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FACIL:50-410 Nine Mile Point Nuclear Station, Unit 2, Niagara Moha 05000410
AUTH.NAME AUTHOR AFFILIATION
CONWAY,J. Niagara Mohawk Power Corp.
MUELLER,J.H. Niagara Mohawk Power Corp.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 93-009-00:on 931108,ESF actuations resulted in loss of power to RPS & PCIS due to personnel error.Reactor scram signal reset,tripped Riley temp switch bypassed & RHS shutdown cooling restored.W/931202 ltr.

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NIAGARA MOHAWK

NINE MILE POINT—UNIT 2/P.O. BOX 63, LYCOMING, NY 13093

John H. Mueller
Plant Manager-Unit 2
Nuclear Generation

December 2, 1993
NMP89334

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

RE: Docket No. 50-410
LER 93-09

Gentlemen:

In accordance with 10CFR50.73 (a)(2)(iv), we are submitting LER 93-09, "Engineered Safety Feature Actuations Resulting From a Loss of Power to RPS and PCIS Caused by Personnel Error."

A telephone report of this event was made in accordance with 10CFR50.72 (b)(2)(ii) at 0204 hours on November 8, 1993.

Very truly yours,

John H. Mueller
Plant Manager - NMP2

JHM/RLM/lmc
Attachment

xc: Mr. Thomas T. Martin, Regional Administrator, Region I
Mr. Barry S. Norris, Senior Resident Inspector

100014

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1/1

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 6 |

TITLE (4) Engineered Safety Feature Actuations Resulting From a Loss of Power to RPS and PCIS Caused by Personnel Error

| 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) |
| 1 1 | 0 8 | 9 3 | 9 3 | — 0 0 9 | — 0 0 | 1 2 | 0 2 | 9 3 | N/A | 0 5 0 0 0 |
| | | | | | | | | | N/A | 0 5 0 0 0 |

OPERATING MODE (9): 5

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 | |
| Mr. John Conway, Manager, Operations NMP2 | 3 1 5 | 3 4 9 - 2 6 9 8 |

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 |
|---|---|---|---|---|---|---|---|---|---|
| B | B N | T 1 S | R 2 8 1 | Y | | | | | |
| | | | | | | | | | |

| 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)


At 0036 hours on November 8, 1993, Nine Mile Point Unit 2 (NMP2) experienced a full reactor scram signal, various Division I Primary Containment Isolation System (PCIS) actuations, and an automatic start of the Standby Gas Treatment System (GTS). Specifically, Uninterruptible Power Supply 2VBB-UPS3A was inadvertently de-energized causing a loss of power to the Reactor Protection System (RPS) and PCIS. At the time of the event, NMP2 was shut down in a refueling outage with the mode switch in "Refuel" (Operational Condition 5). The reactor vessel head was removed, the reactor cavity was flooded, and the Neutron Monitoring System was in a non-coincident logic.

The root cause of this event is personnel error due to inadequate evaluation of plant impact. A contributing cause was an inadequate use of resources.

The immediate corrective actions included determining the cause for the loss of power to 2VBB-UPS3A and re-energizing the UPS. The scram signal was reset, a tripped temperature switch bypassed, and Shutdown Cooling restored. Additional corrective actions include: 1) counseling the operators involved; 2) verifying a generic weakness does not exist; 3) stressing management expectations and requirements for conduct of operations; and 4) conduct seminars for Station Shift Supervisors.

## I. DESCRIPTION OF EVENT

At 0036 hours on November 8, 1993, Nine Mile Point Unit 2 (NMP2) experienced a full reactor scram signal, various Primary Containment Isolation System (PCIS) actuations, and an automatic initiation of the Standby Gas Treatment System (GTS). Specifically, Uninterruptible Power Supply 2VBB-UPS3A was inadvertently de-energized causing a loss of power to one of two divisions of the Reactor Protection System (RPS) and PCIS. The PCIS actuations also caused a loss of Shutdown Cooling.

On November 7, 1993 at 1656 hours, NMP2 had experienced a partial loss of offsite power when Line #5 offsite switchyard breakers tripped. Until the cause for the loss of Line #5 could be identified and corrected, the Division I Emergency Diesel Generator was supplying the Emergency Switchgear and normal switchgear 2NNS-SWG014. This event is described in LER 93-008. As a result of the loss of Line #5, Uninterruptible Power Supply 2VBB-UPS3A automatically transferred from its normal power supply (2NPS-SWG001) to its backup power supply (125 VDC bus 2BYS-SWG001A). As a precautionary measure and to prevent draining the 125 VDC station battery, licensed operators manually transferred 2VBB-UPS3A to its maintenance power source which is supplied from 2NNS-SWG014 via 2NJS-US5. This precautionary measure was inappropriate because battery charger 2BYS-CHGR1A1 was actually supplying the 125 VDC bus. When 2VBB-UPS3A is manually transferred to its maintenance power supply it will not transfer to any other power source on a loss of the maintenance supply.

