U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Report Nos.:	50-220/91-02 50-410/91-02
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License Nos.:	DPR-63 NPF-69
Licensee:	Niagara Mohawk Power Corporation 301 Plainfield Road Syracuse, New York 13212
Facility:	Nine Mile Point, Units 1 and 2
Location:	Scriba, New York
Dates:	January 4 through February 15, 1991
Inspectors:	W. A. Cook, Senior Resident Inspector R. R. Temps, Resident Inspector R. A. Laura, Resident Inspector M. S. Miller, Reactor Engineer N. S. Perry, Resident Inspector - Ginna C. E. Sisco, Operations Engineer, DRS D. J. Vito, Project Engineer, DRP

Approved by: _____ 3-7-91

Glenn W. Meyer, Chief — Date

Reactor Projects Section No. 1B

Inspection Summary:

This inspection report documents routine and reactive inspections during day and backshift hours of activities including: plant operations; radiological protection; and surveillance and maintenance.

Results:

One violation was identified involving the improper procedure revision and implementation of an Appendix J exemption at Unit 1. One non-cited violation was identified at Unit 1 involving improper setting of emergency condenser isolation setpoints. One non-cited violation was identified at Unit 2 involving surveillance testing of source range monitor rod block functions during refueling.

Executive Summary

Nine Mile Point Combined Inspection Report Nos. 50-220/91-02 and 50-410/91-02

PLANT OPERATIONS: Operator performance at Unit 1 was satisfactory during this inspection period. Operator response to the February 5, 1991 recirculation pump trip was good and their prompt and conservative actions to minimize the pressure transients due to turbine control system problems were observed to be satisfactory. Unit 2 operator performance was also assessed to be satisfactory during this inspection period. Outage completion and unit start-up activities were observed, including special turbine testing, and operator command and control of these evolutions was satisfactory. Operations staff response to the electro-hydraulic system leak on 1/23 was good, particularly in rapidly reducing reactor power and securing steam to the condenser prior to any automatic protective function actuations.

SURVEILLANCE AND MAINTENANCE: Various surveillance and maintenance activities were observed or reviewed during this inspection period and no specific problems were identified. Actions at Unit 1 to address Generic Letter 89-13 regarding service water system issues were determined to be thorough and timely. Turbine torsion testing observed at Unit 2 was considered well planned and executed. The inspectors identified a Non-Cited Violation after review of the Unit 2 source range monitor rod block surveillance test Technical Specification (TS) violation, in accordance with the NRC Enforcement Policy.

ENGINEERING AND TECHNICAL SUPPORT: Several unresolved items were reviewed and closed by the inspectors. One unresolved item involving the Unit 1 emergency condenser isolation setpoint TS violation (LER 90-22) was reviewed and the inspectors identified a Non-Cited Violation. Inspector followup of an unresolved item involving the implementation of an Appendix J exemption identified a violation of procedural revision and review requirements. The inadequate procedure revision resulted in conflicting operating and emergency operating procedures and was evidence of a poor licensing staff and station staff interface.

A detailed review of the Unit 2 Safety Parameter Display System (SPDS) modification was conducted and the inspector concluded that Niagara Mohawk had satisfactorily addressed the Operating License Condition C.(8) requiring the SPDS to be operational following the first refuel outage.

SECURITY AND SAFEGUARDS: The inspectors considered the contingency plans and heightened security measures in response to the increased threat of terrorist activities due to the Persian Gulf War to be satisfactory.

DETAILS

1.0. PLANT OPERATIONS

1.1 Unit 1

At the beginning of the report period, the Unit 1 reactor was in cold shutdown to repair main steam isolation valve (MSIV) 01-02 and to identify and repair the sources which were contributing to an increasing drywell leakage rate. Repair of the MSIV 01-02 was discussed in Inspection Report 50-220/90-10. The unit restarted and the turbine synchronized to the grid on January 9, 1991. The plant operated at power until it automatically scrammed on February 12, 1991, due to a pressure oscillation from a turbine control valve going partially closed. Based on the estimated repair time and other factors, the plant manager decided to enter the mid-cycle surveillance outage, originally scheduled to commence on March 1, 1991.

On February 11, 1991, the Region I Regional Administrator closed Confirmatory Action Letter 88-17, Supplement 1.

A. Following repair of MSIV 01-02 and satisfactory post-maintenance and local leak rate testing, the Unit 1 reactor was taken critical on January 9, 1991. The generator was synchronized to the grid on the following day and subsequently increased to full power. Maintenance repairs to correct drywell leakage appeared effective as evidenced by the low leakage rate observed following the startup (< 0.5 gpm).

B. On February 5, 1991, the motor generator (MG) set for the 12 reactor recirculation pump (RRP) tripped due to a ground. This initiated a down-power transient on the plant. Operators responded to the event, power was stabilized and later brought back up to 87%. In three-loop operation, the unit Technical Specifications (TS) impose a limit of 90% reactor power. Following repairs to the RRP MG set, the 12 RRP was restarted on February 7, 1991 and four-loop operation recommenced. The inspector determined that operator response to the event was proper and the appropriate TS limits and procedure requirements for idling and restoring 12 loop were followed. Assessment of the repairs to the MG set are discussed in Section 2.1.A of this report.

