REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8705290102 DOC. DATE: 87/05/22 NOTARIZED: NO DOCKET #
FACIL: 50-410 Nine Mile Point Nuclear Station, Unit 2, Niagara Moha 05000410
AUTH. NAME AUTHOR AFFILIATION
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RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 87-020-00: on 870422, ESF actuation occurred. Caused by air in transmitter. Procedures revised, addl instrument & control technician training & proposed mod to level trasmitters actions taken. W/870422 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 5
TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PD1-1 LA	1	1	PD1-1 PD	1	1
	NEIGHBORS, D	1	1	MINER, S	1	1
INTERNAL:	ACRS MICHELSON	1	1	ACRS MOELLER	2	2
	AEOD/DOA	1	1	AEOD/DSP/ROAB	2	2
	AEOD/DSP/TPAB	1	1	DEDRO	1	1
	NRR/DEST/ADE	1	0	NRR/DEST/ADS	1	0
	NRR/DEST/CEB	1	1	NRR/DEST/ELB	1	1
	NRR/DEST/ICSB	1	1	NRR/DEST/MEB	1	1
	NRR/DEST/MTB	1	1	NRR/DEST/PSB	1	1
	NRR/DEST/RSB	1	1	NRR/DEST/SGB	1	1
	NRR/DLPQ/HFB	1	1	NRR/DLPQ/QAB	1	1
	NRR/DOEA/EAB	1	1	NRR/DREP/RAB	1	1
	NRR/DREP/RPB	2	2	NRR/PMAS/ILRB	1	1
	NRR/PMAS/PTSB	1	1	REG FILE 02	1	1
	RES DEPY GI	1	1	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

TOTAL NUMBER OF COPIES REQUIRED: LTTR 43 ENCL 41

NRC Form 366
(9-83)

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

LICENSEE EVENT REPORT (LER)

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TITLE (4)
ESF Actuation Due to Air in Level Transmitter

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 4	2 2	8 7	8 7	0 2 0	0 0	0 5	2 2	8 7	N/A	0 5 0 0 0
									N/A	0 5 0 0 0

OPERATING MODE (9): 4

POWER LEVEL (10): 0 0 0

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

	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 (AREA CODE)
Robert G. Randall, Supervisor Technical Support	3 1 5 3 4 9 - 2 4 4 5

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)

On April 22, 1987 at 1121 hours, Nine Mile Point Unit 2 experienced a reactor scram signal due to spurious low reactor water level signals. These signals were generated as a result of a Niagara Mohawk Instrument and Control (I&C) technician, who while performing a surveillance test, opened a transmitter isolation valve. Air, introduced into the transmitter during the connection of the test equipment, was compressed once the valve was opened. A pressure transient resulted in the associated instrument line, which caused the low reactor water level signals. At the time of the event the plant was in a shutdown condition with the reactor mode switch in "SHUTDOWN" and all control rods inserted.

Corrective actions consist of a revision to the surveillance procedure, additional I&C technician training and proposed modification to the level transmitters. The procedure was revised to further assure no air is introduced into the instrument lines and I&C technicians will receive additional training in avoiding pressure transients. A proposed modification to the level transmitters test connection valves to avoid the introduction of contaminates into the instrument lines has been submitted to the Engineering Department for evaluation.

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

I. DESCRIPTION OF EVENTS

On April 22, 1987 at 1121 hours, Nine Mile Point Unit 2 (NMP2) experienced a reactor scram signal. At the time of the event, the plant was in the cold shutdown condition with the mode switch in the "SHUTDOWN" position. The vessel was pressurized to approximately 42 psig to perform preliminary leak rate testing of the Main Steam Isolation Valves. All control rods were inserted at the time of the event.

The scram signal was caused by simultaneous spurious reactor water low level (Level 3) trip signals on Trip System A and Trip System B of the Reactor Protection System (RPS). Coincident with the Level 3 trip signals was a high reactor water level (Level 8) turbine trip signal and feedwater pump trip signal. The spurious trip signals have been determined to have been caused by a Niagara Mohawk Instrument and Control (I&C) technician during the performance of surveillance procedure N2-ISP-ISC-R106, "Operating Cycle Calibration of ADS Permissive of Reactor Vessel Level Low, Level 3 Instrument Channels".

Nine Mile Point Unit 2 utilizes four differential pressure transmitters (2ISC*LT7A through D) for low water level. These transmitters sense the difference between the pressure from a constant column of water (reference leg) and the pressure from the actual water level in the vessel (variable leg). One transmitter is provided for each of the four RPS channels (A1, A2, B1, B2). The RPS logic is designed such that a low level signal from one transmitter in each trip system (A and B) will cause a full scram signal. While the transmitters for each RPS channel have separate reference legs, the transmitters for RPS channels A1 and B1 (LT7B, LT7C) share a common variable leg. Likewise, transmitters for RPS channels A2 and B2 (LT7A, LT7D) share a common variable leg.

