RE[redacted]ORY INFORMATION DISTRIB[redacted] SYSTEM (RIDS)

ACCESSION NBR: 8706240157 DOC. DATE: 87/06/15 NOTARIZED: NO DOCKET #
FACIL: 50-410 Nine Mile Point Nuclear Station, Unit 2, Niagara Moha 0500041.0
AUTH. NAME AUTHOR AFFILIATION
RANDALL, R. G. Niagara Mohawk Power Corp.
LEMPGES, T. E. Niagara Mohawk Power Corp.
RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 87-024-00: on 870517-27, ESF actuations from low air flow signal in reactor bldg occurred. Caused by nonexposure of flow switches to recommended setpoints. Flow switches in both refueling floor main exhaust ducts recalibr. W/870615 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 12
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
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	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/TRAB	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
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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)
Nine Mile Point Unit 2	0 5 0 0 0 4 1 0	1 OF 0 5

TITLE (4)

Engineered Safety Feature Actuation from a Low Air Flow Signal in the Reactor Building

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 5	1 7	8 7	8 7	0 2 4	0 0	0 6	1 5	8 7	N/A	0 5 0 0 0
									N/A	0 5 0 0 0

OPERATING MODE (9)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
2	20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) 0 0 1	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 May 17, 1987 at 1424 hours and on May 27, 1987 at 1303 hours, Nine Mile Point Unit 2 (NMP2) experienced the actuation of two Engineered Safety Features (ESF). Each event consisted of a secondary containment isolation and initiation of the Standby Gas Treatment (GTS) system. A sensed low air flow condition in the above refueling floor main exhaust duct of the Reactor Building Ventilation (HVR) system initiated the May 17 event. The May 27 event was initiated by a sensed low air flow condition in the below refueling floor main exhaust duct. At the time of the May 17 event, the plant was in a shutdown condition with the reactor mode switch in the "SHUTDOWN" position and all control rods inserted. At the time of the May 27 event, the plant was at less than 1% power with the reactor mode switch in the "STARTUP" position.

The root cause of both events has been determined to be the use of vendor recommended setpoints, based on an average air flow, to which the flow switches are not exposed. Use of these setpoints provided only a small margin between the flow switches' trip setpoint and their output for normal flow. Corrective action will be to recalibrate the flow switches in both the above and below refueling floor main exhaust ducts to more accurately reflect normal air flow conditions.

IE22
1/1

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Nine Mile Point Unit 2	0 5 0 0 0 4 1 0	8 7	— 0 2 4	— 0 0	0 2 OF 0 5

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

I. DESCRIPTION OF EVENTS

On May 17, 1987 at 1424 hours and on May 27, 1987 at 1303 hours Nine Mile Point Unit 2 (NMP2) experienced the actuation of two Engineered Safety Features (ESF). Each event consisted of a secondary containment isolation and initiation of the Standby Gas Treatment (GTS) system. At the time of the event on May 17, the plant was in a shutdown condition with the mode switch in the "SHUTDOWN" position and all control rods inserted. At the time of the May 27 event, the plant was at less than 1% power with the mode switch in the "STARTUP" position.

On May 17, following the performance of the Operations Surveillance Procedure N2-OSP-GTS-R001, "Standby Gas Treatment System Operability Test", GTS Train "A" was stopped and the Reactor Building Ventilation (HVR) System was returned to service. At the request of the cognizant contractor test engineer, a Niagara Mohawk operator rotated into service exhaust fan 2HVR-FN5B for 2HVR-FN5A, per Operating Procedure N2-OP-52, "Reactor Building Ventilation".

Subsequent to the fan rotation, flow switch 2HVR*FS36B tripped on what it sensed to be a low air flow condition (<2200 feet per minute air velocity) in the above refueling floor main exhaust duct. The tripped flow switch initiated a secondary containment isolation and initiation of the GTS system Train "A". Train "B" of the GTS system did not initiate, since it was secured at the time of the event.

On May 27, again the event was initiated subsequent to an exhaust fan rotation. Per procedure, when the Niagara Mohawk operator rotated the below refueling floor exhaust fan 2HVR-FN2A for 2HVR-FN2B, the two associated flow switches, 2HVR*FS37A and 2HVR*FS37B, tripped on a sensed low air flow condition. The tripped flow switches initiated a secondary containment isolation and initiation of both Train "A" and Train "B" of the GTS system.

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

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Nine Mile Point Unit 2	0 5 0 0 0 4 1 0	8 7	— 0 2 4	— 0 0	0 3 OF 0 5

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

II. CAUSE OF EVENT

For exhaust fan rotation, the operating fan must be shutdown before the standby fan may be started. This creates a decrease in the system flow, but it should not be significant enough to initiate a system isolation. Following the May 17 event, it was thought that the trip setpoint of the flow switch 2HVR*FS36B may have drifted. Work Request (WR) WR117110 was written to recalibrate the above refueling floor flow switches. An additional work request, WR 117384, was issued for the below refueling floor flow switches due to their similar design.