C. On January 25, 1991, small power oscillations as a result of reactor pressure oscillations were observed. Reactor power was reduced slightly and the condition cleared. Over the following two days, the condition repeated itself intermittently. Initial troubleshooting efforts focused on the low oil level for the turbine's hydraulic control system and speculation that this was causing pressure surges in the hydraulic system. However, once oil level was restored to the normal range, the pressure oscillations still occurred. On January 27, 1991, pressure control was switched from the Electronic Pressure Regulator (EPR) over to the Mechanical Pressure Regulator (MPR) to allow testing of the EPR. The EPR was examined extensively and no problems were found. Additionally, a computerized data acquisition system was placed in service to monitor and record for later analysis, various parameters in case the oscillations reoccured.

On February 7, 1991, while on the MPR, the oscillations occurred again. Reactor power was reduced and the condition stabilized. Analyses of the data acquisition system's data indicated that changes in hydraulic pressure were not the cause of the oscillations. Also, the oscillations occurred while on the MPR which indicated the oscillation problem was a result of common elements downstream of the MPR or EPR. The system engineer determined that the most likely source of the problem was the torque tube, which is located in the front standard, and controls the turbine control valves position. Additional data obtained by the data acquisition system on control valve response added credence to the belief that the problem was in the front standard. Niagara Mohawk had numerous conversations with the turbine vendor and an expert in mechanical hydraulic control systems was arranged to be sent to the site. However, before the vendor arrived on February 12, 1991, one of the control valves went rapidly to the 50% closed position and then back to full open. This induced a pressure transient on the reactor which caused reactor power to increase and the reactor to automatically scram as a result of the high flux condition. The plant shutdown, as designed, and a plant cooldown to cold shutdown was initiated as a result of management's decision to enter the mid-cycle outage early. The inspector concluded that Niagara Mohawk was pursuing identification of the pressure surges in a timely and conservative fashion. Additionally, operator response to the automatic shutdown was satisfactory.

1.2 Unit 2

During this inspection period the containment integrated leak rate test was performed, final preparations for reactor startup from the first cycle refuel outage were made and the reactor was taken critical on January 19, 1991. Augmented NRC coverage was provided by region based inspectors during reactor startup. A forced shutdown from 12 percent power was required on January 23, 1991, due to an Electro Hydraulic Control (EHC) piping weld crack. Repairs were affected and the reactor again taken critical on January 24, 1991. At the end of the period, the reactor was operating at 100% power.

A. A review of completed valve line-ups performed on safety related systems to support reactor startup following the refuel outage was performed by the inspector. The review consisted of ensuring independent verification of valve positioning was exercised for safety related valves, the required valve positions were correct by confirming actual position and valve line-up sheets were properly completed. Six systems were reviewed for adequacy and are listed below:

-- N2-OP-33, High Pressure Core Spray
-- N2-OP-36A, Standby Liquid Control
-- N2-OP-74B, Major Components Power Supplies
-- N2-OP-57, System Power Supply Lineup
-- N2-OP-82, Containment Monitoring Leakage (CML)
-- N2-OP-35, Reactor Core Isolation Cooling (RCIC)

The inspector found the valve line-ups were properly executed with only two minor deficiencies. These deficiencies were discussed with operations management and satisfactorily resolved. Overall, the inspector concluded that startup valve line-ups were adequately performed and verified by the operators.

B. The inspector conducted a review of the training organization to verify that procedures and programs were in place to identify plant modifications that require changes to plant procedures, changes to operator training programs, and changes to the Unit 2 simulator. The inspector reviewed a sampling of the plant modifications implemented during the refuel outage and verified that operators were trained on the modifications, plant procedures were properly revised, and that the plant simulator was scheduled to be modified to reflect these modifications.

The inspector concluded that the training program and procedures were adequate to identify plant modifications requiring changes to the operator training program and that the Unit 2 operating staff had been satisfactorily trained on the recent modifications made to the station.

C. During a walkdown of control room panels, the inspector identified that Uninterruptible Power Supply (UPS) 2VBA*UPS2A had a blown fuse on the inverter. Following the inspector's questioning of this condition, operators submitted a work request to replace the blown fuse. The inspector questioned the operability of the UPS per Technical Specification 3.8.3.1 and was subsequently informed that the blown fuse did not impact operability of the UPS in its present power supply lineup. Operations management did commit to evaluate the alarm response procedure 852100 No. 116 and make any necessary changes to ensure that UPS trouble lights are clearly understood by the operators.

The inspectors also observed several shift briefings and turnovers conducted by the station shift supervisors. The briefings and turnovers were thorough, informative and professionally conducted.

D. On January 16, 1991, while performing an inspection for EHC system leakage, the turbine trip logic was reset. Contrary to expectations, turbine speed selection indication changed from "all valves closed" to "1800 rpm" when the speed selection changed. The closed turbine stop valves (TSV) began to open, resetting the existing condenser low vacuum containment isolation bypass. In that the unit was shut down, the condenser low vacuum signal initiated an MSIV isolation signal (the MSIVs were already shut). Niagara Mohawk reported the event per 10 CFR 50.72, and an occurrence report (OR) was initiated.

