U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-220/90-15

Docket No. 50-220

License No. DRP-63

Licensee: Niagara Mohawk Power Corporation
301 Plainfield Road
Syracuse, New York 13212

Facility Name: Nine Mile Point Unit 1

Inspection At: Salina Meadows - Corporate Office

Inspection Conducted: April 3-6, 1990

Inspectors: Leonard Cheung — 5/22/90
Leonard Cheung, Senior Reactor Engineer, PSS, DRS — date

Approved by: C J Anderson — 5/22/90
C. J. Anderson, Chief, Plant Systems Section, EB, DRS — date

Inspection Summary: Inspection on April 3-6, 1990 (Inspection Report No. 50-220/90-15)

Areas Inspected: An inspection was conducted at the NMPC Corporate Office to review the licensee's actions on five RG 1.97 and four electrical restart issues identified in previous inspections 89-12 and 89-23.

Results: No violations were identified. All RG 1.97 and electrical restart items were closed. One unresolved item was identified. All of these items are listed below:

STATUS OF RG 1.97 RESTART ITEMS

ITEM NUMBER	DESCRIPTION	STATUS
50-220/89-12-01	Evaluation of RG 1.97 cable separation deficiencies.	Closed in inspection 50-220/89-35
50-220/89-12-02	Completion of the failure modes and effects analysis for the APRM isolation deficiencies.	Closed in inspection 50-220/89-35
50-220/89-12-03	Review of the RG 1.97 instrument circuit loading and adequacy of installed fuses.	Closed in th inspection
50-220/89-12-04	Review of alternatives to the Category 1 RG 1.97 instruments for which deficiencies exist.	Closed in th inspection
50-220/89-12-05	Evaluation of the RG 1.97 isolation deficiencies.	Closed in thi inspection
50-220/89-12-06	Identification of RG 1.97 instrument power sources and providing instrument power source information at the site in a form useful to the control room operators.	Closed in thi inspection
50-220/89-12-07	Evaluation of the safety significance of the Reactor Pressure Vessel (RPV) common tap for the fuel zone water level instrument.	Closed in thi inspection
50-220/89-12-08	Documenting and docketing Nine Mile 1 RG 1.97 restart activities.	Closed in Inspection 50-220/89-25

STATUS OF ELECTRICAL RESTART ITEMS

ITEM NUMBER	DESCRIPTION	STATUS
50-220/89-23-01	Battery charging MG set corrective actions.	Closed in inspection 50-220/89-35
50-220/89-23-02	Replacement of 125 VDC Station batteries and equalization voltage concern.	Closed in this inspection
50-220/89-23-03	Replacement of power cable for power boards 11, 12, 16 and 17.	Closed in this inspection
50-220/89-23-04	Cable replacement of diesel generators 102 and 103 control power.	Closed in this inspection
50-220/89-23-05	DC breaker testing and replacement of breakers by fuses.	Closed in inspection 50-220/89-35
50-220/89-23-06	Power cable replacement for Electromatic relief valves.	Closed in this inspection

NEW UNRESOLVED ITEM (Not a Restart Item)

50-220/90-15-01	Battery 12 aging issue	Open

DETAILS

1.0 Persons Contacted

See Appendix 1

2.0 Purpose

The purpose of this inspection was to review corrective actions for Regulatory Guide (RG) 1.97 and Electrical restart issues identified in previous inspections 50-220/89-12 and 50-220/89-23 and in an NRC letter to the licensee, dated April 21, 1989. The results of these reviews are discussed in Sections 3.0 and 4.0 of this report.

3.0 Followup of RG 1.97 Restart Items Identified in Inspection 89-12

3.1 (Closed) Unresolved Item (50-220/89-12-03) pertaining to the review of RG 1.97 instrument circuit loading and the adequacy of installed fuses. This item was identified during a March 1989 inspection and was updated in NRC inspection report 50-220/89-25. The licensee's short term action was to install additional subcircuit fuses for circuits that supply non-redundant category 1 instruments before restart. These Category 1 instruments lacked a redundant instrument that could be relied upon in the event of a bus failure resulting from inadequate fuse protection at the subcircuit level. RPS Bus 11 circuit #12 and RPS Bus 12 circuit #7 are affected by this modification.

