NRC Form 366 (9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Limerick Generating Station - Unit 1	0 5 0 0 0 3 5 2	1 OF 0 5

TITLE (4): Reactor Water Cleanup Isolation Due to High Differential Flow Caused by a Pressure Transient While Removing a Filter Demineralizer From Service

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 3	2 6	8 8	8 8	— 0 1 1	— 0 0	0 4	2 5	8 8		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	9 5	20.402(b)	20.405(c)	X 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, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Charles A. Mengers, Senior Engineer, Licensing Section	AREA CODE 2 1 5 — 8 4 1 - 5 1 8 4

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

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

Abstract: 88-011

On March 26, 1988 at 0615 hours, a Reactor Water Cleanup (RWCU) isolation occurred on a Nuclear Steam Supply Shutoff System (NSSSS), an Engineering Safety Feature, Group III Channel A and D "high differential flow" isolation signal. Operations personnel, removing the 'A' RWCU filter demineralizer from service in order to restart the 'C' RWCU pump, opened the filter demineralizer bypass valve HV-44-1F044 in conjunction with closing the 'A' filter demineralizer flow control valve FV-C-45-1-66A. The filter demineralizer bypass valve HV-44-1F044 could not be adjusted to permit the minimum required system flow. This caused the 'A' RWCU pump to trip on low suction flow, resulting in a pressure transient, which caused a high differential flow initiating an NSSSS Group III, A and D Channel "high differential flow" isolation signal. The RWCU inboard and outboard isolation valves HV-044-1F001 and HV-044-1F004 closed isolating RWCU. The isolation was reset at 0640 hours and RWCU was returned to normal operation at 0905 hours. There were no adverse consequences associated with this event and there was no release of radioactive material. The filter demineralizer bypass valve HV-44-1F044 has been scheduled to be replaced, during an outage of sufficient length, with a valve more appropriate for this application after the new valve has been procured.

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

Unit Conditions Prior to the Event:

Operating Mode 1 (Power Operation)

Reactor Power 95%

Description of the Event:

On March 26, 1988 at 0615 hours, a Reactor Water Cleanup (RWCU) isolation occurred on a Nuclear Steam Supply Shutoff System (NSSSS) Group III Channel A and D "high differential flow" isolation signal. The isolation occurred when the 'A' RWCU filter demineralizer was being removed from service to restart the 'C' RWCU pump. The filter demineralizer bypass valve HV-44-1F044 was being opened in conjunction with closing the 'A' filter demineralizer flow control valve FV-C-45-1-66A in accordance with procedures. The required bypass flow was not achieved as the filter demineralizer flow control valve was closed and the filter demineralizer bypass valve was opened (see attached sketch). The system flow fell below the minimum required 60 gpm flow rate causing the 'A' RWCU pump to trip on low suction flow. This resulted in a pressure transient causing a high differential flow condition, for greater than the 45 second time delay, initiating the Nuclear Steam Supply Shutoff System (NSSSS) Group III isolation signal. The RWCU inboard and outboard isolation valves HV-044-1F001 and HV-044-1F004 closed, as designed, isolating RWCU.

The high differential flow isolation was not immediately reset because indicated RWCU inlet flow, sensed by flow element FE-44-1N035, continued to fluctuate between 60 to 80 gpm due to flow turbulence which was caused by the flow path that existed from the bottom head drain to RWCU and back to the recirculation suction line via the HV-044-1F015 valve (see attached sketch). Operations personnel closed the inlet valve, HV-044-1F105, leading from the reactor recirculation pump suction. Indicated RWCU inlet flow and bottom head drain flow dropped to zero and the NSSSS Group III isolation was reset at 0640 hours.

The duration of the isolation was 0 hours and 25 minutes.

Consequences of the Event:

The RWCU system isolated as designed on the high differential flow NSSSS Group III, A and D channel isolation signal. There was no release of radioactive material to the environment. RWCU was out of service for 3 hours and 30 minutes and reactor water purity remained within specified limits following the event. If the RWCU system remained out of service for greater than 4 hours reactor water chemistry grab samples would have been taken, in accordance with Technical Specifications, to determine reactor water purity. In the event that one of the NSSSS Group III isolation signals failed to isolate RWCU, the redundant channel isolation signal is designed to isolate the system.

Cause of the Event:

RWCU isolated on a pressure transient. The pressure transient was caused by the inability of the demineralizer bypass valve HV-44-1F044 to be adjusted to properly control system flow. This valve is believed to be oversized for its application. As a result, Operations personnel experienced difficulty controlling RWCU flow while removing the 'A' filter demineralizer from service (see attached sketch). Operations personnel could not maintain the minimum required 60 gpm system flow because system flow is controlled by adjusting the filter demineralizer bypass valve (HV-44-1F044) in a vary narrow range, less than 10% valve full open. This globe valve has a standard plug, or quick opening, type disc and the adjusting requirements are beyond the capability of the plug type disc. As a result, the 'A' RWCU pump tripped on low suction flow (pump protection). A pressure transient ensued causing a high differential flow condition of greater than 54.9 gpm. This condition lasted for greater than 45 seconds thereby initiating an NSSSS Group III, A and D Channel "high differential flow" isolation signal.

Corrective Actions:

The isolation was reset at 0640 hours and RWCU was returned to operation at 0905 hours.

