

LICENSEE EVENT REPORT (LER)

Form Rev. 2.0

Facility Name (1) Quad Cities Unit One										Docket Number (2) 0 5 0 0 0 2 5 4										Page (3) 1 of 0 4							
Title (4) Residual Heat Removal (RHR) Shutdown Cooling Common Suction Header was Inoperable Due to Inadequate Installation Instructions Resulting In Mechanical Failure of a Mechanical Shock Arrestor (Snubber).																											
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	2	7	9	8	9	8	0	0	8	0	0	0	2	2	5	9	8	0	5	0	0	0				
OPERATING MODE (9) 4					THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)																						
POWER LEVEL (10)		0		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)		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)													
								20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)															
								20.405(a)(1)(iv)		X 50.73(a)(2)(ii)		50.73(a)(viii)(B)															
								20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)															
LICENSEE CONTACT FOR THIS LER (12)																											
Name Charles Peterson, Regulatory Affairs Manager, ext. 3009															TELEPHONE NUMBER AREA CODE 3 0 9 6 5 4 - 2 2 4 1												
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																											
CAUSE		SYSTEM		COMPONENT			MANUFACTURER			REPORTABLE TO EPIX		CAUSE		SYSTEM		COMPONENT			MANUFACTURER			REPORTABLE TO EPIX					
B	B	O	S	N	B	P	0	2	9																		
SUPPLEMENTAL REPORT EXPECTED (14)															Expected Submission Date (15)					Month Day Year							
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)										<input checked="" type="checkbox"/> NO																	

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

ABSTRACT:

On 012798 Unit 1 (U-1) was in Cold Shutdown at 0 percent power when a system operability assessment for an inoperable snubber, which had been installed on the U-1 RHR Shutdown Cooling (SDC) suction header, was completed. The operability assessment determined the SDC suction header had been inoperable with the snubber in place. The snubber was found to be damaged visually on 123097, failed a bench test on 011098, and a replacement snubber was installed on 011198. On 011398 at 1800, the U-1 RHR SDC suction header was declared inoperable because a Technical Specification (TS) required evaluation was not completed as reported in LER 254\98-004. On 012798 at 1430, the event was determined to be reportable and an Emergency Notification System phone call was made based on the operability assessment.

The cause of the mechanical failure of the snubber was lateral forces from impingement of a spring can support due to an installation error. Corrective actions were to replace the snubber, complete an offsite failure analysis for the snubber, and re-evaluate the installation criteria to ensure it establishes adequate clearance to prevent a reoccurrence of the failure.

The consequences of this event could have been significant had a seismic event occurred. During a design basis seismic event, support loads on this line would exceed allowable limits and could have resulted in a piping failure. Since this size pipe is bounded by the Updated Final Safety Analysis Report analysis, the Emergency Core Cooling Systems would have limited the consequences of the accident and adequately protected the public.

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LICPNSEE EVENT REPORT (LER) TEXT CONTINUATION													Form Rev. 2.0						
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TEXT Energy Industry Identification System (EIS) codes are identified in the text as [XX]																			

PLANT AND SYSTEM IDENTIFICATION:

General Electric - Boiling Water Reactor - 2511 MWt rated core thermal power.

EVENT IDENTIFICATION: Residual Heat Removal (RHR) Shutdown Cooling Common Suction Header was Inoperable Due to Inadequate Installation Instructions Resulting In Mechanical Failure of a Mechanical Shock Arrestor (Snubber).

A. CONDITIONS PRIOR TO EVENT:

Unit:	1	Event Date:	012798	Event Time:	1430
Reactor Mode:	4	Mode Name:	Cold Shutdown	Power Level:	0%

This report was initiated by Licensee Event Report 254/98-008.

Cold Shutdown (4) - Mode switch in Shutdown position with average reactor coolant temperature \leq 212 degrees F.

B. DESCRIPTION OF EVENT:

On 012798, Unit 1 (U-1) was in Cold Shutdown at 0 percent power when a system operability assessment for an inoperable snubber [SNB], 1-125, which had been installed on the U-1 RHR [BO] Shutdown Cooling (SDC) suction header, was completed. The operability assessment determined the SDC suction header had been inoperable with the snubber in place. On 012798 at 1430, an Emergency Notification System phone call was made based on the operability assessment.