The licensee issued Mod#89-210 for the installation of new fuses. A total of 15 fuses and fuse blocks were installed, 9 for RPS Bus 22 circuit #12 and 6 for RPS Bus 12 circuit #7. The inspector reviewed the modification package which consists of Work Request No. M00828 for RPS Bus 11 circuit #12 and Work Request No. M00829 for RPS Bus 12 circuit #7. The modification package indicated that the installation and QC inspections had been completed, and the associated drawings had been revised. The inspector also verified the installation of these fuses. The inspector considered the licensee's corrective actions adequate. This item is closed.

3.2 (Closed) Unresolved Item (50-220/89-12-04) pertaining to the review of alternatives to Category 1 RG1.97 instruments. This item had been updated in inspection reports 50-220/89-25 and 50-220/89-35. All issues of this item had been resolved except:

1. Completion of operator training of the alternative instruments

2. Approval and issuance of special operation procedure N1-SOP-14 Revision 1.

During this inspection the inspector reviewed a memo (NMP61761) issued by Nine Mile training on February 22, 1990. This memo indicated that operator training to include the alternative instruments was completed on January 10, 1990. The inspector also reviewed the training records and the attendant sheets and verified that all of the Unit 1 operators received the training.

The inspector also reviewed procedure N1-SOP-14 entitled "EOP Key Parameter - Alternate Instrumentation" Revision 1. This procedure was approved and issued on December 21, 1989 and became effective on January 2, 1990.

This item is closed.

3.3 (Closed) Unresolved Item 50-220/89-12-05 pertaining to RG 1.97 isolation deficiencies. This item had been updated in inspection report 50-220/89-25. During that inspection, the NRC inspector reviewed the licensee's corrective action documents and determined that this item remained open pending licensee's completion of the following short term corrective actions:

1. Modification package No. 89-147 for revising the common feedwater switch so that an internal switch failure would be less likely to disable both inputs.

2. Modification package No. 89-109 for changing the power supply for the wide range reactor water level instruments so that this single channel indication would fail only upon loss of one particular power bus rather than fail if either power bus fails.

3. Modification package No. 89-195 for separating computer inputs from drywell pressure instruments (channel 11 and channel 12) into 2 computer input cards, and for locating the ground connections to computer card IA16.

During this inspection, the inspector reviewed all three modification packages. Mod No. 89-147 was completed and closed on November 8, 1989; Mod No. 109 was completed and closed on January 11, 1990; and Mod No. 89-195 was completed and closed on January 29, 1990. The inspector also observed the installed conditions of items 1 and 3 above and did not identify any deficiencies. The inspector considered the licensee's corrective actions adequate. This item is closed.

3.4 (Closed) Unresolved Item (50-220/89-12-06) pertaining to RG 1.97 instrument power supplies. During the March 1989 inspection (50-220/89-12), the licensee was in the process of generating one line diagrams of supply power circuits for RG 1.97 category 1 instruments. A copy of preliminary Engineering Load List #N1-RG197-LL1 was generated by the licensee at that time. The NRC inspector noted that the power supply information for RPS Bus 11 circuit 4 and RPS Bus 12 circuit 4

was missing from the one-line diagrams. Following that inspection, the licensee conducted an in-plant walkdown of these two circuits and updated document N1-RG197-L11. This document was subsequently finalized and issued on December 22, 1989. As a result of the plant walkdown, the licensee identified several deficiencies in these two circuits. The licensee documented these deficiencies in Problem Reports 1527, 1548, 1603 and in Noncomformance Reports 1-89-0549 and 1-89-0523. Subsequently the licensee issued Mod #89-253 to correct these deficiencies. The modification involved the installation of additional fuses, the replacement of incorrectly sized fuses and the replacement of cable. The modification work was completed and Mod #89-253 was closed on March 29, 1990.

The inspector physically inspected the installed condition of the fuses and cable. No unacceptable conditions were identified. The inspector considered the licensee's short term corrective action adequate. This item is closed.

The licensee's long term corrective action for the RG 1.97 instrument power circuits including the development of a one-line elementary wiring diagram is currently scheduled to be resolved as a part of the Engineering Program Integration Plan (EPIP).