The inspector observed much of the troubleshooting performed on the system and discussed the problem with the responsible I&C staff. No component or equipment failures could be found, consequently an operating procedure change was made to alert operators to the potential for an 1800 rpm signal resulting from a turbine trip reset and pointing out that, in the event of such a signal, approximately 10 seconds were available (while the TSVs open) for the operator to select "all valves closed" and avoid the isolation signal. In addition, operator training would be conducted on this change. The OR was forwarded to the system engineer for review and will remain open until a final engineering determination on corrective action is completed.

The inspector concluded that a reasonable attempt had been made to isolate and recreate the cause of the event. Corrective action taken to date (procedure revision and training), while not a solution to the problem, provides sufficient interim compensatory action.

E. During low power operations on January 23, 1991, a significant oil leak in the EHC system was identified by an operator on rounds. Prompt actions were taken by the control room operators to reduce power, secure steam to the turbine and the condenser and then secure the EHC pumps. This included initiating the steam condensing mode of the B residual heat removal system and starting the reactor core isolation cooling system to control reactor pressure and level. Subsequently, a controlled plant shutdown was performed.

The inspector determined that approximately 150 gallons of EHC oil leaked from the system. The leak was identified to be from a crack in a piping weld. The apparent cause of the weld crack was cyclic fatigue due to vibration. The weld was repaired and all other welds in the system were examined via dye penetrant testing and found to be acceptable.

The inspector concluded that the operators performed well by identifying the leak and then placing the plant in a safe condition. Their prompt actions avoided any automatic protective system actuations.

2.0 MAINTENANCE AND SURVEILLANCE OBSERVATIONS

2.1 Unit 1

A. The following activities were observed:

-- Drywell hydrogen sampling in accordance with procedure N1-CSP-W343.

-- Troubleshooting and repair to reactor recirculation pump motor generator set 12 per Work Request 187782. The cause of the MG set ground was determined to be two worn spots in the epoxy coating of the stator windings which exposed the metal windings. This, in conjunction with the carbon and copper dust inside the machine, set-up a conductivity path which allowed one of the three phases to ground-out and caused the MG set protective relaying to actuate. A vendor representative was called in and repair of the epoxy coating was performed, as well as, cleanup of the machine's internals. These activities resulted in clearing the ground condition.

-- Preventive maintenance procedure N1-MPM-070-A409 on the 12 reactor building closed loop cooling (RBCLC) heat exchanger (HX). Zebra mussels and some silting were found in the HX during the inspection of the service water side. The inspector observed cleanup of the HX and performance of an air pressure test to test integrity of the tube sheet welds prior to an operational pressure test with water which was satisfactory.

No performance or procedural problems were identified.

B. Preliminary Review of Generic Letter (GL) 89-13 Regarding Service Water System Problems Affecting Safety-Related Equipment

The inspector reviewed GL 89-13 and its supplement and held discussions with the appropriate system engineers to determine current and planned practices at Unit 1 to address the requirements of the GL. The inspector determined that for Unit 1, the systems which fall under the general heading of service water as described in the GL are: service water (SW), emergency service water (ESW), emergency diesel generator (EDG) cooling water and the containment spray raw water (RW) supply. Each of these systems has its own suction source in the screenwell house. The inspector determined that the following programs are in place or planned for each of the systems:

B.1 SW and ESW

These two systems provide cooling water to various heat exchangers and area coolers in the reactor and turbine building. The ESW system provides backup to SW in the event of loss of off-site power and supplies specific loads only. The only safety-related load cooled by SW or ESW are the reactor building closed loop cooling (RBCLC) heat exchangers.

By the definition of GL 89-13, RBCLC is a closed system and is thereby exempt from the GL requirements. However, the inspector notes that this system does have its own water chemistry monitoring and surveillance program. The only safety-related loads cooled by RBCLC are the post-accident sampling system and control room emergency ventilation system. These two loads are a small part of the total cooling demand on the RBCLC system. It appears that there is adequate margin to accommodate any degradation in SW or ESW cooling water supply to the RBCLC HXs due to silting or fouling. Potential silting or biofouling of reactor building area coolers was determined not to be of safety significance, in that, they do not support operability of safety-related equipment located in the spaces they cool.

The inspector determined that for the SW and ESW systems, the following maintenance and testing activities are (or have been) performed:

- All of the RBCLC heat exchangers (11,12, and 13) were opened and inspected during the 1988-90 outage. Extensive repairs and post-repair vibration testing were done as a result of flow-induced damage to the tubes and tweeners.

- The SW side of one HX is inspected every three months which results in all three HX's being inspected on a 9-month cycle.

- Power Ascension Test, N1-PAT-11, was performed on the RBCLC HXs during the startup program to verify operability and verify they met their design basis. This data will be used to baseline future tests.

- The area coolers are inspected by various preventive maintenance procedures. These procedures are being revised to include opening them up to allow inspection for silting or biofouling.

