

LICENSEE EVENT REPORT (LER)

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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) Limerick Generating Station, Unit 1	DOCKET NUMBER (2) 05000352	PAGE (3) 1 OF 5
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TITLE (4) Tech Spec Condition Where the Unit 1 A & B and Unit 2 B Hydrogen Recombiners Were Inoperable due to an Inadequate Post-Mod Test Caused by Personnel Error.

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
09	02	95	95	-- 007 --	00	10	02	95	Limerick, Unit 2	05000352
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10) 23	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)						
	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)						
	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input checked="" type="checkbox"/> 50.73(a)(2)(vii)	OTHER						
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	(Specify in Abstract below and in Text. NRC Form 366A)						
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)							
<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)								

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER (Include Area Code)
NAME J. L. Kantner, Manager - Experience Assessment, LGS		(610) 718-3400

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	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)

On 09/02/95 at 0715 hours, the Unit 1 'A' and 'B' and the Unit 2 'A' Primary Containment Post-LOCA Hydrogen Recombiners were declared inoperable after their associated cooling water supply valves failed to stroke as designed. The Unit 2 'B' recombimer was operable. Since both the Unit 1 'A' and 'B' recombimers were inoperable the Technical Specifications (TS) Section 3.0.3 to commence a shutdown was entered. TS Section 3.0.3 was also entered for Unit 2. Unit 1 reduced power to 8% and placed in the startup mode. Unit 2 power was reduced to 35%. At 1823 hours, the Unit 2 'A' recombimer was operable and the power reduction was terminated. Station personnel later determined that TS Section 3.0.3 did not apply for the Unit 2 condition. At 1950 hours, the Unit 1 'B' recombimer was operable and the Unit 1 shutdown was terminated. The consequences of this event were minimal and a postulated event requiring the recombimers did not occur. The primary cause of this event was personnel error resulting in an inadequate development of a Post Modification Test (PMT) for temperature recorders associated with the above recombimers. Corrective actions include All Hands meetings, a generic review of all Engineering Projects for adequate PMTs, and a maintenance training analysis.

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

Conditions Prior To The Event

On September 2, 1995, Unit 1 was in Operational Condition (OPCON) 1 (Power Operation) at approximately 23% power. The unit was returning to 100% power following a maintenance outage of short duration to replace a failed fuel bundle. Operations personnel were performing the Surveillance Test (ST) Procedure ST-6-057-200-1, "Containment Atmospheric Control Valve Test," for the Unit 1 'A' Primary Containment Post-Loss of Coolant Accident (LOCA) Hydrogen Recombiner. During performance of this ST procedure, the cooling water supply valve, HV-057-110A, failed to stroke as designed.

Description of the Event

On September 2, 1995 the Unit 1 A recombimer failed its ST procedure. As part of the troubleshooting activities, the Unit 1 'B' and the Unit 2 'A' and 'B' recombimers were tested to determine if the same condition existed. At 0715 hours, the Unit 1 'A' and 'B' and the Unit 2 'A' (i.e., 1A, 1B, and 2A) recombimers were declared inoperable after their associated cooling water supply valves failed to stroke as designed. The Unit 2 'B' recombimer was demonstrated to be operable.

Since both the Unit 1 'A' and 'B' recombimer trains were inoperable and the Limiting Condition for Operation (LCO) of Technical Specification (TS) Section 3.6.6.1 could not be met (i.e., TS 3.6.6.1 allows only 1 recombimer to be inoperable), the TS Action of Section 3.0.3 to commence a Unit 1 shutdown was entered. With the Unit 2 'A' recombimer being inoperable, Unit 2 entered the TS LCO Action Statement of TS Section 3.6.6.1, which allows continued operation with one train unavailable. During the immediate investigation into the problem, Station personnel discovered that the Unit 2 'B' recombimer had been inoperable for longer than the 30 days permitted by TS Section 3.6.6.1. In a conservative action, the Action Statement of TS Section 3.0.3 was entered for Unit 2.

Power reduction commenced for both units while the problems were being resolved. Unit 1 reduced power to approximately 8% and was later placed in the startup mode (OPCON 2) per TS Section 3.0.3. Unit 2 power was reduced to approximately 35%. At 1823 hours on September 2, 1995, repairs and testing of the Unit 2 'A' recombimer

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were satisfactorily completed, and following a management review of the corrective actions and testing methods, the 'A' recombiner was declared operable, and the Unit 2 power reduction was then terminated. Station personnel later determined that TS Section 3.0.3 was not applicable for the Unit 2 condition since the Unit 2 'B' recombiner was operable and the time limits of TS Section 3.6.6.1 were applicable from the time of identification (i.e., 0715 hours on September 9, 1995).