Actions Taken to Prevent Recurrence:

The inability to properly adjust the valve HV-44-1F044 had been previously identified. A modification has been issued to replace the valve with a valve more appropriate for this application and it will be completed during a future outage of sufficient length after a new valve has been procured.

EIIS Codes:

NSSSS - JM
RWCU - CE
Isolation Valve - ISV
Filter Demineralizer - FDM
Pump - P

Previous Similar Occurrences:

Limerick LERs 84-031, 85-002, 85-003, 85-051, 85-082, and 86-033 reported RWCU isolations on high differential flow conditions.

Tracking Code: (B) Design Deficiency.

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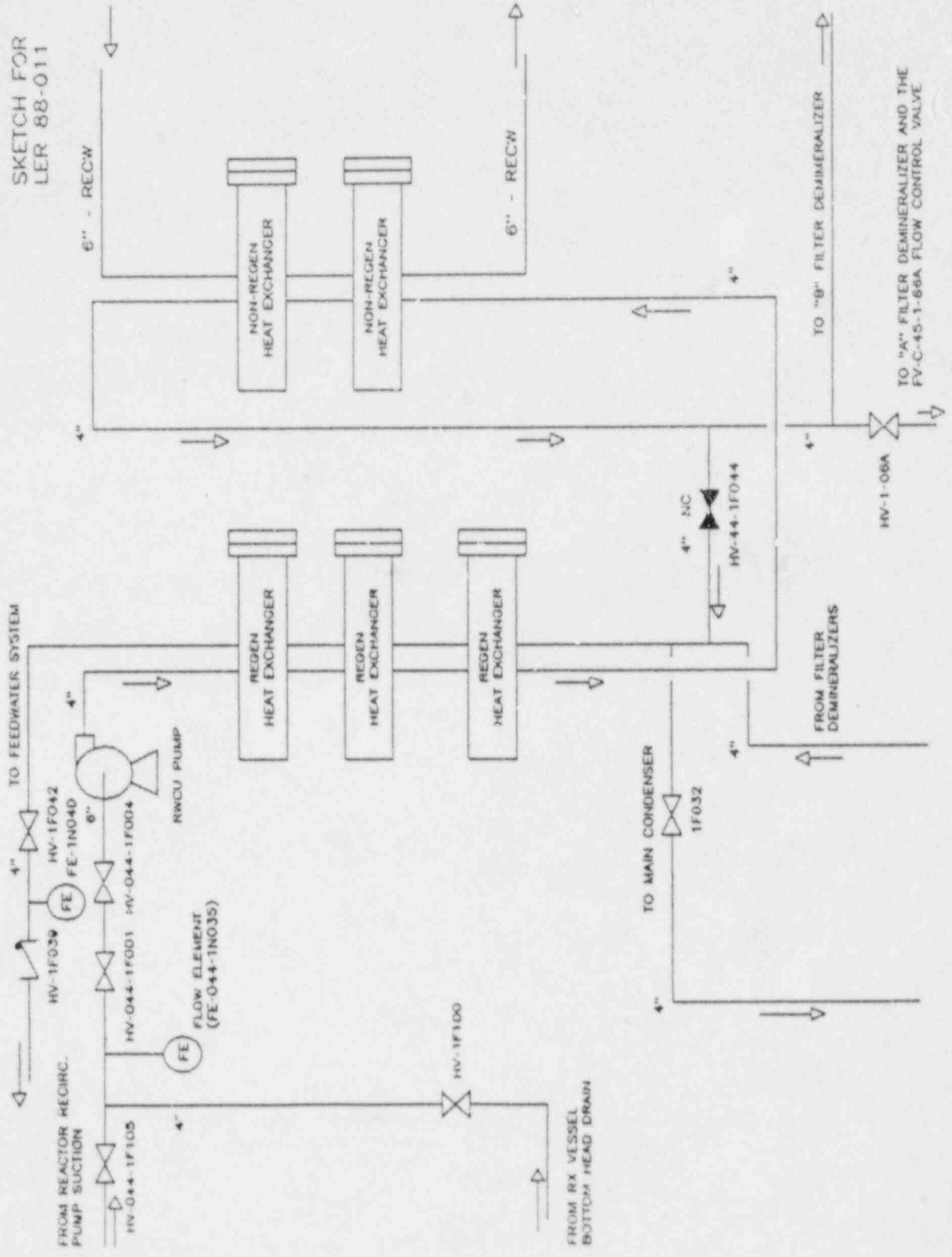
TEXT (If more space is required, use additional NRC Form 366A's) (17)



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April 25, 1988

Docket No. 50-352

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

SUBJECT: Licensee Event Report
Limerick Generating Station - Unit 1

This LER concerns a Nuclear Steam Supply Shutoff System (NSSSS) Group III isolation of the Reactor Water Cleanup System due to a high differential flow caused by a pressure transient while removing a RWCU filter demineralizer from service.

Reference:	Docket No. 50-352
Report Number:	88-011
Revision Number:	00
Event Date:	March 26, 1988
Report Date:	April 25, 1988
Facility:	Limerick Generating Station P.O. Box A, Sanatoga, PA 19464

This LER is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(iv).

Very truly yours,

R. H. Logue
Assistant to the Manager
Nuclear Support Division

cc: W. T. Russell, Administrator, Region I, USNRC
T. J. Kenny, USNRC Senior Resident Inspector

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