- Performance of the ESW system is checked periodically by procedures N1-ST-Q13 (quarterly) and N1-ST-R16 (each refueling) to check the pumps' performance, to obtain vibration data and to verify operability of the downstream check valves.

B.2 CS Raw Water

There are four loops of CS and each loop has its own CS HX with associated cooling supplied by its own RW cooling pump and piping. The inspector determined that:

- One of the four CS HXs is opened up and inspected on the tube side (raw water) every three months resulting in inspection of all four HXs on an annual basis.

- Heat transfer capacity was demonstrated during the power ascension program on one of the HXs. Results indicated degraded performance (a level II test exception was generated) and the HX was opened. Scaling on the lower one-third of the tube bundle was identified and was attributed to incomplete drainage of the HX. The physical arrangement of the connection point of RW to the HX precludes draindown of about one-third of the tubes and both inlet and outlet plenums following operation. The operating and surveillance procedures were modified to ensure complete draindown of the HX's tube side via installed vent and drain valves following operation.

-- Quarterly and refueling surveillances are done to monitor RW pump vibration and flow characteristics for signs of degraded performance.

B.3 EDG Cooling Water Supply

The inspector determined that:

- Performance of each EDG cooling water pump is monitored quarterly as part of the In-Service Testing (IST) program.

- Procedure N1-MPM-079-A412 is performed annually and involves opening up and cleaning the associated heat exchangers.

B.4 Zebra Mussel Intrusion

GL 89-13 also addressed the issue of biofouling of service water systems. Until recently, this was not a concern at the site. However, Lake Ontario is currently experiencing infestation of mollusks referred to as Zebra mussels. Niagara Mohawk has implemented a monitoring program to detect the presence of zebra mussels in their larval (velliger) stage, as well as, adult stage. A treatment system was recently installed and was approved by the New York State Department of Environmental Conservation (DEC), for the application of a molluscicide (Clamtrol) to the various SW systems (including the fire water system). A limited number of treatments are

allowed by the DEC each year with treatments based on the velliger monitoring program, presence of adult mussels on the substrate racks and on breeding habits. The inspector observed a molluscicide treatment on January 16, 1991, on the SW and fire water headers. Post-treatment results indicated that an effective treatment had been performed. The inspectors determined that procedures were being properly followed.

B.5 Overall Assessment

Niagara Mohawk responded to GL 89-13 by letter dated February 16, 1990, and in a supplement letter, which provided more detail as to programs to address each GL issue, dated December 10, 1990. The inspector verified that the stated programs were in place and that future activities were identified and were being tracked by the responsible system engineers. The inspector concluded that Niagara Mohawk was addressing the issues of GL 89-13 in a timely and comprehensive manner.

2.2 Unit 2

A. Portions of the following special tests were observed by the inspectors:

-- Integrated Leak Rate Test per N2-TSP-CNT-@001.

-- Turbine Torsion Test per N2-STP-9.

-- Turbine Valve Surveillance Test per N2-STP-24, performed for post-modification testing.

The performance of these tests were assessed to be well controlled and executed in a cautious and deliberate manner. The interface between operations and the system engineering test directors was observed to be good. When problems arose, the tests were stopped and the problems appropriately resolved.

B. While reviewing a completed source range monitor and rod block function check per N2-ISP-NMS-W@008, an Instrument and Controls (I&C) supervisor identified the rod block check portion was not performed on December 3, 1990. The reactor was in mode 5 (refueling) at the time of the discovery. In addition, at the time of the supervisor's review, the surveillance test frequency had been exceeded by 12 hours. This resulted in a violation of TS Table 4.3.6-1 for the surveillance frequency.

The I&C technician who performed the test did not perform the rod block checks due to conflicting plant conditions. The technician noted this in the procedure, but failed to obtain a proper review to determine if this exception was acceptable. The supervisory review of the surveillance was not performed in a timely manner and thus when the error was detected, a violation of TS had already occurred.

The missed surveillance was reported to the station shift supervisor (SSS). The SSS directed that all activities involving core alterations be stopped. However, three hours later a management review of these actions determined that at least one rod block channel should have been placed into the tripped conditions within one hour of discovery. The failure to take this action resulted in a violation of TS Table 3.3.6-1, Action Statement 6.1.b.

A Niagara Mohawk review of previously performed N2-ISP-NMS-W@008 tests was performed and identified that on September 19 and September 25, 1990, the rod block checks were similarly not completed. On these occurrences, the supervisory reviews did not detect the missed rod block test exceptions. Based on the identification of these two additional missed rod block checks, the plant manager directed a 100% review of all completed I&C surveillances be performed and a sampling of other departments' completed surveillance tests be performed. No additional TS violations were identified. However, several instances of minor procedural adherences and misuse of notes were found in other I&C tests. Other corrective action directed by the plant manager included training on procedural adherence and an accountability meeting.

