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FACIL:50-388 Susquehanna Steam Electric Station, Unit 2, Pennsylva 05000388
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SUBJECT: LER 91-002-00:on 900801,HPCI steam supply outboard containment isolation valve declared inoperable when closing torque switch was improperly set.Caused by personnel error. Torque switch reset & procedure changed.W/910208 ltr.

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

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February 8, 1991

U.S. Nuclear Regulatory Commission
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Washington, DC 20555

SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 91-002-00
FILE R41-2
PLAS - 471

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

Attached is Licensee Event Report 91-002-00. This event was determined to be reportable per 10CFR50.73(a)(2)(i)(B) in that the High Pressure Coolant Injection steam supply outboard containment isolation valve was inoperable for longer than 4 hours without taking the actions required by Technical Specification 3.6.3.

H.G. Stanley
Superintendent of Plant - Susquehanna

MLC/mjm

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IE22
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NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92
ESTIMATED BURDEN PER RESPONSE TO COMPLY WTH 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)	DOCKET NUMBER (2)	PAGE (3)
Susquehanna Steam Electric Station - Unit 2	0 5 0 0 0 3 8 8	1 OF 0 5

TITLE (4) HPCI Outboard Steam Supply Containment Isolation Valve Declared Inoperable Due to Incorrect Torque Switch Setting

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 8	0 1	9 0	9 1	0 0 2	0 0					0 5 0 0 0
										0 5 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)

20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
20.405(a)(1)(i)	50.36(c)(1)	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
M.L. Crist - Compliance Evaluator	AREA CODE 7 1 7 5 4 2 - 3 2 8 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)

		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)

At 1715 hours on August 1, 1990, with Unit 2 operating in Condition 1 at 100% power, the High Pressure Coolant Injection (HPCI) steam supply outboard containment isolation valve, HV-255-F003, was declared inoperable due to the closing torque switch being improperly set. As such, Limiting Condition for Operation 3.6.3 Action a was entered. Actions were immediately taken to correct the torque switch setting and the valve was declared operable at 1935 hours. The root cause of the event is cognitive personnel error. During maintenance activities on HV-255-F003, in September 1986, the minimum torque switch setting was changed from 2 1/2 to 2 7/8 as a result of NRC Generic Letter 85-03, however, the calibration chart, located in the valve, was not changed to reflect the new range. During April 1988, the actuator for HV-255-F003 was overhauled. As part of the work plan, direction was given to return the torque switch settings to the minimum setting. With the incorrect calibration chart the torque switch was returned to 2-1/2. The condition is being reported under the provisions of 10CFR50.73(a)(2)(i)(B) in that containment isolation valve HV-255-F003 was inoperable from April 9, 1988 until August 1, 1990. This determination was made on January 10, 1991 following re-evaluation of an earlier operability/reportability determination. Corrective actions consisted of resetting the torque switch within the required range and replacing the calibration chart. The new procedure governing torque switch settings provides the necessary additional controls to prevent recurrence of this type of event. There were no safety consequences or compromise to the public health and safety as a result of this event.

DESCRIPTION OF EVENT

At 1715 hours on August 1, 1990, with Unit 2 operating in Condition 1 at 100% power, the High Pressure Coolant Injection (HPCI, EIIS Code: BJ) steam supply outboard containment isolation valve, HV-255-F003, was declared inoperable when it was discovered that the closing torque switch was improperly set. The condition was discovered by Nuclear Plant Engineering (NPE) personnel (utility, other) while performing a data review to supply motor operated valve (MOV) information to Electric Power Research Institute (EPRI) regarding Generic Letter 89-10.

The torque switch was set at 2-1/2 instead of within its required range of 2-7/8 to 3-3/4. A torque switch minimum setting of 2-7/8 is required to fully close the valve under a HPCI steam line high differential pressure isolation condition. The torque and limit switch logic is such that the torque switch setting does not trip the motor until the limit switch opens. The limit switch is set to open when the valve is 97% closed. Once the limit switch has opened, the motor is then controlled by the torque switch. With a setting of 2-1/2 the valve may not close the final 3% during a HPCI steam line high differential pressure isolation condition. As such, Limiting Condition for Operation 3.6.3 Action a was entered. This LCO requires the affected containment isolation valve be restored to operable status within 4 hours or isolate the affected penetration. Operability of the HPCI system was not affected by this condition.

Actions were immediately taken to correct the torque switch setting. At 1935 hours the valve was declared operable following adjusting the torque switch to within the required range.

CAUSE OF EVENT

The root cause of the event is cognitive personnel error. During maintenance activities on HV-255-F003, in September 1986, the minimum torque switch setting was changed from 2-1/2 to 2-7/8. The new setting was determined by calculations performed as result of NRC Generic Letter 85-03, Motor-Operated Valve Common Mode Failures During Plant Transients Due To Improper Torque Switch Settings. The new setting was documented in the appropriate plant procedure, however, the calibration chart, located in the valve, was not changed to reflect the new torque switch range. This was an oversite on the part of the work crew involved.

