.73(a)(2)(v). This conservative determination was made based on the assumption that the three MSIV-LCS valves were inoperable during the installed period which is assumed to be from February of 1983 to June of 1988. Environmentally qualified splices were immediately installed on HV-239F001F, HV-239F006 and HV-239F009 to correct the condition. Procedural changes have been made outlining the usage of only environmentally qualified connections in EQ MOVs. Proper inspection criteria and installation information for wire splices have been incorporated into plant maintenance procedures. Review of work documents for safety related MOV actuator overhauls performed in the most recent Unit 1 and 2 refuel outages identified no problems with unqualified MOV wire splices.

DESCRIPTION OF EVENT

During Maintenance inspections it was discovered as documented on June 15, 1988 that the motor splices utilized on three valves on the Main Steam Isolation Valve Leakage Control System (MSIV-LCS, EIIS Code: BD) were not environmentally qualified. The following non-qualified connections were installed on the internal winding connections of the dual voltage motors for these valves: an amp butt splice connection on HV-239F001F and lug and bolt connections on both HV-239F006 and HV-239F009. All three connections were immediately replaced with qualified Raychem NPKV Kit connections.

CAUSE OF THE EVENT

At the time of installation, the lug and bolt and amp butt type splices were considered procedurally acceptable. It was later recognized that Environmental Qualification (EQ) documentation on these type splices did not exist and that plant procedures did not adequately reflect EQ requirements. As a result of a generic industry concern with the qualification of Thomas and Betts RC-4/RC-6 connectors in Limitorque MOVs, all MOVs inside containment and 21 MOV's outside of containment were inspected during the Unit 2 second refueling outage. During these inspections, the three referenced anomalies were discovered.

REPORTABILITY/ANALYSIS

Technical Specification 3.6.1.4 requires that two independent MSIV-LCS subsystems shall be operable in Conditions 1, 2, and 3. The action statement requires that with one MSIV-LCS subsystem inoperable, the inoperable subsystem shall be restored to operable status within 30 days or the plant shall be in at least hot shutdown within the next 12 hours and in cold shutdown within the following 24 hours. The conservative determination was made that the three MSIV-LCS valves which were found to contain non-qualified splice configurations should be considered to have been inoperable during the installed period which is assumed to be from February of 1983 to June of 1988. Since there is no analysis to confirm that the valves would have performed their post-LOCA design function, it is conservatively assumed that they would not. The postulated failure mechanisms resulting from the unqualified splices are phase-to-phase or phase-to-ground shorting of the motor power leads. Therefore, it is assumed that the valves would not have opened in the event of a LOCA. Under these conditions, a leakage control path could not be established for the "B" Main Steam Line between the inboard and outboard MSIV's or for all four Main Steam Lines between the outboard MSIV's and the turbine stop valves.

As stated in the FSAR, the MSIV-LCS controls and minimizes the release of fission products which could leak through the closed MSIV's after a LOCA. The system provides this control by processing MSIV leakage prior to release to the atmosphere. This is accomplished by directing the leakage through a bleed line

into an area served by the Standby Gas Treatment System (SGTS, EIIS code: BH). Two independent systems, one between the inboard and the outboard MSIV's and the other between the outboard MSIV's and the turbine stop valves, are provided to accomplish the leakage control function.

The safety significance of this condition is considered minimal. One of the aspects considered in NUREG 1169, Resolution of Generic Issue C-8, was to evaluate the need for a safety-grade MSIV-LCS and more specifically, to evaluate the existing safety-related LCS by comparing its effectiveness with that of other methods of handling the leakage that likely would be available after a LOCA. The conclusion as reported in the NUREG was that "public risks were estimated conservatively by overestimating the frequency of events and underestimating the attenuation of fission products in the plant outside the steam lines. The conservative analysis indicates that there are relatively low public risks from MSIV leakage without MSIV-LCS, even at relatively high leak rates, if the containment remains intact (i.e., there is no containment failure). The contribution to the public risk from leakage past the MSIV's is also considered to be insignificant for the scenarios where the containment may fail" (Reference: NUREG 1169, 5.5 Conclusions).

On January 18, 1989 following final engineering review of the as-found spliced connections, this condition was determined reportable per 10CFR50.73(a)(2)(i) and 10CFR50.73(a)(2)(v).

CORRECTIVE ACTIONS

Environmentally qualified splices have been installed on HV-239F001F, HV-239F006 and HV-239F009. Procedural changes have been made outlining the usage of only environmentally qualified connections in EQ MOV's. Proper inspection criteria and installation information for wire splices were included in a May 5, 1989 procedural change to the station Maintenance Department's Limitorque inspection and overhaul procedure. Every refueling outage a number of safety related MOV actuator overhauls are performed. There were 33 such overhauls completed in Unit 1's fifth refuel and inspection (RIO) outage (September 12 - November 20, 1990) and 24 in Unit 2's third RIO (September 10 - November 23, 1989). The work documents associated with the actuator overhauls for these outages were reviewed. The review identified no problems with unqualified MOV wire splices. The overhaul and inspection of a similar quantity of safety related MOV actuators routinely each RIO with programmatic controls in place requiring the proper installation of environmentally qualified splices will provide reasonable assurance that EQ MOV's at Susquehanna continue to meet EQ requirements.

ADDITIONAL INFORMATION

Failed Component Identification: None

Previous Similar Events: None.