The inspector concluded that the safety significance of the three missed rod block surveillance tests was low because the rod block function was proven to be functionally operable during the next performance of the test. As noted above, several I&C technicians marked the rod block checks section of the test as Not Applicable, wrote a note in the remarks section as justification, and did not obtain a proper technical review. Also, I&C supervision did not detect this problem on two other occasions. When it was finally identified on December 7, 1990, the review was not timely and resulted in a third violation. The improper use of notes and inadequate technical review of completed surveillance tests were the root cause of similar TS surveillance violations a few years ago. However, Niagara Mohawk did identify these missed rod block checks and performed a thorough review to determine the scope of the problem. Additionally, the corrective actions described in the associated LER (90-19) appeared to be thorough and satisfactory.

In that these TS surveillance violations were of minor safety significance, were promptly reported to the NRC, were identified by Niagara Mohawk and corrective actions taken appear to be thorough, no Notice of Violation is being issued in accordance with the NRC Enforcement Policy stated in 10 CFR 2, Appendix C, Section V.G. NON-CITED VIOLATION (50-410/91-02-01)

C. (Closed) Violation (50-410/90-09-01): Two examples of the failure to adhere to procedures by mechanical maintenance technicians were identified during safety related preventive maintenance on hydraulic control units. Niagara Mohawk admitted to the violation, as stated. The plant manager conducted an accountability meeting with all personnel involved and disciplinary actions were taken. Procedural adherence was reinforced within the maintenance department. The inspector verified that the corrective action stated in the Niagara Mohawk response to this violation (letter dated January 2, 1991) were adequately implemented. This violation is closed.

D. After engineering review of data obtained during surveillances on the standby gas treatment system, per procedure N2-OSP-GTS-R001, it was determined that although acceptance criteria were met, the drawdown time was greater than expected. A retest of the system was initiated on January 17, 1991. During performance of the procedure preliminaries, the A train fan tripped twice when given a manual initiation signal. The problem was determined to be a relay which failed to latch properly. The relay was replaced, and the surveillance was successfully performed with a satisfactory drawdown time.

The inspector observed portions of the surveillance, and noted that timing of the drawdown was started when the fan started rather than when the signal was initiated. The fan starts approximately five seconds after signal initiation. Plant personnel indicated that the accident analyses takes credit for drawdown time from when the fan starts, so the method of timing used during the surveillance test was appropriate. The inspector concluded that the surveillance test was adequately performed.

3.0 ENGINEERING AND TECHNICAL SUPPORT

3.1 Unit 1

A. (Closed) Unresolved Item (50-220/88-34-09): Lack of proper identification of post-accident instrumentation on the control boards. Following identification of this concern Niagara Mohawk implemented, on an interim basis, the use of colored dots to identify accident assessment instrumentation. After a detailed evaluation and operator input, Niagara Mohawk implemented, on November 7, 1990, a design change to identify all control panel accident assessment instrumentation with distinctive 3/4 inch red tape affixed above each of the indicators. The inspector conducted a control panel walkdown and verified the accident assessment instrumentation was properly identified. This unresolved item is closed.

B. (Closed) Unresolved Item (50-220/88-34-08): Adequacy of electrical and physical separation of the redundant control room post-accident monitoring components. By letter dated May 19, 1989, (NMP1L 0401), Niagara Mohawk committed to develop and implement a long term action plan to address electrical and physical separation of control room Regulatory Guide (RG) 1.97 Category 1 instrumentation. To support the long term plan, various short term actions were undertaken by Niagara Mohawk to ensure the as-built configurations were in compliance with RG 1.97. These action items were previously reviewed and found acceptable by the inspector and documented in Inspection Report 50-220/89-35, Section 3.1. Using the information gathered from the short term plan, elements of the long term action plan were developed as documented in an October 29, 1990 letter (NMP1L 0534). The inspectors reviewed the long term cable separation program for RG 1.97 Category 1 instrumentation which is a subset of the broader Design Basis Reconstitution Program. The inspector concluded the action plan being implemented by Niagara Mohawk was satisfactory and adequately addressed the commitments made for this item. This unresolved item is closed.

C. (Closed) Unresolved Item (50-220/90-09-02): This item was open pending review of the LER for the improper setting of the emergency condenser isolation setpoint, which did not meet the design basis. LER 90-22, issued November 19, 1990, was reviewed by the inspector. Niagara Mohawk's conclusion as to the root cause for this condition was inadequate design documentation. Further, the root cause which allowed the condition to continue after it was initially discovered was a programmatic failure. The inspector agreed with this assessment.

Due to the low safety significance of the event, prompt reporting of this violation to the NRC, the condition was self-identified and that appropriate corrective actions, as described in LER 90-22, have been taken, the violation for non-conservative setpoints was not cited, in accordance with the criteria in the NRC Enforcement Policy of 10 CFR Part 2, Appendix C, Section V.G. NON-CITED VIOLATION (50-220/91-02-01)

D. (Closed) Unresolved Item (50-220/90-09-03): This item was open pending Niagara Mohawk investigation of NRC identified deficiencies with implementation of the Appendix J water seal methodology on the containment spray discharge check valves. The unresolved item included three concerns. Inspector review of these concerns follows:

D.1 Steps were added to N1-OP-14 describing an alternate water seal method that did not receive NRC review and approval. Further, the addition of the steps caused the entire subsection of N1-OP-14 (Section H.7) dealing with the water seal to be confusing as to its applicability and implementation, based upon interviews with several licensed operators.

