NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

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

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98
ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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TITLE (4)

Safety Relief Valve Setpoint Drift

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 NAME	DOCKET NUMBER
									N/A	05000
03	11	98	98	-- 002 --	00	04		98	N/A	05000

OPERATING MODE (9)	N
POWER LEVEL (10)	100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.2201(b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)
	20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)
	20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
	20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER
	20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Robert Steigerwald, Sr. Licensing Engineer	(315) 349-6209

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
B	AD	RV	T020	Y					

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 15 single-spaced typewritten lines) (16)

Review of the as-found setpoints for 4 Safety Relief Valve (SRV) pilot assemblies, removed during a December, 1997 forced outage, determined that 2 of the 4 SRVs were outside the tolerance of 1145 psig ± 3 percent allowed by Technical Specification (TS) Surveillance Requirement 4.6.E. The cause of the out of tolerance SRV setpoints was determined to be corrosion bonding between the SRV pilot disc and seat. Corrective actions include continued participation in the BWR Owners Group SRV Committee, a proposed modification to provide pressure switch actuation of the SRVs, and an analysis of the effect of the condition on Reactor Pressure Vessel pressure protection. Similar problems were reported in LER 95-006, Revision 1.

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

EIIS Codes are in []

Description:

On December 7, 1997, The plant was shutdown to replace the pilot valve assemblies of 4 safety relief valves (SRVs)[SB] due to suspected leakage. Results of the subsequent as-found setpoint testing at Wyle Laboratories for these pilot assemblies were reported to FitzPatrick on 3/11/98. The as-found setpoints for 2 of the 4 SRV pilot assemblies were outside the allowed tolerance of 1145 psig ± 3 percent per TS surveillance requirement 4.6.E. This report is being made under 10CFR50.73(a)(2)(i)(B) due to multiple test failures of SRVs. Similar problems were reported in LER 95-006 Revision 1.

Test Results:

Plant Valve Number	Pilot Assembly Serial No.	As-Found Setpoint Pressure	Percent Above TS Required Setpoint
02RV-71D	1191	1220 psig	+ 6.6 percent
02RV-71H	1045	1208 psig	+ 5.5 percent

Cause:

The most likely cause of the out of tolerance SRV setpoints is corrosion bonding between the SRV pilot disc and seat, and is the same cause as that reported in LER 95-006, Revision 1. As stated in LER 95-006 Revision 1, this conclusion is based on metallurgical examinations of pilot discs from many previously affected SRVs (Reference GE-NE-126-E031-0692, DRF B21-00491). The above referenced BWR Owners Group SRV Committee report states that radiologically produced hydrogen and oxygen can concentrate in the immediate vicinity of the pilot disc and seat interface as a result of reactor steam condensation and attributes oxygen concentration in this area to be the most likely contributor to SRV upward setpoint drift.

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Analysis:

Technical Specification Limiting Condition for Operation (LCO), 3.6.E, requires the safety mode of 9 of 11 SRVs to be operable when reactor coolant pressure is greater than atmospheric and temperature is greater than 212 F. Conservatively, the 2 SRVs (02RV-71D and H) were postulated to be inoperable from the time of their pilot assembly removal back to the last refueling outage, at which time all 11 SRV pilot assemblies were replaced. A review of plant operating history back to the last refueling outage determined there were no other SRVs declared inoperable. Therefore, TS LCO 3.6.E was not exceeded. Adequate over-pressure protection existed during the time period that the subject pilot assemblies were in service.