On November 8, 1993 at approximately 0030 hours, normal 13.8 KiloVolt switchgear 2NPS-SWG001 was energized from offsite Line #5. The next evolution was to transfer 2NNS-SWG014 from the Division I Emergency Diesel Generator to switchgear 2NPS-SWG001. There are interlocks that prevent paralleling the diesel generator and offsite power across 2NNS-SWG014, therefore a "dead bus" transfer is required. When the reactor operator de-energized 2NNS-SWG014 (in accordance with Operating Procedure N2-OP-71B, "4.16 KV AC Power Distribution"), the maintenance supply for 2VBB-UPS3A was lost. 2VBB-UPS3A supplies power to the Division I Average Power Range Monitors (APRM) and when power was lost, a Division I APRM "Inop" trip resulted. Since RPS was in a non-coincident logic for Neutron Monitoring System (NMS) trips, a full reactor scram signal was generated. 2VBB-UPS3A also supplied the Division I PCIS. When power was lost, the following Division I isolation signals were generated.

- group 2 - Reactor Water Sample Line valves (which were already shut)
- group 4 - Residual Heat Removal (RHS) Sample and Discharge line valves (which were already shut)
- group 5 - RHS Shutdown Cooling isolation valves (these isolated Shutdown Cooling)
- group 6 - Reactor Water Cleanup System outboard isolation (which was already shut)

## I. DESCRIPTION OF EVENT (cont.)

- group 8 - Containment Auxiliary Systems isolation valves (this caused an isolation of Secondary Containment and an automatic start of GTS)
- group 9 - Containment Purge System valves (which were already shut)
- group 10 - Reactor Core Isolation Cooling System steam supply valves (which were already shut)

The group 5 isolation signal caused the isolation and loss of RHS Shutdown Cooling, and the group 8 isolation signal caused the automatic start of the GTS. The RPS and PCIS actuations along with the GTS start were all expected responses for the loss of power supply 2VBB-UPS3A.

The Control Room operators energized 2NNS-SWG014 from its normal supply, 2NPS-SWG001. When 2VBB-UPS3A was re-energized, temperature switch (E31-N622A) tripped high, causing a second group 5, group 6, and group 10 isolation signal. At 0046 hours the Electrical Protection Assemblies and the scram signal were reset. The tripped temperature switch was bypassed and the recovery of Shutdown Cooling was commenced. The tripped Riley temperature switch delayed the restoration of RHS Shutdown Cooling until 0054 hours. Reactor Coolant temperature was 90 degrees Fahrenheit before the loss of 2VBB-UPS3A and remained 90 degrees Fahrenheit when RHS Shutdown Cooling was restored 18 minutes later.

## II. CAUSE OF EVENT

A root cause evaluation was performed in accordance with Nuclear Interfacing Procedure NIP-ECA-02, "Root Cause Evaluations." The root cause of the loss of power for 2VBB-UPS3A was personnel error caused by inadequate plant impact evaluation. A contributing cause was identified as poor research and utilization of available plant resources.

The Assistant Station Shift Supervisor (ASSS) assigned a reactor operator to review procedures for transferring 2NNS-SWG014 to its normal power supply. The ASSS did not consider the impact of this evolution on 2VBB-UPS3A and did not inform the reactor operator that 2VBB-UPS3A was supplied by maintenance power. The assigned reactor operator did not adequately review the loads on 2NNS-SWG014 and 2NJS-US5 for plant impact.

The reason for the operators transferring 2VBB-UPS3A to its maintenance supply was invalid. The Control Room operators assumed the battery charger supplying the 125 VDC station battery was de-energized, which led them to believe that 2VBB-UPS3A was draining the battery. No attempt was made to check the battery discharge rate nor verify the battery charger power supply. In reality, battery charger 2BYS-CHGR1A1 was powered from 2NJS-US5 via 2NNS-SWG014, which was powered from the Division I Emergency Diesel Generator. This

## II. CAUSE OF EVENT (cont.)

error placed the UPS in a vulnerable state because it was left without the battery as a backup power supply.

The cause for the high indication on Riley temperature switch E31-N622A was the electrical supply perturbation caused by the loss and restoration of power to the switch. The temperature switch was bypassed to allow restoration of Shutdown Cooling and then reset on its own some time later. Slow reset time is indicative of a failing temperature switch. Problems with this type of temperature switch have been noted by NMP2 and the industry.