Niagara Mohawk root cause analysis identified that:

-- The procedure steps were added at the behest of the operations department for the potential scenario where no containment spray pumps are running and a water sealing function is needed. The change to add these steps to N1-OP-14 were approved via routing the change to SORC members vice a routine SORC meeting.

-- Review of letters between Niagara Mohawk and NRC staff made it clear that the NRC wanted to be informed of the method(s) of implementing the water seal.

-- The corporate licensing group which was tasked with oversight of the water seal project were unaware of the change made to N1-OP-14 by the operations department, and the operations department was unaware of the fact that the NRC had to be informed of any methods used for establishing a water seal.

-- Operators did not receive training in the simulator for the Section H.7 changes. This was considered one reason why operators were confused over its implementation when questioned by the inspector. Niagara Mohawk speculates that had training been given, the procedural problems might have been identified and properly resolved.

D.2 This concern dealt with a revision to the Niagara Mohawk Safety Evaluation 89-13 which appeared to add a commitment to enter the containment spray system Limiting Condition for Operation (LCO) for certain conditions, specifically, torus cooling or makeup mode. The inspector identified that these instructions were not reflected in the appropriate sections of N1-OP-14. Further discussions with operations management determined that an assumption was made that the operators entered the LCO anytime these conditions were established. This was found not to be the case. Consequently, N1-OP-14 has been revised to caution operators to enter the applicable LCO when in the torus cooling or torus makeup modes.

D.3 The ALARA review for Safety Evaluation 89-13 did not appear to be comprehensive, in that, the modification of valves 80-40 and 80-45 to manually operated (normally open) had been judged by Niagara Mohawk to be of minor radiological significance since the valves would not have to be operated to mitigate or recover from an accident. However, the inspector identified that EOP-10, Drywell Flooding, requires operation of these valves per Section H.8, N1-OP-14.

A subsequent Niagara Mohawk evaluation of this issue concluded the same. However, the ALARA group was not faulted for the inadequate evaluation as they were informed that the valves would only be operated during routine plant evolutions. The inspector agreed with this assessment.

Conclusion

The inspector considered these three concerns to be resolved and Item 50-220/90-09-03 closed. However, the inspector concluded that N1-OP-14 was revised, on May 7, 1990, per Safety Evaluation 89-13, and as a result conflicted with EOPs. Two specific examples were identified. First, Section H.7 of N1-OP-14 states that following a design basis Loss of Coolant Accident (LOCA), two containment spray pumps should remain in operation when containment pressure is greater than 3 psig and one pump should remain in operation when less than 3 psig, in order to maintain a long term water seal. However, EOP-4 states to terminate containment sprays when drywell pressure is less than 3.5 psig. Secondly, EOP-10 directs performance of Section H.8 of N1-OP-14. Section H.8 requires alternate closing/opening operations of valves 80-40 and/or 80-45. However, in the event of a LOCA, the radiation field in the vicinity of these valves would likely preclude operation of the valves. Both of these conditions were not identified during the procedural revision process for incorporating the water seal steps to operating procedure N1-OP-14. The two Emergency Operating Procedure conflicts and the inadequate and confusing water seal implementation steps in Section H.7 of N1-OP-14 are contrary to Technical Specification 6.8.1 and ANSI 18.7-1972 regarding proper procedure revision and review. This is a VIOLATION. (50-220/90-02-02)

Assessment

Niagara Mohawk's root-cause analysis for this event revealed numerous other procedural and programmatic deficiencies. Additionally, lessons learned transmittals have been prepared and disseminated to corporate and site personnel. The root-cause analysis, as well as, preliminary corrective actions taken were discussed with the resident staff.

Niagara Mohawk's overall root-cause was that the failure to adequately implement the Appendix J water seal commitment was poor managerial methods. The inspectors concurred with this broad conclusion, but remained concerned that the interface between the corporate licensing group and the station warrants further examination, in that, this project was the responsibility of the licensing group. Particularly troubling to the inspectors was that the exemption to Appendix J was a specific issue in the Restart Action Plan and thus was supposed to have received a higher level of attention and review. Despite these additional oversight functions and review processes, the water seal methodology was poorly implemented.

3.2 Unit 2

A. SPDS Implementation

On September 13, 1985, the NRC submitted the results of its Nine Mile Point Unit 2 SPDS pre-implementation audit to Niagara Mohawk and requested that Niagara Mohawk respond to the concerns which resulted from the audit. Niagara Mohawk responded to these concerns in a letter dated November 15, 1985, which delineated the corrective actions to be taken for each area in question. NRC concurred with the proposed corrective actions and included a License Condition (C.(8)) in the Nine Mile Point Unit 2 Facility Operating License dated July 7, 1987. The License Condition indicated that Niagara Mohawk shall have an operational SPDS that includes the enhancements described in their 11/19/85 letter prior to startup following the first refueling outage.

