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HODGES,M.W. Region 1 (Post 820201)

SUBJECT: Responds to NRC Augmentated Insp Team Rept 50-410/92-18 on 920324-29 re 920323 loss of control room annunciators. Corrective actions:lessons learned transmittal will be sent to all personnel to stress urgency of corrective maint.

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B. Ralph Sylvia
Executive Vice President
Nuclear

May 13, 1992
NMP84888

Mr. Marvin W. Hodges
Director, Division of Reactor Safety
United States Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406-1415

RE: Nine Mile Point Unit 2
Docket No. 50-410
NPF-69

Subject: Response to the NRC Region I Augmented Inspection Team (AIT) Review of the March 23, 1992 Nine Mile Point Unit 2 Loss of Offsite Power and Control Room Annunciator Event, Inspection Report No. 50-410/92-81

Dear Mr. Hodges:

On March 23, 1992 Nine Mile Point Unit 2 (NMP2) declared an "ALERT," in accordance with its Emergency Plan criteria, as a result of the loss of all Control Room annunciators. The loss of Control Room annunciators was due to the unplanned loss of offsite 115 KV power line No. 5, associated Reserve Transformer 1A, and related Division I loads as a result of an inadvertent actuation, during restoration from calibration, of an overcurrent protection relay. At the time of this event, NMP2 was in the Second Refuel Outage, and the reactor core was partially offloaded. Fuel movements were not in progress at the time of the event. A detailed description of the sequence of events is contained in LER 50-410/92-06, dated April 22, 1992.

In response to this event, the NRC formed an Augmented Inspection Team (AIT) on March 24, 1992. During the period of March 24-28, 1992 the AIT conducted an independent inspection, review, and evaluation of the conditions and circumstances associated with this event. The AIT had complete access to plant staff and records to support their investigation. Niagara Mohawk cooperated fully with the AIT. The AIT's inspection report, 50-410/92-81, was received by Niagara Mohawk on April 13, 1992. Niagara Mohawk was requested to respond to this report within 30 days of receipt, discussing our plan for corrective actions.

This letter summarizes Niagara Mohawk's corrective actions relative to the NRC's findings in Inspection Report 50-410/92-81. This letter also includes the corrective actions identified in LER 50-410/92-06, dated April 22, 1992 and Niagara Mohawk's presentation at the AIT exit meeting on April 1, 1992. A complete listing of all corrective actions is contained in the Niagara Mohawk assessment team report.

ASSESSMENT TEAM

Immediately following termination of the ALERT, an NMPC assessment team was formed under the direction of the Nine Mile Point Unit 2 Plant Manager, to investigate and evaluate the circumstances leading to the declaration of the ALERT, and to evaluate the performance of equipment and personnel. A written report, consisting of individual team reports and corrective actions has been prepared. Corrective actions have been established for all identified concerns

and will be tracked to conclusion via the Deviation/Event Report (DER) process. The assessment report has been reviewed by the Station Operations Review Committee. A copy of the assessment report will be provided to the Senior Resident Inspector at Nine Mile Point.

WORK PRIORITIZATION AND SCHEDULING

Correcting the deficiency that prevented UPS-1A from transferring back to the normal power source from the maintenance power supply was not given the proper priority by Operations, Outage Management, Work Control or System Engineering. This lack of timeliness allowed the deficiency to remain uncorrected for 15 days, during which time the plant was vulnerable to a loss of UPS-1A loads (Control Room annunciator local power supplies) through loss of the maintenance power supply.

The root cause of the failure to properly prioritize this work was that Operations did not exercise their responsibility for setting work priority and tracking work. Contributing factors were: the procedure requires that Work Requests (WRs) be sent to the Operations Planning group (part of the Work Control Center) rather than to Operations Department personnel, responsible personnel may have been distracted by multiple outage priorities early in the outage, and the potential for the loss of all Control Room annunciators upon loss of a single UPS (in this case, UPS-1A) was not widely understood.

Corrective actions are:

- Administrative Procedure (AP) 5.5.1, "Work Requests" will be revised to clearly require the Station Shift Supervisor (SSS)/Assistant SSS establish WR priority. This will be completed by September 1992. In the interim, WRs are sent to the Control Room to establish priority.

- A Lessons Learned Transmittal (LLT) will be sent to all Operations, Work Control and Technical Support personnel to remind them that Operations personnel have the responsibility to establish work priorities commensurate with the importance to station operations. This will be completed by June 1992.

- Operations has included the UPS's on a Control Room status board.

- Operations is developing a list of important equipment to be included in the daily work schedule. This will be completed by September 1992.