3.5 <u>(Closed) Unresolved Item 50-220/89-12-07</u> pertaining to redundant fuel zone level transmitters with a common variable leg. This item was updated in the September, 1989 inspection (Inspection Report 89-25, paragraph 3.6). During that inspection, the NRC inspector reviewed the licensee's evaluation for the effect of the postulated instrument line break at the fuel zone level transmitter variable leg. At that time, the NRC determined that this item should remain open pending licensee completion of the following corrective actions:

1. Additional training for the crews that went through the original training and the remaining operators and staff before restart. The training lesson plan must include consequences and diagnostic aids given in the fuel zone common tap issue analysis.

2. The EOP training must include the discussion of fuel zone level instrument line break caution statements that were added to the EOP.

3. Add fuel zone level common tap failure analysis information in the Operations Technology Manual for the operating staff's reference.

4. Add information regarding the core spray differential pressure alarm versus fuel zone level instrument line break detection in the Annunciator Response Procedure OP-2.

Following the September 1989 inspection, the licensee revised their operator training lesson plan for Reactor Vessel Instrumentation (#01-REQ-001-216-1-01) Revision 1. Paragraph C entitled Fuel Zone Water Level Monitoring System (FZWLMS) Variable Leg Break was added to pages 28 through 31 to provide the consequences and diagnostic aids to the trainees. The EOP training to discuss the fuel zone level caution was added to pages 32 and 33. A memo (NMP-60999) was issued on January 17, 1990 by the training department, stating that the operator training on RG 1.97 and fuel zone level instrumentation diagnostics was given to all Nine Mile 1 operators before January 15, 1990.

The inspector reviewed Nine Mile 1 Operation Technology Manual Chapter 3 entitled "Reactor Vessel Instrumentation," Revision 5 dated January 10, 1990. Section II paragraph C on page 23 provided a discussion of the FZWLMS variable leg break scenario.

The information regarding the core spray differential pressure alarm versus fuel zone level instrument line break was added to page 41 of operating procedure No. N1-OP-2, entitled Core Spray System, Revision 21.

The inspector interviewed Nine Mile 1 training personnel and reviewed the training records pertaining to items 1 and 2 above. No deficiencies were identified. The inspector considered the licensee's corrective actions adequate. This item is closed.

4.0 Followup of Electrical Restart Items Identified in NRC Inspection 50-220/89-23

4.1 (Closed) Unresolved Item 50-220/89-23-02 pertaining to the replacement of 125 VDC battery. During inspection 89-23, the NRC inspector determined that the licensee had identified the potential inadequacy of the 1500 ampere-hour safety-related 125 Vdc Batteries 11 and 12 to satisfy the worst case battery loading cycle (10 CFR 50 Appendix R induced LOOP/LOCA).

The inspector determined that the licensee now has replaced these batteries with 2320 ampere-hour batteries to provide for the additional capacity required. A review of licensee battery replacement sizing calculations and analyses contained in Calculation No. 125 VDC-Batt 12-APP R/SP dated January 16, 1990 shows that Battery 11 has sufficient capacity to meet the recommended sizing criteria of IEEE Standard 485 for new or replacement batteries for generating stations. However, Battery 12 does not have sufficient capacity to meet these criteria. Specifically IEEE Standard 485 recommends that batteries be sized to include an additional capacity factor of 25 percent to allow for battery aging degradation and additional capacity to allow for the lowest temperature in which the battery is required to operate. The licensee calculations show that for Battery 12, after a temperature correction factor of 1.08 is included, the battery has 8% margin

left. This is not sufficient to meet 25% aging factor criterion in IEEE 485. The licensee conducted an evaluation of this issue to justify the plant's short term operation. The licensee's justification is that Battery 12 has sufficient capacity to handle the design load with adequate margin through the next operating cycle because the battery will not degrade below 100% capacity for the next 3 to 5 years. The licensee stated that they have several options to resolve this issue before the next outage. One of their options is to add a non-safety related battery using the replaced battery which is about one year old. The non-safety related loads currently powered by Battery 12 could then be removed from the Battery 12 load list.

On April 20, 1990, the licensee transmitted a letter dated April 19, 1990 and the battery capacity curves from the battery manufacturer, C&D Charter Power System, to the inspector for review. The curves indicate that the battery capacity will not degrade below 100% for about 12 years.