During the current inspection period, the inspectors reviewed the implementation of the Nine Mile Point Unit 2 SPDS to determine if License Condition C.(8) had been met.

Issue #1 Man-in-the-Loop Testing, Validation and Verification Documentation Centralization

The inspectors determined that adequate man-in-the-loop testing was performed to verify that the SPDS displays and parameter set provide the necessary safety status information during both normal and abnormal plant conditions. The testing involved the imposition of various plant scenarios on the Unit 2 simulator and having control room personnel and test observers evaluate the dynamic performance of the SPDS. Several modifications were made following the test to correct system problems and improve usability. In addition, a followup man-in-the-loop test was performed to validate these modifications.

The inspectors found that all documentation, both internal and external to Niagara Mohawk, relating to the design, construction, installation, validation and verification of the Unit 2 SPDS was in Niagara Mohawk's possession. This resolved an NRC audit comment relating to the centralization of SPDS validation and verification documentation.

Issue #2 Content of Field Verification and Validation Testing

Following the man-in-the-loop testing, SPDS computer operational testing was performed. The system was tested by the insertion of predetermined raw data inputs and verification of data manipulation and validation, alarm setpoints, display functions and system response times. Testing also included the performance of calibration procedures on instrument loops providing SPDS inputs and verifying that input point values (at the SPDS computer) corresponded with calibration inputs, thereby validating sensor to display response of SPDS. Test exceptions were minor and have been satisfactorily resolved. The inspectors concluded that the field testing was successfully completed and appropriately addressed the testing aspects of SPDS validation and verification.

Issue #3 Evaluation of SPDS Reliability

In the November 19, 1985 letter, Niagara Mohawk indicated that a computer log would be maintained to document SPDS system failures, their duration, and the equipment that failed. The inspectors reviewed procedure N2-COMP-L.WS.01, Liquid Radwaste Computer System Power-Up/Power-Down Procedure. This procedure has been temporarily changed to include the SPDS availability log which will be maintained by system support engineering. While the procedure notes that the log should be evaluated periodically to assess SPDS reliability, goals for reliability were not indicated. However, reliability goals were noted in the SPDS design documentation. The inspectors concluded that this commitment had been adequately addressed by Niagara Mohawk.

Issue #4 Use of BWROG Parameter Set at NMP2

On September 7, 1990, Niagara Mohawk submitted to NRC its evaluation of the adequacy of the BWROG parameter set used for the Unit 2 SPDS. This met the commitment noted in the November 19, 1985 letter.

Issue #5 Human Factors Improvements

Niagara Mohawk implemented the human factors recommendations noted in the November 19, 1985 letter, as well as, other recommendations which have resulted from validation testing. The inspectors verified that these changes had been implemented by observation of the affected SPDS displays.

Issue #6 Radioactivity Control SPDS Display

The NRC pre-implementation audit noted that the display of radioactivity control parameters was not concise because too many instruments (two annunciators, two displays, and two strip chart recorders) would have to be observed by the operators to assess the status of necessary parameters. Niagara Mohawk responded to this concern by adding the necessary radioactivity control parameters to the SPDS Level II displays.

In their summary report dated January 11, 1991, the independent engineering consultant that performed the SPDS validation and verification stated that the Unit 2 SPDS displays were adequate to ensure that the information provided will be readily comprehended by the operating staff with one exception. The consultant felt that placing four trend plots on the Radioactivity Control SPDS display may not provide sufficient resolution for indication of the trended parameters and that Niagara Mohawk should evaluate this after the operators gained experience with the SPDS. Niagara Mohawk disagreed with the consultant's position because they felt that the current display does provide adequate resolution and also because the current display was responsive to the NRC pre-implementation audit concern. The inspectors observed the SPDS Radioactivity Control display and found the resolution of the trended parameters to be adequate.

Issue #7 Continuous Display of SPDS in Control Room

In response to an NRC audit concern, Niagara Mohawk committed to ensuring that at least one screen of the Honeywell System in the control room will be dedicated to the SPDS mode at all times. Niagara Mohawk has included this requirement in Operating Procedure OP-91B, SPDS. The inspectors noted, during numerous visits to the control room, that one of the Honeywell screens was indeed committed to SPDS.

During the review of the Operating Procedure OP-91B, the inspectors noted a precaution related to the SPDS Level II display of group isolation valve status. In particular, since input signals to the SPDS computer are provided by valve control power, it is possible for the computer to indicate a valve as closed even if it is open, if power is lost to the isolation valve control circuitry or to optical isolators in the circuitry. This could result in faulty indication of a containment isolation valve group on the associated SPDS Level II display. When questioned as to the possibility of physically modifying the circuitry to eliminate this problem, Niagara Mohawk indicated that the problem is not unique in the industry and that the physical modifications needed to resolve this problem would be extensive and costly and not commensurate with a comparable improvement in safety. Niagara Mohawk has included a discussion of this potential problem in the operations training lesson plan for SPDS. The inspectors concluded that the issue had been adequately addressed by Niagara Mohawk.