- A Lessons Learned Transmittal (LLT) will be sent to all NMP2 personnel to stress the urgency of corrective maintenance on UPS's, until the full capability of the UPS is restored. This will be completed by June 1992.

WORK CONTROL

Regarding maintenance work control, NMP2 had begun implementing improvements following NMP1's inadvertent Loss of the Ultimate Heat Sink event of February 1992. Work packages were prescreened, and plant impact was assessed. However, the plant impact assessment part of the overcurrent protection relay work package was inadequate in that it did not address the impact of inadvertent relay actuation during the work. Interviews with Control Room supervision, Outage Management, Operations Management, and the technicians performing the work

all confirm that no one had considered the risk of tripping line No. 5 during the calibration of these relays. This could occur during calibration when the cover is re-installed on the relay. Following the March 23, 1992 event, all relay work was stopped at NMP2, and plant impact statements in relay work packages were re-assessed and clarified before allowing work to continue. Direction was given by the NMP1 and NMP2 Plant Managers, via memo to Branch Managers onsite, reinforcing expectations for pre-work job planning of Relay and Control Work In Progress (WIP) data sheets as outlined in Site Administrative Procedure AP-5.2.5, "Work In Progress."

RELAY AND CONTROL TECHNICIAN AND OPERATOR PERFORMANCE

Relay and Control technician job performance leading up to and during the event was not up to expectations. The technicians did not have a full understanding of the potential equipment and plant impact. Once the inadvertent relay actuation and line loss had occurred, the technicians did acknowledge the error to the Control Room. However, subsequent evaluation and communication to the Assistant SSS regarding the use of line No. 6 to reenergize the line No. 5 bus was inadequate, resulting in the further loss of line No. 6.

As the AIT report notes, a human factors issue contributed to the inadvertent relay actuation. The relay that actuated when the cover was replaced is located only inches from the floor, making cover replacement difficult. The technicians had not been trained in this particular configuration.

To address the noted performance deficiencies, Relay and Control supervision instructed all Relay and Control technicians at NMP2 that complete and concise equipment impact statements must be included on the WIP data sheets and that they must provide Operations with a full functional description of the protective relay or metering logic pertaining to the system under test. Improved pre-job briefings will be conducted and will include sufficient detail to establish a full understanding by all personnel involved in the particular test of the circuit functions, including all auxiliary relays associated with the scheme under test. Additionally, a training mockup has been developed to certify Relay and Control personnel for removal/re-installation of relay covers.

A training effectiveness evaluation was conducted by the Operations Training Department to review and identify operator strengths and weaknesses resulting from this event. This review resulted in the modification of existing, and the development of new Requalification Lesson Plans to upgrade licensed and non-licensed operator training programs. The plans include but are not limited to:

- The review of the auxiliary boiler relay protection logic and how it affects offsite power availability.
- Plant impacts upon loss of individual UPS loads.
- A technical seminar by the Relay and Control Department on line protection schemes and relaying.

Additionally, simulator evaluations identified that a reproduction of a similar loss of line No. 5 scenario was not possible. A Simulator Discrepancy Report was generated to correct the deficiency and completed on April 3, 1992.

Operations management will discuss the miscommunication aspects of the March 23, 1992 event with Operations personnel, and develop guidelines for a more assertive and inquisitive type of communication between Operations and Support personnel, including Relay and Control personnel. These actions will be completed prior to Unit 2 startup from its Second Refuel Outage.

Additionally, to aid operators in correcting alarm conditions resulting from tripped relays, Operating Procedure N2-OP-70, "Station Electrical Feed and 115 KV Switchyard," will be revised to include protective devices relaying schemes. The procedure will be revised prior to Unit 2 startup from its Second Refuel Outage.

WEAKNESSES IN MANAGEMENT SUPPORT OF OPERATIONS

The AIT report addresses three weaknesses in management support of Operations. The first is acceptance of delays in operation of offsite power supply breakers inherent with the use of a traveling operator. In order to minimize this delay, plant operators will be trained to identify "targets" of tripped devices in the Scriba switchyard, and to communicate this information to Power Control. Depending on the cause for the tripped condition, Power Control will then remotely operate switchyard equipment to re-energize lines. This training will be conducted by December 1992.

The second weakness concerned the absence of a backup air supply during the refueling outage, with air pressure being used in reactor vessel and main steam line seals. These seals have multiple methods of sealing: mechanical as well as an inflatable seal. Thus, no backup air supply is needed. However, Niagara Mohawk had planned to and will assess the need for a backup air supply for the Third Refuel Outage for normal maintenance reasons.