A check of the above refueling floor flow switches revealed that no setpoint drift had occurred, as the setpoints were the same as from the previous calibration. However, the margins of difference between the flow switches' output for normal air flow conditions and their trip setpoints for low flow conditions were found to be too conservative.

A flow profile of the exhaust ducts at the location of the flow switches to determine trip setpoints was not originally performed. Instead the flow switches were calibrated to trip at vendor (Fluid Component Incorporated) recommended values. These values, based on an average flow, were determined under optimum flow conditions at the vendor's facilities. However, with the air flow pattern developed in the HVR system, a less than average flow exists at the location of flow switches. Under the initial condition of the HVR system (i.e., clean filters and ducts, very little operating time on the equipment) an adequate margin existed between the flow switches' output at normal flow and trip setpoints. However, as the system has acquired an operating history, the flow patterns in the vicinity of the flow switches has changed. Although total flow through the exhaust ducts has remained constant, the flow switches which are sensitive to flow changes in a very small area (approximately one square inch), are now exposed to a slower moving stream of air. With this reduction in the margin between the trip setpoints and the flow switches' output for normal flow conditions, minor disruptions in the air flow (i.e., exhaust fan rotation) initiated the system isolations.

A root cause analysis for the events has been completed per Supervisory Procedure S-SUP-1, "Root Cause Analysis Program", and has concluded that the root cause was the use of the vendor recommended setpoints, based on an average air flow, to which the flow switches are not exposed. Use of these setpoints provided only a small margin between the flow switches' trip setpoints and their output for normal operating conditions.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Nine Mile Point Unit 2	0 5 0 0 0 4 1 0	8 7	— 0 2 4	— 0 0	0 4 OF 0 5

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

III. ANALYSIS OF EVENT

Both the secondary containment isolations and initiations of the Standby Gas Treatment System, which occurred as a result of sensed low flow conditions, are conservative actions and pose no adverse safety consequences at any reactor power level. The events did not in any way adversely affect any other safety systems nor the operators' ability to achieve safe shutdown.

The total duration of the events were approximately seven minutes for the May 17 event and forty minutes for the May 24 event.

IV. CORRECTIVE ACTIONS

Immediate corrective actions for each event were for the operators to reset the low flow signals, secure the GTS system and return the HVR system to service.

To recalibrate the FCI flow switches at NMP2, a new Instrument and Control Procedure (N2-ICP-GEN-@003) for the calibration of FCI flow switches, is being written. Additional temporary flow instruments (pitot tube/manometer) will be installed at the same location as the flow switch, where the total flow across the duct will be measured. System flow will then be manually restricted by repositioning dampers to the minimum design air flow. The flow switch will then be calibrated to trip at this new flow reading for the minimum flow condition. Once recalibrated, the flow switches will not be as sensitive to minor changes in the air flow to which they are exposed. However, this procedure will also account for possibly significant changes in the air flow pattern to which the switches are exposed in the future. The technician is instructed to compare the current normal flow reading from the flow switch with the previous normal flow reading. Should the new reading indicate that the air flow pattern in the vicinity of the flow switch has changed, the flow switch will be recalibrated following Engineering evaluation and approval.

Once the above and below refueling floor main exhaust duct flow switches are recalibrated, a one time special test will be performed on the HVR system. This test will rotate both above and below refueling floor exhaust fans to assure that this normal disruption of the air flow does not initiate a low air flow trip. Fan rotations will be performed with three different HVR exhaust fan damper configurations. One rotation sequence will have the standby fan discharge damper fully open, another sequence will have the standby fan discharge damper 40% open (standby fan start permissive setpoint) and the remaining rotation sequence will have the standby fan discharge damper fully closed. With the standby fan discharge damper fully open, a decreased flow condition will exist due to the establishment of a recirculation flow path through the standby fan. Fan rotation with the damper standby fan 40% open simulates current operator practice, while rotation with the damper fully closed simulates an automatic start of the standby fan without operator intervention. The flow readings for each flow switch during each fan rotation will be recorded.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Nine Mile Point Unit 2	0 5 0 0 0 4 1 0	8 7	— 0 2 4	— 0 0	0 5 OF 0 5

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

The above corrective actions will be performed upon final approval of the new calibration procedure and special test, and the availability of required systems. Implementation should be completed prior to the next calibration of the flow switches, currently scheduled for mid-July.

V. ADDITIONAL INFORMATION

Identification of Components/Systems Referred to in this LER

Component/System	IEEE 803 EIIS Funct	IEEE 805 System ID
Flow Switch	FS	VA
Reactor Building Ventilation (HVR)	N/A	VA
Standby Gas Treatment (GTS)	N/A	VA

There have been no previous similar events at NMP2.