Summary

The inspectors concluded that the Unit 2 SPDS has undergone appropriate modification and testing and has been properly validated and verified to ensure compliance with applicable regulatory requirements and guidelines provided in NUREG 0737, Supplement 1, NUREG-1342, and the Standard Review Plan. Niagara Mohawk adequately addressed and responded to the specific SPDS commitments which resulted from the 1985 NRC pre-implementation audit of the Unit 2 SPDS. The inspectors concluded that in adequately addressing these specific SPDS commitments, Niagara Mohawk had successfully met Facility Operating License Condition C.(8).

B. (Closed) Unresolved Item (50-410/88-201-01): Molded case breaker testing deficiencies involving a lack of guidance for adjustable trip relay settings. To address this issue Niagara Mohawk conducted a comprehensive walkdown of all safety-related molded case circuit breakers (MCCBs) and motor control centers to identify which MCCBs have adjustable trip settings. In addition, the generic testing procedure, N2-EPM-GEN-V582, was revised to incorporate the necessary acceptance criteria for magnetic trip testing. These corrective actions were reviewed and found acceptable during a previous inspection (reference Inspection Report 50-220/90-23, Section 3.4). During this inspection period the inspector verified that the appropriate design drawing, AE-003, "Overload Heater List," was revised per Engineering Design Change (EDC) 2E10330 and that the associated electrical maintenance procedures were properly revised to correctly identify the required trip settings. This unresolved item is closed.

3.3 Unit 1 and 2

Generic Letter 89-10 Response Review

By letters dated December 14, 1990, (NMP1L 0556 and NMP2L 1267) Niagara Mohawk responded to GL 89-10, Supplement 3, Consideration of the Results of NRC sponsored Test of Motor-Operated Valves, dated October 25, 1990. This GL supplement specifically requested licensees to complete a plant specific safety evaluation of the susceptibility to failure under accident conditions of motor-operated valves in the high pressure core injection (HPCI), reactor core isolation cooling (RCIC), reactor water cleanup (RWCU) and isolation condenser (IC) systems, if applicable. For the impacted systems (Unit 1 - RWCU and IC, Unit 2 - RWCU and RCIC) Niagara Mohawk concluded that the isolation valves would function satisfactorily under accident full-flow conditions.

The inspector reviewed the supporting safety assessments for both units (Calculation No. S14-33-V001, dated December 11, 1990, for Unit 1 and Safety Assessment for NRC Generic Letter 89-10, Supplement 3, dated December 13, 1990 for Unit 2) and concluded that they adequately addressed the specific assessment considerations outlined in Supplement 3. However, following discussions with Headquarters and region-based specialists, the inspector was informed that a more detailed technical evaluation of the utilities' Generic Letter responses would be conducted by a schedule not yet established. Consequently, this inspector's review is complete, but the formal NRC technical assessment of Niagara Mohawk's response to Generic Letter 89-10 will be conducted in a subsequent inspection.

4.0 REVIEW OF LICENSEE EVENT REPORTS (LERs) AND SPECIAL REPORTS

4.1 Unit 1

The following LERs were reviewed and found satisfactory:

-- LER 90-19, Reactor scram due to spurious trip of neutron monitor caused by noise.

-- LER 91-01, Reactor scram due to spurious non-coincident logic trip signal.

Special Report dated January 25, 1991, (NMP77309), dealing with inoperability of the 12 Containment Hydrogen Monitoring System was reviewed and found acceptable.

4.2 Unit 2

The following LERs were reviewed and found satisfactory:

-- LER 90-17, Personnel error results in inadvertent actuation of the standby gas treatment system.

-- LER 90-18, Standby liquid control system declared inoperable due to excessive pipe stress caused by a failed mechanical snubber.

-- LER 90-19, Technical Specification violations of rod block checks due to procedural non-compliance and inadequate work practices. (see Section 2.2.B)

5.0 SECURITY/SAFEGUARDS

A. (Closed) Unresolved Item (50-220/88-30-01 and 50-410/88-29-01): This item was recently updated in a security inspection conducted the week of December 17, 1990. The item was left open pending repair of certain areas. These areas were repaired soon after the security team's visit and verified to be proper by the resident staff. This item is closed.

B. The inspectors discussed the heightened Security Guard Force preparedness measures and contingency plans initiated as a result of the increased potential for terrorist activities with respect to the Persian Gulf War. The inspectors found these measures satisfactory.

6.0 MANAGEMENT MEETINGS

Management/Exit Meetings conducted by Region Based inspectors during this inspection period:

Date	Subject	Report No.	Inspector
1/25/91	EP Program Review	91-03/91-03	Amato
2/1/91	EOP Review - Unit 2	91-80	Walker
2/15/91	Effluents	91-05/91-05	Jang
2/15/91	HP/Transportation	91-04/91-04	Furia

7.0 PRELIMINARY INSPECTION FINDINGS

At periodic intervals and at the conclusion of the inspection, meetings were held with senior station management to discuss the scope and findings of this inspection. Based on the NRC Region I review of this report and discussions held with Niagara Mohawk representatives, it was determined that this report does not contain safeguards or proprietary information.