The third weakness was acceptance of cumbersome, generic procedures which require operators to use, concurrently, several procedures during a loss of offsite power. Niagara Mohawk will be writing new procedures for "Station Blackout." At that time, we will review operating procedures to determine if improvements can be made. This will be done by December 1992.

DIVISION III EMERGENCY DIESEL GENERATOR

Due to inadequate design of the Service Water cooling pressure detection logic, two new scenarios have been identified that would have the Division III Emergency Diesel Generator running for a test surveillance, or as a result of a low reactor water "level two" initiation, with either situation followed by a sequential loss of offsite power. The cooling water to the Division III Diesel Generator would isolate in either scenario. This would render the Division III Diesel Generator unavailable for accident mitigation, due to high temperature damage, without operator action to return service water cooling.

To correct this, a modification will be implemented during the Second Refuel Outage that addresses the scenarios identified above to prevent the loss of Division III Diesel Generator during a sequential loss of offsite power. This modification will install a time delay for the service water cooling supply valves to close the valves after receipt of a low pressure signal on the service water supply header. This will provide sufficient time for the service water system to re-establish proper pressure, after power is restored, following loss of divisional or

offsite power. The present time delay, which permitted closing Service Water valves after one minute of diesel operation, will be disconnected.

Additionally, administrative controls have been established in N2-OP-100B, "High Pressure Core Spray Diesel Generator," such that during periods when Division I or II Diesel Generators are out of service, Division III switchgear will be aligned to an offsite power source protected by the operable Division I or Division II Diesel Generator.

Niagara Mohawk's assessment, the significance of design deficiencies identified, and corrective actions will be reported in a supplement to LER 50-410/92-06. The expected submittal date is June 15, 1992.

CONTROL ROOM ANNUNCIATOR POWER SUPPLIES AND UPS-1A

Engineering's evaluation showed that the loss of Control Room annunciation was consistent with the design. Presently, ten power supplies are provided to supply the annunciator load for the NSSS panel. A minimum of five power supplies are required to carry the full load (two 125/24/12/VDC power supplies, two 125VDC power supplies, and one 12VDC power supply). The remaining five provide 100% backup. However, the majority of the 125VDC power supplies are fed from UPS-1B. Therefore, a loss of UPS-1B power feed would cause the loss of all NSSS Plant Monitoring System computer inputs. All of the 12VDC and 24VDC power supplies are fed from UPS-1A so loss of this UPS power feed would totally disable the NSSS annunciator system.

Plant changes are being made which include a rearrangement of the annunciator power supplies within the annunciator cabinets to preclude loss of all annunciation upon loss of one UPS. This is to be done in two steps: first, a redistribution of the load in the NSSS panel; and second, an upgrade and/or redistribution of the load in the BOP annunciator panel. Engineering has completed the design for rearrangement of the NSSS annunciator power supplies, and field installation will be completed during the Second Refuel Outage. Upgrading the annunciator power supplies or redistributing the loads in the BOP annunciator panel will be done during the Third Refuel Outage.

UPS-1A was out of service on March 23, 1992 due to the UPS being on its maintenance power supply. Corrective maintenance determined that one of the six sets of internal batteries in the UPS were degraded which prevented the Unit from being returned to normal service. The design life of the batteries is 18 months (recently increased from 12 months), but they only lasted about 7 months in service. This premature failure is being evaluated at an independent laboratory. Subsequent to a design modification made in 1991, the batteries were only required for startup of the Unit. A design change to eliminate dependence on the batteries has been completed and will be installed in the Second Refuel Outage. Increased UPS reliability is possible through the implementation of this design change.

SAFETY ASSESSMENT

NMP2 had performed a shutdown safety review of the Second Refueling Outage prior to its start. This review was performed following the NUMARC guidelines. The goal was to maintain, throughout the outage, at least three sources of power available to the station. On March 23, 1992 these three sources were the two offsite 115 KV lines, designated line No.

5 and line No. 6, and the Division II Emergency Diesel Generator. This proved to be an adequate defense-in-depth for the event that occurred.

After the March 23, 1992 event, the Independent Safety Engineering Group's Safety Assessment Report concluded that at no time during the March 23, 1992 loss of offsite power event was there any danger to the fuel, the plant, or to the health and safety of the public because of decay heat loads.

In conclusion, Niagara Mohawk has assessed the safety aspects associated with the March 23, 1992 ALERT event, and has taken or will take the necessary corrective actions to minimize the potential for loss of all Control Room annunciators and to address other identified deficiencies.

Very truly yours,

B. Ralph Sylvia
Exec. Vice President - Nuclear

BRS/JTP/lmc
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