Technical Specification Table 3.2-7, Anticipated Transient Without Scram (ATWS) Recirculation Pump Trip Instrumentation Requirements, Note 3, requires the high pressure recirculation pump trip setpoint to be ≤ 1155 psig when either zero or one SRV is out of service and ≤ 1120 psig when two or more SRVs are out of service. The analysis used to support TS Amendment 237 (Reference 2 of TS Amendment 237) determined that during an ATWS event with closure of the Main Steam Isolation Valves (MSIVs) the reactor vessel pressure would reach 1507 psi with 2 out-of-service SRVs and an ATWS recirculation pump trip setpoint of 1155 psi. This would marginally exceed the reactor pressure vessel emergency overpressure rating of 1500 psi by 7 psi. The analysis assumes that the 2 inoperable SRVs are out-of-service and would not lift. The 2 out-of-service SRVs in this case would have lifted, only at a slightly higher setpoint than the allowed value of 1145 psig ± 3 percent. SRVs "D" and "H" lifted at a value of 1220 and 1208 psig respectively per the test results. Based on engineering judgement and previous similar analysis, it is most likely that the RPV emergency overpressure rating of 1500 psi would <u>not</u> have been exceeded with the 2 out-of-tolerance SRV setpoints.

Extent of Conditions:

The 4 SRV pilot assemblies that were removed during the December, 1997, forced outage were replaced with certified pilot assemblies. Of the 7 SRV pilot assemblies not replaced during the forced outage, 5 have the new platinum alloy discs. The use of a platinum alloy disc was a recommendation from the BWR Owners Group in an effort to limit disc to seat bonding due to corrosion. The four pilot assemblies that were removed and tested were not of this type.

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Extent of Conditions: (cont'd.)

SRV pilot valve setpoint upward drift due to bonding is an industry issue. The Authority has reported similar failures and participates in the BWR Owners Group SRV committee. As a result of repeated failures, and as stated in LER 95-006, Revision 1, all of the pilot assemblies will be replaced during the next refueling outage and will be sent to Wyle Laboratories for testing. The results of the as-found testing of the pilot assembly setpoints will be evaluated to determine the effectiveness and continued use of the new alloy material.

Corrective Actions Ongoing Prior To This Report:

1. All SRV pilot assemblies will be tested and replaced each operating cycle.

2. Five SRV pilot assemblies prior to this event had platinum alloy discs installed. This was a recommendation from the BWR Owner's Group that provides an alternative disc material in an effort to limit disc to seat bonding due to corrosion.

3. The Authority is continuing to participate in the BWR Owner's Group effort to address SRV setpoint drift.

4. All 11 SRVs have not met the performance criteria established by the Maintenance Rule and are considered as (a)(1) per the Rule. A Maintenance Rule Action Plan has been established in order to return the SRVs to an (a)(2) status. To address pilot seat to disc bonding, a BWR Owners Group recommended modification to provide pressure switch actuation of the SRVs is scheduled for refuel outage 14 (Fall, 2000).

Corrective Actions As A Result Of This Event:

1. The four pilot assemblies were removed and replaced with steam certified assemblies.

2. Engineering analyses will be performed to verify that the RPV pressure limits would not have been exceeded given the as-found data of the 4 tested SRV pilots. If the analyses determine that pressure limits could have been exceeded a revision to this LER will be made. **(Scheduled Completion Date: 7/15/98)**

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Corrective Actions As A Result Of This Event: (cont'd.)

3. Based on the as-found test results of the SRV pilots following the Fall 1998 refueling outage, evaluate the effectiveness and continued use of the platinum alloy material and determine appropriate action. **(Scheduled Completion Date: 3/30/99)**

Similar Events:

LERs 95-006 Revision 1, 95-001, 94-005, 94-002, 92-016, 90-018, 89-026, 88-010, 88-004, 87-004, 85-013, 85-009

Failed Component Identification:

Manufacturer: Target Rock Corporation
Model Number: 7567F-10
NPRDS Manufacturer Code: T020
NPRDS Component Code: Valve

Reference:

GE-NE-126-E031-0692, DRF B21-00491; Evaluation of the BWROG SRV Setpoint Drift Fix Sub-Committee's Proposed Design Modification for Target Rock Two-Stage Safety Relief Valve Design, Model No. 7567F.

Attachment 1 to JAFP-98-0122

LER-98-002

Commitment Status

Number	Commitment	Due Date
JAFP-98-0122-01	Engineering analyses will be performed to verify that the RPV pressure limits would not have been exceeded given the as-found condition of the 4 tested SRV pilots. If the analyses determine that pressure limits could have been exceeded a revision to this LER will be made.	7/15/98