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PSEG Nuclear LLC

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U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

LER 354/2003-003-00
HOPE CREEK GENERATING STATION
FACILITY OPERATING LICENSE NO. NPF-57
DOCKET NO. 50-354

Gentlemen:

This LER entitled "As Found Values for Safety Relief Valve Lift Setpoints Exceed Technical Specification Allowable Limits" is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(i)(B). The attached LER contains no commitments.

Sincerely,

Lon H. Waldinger
Director - Operations

Attachment

/MGM

C Distribution
LER File 3.7

IE22

NRC FORM 366 (7-2001)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 7-31-2004

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LICENSEE EVENT REPORT (LER)

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

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As Found Values for Safety Relief Valve Lift Setpoints Exceed Technical Specification Allowable Limits

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 05000
04	26	2003	2003	- 003	- 00	06	25	03	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE	4
10. POWER LEVEL	000

20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)
20.2201(d)	20.2203(a)(4)	50.73(a)(2)(iii)	50.73(a)(2)(x)
20.2203(a)(1)	50.36(c)(1)(i)(A)	50.73(a)(2)(iv)(A)	73.71(a)(4)
20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)
20.2203(a)(2)(ii)	50.36(c)(2)	50.73(a)(2)(v)(B)	OTHER Specify in Abstract below or in NRC Form 366A
20.2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)	
20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	50.73(a)(2)(v)(D)	
20.2203(a)(2)(v) X	50.73(a)(2)(i)(B)	50.73(a)(2)(vii)	
20.2203(a)(2)(vi)	0.73(a)(2)(i)(C)	50.73(a)(2)(viii)(A)	
20.2203(a)(3)(i)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(B)	

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER (Include Area Code)
Michael G. Mosier, Senior Licensing Engineer	856-339-5434

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
B	SB	RV	T020	Y					

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

On April 26, 2003 Hope Creek Engineering personnel received the initial results of the Target Rock Model 7567F Safety Relief Valve (SRV) setpoint testing required by Technical Specification 4.4.2.2. This testing revealed that following Hope Creek Cycle 11, eight of the fourteen SRVs experienced setpoint drift outside of the Technical Specification 3.4.2.1 limit of +/- 3%. The apparent cause for six SRV setpoint failures is corrosion bonding/sticking of the pilot disc. Pilot seat leakage was the apparent cause for the remaining two valves. Immediate corrective action was to replace all eight valves with tested and certified spare pilot assemblies; this was part of a scheduled activity to replace all fourteen SRV pilot assemblies during the refueling outage. Since the number of SRVs outside of the setpoint tolerance limit (eight) was greater than the number of SRVs (one) allowed to be inoperable by Technical Specification 3.4.2.1, this condition was determined to be reportable under 10CFR50.73(a)(2)(i)(B), as any operation or condition prohibited by the plant Technical Specifications.

These eight valves will be disassembled and inspected to document the cause of the failure. In addition, since this failure mechanism could be present in all the valves, PSEG Nuclear LLC will continue to test all fourteen pilot assemblies at the next refueling outage.

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

PLANT AND SYSTEM IDENTIFICATION

General Electric – Boiling Water Reactor (BWR/4)
Main Steam – EIIS Identifier {SB}*
Safety Relief Valves - EIIS Identifier {--/RV}*

*Energy Industry Identification System (EIIS) codes and component function identifier codes appear as {SS/CC}

CONDITIONS PRIOR TO OCCURRENCE

The plant was in the shutdown condition for Hope Creek's eleventh refueling outage (RF11). No structures, systems, or components were inoperable at the time of discovery that contributed to the event.

DESCRIPTION OF OCCURRENCE

On April 26, 2003 Hope Creek Engineering personnel received the initial results of the Main Steam Safety Relief Valves (SRV){SB/RV} (Target Rock Model 7567F) setpoint testing required by Technical Specification 4.4.2.2. This testing revealed that following Hope Creek Cycle 11 run, eight of the fourteen SRVs experienced setpoint drift outside of the Technical Specification 3.4.2.1 limit of +/- 3%.

SRV With Out-of-Tolerance Drift

Valve Id	As found (psig)	TS Setpoint (psig)	Acceptable band (psig)	% Difference
F013A*	1190	1130	1096 - 1163	+5.3
F013D**	1196	1130	1096 - 1163	+5.8
F013E**	1187	1130	1096 - 1163	+5
F013G**	1204	1120	1086 - 1154	+7.5
F013J**	1165	1120	1086 - 1154	+4
F013K**	1142	1108	1075 - 1141	+3.1
F013L**	1191	1120	1086 - 1154	+6.3
F013M*	1150	1108	1075 - 1141	+3.8

* These valves failed due to seat leakage
** These valves failed due to corrosion bonding/sticking of the pilot disc

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DESCRIPTION OF OCCURRENCE (Cont'd)

Since the number of SRVs outside of the setpoint tolerance limit (eight) was greater than the number of SRVs (one) allowed to be inoperable by Technical Specification 3.4.2.1, this condition was determined to be reportable under 10CFR50.73(a)(2)(i)(B), as any operation or condition prohibited by the plant Technical Specifications.

