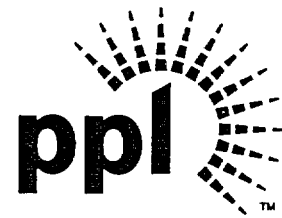


R. L. Anderson
Vice President - Nuclear Operations

PPL Susquehanna, LLC
769 Salem Boulevard
Berwick, PA 18603
Tel. 570 542 3883 Fax 570 542-1504
randerson@pplweb.com



DEC 23 2002

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station OP1-17
Washington, DC 20555

**SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 50-388/2002-006-00
PLA-5569**

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

Attached is Licensee Event Report (LER) 50-388/2002-006-00. This event is reportable per 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by Technical Specifications in that the Unit 2 Reactor Core Isolation Cooling steam exhaust line check valve was determined to be inoperable for a period of time that exceeded Technical Specification specified completion times. The RCIC system's ability to inject flow to the reactor vessel was not affected. Additionally, the penetration's inboard isolation valve remained operable thereby preserving the penetration isolation function. There were no actual consequences to the health and safety of the public as a result of this event.

Richard L. Anderson
Vice President - Nuclear Operations

Attachment

cc: Mr. H. J. Miller
Regional Administrator
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

cc: Mr. S. L. Hansell
Sr. Resident Inspector
U.S. Nuclear Regulatory Commission
P.O. Box 35
Berwick, PA 18603-0035

IE22

bcc:	R. L. Anderson	NUCSB3
	P. W. Nederostek (GE)	NUCSB2
	W. R. Licht	GENA92
	C. D. Markley	NUCSA4
	D. F. McGann	NUCSB2
	E. J. Miller	NUCSA4
	L. G. Oberrender	NUCLC
	G. F. Ruppert	NUCSB3
	R. R. Schechterly	NUCSA3
	J. D. Shaw	NUCSA2
	SRC (Attn: V. Shellenberger)	GENA61
	B. L. Shriver	NUCSB3
	R. R. Sgarro	GENA61
	W. F. Smith	NUCSA3
	T. G. Wales	GENA63
	H. D. Woodeshick	SSO
	NRA File	GENA61
	DCS	GENA62

Attn: S. Vierling
R. Osborne
Allegheny Electric Cooperative
P. O. Box 1266
Harrisburg, PA 17108-1266
R. Janati
Bureau of Radiation Protection
Rachel Carson State Office Building
P. O. Box 8469
Harrisburg, PA 17105-8469

Estimated burden per response to comply with this mandatory information collection request 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

1. FACILITY NAME Susquehanna Steam Electric Station - Unit 2	2. DOCKET NUMBER 05000388	3. PAGE 1 OF 3
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4. TITLE
Operations Prohibited by Technical Specifications Due to Inoperable Reactor Core Isolation Cooling Check Valve.

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
10	30	2002	2002	006	00	12	23	2002	FACILITY NAME	DOCKET NUMBER
										05000
										05000

9. OPERATING MODE 1	10. POWER LEVEL 100	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check all that apply)																																				
		<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)															
											<input type="checkbox"/> 50.73(a)(2)(i)(A)				<input type="checkbox"/> 50.73(a)(2)(i)(B)				<input type="checkbox"/> 50.73(a)(2)(i)(C)				<input type="checkbox"/> 50.73(a)(2)(ii)(A)				<input type="checkbox"/> 50.73(a)(2)(ii)(B)											
											<input type="checkbox"/> 50.73(a)(2)(v)(A)				<input type="checkbox"/> 50.73(a)(2)(v)(B)				<input type="checkbox"/> 50.73(a)(2)(v)(C)				<input type="checkbox"/> 50.73(a)(2)(v)(D)				<input type="checkbox"/> 50.73(a)(2)(vii)				<input type="checkbox"/> 50.73(a)(2)(viii)(A)				<input type="checkbox"/> 50.73(a)(2)(viii)(B)			

12. LICENSEE CONTACT FOR THIS LER

NAME Eric J. Miller - Nuclear Regulatory Affairs	TELEPHONE NUMBER (Include Area Code) 570 / 542-3321
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
X	BN	ISV	A391	Y					

14. SUPPLEMENTAL REPORT EXPECTED				15. EXPECTED SUBMISSION DATE		
YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO		MONTH	DAY	YEAR

16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On October 30, 2002 with Unit 2 in Mode 1 (Power Operation) at 100% power, the Unit 2 Reactor Core Isolation Cooling (RCIC) exhaust check valve (249F040) was declared inoperable following Local Leak Rate Testing (LLRT). A review of the system operating history concluded that the valve had likely been inoperable for 18 days prior to the time of discovery. This period exceeds Technical Specification required action completion times developed for Primary Containment Isolation Valves (PCIV). Disassembly revealed that the valve had not fully seated following the last RCIC turbine operation. During the investigation, the minimal force generated by the weight of a maintenance tool was sufficient to return the disk assembly to a fully seated position. The RCIC system's ability to inject flow to the reactor vessel was not affected by this event. Additionally, the inboard isolation gate valve (HV249F059) in this penetration remained operable and capable of performing the containment isolation function. Potential cause contributors to the exhaust check valve failure have been addressed through cleaning the valve internals and chamfering sharp edges that had been present on the valve's guide ribs. A Local Leak Rate Test was satisfactorily performed following the valve maintenance effort. Upon refilling the test volume following turbine operation under low steam flow, visual observation at an upstream drain did not detect leakage past the valve thus providing additional assurance that the valve would fully seat under these conditions. This event is reportable for Unit 2 as a condition prohibited by Technical Specification 3.6.1.3 per 10 CFR 50.73(a)(2)(i)(B). There were no actual adverse consequences to other plant equipment or to the health and safety of the public as a result of this event.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Susquehanna Steam Electric Station - Unit 2	05000388	2002	- 006	- 00	2 OF 3