The licensee conducted two tests on Batteries 11 and 12. The capacity test was performed by the manufacturer in December, 1989 just before the batteries were shipped to the site. The second test was a service test, conducted in February 1990 at the site. The batteries passed both tests successfully.

The inspector found the licensee's short term corrective actions for this item to be acceptable. This restart issue is closed. However, for the long term, the licensee plans additional corrective actions before start from the next outage to ensure that Battery 12 has sufficient capacity to handle the required load with the aging factor included. This new issue, which is not a restart issue, is unresolved, pending NRC review of the licensee's long term corrective action (50-220/90-15-01).

4.2 (Closed) Unresolved Item 50-220/89-23-03 pertaining to the replacement of power cable for power boards 11, 12, 16 and 17. The modification was almost complete at the time of an August 1989 inspection (50-220/89-23). During that inspection, the inspector verified that the installation was complete except for a few terminations of power feeders at board 11 and 12.

During this inspection, the inspector observed the completed cable termination at battery boards 11 and 12. The inspector did not identify any deficiencies. The as-built documents for power boards 16 and 17 had been completed while as-built documents for power boards 11 and 12 were still being completed. The inspector considered the licensee's corrective actions adequate. This item is closed.

4.3 (Closed) Unresolved Item (50-220/89-23-04) pertaining to Plant Modification 85-092 for replacing power feeder cables from Battery Boards 11 and 12 to Emergency Diesel Generator Control Panels 102 and 103, respectively. This item had been updated in inspection report 50-220/89-35. All technical issues of this item had been resolved and were discussed in inspection report 50-220/89-35, except for the final SORC approval of modification 85-092. The licensee explained that SORC approval had been provided before the start of this modification. Final SORC review and approval of the completed work cannot be provided until immediately before restart. All installation and QC inspections had been completed and the two associated modification work requests (Nos. 00618 and 00629) were closed on June 8, 1989 and August 28, 1989, respectively. The inspector found the licensee's corrective actions to be adequate. This item is closed.

4.4 (Closed) Unresolved Item 50-220/89-23-06 pertaining to the power cable replacement for the Electromatic Relieve Valves (ERV). There are six 125 VDC ERVs, three powered from battery board 11, and three from battery board 12. The modification involved replacing the existing cable (one #10 AWG) with larger cable (three #2 AWG) to reduce the voltage drop and to ensure sufficient voltage for proper valve operation. The new cable was pulled before a August 1989 inspection (50-220/89-23). However, cable terminations were not completed at that time.

The licensee generated a calculation package entitled "125VDC System Redesign; ERV analysis", Revision 0 dated March 31, 1989. This calculation indicates that the new cable will reduce the voltage drop sufficiently to ensure proper operation of the ERVs.

During this inspection, the inspector physically observed the completed termination for the cable and the installed GE CR120 relays (to replace the old ERV relays). No deficiencies were identified. The inspector also verified the qualification status of the GE CR 120 relays. The licensee stated that the preoperational test for the ERVs was scheduled on April 16, 1990.

The inspector found the licensee's corrective actions to be adequate. This item is closed.

5.0 Exit Meeting

At the conclusion of the inspection on April 6, 1990, the inspector met with the licensee representatives denoted in Appendix 1. The inspector summarized the scope and results of the inspection at that time.

At no time during this inspection was written material given to the licensee.

APPENDIX 1

1.0 Persons Contacted

1.1 Niagara Mohawk Power Corporation (NMPC)

J. Benson, Senior Engineer
F. Constance, Electrical Engineer
W. D'Awcelo, Consultant
G. FitzPatrick, NC & V Engineer
D. Jakubowski, RAP SI #18 Task Manager
S. Kim, Associate Senior Electrical Engineer
*G. Lapinsky, Associate Sr. Engineer
W. Nowicki, Senior Electrical Engineer
V. Roy, Assoc. Sr. Engineer
G. Simonetta, Electrical Designer
B. Wolken, Project Manager, Licensing
D. Wolniak, Assist Manager, Licensing

1.2 NMPC Contract Personnel

J. Schilder, Sr. Consulting Engineer, OEI
B. Vaden, EQ Engineer, Gasser Assoc.

*Denotes personnel not present at the exit meeting on April 6, 1990.