CAUSE OF OCCURRENCE

The apparent cause for six of the SRV setpoint failures is corrosion bonding/sticking of the pilot disc. PSEG has continued to experience as-found setpoint failures on SRVs even with the industry recommended ion beam assisted deposition (IBAD) coating installed on the pilot disc. The initial lift being out of specification, with subsequent lifts within specification and/or the initial failure of the stick test, is an indication of the pilot disc corrosion bonding. The apparent cause for two of the SRV pilot setpoint failures was pilot seat leakage that required an increase in pressure to lift the pilot disc.

PRIOR SIMILAR OCCURRENCES

LER 354/01-007-00, reported events where SRV setpoint drift exceeded the Technical Specification allowable limits during RF10.

SAFETY CONSEQUENCES AND IMPLICATIONS

A previous analysis was performed and documented in NEDC-32511P, "SAFETY REVIEW FOR HOPE CREEK GENERATING STATION SAFETY/RELIEF VALVE TOLERANCE ANALYSIS". This analysis supported the increase in allowable Technical Specification (TS) setpoint drift from +1 percent to +3 percent. An individual SRV upper limit setpoint of 1250 psig and thirteen SRVs available out of a total of fourteen was assumed in the calculation. The calculated peak vessel pressure at the bottom of the reactor vessel was 1331 psig. This provides a margin of 44 psi to the ASME upset limit of 1375 psig. In addition, each SRV discharge line was analyzed to determine the maximum allowable set-point increase. The maximum as found increase for seven of the eight valves is below their maximum allowable increase. However, the maximum allowable increase for the discharge line associated with SRV F013A is +3 percent. The as found set-point for SRV F013A was +5.3 percent. The effect on the "A" SRV discharge line is being evaluated as one of the corrective actions. Therefore, based on the above analysis and the fact that no accidents or transients occurred during cycle 11 requiring the SRVs to actuate, the public health and safety was not affected.

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CORRECTIVE ACTIONS

IMMEDIATE

Immediate corrective action was to replace all eight valves with tested and certified spare pilot assemblies; this was part of a scheduled activity to replace all fourteen SRV pilot assemblies during RFO11.

PLANNED

The following corrective actions apply to the 6 valves exhibiting corrosion bonding/sticking of the pilot disc, thus resulting in high set points. Corrective actions for the 2 valves that exhibited pilot seat leakage have been included in the readiness of the spare SRVs installed during RFO11. Those corrective actions to minimize pilot seat leakage are discussed in the next section.

1. Investigate options to mitigate the drift issue based on a survey of other users.
2. Document the as-found, internal parts condition of each SRV pilot during disassembly and inspection.
3. Determine if there is a maximum number of laps & lifts, which the coating can experience before the IBAD coating needs to be replaced.
4. Evaluate reactor water chemistry for potential to support the corrosion bonding of the pilot disc seating surfaces.
5. Examine the IBAD disc coating of the failed SRVs under an electron microscope or equal. The results are expected to determine if the coating exists at the seating surface of the disc.
6. Determine the impact of the A-SRV set point drift of +5.3% against the SRV discharge line analysis limit of +3%.

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CORRECTIVE ACTIONS (Cont'd)

PREVIOUSLY PERFORMED (Resulting from CYCLE 11 Seat Leakage)

Corrective actions resulting from Cycle 11 seat leakage and successful industry practices are as follows. These enhancements were implemented on the spare SRVs installed in place of the removed SRVs during RFO11.

1. Purchased 6 new pilots to provide a full complement of spare SRV pilots. This permits all replacement pilots to be fully refurbished, including a new IBAD coating applied to the pilot disc, prior to each installation. All pilots installed during RF11 were either new or fully refurbished with new IBAD coating applied.

2. The offsite test procedure was revised to limit the number of pilot disc laps to 2 to prevent lapping damage to the IBAD coating. If additional lapping is required, the disc will require a re-coat.

3. The offsite test procedure was revised to reduce the number of certification lifts from a minimum of 4 to a minimum of 2, to prevent unnecessary wear on the IBAD coating.

4. The offsite test procedure was revised to require the performance of an additional seat leakage test at 10 psig higher than the seat leakage certification test. This additional test provides added assurance of the valve's ability to be leak tight. The certification seat leakage test pressure is currently performed at the maximum operating pressure of 1010 psig.

5. The SRV valve engineer witnessed the lapping and testing process to ensure the highest level of compliance to our standards.

6. Seven (7) main bodies were inspected in accordance with GE SIL #646. No worn or damaged parts were found.

7. A mock-up pilot & pilot base was constructed in the mechanical hot shop to allow a hands-on familiarization by maintenance personnel with the valve features & scope of work during the pre-job briefs.

8. The offsite test procedure was revised to eliminate the acceptance of fogging during the as-left certification seat leakage test.

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CORRECTIVE ACTIONS (Cont'd)

PREVIOUSLY PERFORMED (Resulting from LER 354/2001-007-00)

Completed corrective actions resulting from RFO10 as-found set pressure testing failures, previously identified by LER 354/2001-007-00 are as follows:

1. All valves including the three failed valves were removed from the plant and replaced with tested and certified spare or re-certified valves during RFO10.

2. The failed valves were dismantled, inspected, and refurbished prior to their next use. No anomalies were found.

3. Continue to monitor the performance of the IBAD coating on the pilot discs.

4. Test all fourteen pilot valves at the next refueling outage.

COMMITMENTS

The corrective actions cited in this LER are voluntary enhancements and do not constitute commitments