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)
Nine Mile Point Unit 2	0 5 0 0 0 4 1 0	1 OF 0 5

TITLE (4)

Engineered Safety Feature Actuation from a Low Air Flow Signal in the Reactor Building

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)
									N/A	0 5 0 0 0
0 5	1 7	8 7	8 7	0 2 4	0 0	0 6	1 5	8 7	N/A	0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
2		20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
0 0 1		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)	
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		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 May 17, 1987 at 1424 hours and on May 27, 1987 at 1303 hours, Nine Mile Point Unit 2 (NMP2) experienced the actuation of two Engineered Safety Features (ESF). Each event consisted of a secondary containment isolation and initiation of the Standby Gas Treatment (GTS) system. A sensed low air flow condition in the above refueling floor main exhaust duct of the Reactor Building Ventilation (HVR) system initiated the May 17 event. The May 27 event was initiated by a sensed low air flow condition in the below refueling floor main exhaust duct. At the time of the May 17 event, the plant was in a shutdown condition with the reactor mode switch in the "SHUTDOWN" position and all control rods inserted. At the time of the May 27 event, the plant was at less than 1% power with the reactor mode switch in the "STARTUP" position.

The root cause of both events has been determined to be the use of vendor recommended setpoints, based on an average air flow, to which the flow switches are not exposed. Use of these setpoints provided only a small margin between the flow switches' trip setpoint and their output for normal flow. Corrective action will be to recalibrate the flow switches in both the above and below refueling floor main exhaust ducts to more accurately reflect normal air flow conditions.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)				PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Nine Mile Point Unit 2	0 5 0 0 0 4 1 0	8 7	— 0 2 4	— 0 0	0 2	OF 0 5

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

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Nine Mile Point Unit 2	0 5 0 0 0 4 1 0	8 7	— 0 2 4	— 0 0	0 3 OF 0 5

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

II. CAUSE OF EVENT

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Nine Mile Point Unit 2	0 5 0 0 0 4 1 0	8 7	— 0 2 4	— 0 0	0 4 OF 0 5

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

III. ANALYSIS OF EVENT

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The total duration of the events were approximately seven minutes for the May 17 event and forty minutes for the May 24 event.

IV. CORRECTIVE ACTIONS

Immediate corrective actions for each event were for the operators to reset the low flow signals, secure the GTS system and return the HVR system to service.

To recalibrate the FCI flow switches at NMP2, a new Instrument and Control Procedure (N2-ICP-GEN-@003) for the calibration of FCI flow switches, is being written. Additional temporary flow instruments (pitot tube/manometer) will be installed at the same location as the flow switch, where the total flow across the duct will be measured. System flow will then be manually restricted by repositioning dampers to the minimum design air flow. The flow switch will then be calibrated to trip at this new flow reading for the minimum flow condition. Once recalibrated, the flow switches will not be as sensitive to minor changes in the air flow to which they are exposed. However, this procedure will also account for possibly significant changes in the air flow pattern to which the switches are exposed in the future. The technician is instructed to compare the current normal flow reading from the flow switch with the previous normal flow reading. Should the new reading indicate that the air flow pattern in the vicinity of the flow switch has changed, the flow switch will be recalibrated following Engineering evaluation and approval.

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The above corrective actions will be performed upon final approval of the new calibration procedure and special test, and the availability of required systems. Implementation should be completed prior to the next calibration of the flow switches, currently scheduled for mid-July.

V. ADDITIONAL INFORMATION

Identification of Components/Systems Referred to in this LER

Component/System	IEEE 803 EIIS Funct	IEEE 805 System ID
Flow Switch	FS	VA
Reactor Building Ventilation (HVR)	N/A	VA
Standby Gas Treatment (GTS)	N/A	VA

There have been no previous similar events at NMP2.

NMP23898

NIAGARA MOHAWK POWER CORPORATION

NIAGARA MOHAWK

301 PLAINFIELD ROAD
SYRACUSE, NY 13212

THOMAS E. LEMPGES
VICE PRESIDENT—NUCLEAR GENERATION

June 15, 1987

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

RE: Docket No. 50-410
LER 87-24

Gentlemen:

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

LER 87-24 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)."

10 CFR 50.72 (b) (2) (ii) reports were made at 1500 hours on May 17, 1987, and at 1415 hours on May 27, 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

NMP23898

NIAGARA MOHAWK POWER CORPORATION

NIAGARA MOHAWK

301 PLAINFIELD ROAD
SYRACUSE, NY 13212

THOMAS E. LEMPGES
VICE PRESIDENT—NUCLEAR GENERATION

June 15, 1987

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

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LER 87-24

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TEL/JTD/mjd

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IE22
1/1