Once the surveillance test was initiated, an error was discovered in the procedure. The technician decided to exit the test and have the error corrected. While returning the transmitter 2ISC*LT12B to service, an inadvertent pressure transient occurred on the variable leg common to transmitters 2ISC*LT7B and 2ISC*LT7C. This transient caused the two transmitters to sense a high differential pressure (low water level) and initiated the scram signal. The transient also caused a trip of the high water level transmitter 2ISC*PDT14B, which is on the same common variable leg.

Throughout the event, reactor water level was 184 inches, which is within the normal reactor water level range (178.3 and 187.3 inches). Operator action was to reset the reactor scram per Niagara Mohawk Operating Procedure N2-OP-101C, "Plant Shutdown". Since all control rods were inserted at the time, and the turbine and feedwater pumps were not in operation, the event resulted in protective signals, but no actuations occurred and no further operator action was required.

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

II. CAUSE OF EVENT

A Root Cause Analysis for the event has been completed per Supervisory Procedure S-SUP-1, "Root Cause Analysis Program", and has concluded that the root cause was air in the transmitter 2ISC*LT12B. Increased sensitivity to air, due to the elevated reactor pressure (approximately 42 psig) was a contributing factor. The air is believed to have been introduced during the installation of the test equipment to the transmitter undergoing surveillance testing. When the I&C technician opened the "HIGH" side isolation valve (variable leg) per procedure, the air was compressed, creating a pressure transient in the variable leg common to level transmitters 2ISC*LT7B and 2ISC*LT7C. This pressure transient resulted in the spurious low level trip signals, which generated the scram signal.

III. ANALYSIS OF EVENT

The reactor scram signal which occurred as a result of the Level 3 trip is a conservative action and poses no adverse safety consequences at any reactor power level. The event did not in any way adversely affect any other safety systems nor the operators' ability to achieve safe shutdown.

It should be noted this event occurred under slightly unusual circumstances, in that the test was terminated without having performed the transmitter calibration. Had the calibration been performed, the air would have been detected by the transmitter's unacceptable response to specified input signals. Detection and removal of the air from the transmitter would have prevented this event.

IV. CORRECTIVE ACTIONS

Actions to prevent similar events from occurring in the future include a revision to procedures, additional I&C technician training and a proposed modification to the level transmitters.

The procedure which was being performed at the time of the event states that it be ensured there are no air bubbles in the test lines of the test equipment. The procedure has since been revised to state that it also be ensured that the area between the test lines and the test connection valves be free of any air bubbles. It is this area where the air is believed to have entered the transmitter. Similar procedures which call for test equipment hookup to level transmitters will be revised as required on a continuing basis, with completion prior to their next scheduled cycle.

Training for I&C technicians will be expanded to include the use of an isolation valve handle extender when restoring a transmitter to service. Procedures for level transmitter calibration caution the technicians to close and open the isolation valves slowly. The handle extender, which may be something as simple as a Crescent wrench, allows for finer control of the isolation valves. Use of the handle extender will aid in avoiding the formation of pressure surges in the instrument lines.

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

A modification request has been submitted via Problem Report #06837. The problem report notes the current design of the test connection valves allows for the possibility of contaminates to be introduced into the system. Modification of the test connection valves would be the replacement of the current plug design with a Swagelock quick disconnect and cap. Replacement of the plug with the Swagelock quick disconnect would prevent the introduction of contaminates into the instrument lines. This new arrangement would also assure no introduction of air into the system, for the test lines would remain solid. Modification of the isolation valves would occur during the next scheduled transmitter calibration.

V. ADDITIONAL INFORMATION

Identification of Components Referred to in this LER

Component	IEEE 803 EIIS Funct	IEEE 805 System ID
Reactor Protection System	N/A	JC
Valve (Shutoff)	SHV	JC
Pressure Transmitter	PDT	JC

There has been one previous event at NMP2 which also involved a spurious scram signal while performing a valve operation on an instrumentation line (LER 87-10). However, the circumstances associated with that event differ to the extent that the two events are not considered similar.

NMP23885

NIAGARA MOHAWK POWER CORPORATION

NIAGARA MOHAWK

301 PLAINFIELD ROAD
SYRACUSE, NY 13212

THOMAS E. LEMPGES
VICE PRESIDENT—NUCLEAR GENERATION

May 22, 1987

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

RE: Docket No. 50-410
LER 87-20

Gentlemen:

We hereby submit the following Licensee Event Report:

LER 87-20 Which 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)."

A 10 CFR 50.72 (b) (2) (ii) report was made on April 22, 1987.

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

Very truly yours,

Thomas E. Lempges

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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