

LICENSEE EVENT REPORT (LER)

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.

FACILITY NAME (1) Oyster Creek Unit 1		DOCKET NUMBER (2) 50 - 219	PAGE (3) 1 of 3
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TITLE (4)
Automatic Depressurization System Inoperable Due to Inadequate Design

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
03	30	98	98	005	0	04	29	98	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9) N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR <input type="checkbox"/> : (Check one or more) (11)									
POWER LEVEL (10) 0	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(iii)	73.71						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iv)	OTHER						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)							
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)							

LICENSEE CONTACT FOR THIS LER (12)

NAME Michael Godknecht	TELEPHONE NUMBER (Include Area Code) 609.971.4189
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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	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).	<input checked="" type="checkbox"/> NO						

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

During an evaluation of the voltage drop to the DC operated Electromatic Relief Valves (EMRV) in the Automatic Depressurization System (ADS), it was found that only two of five EMRV solenoids could be assured of operating under Design Basis Small Break Loss of Coolant Accident (SBLOCA) conditions (assuming a loss of offsite power, a single failure and the environmental conditions of the SBLOCA). The cause of the inoperability of the ADS was inadequate design. The inadequate design was not previously recognized since voltage drop calculations had not been performed to the component level for safety-related DC equipment in all cases. This condition may have existed since original plant construction. An evaluation (currently being design verified) indicates that fuel temperatures would have remained below the 10CFR50 Appendix K limits for the entire spectrum of SBLOCAs with only 2 EMRVs operating. Modifications were performed to insure that adequate voltage is provided to the EMRV solenoids under all modes of operation and other loads were evaluated to assure that other voltage drop concerns did not exist.

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Oyster Creek, Unit 1	05000				2 of 3
	-219	98	005	00	

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

DATE OF OCCURRENCE

This condition was identified on March 30, 1998.

IDENTIFICATION OF OCCURRENCE

During an evaluation of the voltage drop to the DC operated Electromatic Relief Valves (EMRVs) [EHS-PCV] in the Automatic Depressurization System (ADS) [EHS-JE], it was found that only two of five valves would have adequate voltage to ensure operation during Design Basis Accident (DBA) conditions. Three of five valves are required to meet the Oyster Creek Design Basis. Therefore, it has been determined that the Plant has operated outside its design basis. This condition is reportable under 10CFR 50.73(a)(2)(ii)(B).

CONDITIONS PRIOR TO OCCURRENCE

The Reactor was in Cold Shutdown at the time of identification. However, this condition may have existed since original plant construction and, therefore, in all modes of operation.

DESCRIPTION OF OCCURRENCE

Based on questions from the NRC during a Safety System Engineering Inspection (SSEI), Oyster Creek Engineering investigated the required voltage for EMRV solenoid actuation under all modes of operation, and the actual voltage that would be available in each of these modes. Since no previous evaluation had been performed, this investigation included voltage drop calculations, testing of equipment, and field measurements of actual voltage drops. The end result of the evaluation was that only two of five EMRVs would have sufficient voltage for operation under Design Basis Small Break Loss of Coolant Accidents (SBLOCA) conditions. The Design Basis requires that at least three of the five EMRVs will operate for SBLOCAs.

APPARENT CAUSE OF OCCURRENCE

The cause of the inoperability of the ADS was inadequate design. The inadequate design was not previously recognized due to the fact that voltage drop calculations had not been performed to the component level for safety-related DC equipment in all cases. Voltage drop calculations had only been performed to the panel level. Although the component level analyses were scheduled, they had not been performed at the time of the NRC inspection.

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ANALYSIS OF OCCURRENCE AND SAFETY ASSESSMENT

The ADS is designed to rapidly depressurize the Reactor Coolant System (RCS) during SBLOCAs to allow the Low Pressure Core Spray System [EIS-BM] to inject and maintain core temperatures below the 10CFR50 Appendix K limits. Design basis assumptions include loss of offsite power, a single failure and environmental conditions existing due to the SBLOCA. The EMRVs provide the depressurization path used by ADS, and 3 of 5 valves are required to meet Design Basis requirements. The EMRVs also provide a high pressure relief function during plant transients, including Main Turbine Trip and Main Steam Isolation Valve closure.

The voltage calculations performed indicate that only 2 of 5 valves would have been assured of having adequate voltage to operate during SBLOCA conditions. An evaluation was performed (and is currently being design verified) to determine the impact on fuel temperatures with only 2 EMRVs available during a SBLOCA, and the results indicate that fuel temperatures would have remained below the 10CFR50 Appendix K limits for the entire spectrum of SBLOCAs. The design safety limits for RCS pressure would be maintained by mechanically actuated safety valves which are independent of EMRV operation.

CORRECTIVE ACTION

Immediate

Prior to plant start up, modifications were performed to install additional cables and utilize spare conductors, such that the voltage drop to the EMRV solenoids was reduced. These modifications insure that adequate voltage is provided to the EMRV solenoids to operate all 5 valves under all modes of operation.

Prior to plant start up, a selection of AC and DC loads were evaluated to determine if any other voltage drop concerns existed. This included identifying the DC component loads that had voltage drop calculations and those that did not. Computations were developed for a sampling of loads that appeared to be the most limiting circuits and are the highest impacts from a Probabilistic Risk Assessment viewpoint. A sampling of AC loads meeting the same criteria were also reviewed. No additional deficiencies were identified.

Long Term

Bounding calculations will be performed to establish the voltage drops to the component level for safety-related DC components.

SIMILAR EVENTS

None