# CATEGORY 1

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FACIL:50-410 Nine Mile Point Nuclear Station, Unit 2, Niagara Moha 05000410
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RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 97-016-00:on 971203,missed TS SR 4.3.4.1.2 for ATWS RPT trip of low frequency motor generator noted.Caused by misintepretation of ATWS RPT regulatory requirements.Will revise logic sys functional test procedure.W/980102 ltr.

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NIAGARA MOHAWK
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CARL D. TERRY
Vice President
Nuclear Safety Assessment and Support

January 2, 1998
NMP2L 1742

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

RE: Docket No. 50-410
LER 97-16

Gentlemen:

In accordance with 10CFR50.73(a)(2)(i), we are submitting LER 97-16, "Missed Technical Specification Surveillance Requirement 4.3.4.1.2 for ATWS-RPT Trip of LFMG."

Very truly yours,

Carl D. Terry
Vice President
Nuclear Safety Assessment & Support

CDT/GJG/lmc
Attachment

xc: Mr. H. J. Miller, Regional Administrator, Region I
Mr. B. S. Norris, Senior Resident Inspector
Records Management

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

# LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503

| FACILITY NAME (1) | DOCKET NUMBER (2) | PAGE (3) |
|---|---|---|
| Nine Mile Point Unit 2 | 05000410 | 1 OF 4 |

TITLE (4)
Missed Technical Specification Surveillance Requirement 4.3.4.1.2 for ATWS-RPT Trip of LFMG

| 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) |
| 12 | 03 | 97 | 97 | | 016 | | 00 | 01 | 02 | 98 | N/A | 05000 |
| | | | | | | | | | | | N/A | 05000 |

OPERATING MODE (9): 4

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

POWER LEVEL (10): 000

- ☐ 20.402(b)
- ☐ 20.405(a)(1)(i)
- ☐ 20.405(a)(1)(ii)
- ☐ 20.405(a)(1)(iii)
- ☐ 20.405(a)(1)(iv)
- ☐ 20.405(a)(1)(v)
- ☐ 20.405(c)
- ☐ 50.36(c)(1)
- ☐ 50.36(c)(2)
- ☒ 50.73(a)(2)(i)
- ☐ 50.73(a)(2)(ii)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)
- ☐ 50.73(a)(2)(v)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(b)
- ☐ 73.71(c)
- ☐ OTHER *(Specify in Abstract below and in Text, NRC Form 366A)*

LICENSEE CONTACT FOR THIS LER (12)

| NAME | TELEPHONE NUMBER |
|---|---|
| R. J. Dean - Engineering Manager Unit 2 | (315) 349-4240 |

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFAC-TURER | REPORTABLE TO NPRDS | | CAUSE | SYSTEM | COMPONENT | MANUFAC-TURER | REPORTABLE TO NPRDS |
|---|---|---|---|---|---|---|---|---|---|---|
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| SUPPLEMENTAL REPORT EXPECTED (14) | | EXPECTED SUBMISSION DATE (15) | MONTH | DAY | YEAR |
|---|---|---|---|---|---|
| ☐ YES *(If yes, complete EXPECTED SUBMISSION DATE)* | ☒ NO | | | | |


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

On December 3, 1997, Niagara Mohawk Power Corporation determined that the Anticipated Transient Without Scram Recirculation Pump Trip (ATWS-RPT) Logic System Functional Test (LSFT) did not test the Low Frequency Motor Generator (LFMG) trip for high reactor vessel pressure. The LSFT did appropriately test for the LFMG trip on low reactor water level and for the high speed trip to the LFMG of the recirculation pumps on high reactor pressure. Failure to perform an LSFT of the LFMG trip on high reactor vessel pressure is a violation of Technical Specification Surveillance Requirement 4.3.4.1.2.

The cause of this event has been determined to be a misinterpretation of the ATWS-RPT regulatory requirements due to analysis deficiency.

On November 9, 1997, during forced outage 97-03, the ATWS-RPT LFMG trip was successfully tested.

## I. DESCRIPTION OF EVENT

On December 3, 1997, Niagara Mohawk Power Corporation (NMPC) determined that the Anticipated Transient Without Scram Recirculation Pump Trip (ATWS-RPT) Logic System Functional Test (LSFT) did not test the Low Frequency Motor Generator (LFMG) trip for high reactor vessel pressure. The LSFT did appropriately test the LFMG trip on low reactor water level and for the high speed trip to the LFMG of the recirculation pumps on high reactor pressure. Failure to perform an LSFT of the LFMG trip on high reactor vessel pressure is a violation of Technical Specification (TS) Surveillance Requirement (SR) 4.3.4.1.2.

The Nine Mile Point Unit 2 (NMP2) ATWS-RPT trip system is designed to trip the recirculation pumps from high speed to low speed upon receipt of a high reactor pressure signal. If after 25 seconds, the Average Power Range Monitors (APRMs) are not downscale, the LFMGs trip. The high speed trip on high reactor pressure has always been tested, but the high reactor pressure LFMG trip had not been tested.