## III. ANALYSIS OF EVENT

This event is reportable in accordance with 10CFR50.73 (a)(2)(iv), "any event or condition that results in manual or automatic actuation of an engineered safety feature (ESF), including the reactor protection system (RPS)." The loss of power to 2VBB-UPS3A caused a full reactor scram signal, several PCIS isolations and an automatic start of GTS system.

The reactor scram signal occurred because the Neutron Monitoring System (NMS) logic was non-coincident, and power was lost to Division I APRM channels. No rod motion occurred because all control rods were fully inserted. The scram signal on loss of APRM power is a conservative action to maintain this RPS safety function.

The PCIS isolations occurred on the Division I valves because of a loss of power to the Division I logic. All of the valves except for RHS Shutdown Cooling and Primary Containment Auxiliary System isolation valves were already shut. Again, the PCIS isolation occurred as a conservative measure to maintain Primary Containment integrity upon loss of power.

The Secondary Containment isolation and GTS automatic start were conservative actions caused by the Primary Containment Auxiliary System isolations. The logic starts GTS to maintain Secondary Containment negative pressure upon receipt of the PCIS isolation.

Had this event occurred with the reactor at any power level, no adverse safety consequences would have been experienced. Actuation of the above systems has no adverse affect to the safety of the general public or plant personnel at any power level. This event in no way adversely affected any other safety systems nor the operators' ability to maintain safe reactor plant conditions.

The reactor scram signal was reset 10 minutes after receipt. Shutdown Cooling was lost for 18 minutes with no appreciable rise in reactor coolant temperature.

## IV. CORRECTIVE ACTIONS

After the loss of 2VBB-UPS3A, the Control Room operators immediately determined the cause for the loss of power and re-energized 2VBB-UPS3A. The operators then reset the reactor scram signal, bypassed the tripped Riley temperature switch, and restored RHS Shutdown Cooling. GTS was then restored to its standby condition after the associated Secondary Containment isolation valves were reopened.

*Further corrective actions include:*

1. The ASSS and reactor operator involved have been counseled by the General Supervisor of Operations on expectations for proper evaluation of plant impact and use of available resources.

2. Operations management monitored the Control Room staff to validate proper plant impact determinations were made and available resources were used. Management is coaching the operating shift crews on proper conduct of plant operations.

3. Operators have been briefed on the causes for this event. Management has stressed the requirements and expectations for proper conduct of critical evolutions.

4. The General Supervisor of Operations will conduct seminars with Station Shift Supervisors to provide additional guidance on plant operation and supervisory skills.

5. Riley Temperature Switch E31-N622A was replaced under Work Order #2819 on November 24, 1993. A Deviation Event Report (DER #2-93-2693) was written to address the issue of Riley Temperature Switch reliability. The long term corrective actions for Riley Temperature Switches will be addressed by DER #2-93-0466.

## V. ADDITIONAL INFORMATION

A. Failed components:

| | | |
|---|---|---|
| Component | - | Reactor Building Radioactive Pipe Chase Ambient Temperature |
| Description | - | Air Temperature Switch |
| Mark Number | - | 2WCS*TS1622A |
| Manufacturer | - | General Electric |
| Manufacturer Number | - | E31-N622A |
| Component ID | - | 164C5687P001 |

B. Previous similar events:

There have been numerous scram and isolation signals received, however, none have had similar circumstances and a similar root cause to this event. Therefore, previous corrective actions would not have prevented this occurrence.

## V. ADDITIONAL INFORMATION (cont.)

C. Identification of components referred to in this LER:

| COMPONENT | IEEE 803 EIIS FUNCTION | IEEE 805 SYSTEM ID |
|---|---|---|
| Reactor Protection System | N/A | JC |
| Primary Containment Isolation System | N/A | JM |
| Standby Gas Treatment System | N/A | BH |
| Neutron Monitoring System | N/A | IG |
| Scriba Switchyard | N/A | FK |
| Emergency Diesel Generator | N/A | EK |
| Main Steam System | N/A | SB |
| Reactor Water Sample System | N/A | KN |
| Residual Heat Removal System | N/A | BO |
| Reactor Water Cleanup System | N/A | CE |
| Containment Purge System | N/A | VB |
| Reactor Core Isolation Cooling | N/A | BN |
| Line #5 | FD | FK |
| Uninterruptible Power Supply | UJX | EA |
| Switchyard Breakers | 52 | EA |
| 125 VDC Battery | BTRY | EK |
| 2NPS-SWG001 | SWGR | EA |
| 2NJS-4S5 | SWGR | EA |
| Diesel Generator | DG | EK |
| 2NNS-SWG014 | SWGR | EA |
| Average Power Range Monitors | MON | IG |
| Isolation Valve | ISV | Various |
| Temperature Switch | TS | JM |
| Electrical Protection Assemblies | 92 | ED |