

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8709150276 DOC. DATE: 87/09/11 NOTARIZED: NO DOCKET #
 FACIL: 50-410 Nine Mile Point Nuclear Station, Unit 2, Niagara Moha 05000410
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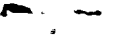
SUBJECT: LER 87-032-01: on 870612, while plant in hot shutdown condition, RWCU sys isolation occurred. Caused by design & const deficiencies. RWCU has been oriented to eliminate air collection point. W/870911 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 6
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES: 21

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	<u>REG FILE</u> 02	1 1	RES DEPY GI	1 1
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	RGN1 FILE 01	1 1		
EXTERNAL:	EG&G GROH, M	5 5	H ST LOBBY WARD	1 1
	LPDR	1 1	NRC PDR	1 1
	NSIC HARRIS, J	1 1	NSIC MAYS, G	1 1



LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Nine Mile Point Unit 2	DOCKET NUMBER (2) 0 5 0 0 0 410	PAGE (3) 1 OF 04
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TITLE (4) **Reactor Cleanup System Isolation on High Differential Flow Oscillations Due to Design and Construction Deficiencies**

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)
06	12	87	87	032	01	09	11	87	N/A		0 5 0 0 0
									N/A		0 5 0 0 0

OPERATING MODE (9) 3	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)									
POWER LEVEL (10) 000	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.406(c)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)						
	<input type="checkbox"/> 20.406(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)						
	<input type="checkbox"/> 20.406(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)						
	<input type="checkbox"/> 20.406(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(vii)(A)							
	<input type="checkbox"/> 20.406(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(vii)(B)							
	<input type="checkbox"/> 20.406(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)							

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER	
Robert G. Randall, Supervisor Technical Support		AREA CODE 315	349-2445

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
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO					

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

On June 12, 1987 at 2121 hours, Nine Mile Point Unit 2 (NMP2) experienced actuation of an Engineered Safety Feature (ESF), specifically, isolation of the Reactor Water Cleanup (RWCU) system. At the time of the event, the plant was in a hot shutdown condition with the reactor mode switch in "SHUTDOWN". Reactor pressure and temperature were approximately 583 pounds per square inch gauge (psig) and 482°F, respectively.

Although at the time of the event no conclusions could be made, the root cause for this event has been determined to be a combination of design and construction deficiencies.

The corrective actions for this event are:

1. The RWCU suction flow element has been properly oriented.
2. The flex hoses will be removed and the blocking globe valves re-oriented.
3. A special task force has been assigned to evaluate and troubleshoot the RWCU flow transmitter problems.
4. The reject flow transmitter orifice element will be relocated.

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		87	— 032	— 01	02 .	OF 04

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

I. DESCRIPTION OF EVENT

On June 12, 1987 at 2121 hours, Nine Mile Point Unit 2 (NMP2) experienced actuation of an Engineered Safety Feature (ESF), specifically, isolation of the Reactor Water Cleanup (RWC) system. At the time of the event, the plant was in a hot shutdown condition with the reactor mode switch in "SHUTDOWN". Reactor pressure and temperature were approximately 583 pounds per square inch gauge (psig) and 482°F, respectively.

Following a scram at 2056 hours (LER 87-31), a Niagara Mohawk operator was controlling reactor water level. During reactor startup/hot standby, it is necessary to remove excess reactor coolant, due to Control Rod Drive (RDS) system cooling water in-flow and reactor water thermal swell, via the RWC system until steam can be passed directly to the Main Condenser. The removed excess reactor coolant (reject flow) may be directed to either the Main Condenser or to the Liquid Radioactive Waste Treatment system. While removing the inservice RWC filter demineralizer in preparation to reduce the amount of reject flow, a sensed high flow differential between RWC system suction and reject flow transmitters occurred and initiated the RWC system isolation.

For the event, operator actions were per the approved temporary operating procedure 87-41, "Feedwater/Clean-Up System Operation". This procedure was in effect during startup and shutdown of the plant to mitigate feedwater line temperature stratification.

There were no components or systems which were inoperable and/or out of service which contributed to the event. No plant system or component failures resulted from the event.

II. CAUSE OF EVENT

Although at the time of the event no conclusions could be made, the root cause for this event has been determined to be a combination of design and construction deficiencies.

There has been a history of erratic flow indication problems, specifically with the RWC system flow indicators. It has been determined that air in the transmitter sensing lines is the most probable cause for the erroneous flow signal experienced in the event discussed in this report and for the RWC system isolation. Air in the sensing lines can have an amplifying affect on perturbations that may be present in the process system. Additionally, the type of transmitters used for RWC flow indication have a very fast response time and are particularly sensitive to air amplified noise.