17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

EVENT DESCRIPTION

On October 30, 2002 with Unit 2 in Mode 1 (Power Operation) at 100% power, Local Leak Rate Testing (LLRT) of the Unit 2 Reactor Core Isolation Cooling (RCIC; EISS Code: BN) exhaust check valve (249F040) could not be satisfactorily completed as a result of excessive leakage past the valve. The check valve (outboard Primary Containment Isolation Valve; EISS Code: ISV), in conjunction with the inboard Unit 2 RCIC exhaust isolation valve (HV249F059), provides containment isolation between the suppression pool and the Unit 2 RCIC turbine exhaust. The excessive leakage was identified when the LLRT test volume could not be filled to obtain as-found hydrostatic test results in preparation for a planned inspection/corrective maintenance effort on the check valve. By virtue of their design similarities, inspection of the valve had been initiated as part of the corrective action plan developed following failure of the Unit 1 High Pressure Coolant Injection (HPCI; EISS Code BJ) exhaust check valve on September 3, 2002 (reference LER 50-387/2002-007-00). Because the inspection/maintenance effort was a pre-planned activity, appropriate Limiting Conditions for Operation and associated compensatory measures were already in place when the valve was discovered to be inoperable. Disassembly of RCIC check valve 249F040 revealed that the disk assembly was off its seat. When the minor force associated with the weight of a removal tool was applied to the valve disk, the disk returned to a fully seated position. Additionally, there was no apparent degradation of the check valve's seating surfaces.

Investigation has concluded that the Unit 2 RCIC Turbine Exhaust Check Valve, 249F040, failed to fully seat following the last previous operation of the RCIC turbine on October 3, 2002. The RCIC system had been placed in the pressure control mode of operation at that time to support the Unit shutdown initiated in response to a fire at Startup Transformer No. 20 (EISS Code: FK) (reference LER 50-387/2002-006-00). Although actual reverse flow through the check valve may have provided enough force to dislodge the valve disk and effect isolation, the RCIC Check Valve 249F040 has conservatively been classified as inoperable and in non-compliance with Technical Specifications from Unit Startup on October 12, 2002 until the time the valve was removed from service on October 30, 2002, a period of 18 days.

CAUSE OF EVENT

The cause of the Unit 2 RCIC Turbine Exhaust Check Valve failure to fully close was mechanical interference between the guide rib and disk assembly. This interference was likely a combination of:

- A small amount of dirt and/or corrosion products caught between one or more of the guide ribs and the valve disk assembly, and
- Contact between the unchamfered edge(s) of one or more of the guide rib notches made during the manufacturing process against the disk assembly.

Neither of the above stated conditions, alone, would likely have acted to hold the valve open. The valve only became susceptible to these conditions when the disk assembly was positioned, by virtue of operation at low steam flow conditions, in a lower vertical location during the October 3 Unit shutdown.

The failure mode of the Unit 2 RCIC Turbine Exhaust Check Valve was substantially different from that experienced on the Unit 1 HPCI Turbine Exhaust Check Valve as described in LER 50-387/2002-007-00. The failure modes identified through these two events were not found to be present during inspections of all other similarly constructed valves (Unit 1&2 HPCI/RCIC exhaust check valves).

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
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Susquehanna Steam Electric Station - Unit 2	05000388	2002	- 006	- 00	3 OF 3

17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

ANALYSIS/SAFETY SIGNIFICANCE

This event is reportable as a condition prohibited by Technical Specifications per 10 CFR 50.73(a)(2)(i)(B) for Unit 2 in that the Primary Containment Isolation Valve 249F040 was likely inoperable and in non-compliance with Technical Specifications for a period of 18 days. This period exceeds the action completion times allowed in Technical Specification 3.6.1.3. However, the RCIC Exhaust Line Primary Containment penetration was still able to maintain the Primary Containment Isolation safety function because the inboard isolation gate valve HV249F059 remained operable to complete the isolation as necessary. Two as-left LLRTs performed on November 1 and 3, 2002 fully verified the integrity of this valve. In addition, a review of system operation revealed that the RCIC turbine was at low speed and steam flow during the recent pressure control mode of operation. These conditions would not have allowed the valve to open to the same degree as that which would have been attained during full flow conditions. At the lower flow, the disk may have been placed vertically in the valve body at a location where the forces acting on the disk assembly were in dynamic equilibrium. At the higher steam flows associated with a quarterly surveillance run, the disk assembly is located higher in the valve and would more readily have overcome any mechanical resistance that may have existed. Based on these arguments, the valve would likely have reseated following the next Unit 2 RCIC full flow run. More importantly, the valve would likely have reseated to perform its isolation function if subjected to the forces present during actual reverse flow conditions. At no time was the RCIC injection function adversely affected by the condition of the exhaust check valve. There were no actual adverse consequences to the health and safety of the public as a result of this event.

In accordance with guidance in NUREG-1022, Revision 2, the due date for this report is December 30, 2002.

CORRECTIVE ACTIONS

Corrective actions that have been completed:

- Per vendor recommendation, all unchamfered guide rib notches on 249F040 were chamfered to eliminate this potential failure contributor. In addition, the neck bore was cleaned to allow the disk assembly smooth insertion into the valve body.
- The valve was successfully leak rate tested following performance of the above stated corrective actions.
- The LLRT volume was filled following turbine operation under low-pressure steam. No leakage was observed at an upstream drain to 249F040 thus providing additional confidence that the valve would fully seat following operation under low flow conditions.

ADDITIONAL INFORMATION

Past Similar Events: None
 Failed Component: RCIC Exhaust Check Valve 249F040
 Manufacturer: Anchor Darling Valve Co.
 Model Number: W8121410