On 040496, the snubber pipe clamp was inadvertently relocated during the performance of a weld inspection on the SDC header. The clamp had been removed and when the clamp was reinstalled, the snubber moved slightly closer to an adjacent spring can hanger.

On 123097, a Technical Specification (TS) required visual inspection of this snubber was performed and visual damage was identified. The snubber discrepancy was documented in Problem Identification Form (PIF) Q1997-05047. In accordance with TS 4.8.F, an unacceptable snubber may be declared inoperable or operation may continue with an unacceptable snubber. The Shift Manager determined operation could continue, with the unacceptable snubber, pending further evaluation. The snubber failed a bench test on 011098 and a replacement snubber was installed on 011198. On 011398 at 1800, the U-1 RHR SDC suction header was declared inoperable because a TS required evaluation was not completed as reported in LER 254/98-004, "Residual Heat Removal (RHR) Shutdown Cooling Common Suction Header was Made Inoperable Due to a Technical Specification Limiting Condition for Operation (LCO) When Evaluating an Unacceptable Mechanical Shock Arrestor (Snubber) Due to Operations and Engineering Knowledge Deficiencies and an Inadequate Procedure." On 011398 at 2117, the evaluation was completed and the SDC system was declared operable.

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On 021998, System Material Analysis Department (SMAD) completed an evaluation of the failed snubber components. The analysis determined the cause to be fretting wear that caused subsequent galling between the bearing surfaces of the shaft and the inertia mass internal to the snubber. When thermal expansion occurred during operation, the spring can hanger pipe clamp came in contact with the snubber body accelerating the degradation of the snubber. There are no other anticipated similar snubber problems on U-1 (based on 100% visual inspection) as there were no other indications of visual damage or moved clamps on U-1.

C. CAUSE OF THE EVENT:

The failure of the snubber was caused by an inadequate installation. The installation procedure did not provide adequate guidance to insure the snubber clamp was reinstalled with the required degree of precision. Normally the removal and installation instructions allow the placement to be designated with a marking pen. The tight clearances in this particular application required a higher degree of precision. Because the actual as left clearances could not compensate for the potential thermal growth during the operating cycle, lateral forces applied by the impinging spring can hanger clamp, caused the snubber damage.

D. SAFETY ANALYSIS:

The consequences of this event could have been significant had a seismic event occurred. This snubber was installed on the U-1 SDC suction header 1-1025-20"-A upstream of the isolation valve MO-1-1001-50. The piping analysis performed, assuming that this snubber was failed, showed that support loads on this line would exceed allowable limits during a design basis seismic event. This could have resulted in a piping failure. If this had occurred during operation, a loss of coolant accident would have been initiated on this 20 inch pipe. The Emergency Core Cooling (ECCS) subsystems would have responded to this accident. Since this size pipe is bounded by (smaller than) the recirculation suction pipe, this accident is bounded by the analysis in Section 15.6.5 in the Updated Safety Analysis Report (UFSAR). As per the UFSAR, the ECCS would have limited the consequences of the accident and adequately protected the public. Dose rates at the site boundary would have remained well below 10CFR100 limits.

E. CORRECTIVE ACTIONS:

Corrective Actions Completed:

1. The defective snubber (1-125) was replaced with a new snubber on 011198.
2. Dimensions on snubber (1-125) have been validated to ensure no future impingement on 011198.
3. A failure analysis on the failed snubber was completed on 021998.

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Corrective Actions to be Completed:

1. A review of Unit 2 snubbers will be performed to ensure a similar failure will not occur. (NTS# 25418098SCAQ0000801 to Engineering, Due Date: 033098).
2. Revise procedures QCMM 1530-08, -11 and -16 to include work instructions to have adequate clearances for installations with 1 inch clearance or less. (NTS#25418098SCAQ0000802 to Maintenance, Due Date: 103098).

F. PREVIOUS OCCURRENCES:

A search was done to identify any other reportable events related to failed snubbers. There have been no previous occurrences of failed snubbers reported in the last 2 years.

LER 98-004 was previously submitted for this event, to address the timeliness of 72 hour reportability. The Unit 1 RHR SDC suction header was declared inoperable because a TS required evaluation was not completed.

G. COMPONENT FAILURE DATA:

Pacific Scientific Model Number PSA Model 3 Serial Number 16196.