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Efforts have been expended to determine the air source and the areas where air collects. It has been determined that air coming out of aqueous solution at decreasing reactor pressures tends to collect at specific points in the transmitter sensing lines. Furthermore, it has been determined that these air collection points could have been avoided by using a different design or proper construction techniques. Specifically, the following design and construction deficiencies have been identified; (1) The RWCU Suction Transmitter (2WCS*FT67X(Y)) sensing line flex hoses are positioned horizontally with a slight vertical slope. This orientation allows air to collect in the uneven interior surface of the hose. The instrument tubing run could have been designed with a greater vertical slope; eliminating these collection points. (2) The globe blocking valves on the RWCU suction flow transmitter sensing lines were installed with their stems in a vertical orientation creating another air collection point. These valves could have been installed with the stems horizontal avoiding this collection point. (3) The RWCU Suction Flow Element (2WCS*FE115) was installed at an improper orientation, with the vent and drain holes not at top and bottom, but rotated at a 45 degree angle. This improper installation allowed an air collection point by eliminating a vent passage. Proper orientation of this orifice would have avoided this air collection point.

Flow oscillations from the RWCU Blowdown Flow Transmitters (2WCS*FT69X(Y)) are attributed to the location of the Flow Element (2WCS*FE126), which is an identified design deficiency. Modification PN2Y87MX119 has been prepared by Niagara Mohawk to relocate this flow element when the Power Ascension schedule permits. This modification, when implemented, should mitigate future erratic flow indications.

III. ANALYSIS OF EVENT

The NMP2 Final Safety Analysis Report Section 5.4.8 states: "The RWCU system is classified as a primary power generation system (not an Engineered Safety Feature (ESF)), a small part of which is part of the reactor coolant pressure boundary (RCPB) up to and including the outside isolation valve. The other portions of the system are not part of the RCPB and can be isolated from the reactor. The RWCU system may be operated at anytime during planned reactor operations or it may be shutdown if water quality is within the Technical Specification limits."

An RWCU isolation does not impair the station's capability to achieve a safe shutdown condition. The RWCU isolation function operated as designed with no other transients or inoperable systems contributing to the event.

The event is considered reportable via 10CFR50.73 (a)(2)(iv) because the isolation function is an ESF function which is part of the Primary Containment and Reactor Vessel Isolation Control System.

The duration of the event was approximately nine minutes.



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

IV. CORRECTIVE ACTIONS

1. The RWCU Suction Flow Element (2WCS*FE115) has been properly oriented to eliminate an air collection point.
2. Per NMP2 Modification PN2Y87MX167, the RWCU Suction Flow Transmitter (2WCS*FT67X(Y)) sensing lines inside the primary containment will be modified as follows to eliminate identified air collection points; the flex hoses will be replaced with rigid tubing and the blocking globe valves will be re-oriented. This work is presently scheduled to be completed during the Test Condition 2 outage.

If the actions described above are not effective in reducing the erratic flow signals (from the RWCU suction flow transmitters) to an acceptable level, the transmitter lines outside of the primary containment will be reworked to eliminate probable air collection areas. These actions are being taken as part of a systematic troubleshooting program to correct the RWCU flow transmitter problems.

This corrective action in conjunction with corrective action item #1 should minimize transient effects on the RWCU suction flow transmitters due to entrapped air in the sensing lines.

3. A special task force has been assigned to evaluate and troubleshoot the RWCU transmitter problems.
4. Modification PN2Y87MX119 will incorporate the suggested design changes from General Electric Service Information Letter (SIL) 450. SIL 450 recommends that the RWCU Blowdown Flow Element (2WCS*FE126) be placed upstream of 2WCS-FV135 to prevent erratic flow indications from the RWCU Blowdown Flow Transmitters (2WCS*FT69X(Y)) and unnecessary RWCU isolations. This modification is scheduled to be completed during the Test Condition 2 outage.

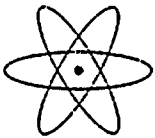
V. ADDITIONAL INFORMATION

Identification of Components Referred to in this LER

Component	IEEE 803 EIIS Funct	IEEE 805 System ID
Flow Transmitter	FT	IJ
Instrument Line	TBG	CE
Reactor Water Cleanup System	N/A	CE
Flow Indicator	FI	CE
Isolation Logic System	N/A	JE
Globe Valve	RTV	IJ

Two similar events involving RWCU isolations have occurred at NMP2 since this event and are discussed in LER 87-47.





NIAGARA MOHAWK POWER CORPORATION

NIAGARA  MOHAWK

301 PLAINFIELD ROAD
SYRACUSE, NY 13212

THOMAS E. LEMPGES
VICE PRESIDENT—NUCLEAR GENERATION

September 11, 1987

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

RE: Docket No. 50-410
LER 87-32 - Supplement 1

Gentlemen:

In accordance with 10 CFR 50.73, we hereby submit the following Licensee Event Report:

LER 87-32 Supplement 1 Is being submitted in accordance with 10 CFR 50.73 (a) (2) (iv), "Any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS). However, actuation of an ESF, including the RPS, that resulted from and was part of the preplanned sequence during testing or reactor operation need not be reported."

A 10 CFR 50.72 (b) (2) (ii) report was made at 2345 hours on June 12, 1987.

This report was completed in the format designated in NUREG-1022, Supplement 2, dated September 1985.

Very truly yours,

Thomas E. Lempges
Vice President
Nuclear Generation

TEL/JTD/mjd

Attachments

cc: Regional Administrator, Region 1
Sr. Resident Inspector, W. A. Cook

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