This SR discrepancy had previously been identified on December 5, 1996, when Deviation/Event Report (DER) 2-96-3268 was initiated. The disposition of that DER concluded that testing of the LFMG trip was not necessary to meet TS SR 4.3.4.1.2. The basis for that conclusion was that the LFMG trip does not affect the reactor high pressure transient and the high cladding temperature transient, since the time delay of 25 seconds delays the LFMG trip until after the peak pressure and cladding temperature have occurred.

After subsequent review by NMPC personnel preparing the Improved Technical Specifications (ITS), it has been determined that the possible intent of the SR was to test the LFMG trip function also. Therefore, on December 3, 1997, it was concluded that this was a missed SR and was reportable.

## II. CAUSE OF EVENT

The cause of this event has been determined to be a misinterpretation of the ATWS-RPT regulatory requirements due to analysis deficiency. When the procedure was developed, it is believed that personnel involved in the review determined that the LFMG trip was not required to be tested since it was not a required function of the circuit. A technical analysis indicates that the LFMG trip occurs after the plant reaches its peak reactor pressure and fuel cladding temperature and therefore does not mitigate these factors of the limiting event. In addition, neither TS Table 3.3.4.1-1 nor its Bases discuss the LFMG or its associated trip instrumentation. It is believed for these reasons the trip was excluded. However, since the Updated Safety Analysis Report (USAR) in Section 7.6.1.8 describes the ATWS-RPT functions and includes a description of the LFMG trip, the possibility remains that the LFMG portion was intended to be tested in accordance with TS SR 4.3.4.1.2.

## III. ANALYSIS OF EVENT

This event is reportable in accordance with 10CFR50.73 (a)(2)(i)(B), "any operation or condition prohibited by the plant's Technical Specifications."

General Electric performed ATWS analysis for the NMP2 power uprate. This is documented in EAS-GENE-770-36-0492, Analysis of Anticipated Transients Without Scram at Uprated Power Conditions - Nine Mile Point Unit 2. The most limiting pressure transient is closure of the main steam isolation valves (MSIVs) and failure to scram. In this event, the following occurs:

- 4 seconds: 1) maximum reactor power; 2) ATWS high setpoint reached for reactor recirculation pumps transfer to low speed; and 3) Standby Liquid Control System (SLCS) and feedwater redundant logic initiated.
- 9.2 seconds: peak fuel cladding temperature reached (1417°F).
- 29 seconds: LFMGs trip.
- 54 seconds: reactor water level reaches level 2 which provides a second LFMG trip signal.
- 120 seconds: SLCS initiated.
- 20 minutes: hot shutdown is achieved.
- 3.86 hours: maximum suppression pool temperature reached at 157°F.

For the MSIV closure transient, the peak cladding temperature of 1417°F is well below the 2200°F fuel damage criteria of 10CFR50 Appendix K. In addition, the maximum suppression pool temperature of 157°F is well below the design limit of 212°F. The pressure regulator failure-open transient includes a subsequent ATWS-RPT and causes a high peak cladding temperature of 1737°F, but the peak is also well below the 10CFR50 Appendix K criteria.

If the first ATWS-RPT LFMG trip had not occurred, the LFMGs would have tripped at 54 seconds into the ATWS event based upon low reactor water level, which had been properly tested. The low reactor water level trip has been routinely tested. Since the peak pressure and peak cladding temperatures occurred prior to the 25 second delay, an additional delay of 29 seconds does not affect the overall plant response to the event. The ATWS-RPT LFMG trip was successfully tested on November 9, 1997, which demonstrated operability. This test confirms that the APRM not downscale signal is properly received into the redundant reactivity control system (RRCS) which includes the logic to initiate a LFMG trip. The RRCS has a self test feature which tests the internal logic. The operation of the APRM not downscale signal is verified by APRM surveillance. Therefore, it is reasonable to conclude that the high reactor pressure LFMG trip was operable throughout this period.

Based upon the preceding, there was no consequence to the public or plant personnel.

## IV. CORRECTIVE ACTIONS

1. In November 1997 during forced outage 97-03, the LSFT procedure was temporarily revised and the ATWS-RPT LFMG trip was successfully tested.

2. The LSFT procedure will be permanently revised prior to refueling outage 6 (May 1998).

3. NMP2 personnel responsible for development and review of surveillance procedures, including Engineering and Technical Support, will be trained on this event by June 30, 1998.

In addition to the specific corrective actions, NMPC is continuing our efforts in preparing the ITS and in review of surveillance procedures in response to Generic Letter (GL) 96-01. Both of these efforts have been successful, to date, in identifying surveillance deficiencies.

## V. ADDITIONAL INFORMATION

A. Failed components: none.

B. Previous similar events:

NMP2 has had a number of instances where inadequate procedure preparation or review caused missed or inadequately performed surveillance tests. Those events were attributable to problems with past practices identified by personnel involved in procedure review activities. The difference in this event is that it is attributable to a misinterpretation of the ATWS-RPT regulatory requirements. Personnel involved with procedure development for the ATWS-RPT LSFT clearly considered the LFMG trip, but did not believe that testing was required.

C. Identification of components referred to in this LER:

| COMPONENT | IEEE 803 FUNCTION | IEEE 805 SYSTEM ID |
|---|---|---|
| Reactor Recirculation System (LFMG) | MG | AB |