During April 1988, the actuator for HV-255-F003 was overhauled. As part of the work plan, direction was given to return the torque switches to the minimum settings. Since no activities were performed which would require engineering involvement to determine if a torque switch setting change was required, the maintenance mechanics (utility, other) returned the torque switch to the minimum setting specified on the calibration chart. With the incorrect calibration chart installed the torque switch was returned to the pre-September 1986 setting of 2-1/2.

REPORTABILITY/ANALYSIS

The condition is being reported under the provisions of 10CFR50.73(a)(2)(i)(B) in that containment isolation valve HV-255-F003 was inoperable from April 9, 1988 until August 1, 1990 and the actions of LCO 3.6.3 were not complied with. This was considered as a condition prohibited by Technical Specifications. This determination was made on January 10, 1991.

On August 1, 1990, NCR 90-0161 and SOOR 2-90-107 were issued to document the condition and assess operability/reportability issues. The condition was assessed for operability pursuant to Technical Specification 3.6.3. The valve was initially determined to be inoperable, however subsequent review, following completion of the work activities, determined that the valve had not in fact been inoperable. This determination was based, in part, on guidance provided by the NRC, during May 1987, on a similar condition with the Unit 1 HPCI steam supply inboard containment isolation valve. Based on this subsequent operability determination, the condition was determined not to be reportable per 10CFR50.73(a)(2)(i)(B).

On October 23, 1990, the NRC informed station management that a similar interpretation made concerning the May 1987 letter was inappropriate for a condition on the Unit 2 Reactor Water Cleanup (RWCU, EIIS Code: CE) inboard containment isolation valve. Based on that input, operability of HV-255-F003 with a torque switch setting of 2 1/2 was once again re-evaluated. On January 10, 1991 it was determined that the valve was inoperable from April 9, 1988 to August 1, 1990 and the condition is reportable per 10CFR50.73(a)(2)(i)(B).

The HPCI steam supply containment isolation valves HV-255-F003, outboard, and HV-255-F002, inboard, are normally open valves. This is to allow steam to fill the lines up to the turbine steam admission valves which is just upstream of the HPCI turbine. This allows the steam lines to remain warm and reduce the chances of a steam hammer when the HPCI system is called upon in an emergency. Therefore, these valves must remain open at all times during reactor operation in order for the HPCI system to be available for use to mitigate an accident.

There are two situations which require the valves to be closed:

1. To provide containment isolation for a LOCA inside the containment where HPCI does not receive a start signal, and

2. To automatically isolate the reactor in the event of a HPCI steam line break.

For the case where the valves must close for a LOCA inside the containment, analysis has shown that with a torque switch setting of 2-1/2 the valves would fully close. The only design basis accident or operating scenario that was determined to create the high differential pressure conditions of concern is a break in the HPCI steam supply line outside of containment. Therefore, for all accidents where primary containment isolation is required, the valve would have performed its intended safety function.

For the HPCI line break scenario, both the HPCI HV-255-F003 and HV-255-F002 valves receive signals to close from the HPCI leak detection system. The F002 valve is assumed to fail (single failure). The F003 valve would close approximately 97% with a torque switch setting of 2-1/2. This results in a small release of radioactive steam outside the primary containment.

The consequences of this event with respect to environmental affect on equipment required for safe shutdown and offsite dose have been analyzed. The analysis concluded that in the unlikely event of a HPCI steam supply line break concurrent with the failure of the HPCI F002 valve and the closure capability of the F003 valve limited to 97%, equipment required for safe shutdown of Unit 2 would not be affected and the offsite dose consequences are within those established by 10CFR100. As such, there were no safety consequences or compromise to the public health or safety.

In accordance with the guidance provided in NUREG 1022 Supplement 1, items 14.1, 14.2, and 14.10, the required submission date for this report was determined to be February 11, 1991.

CORRECTIVE ACTIONS

The torque switch for HV-255-F003 was reset to within the required range and the calibration chart was replaced with a new chart that reflected the proper range. Maintenance Engineering (utility, other) has reviewed the torque switch settings for the remaining containment isolation valves, located in high pressure lines, and confirmed that the valves have the proper torque switch settings. Since the time the incorrect torque switch setting was left on the HV-255-003 valve, procedural changes have been instituted to better control

final torque switch settings on all safety related valves at the station. The current procedure governing torque switch settings requires contacting Maintenance Engineering for torque switch adjustments, and Maintenance Engineering review and sign-off for all such activities. This change provides an additional level of review and assurance of the proper as-left torque switch settings for all MOVs. As a result, no other actions to prevent recurrence are required.

ADDITIONAL INFORMATION

Failed Component Identification: Not applicable

Similar Reportable Events: A review of past similar reportable events was conducted. The following Licensee Event Reports also identified instances were the torque switch for a containment isolation valve was improperly set.

LER 87-019, Docket No. 50-387/License No. NPF-14
LER 90-011, Docket No. 50-388/License No. NPF-22