At 1950 hours, repairs and testing of the Unit 1 'B' recombiner were satisfactorily completed, and following a management review of the corrective actions and testing methods, the 'B' recombiner was declared operable. The Unit 1 shutdown was then terminated. At 2055 hours, repairs and testing of the Unit 1 'A' recombiner were completed and the recombiner was declared operable and the return to nominal full power commenced.

A 1-hour notification was made to the NRC at 0819 hours on September 2, 1995, in accordance with the requirements of 10CFR50.72 (a)(1)(i)(A) since a plant shutdown had commenced at 0743 hours per TS Sections 3.6.6.1 and 3.0.3. This event is also reportable per 10CFR50.72 (b)(2)(iii)(D) due to loss of the recombiner system safety function on Unit 1. A 1-hour notification was made to the NRC at 1230 hours on September 2, 1995, since Unit 2 initially entered TS Section 3.0.3. This notification was later retracted since the Unit 2 'B' recombiner was operable and TS Section 3.0.3 did not apply. Additionally, this event resulted in independent safety trains being inoperable for a common cause. This LER is being submitted in accordance with the requirements of 10CFR50.73(a)(2)(i)(B), (a)(2)(v)(D), and (a)(2)(vii)(D).

Analysis of the Event

The consequences of this event were minimal and there was no release of radioactive material to the environment as a result of this event. A postulated event requiring the use of the recombiners did not occur while the recombiners were inoperable. The Unit 2 'B' recombiner was operable throughout the period of concern for Unit 2 and therefore the recombiner system safety function was available for Unit 2 if a postulated LOCA occurred.

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The recombiners are designed to control the quantity of hydrogen and oxygen postulated to be generated in the Primary Containment following a design basis LOCA with an assumed non-mechanistic fuel failure. During the time periods that the recombiners were inoperable, sufficient Emergency Core Cooling Systems (ECCS) were operable to prevent fuel failure. Without the high fuel temperatures, associated with fuel failure, the generation of hydrogen and oxygen in the Primary Containment would have been prevented and therefore the recombiners would not have been needed to mitigate the accident.

Cause of the Event

The cause of the event is personnel error. During installation of a modification to the recombiner temperature recorders, a wiring error and several logic errors were made that rendered the recombiners inoperable. These conditions should have been identified during Post Modification Testing (PMT). However, contrary to the requirements of procedure MOD-C-5, "Mod Process Acceptance Testing," the system manager did not prepare the PMT in advance of the completion of the modification installation, and the maintenance planner who planned the modification work orders and the PMT did not involve the system manager. During the development of the PMT, the planner did not realize that the modification had the potential for adversely impacting the logic function of the temperature recorders and the recombiners. As a result, the PMT only verified the indication function and missed the logic errors. The planner did not involve the system manager due to a misperception that the modification was only a recorder replacement (as was being performed with several other recorders) and due to a lack of familiarity with the modification process procedures from inadequate training.

Even though there were several individual personnel errors during the installation of the modification, the modification process relies on the PMT to identify any installation errors. The specific personnel errors which occurred during installation were investigated and determined not to have generic implications. The inadequate training was determined to have generic implications and appropriate corrective actions were developed.

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Corrective Actions

1. As a result of a similar Peach Bottom Atomic Power Station event and an Engineering Self Assessment, the various common procedures which address the modification process were streamlined and enhanced. These procedural changes were under development at the time of this event. These enhancements have been reviewed and were determined adequate to address this event being reported.
2. A review was performed of all Engineering Projects (2273 total, including archived data) Engineering Change Requests (ECR) and no similar issues were identified. All modification and ECR implementation was placed on hold as soon as the cause of the event was identified, and is being released only through the Senior Manager-Design Engineering until the enhanced modification process/procedures stated in 1 above are determined to be fully understood and implemented by appropriate Station personnel.
3. All Hands meetings have been conducted by the Senior Manager-Design Engineering with personnel from Maintenance Planning, Design Engineering, Plant Engineering, and Operations. These meetings were conducted to ensure personnel understand the 'lessons learned' from this event, and are aware of the modification process enhancements stated in 1 above.
4. A training needs analysis will be performed by December 15, 1995, for Maintenance personnel on the modification/ECR process including the PMT process. Training lesson plans and materials will be developed as necessary by February 1, 1996.

Previous Similar Occurrences

None