

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos.: 50-220/90-04
50-410/90-04

Docket Nos.: 50-220
50-410

License Nos.: DPR-63
NPF-69

Licensee: Niagara Mohawk Power Corporation
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Syracuse, New York 13212

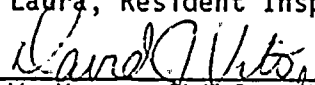
Facility: Nine Mile Point, Units 1 and 2

Location: Scriba, New York

Dates: April 11 through May 30, 1990

Inspectors: W. A. Cook, Senior Resident Inspector
R. R. Temps, Resident Inspector
R. A. Laura, Resident Inspector

Approved by:



Glenn W. Meyer, Chief
Reactor Projects Section No. 1B

6/20/90
Date

Inspection Summary:

This inspection report documents routine and reactive inspections during day and backshift hours of station activities including: plant operations; radiological protection; surveillance and maintenance; engineering and technical support; and safety assessment/quality verification.

Results: The inspectors identified one unresolved item concerning the feed-water testing at Unit 1 and a non-cited violation at Unit 2 involving a rod position indication Technical Specification violation. An Executive Summary follows.



Executive Summary

Nine Mile Point Units 1 and 2 - Inspection Report Nos. 50-220/90-04 and 50-410/90-04

Plant Operations: Operator actions at Unit 2 quickly mitigated the severity of an instrument air piping failure and were commendable. A non-cited violation concerning control rod position indication operability requirements at Unit 2 is discussed in Section 1.2.b. At Unit 1, the root cause evaluation and corrective actions related to the feedwater/High Pressure Coolant Injection system (HPCI) testing problems encountered in March 1990 were assessed to be thorough and comprehensive. The May 23 event which involved the running of the 11 HPCI pump with the suction valve shut represented an unresolved item pending completion of Niagara Mohawk's root cause evaluation, corrective actions and inspector review.

Radiological Protection: The Unit 2 reactor core isolation cooling room entrance was found to be in a poor radiological condition. Three batch discharges conducted from Unit 1 the week of May 14 were assessed as having been done properly and in accordance with the Unit Technical Specifications and approved procedures.

Surveillance and Maintenance: The inspector observed surveillance testing at Unit 1 and Unit 2 and concluded that testing was well paced and controlled. A Division 1 diesel generator maintenance outage at Unit 2 had good preplanning and the work was carried out appropriately.

Engineering and Technical Support: The questioning attitude of engineering personnel resulted in the identification and proper resolution of inadequate leak rate testing methodology utilized on five traversing incore probe system pipe flanges at Unit 2. Inspection pursuant to Temporary Instruction 2500/27 on fastener testing revealed Niagara Mohawk has adequately resolved the fastener testing failures and has made substantial improvements in their procurement process.

Safety Assessment/Quality Verification: The overall performance of the Unit 2 operations department improved. This was evidenced by good performance during the operator requalification program testing administered by the NRC, mitigation of the severity of the plant impact of the instrument air line break and thorough corrective actions taken in response to the TS violation concerning control rod position indication operability requirements. Performance by the Unit 1 operating staff has been generally good with the conservatively paced support of the remaining restart testing activities. The incident involving the starting of the No. 11 feedwater pump with its suction valve closed is considered another recent example of poor configuration control.



DETAILS

1. Plant Operations (Modules 71707, 71710, 93702)

The unit remained shutdown during this period. Efforts for restart of the unit continued to progress. On May 30, major testing left to be performed in the cold shutdown condition included feedwater/HPCI pump curve validation testing, reactor vessel hydrostatic test, Loss of Coolant Accident/Loss of Offsite Power (LOCA/LOOP) logic testing and the loss of offsite power testing.

During the week of April 30 to May 4, 1990 a Readiness Assessment Team Inspection (RATI) was conducted at Unit 1. The team's findings and assessments are contained in inspection report 50-220/90-80.

On May 7, 1990, the initial Systematic Assessment of Licensee Performance (SALP) report for Nine Mile Point Units 1 and 2 was issued. The assessment period covered March 1, 1989 through February 28, 1990, (report numbers 50-220/89-99 and 50-410/89-99). A management meeting at the site to discuss Niagara Mohawk's response to the report is scheduled for June 14, 1990.

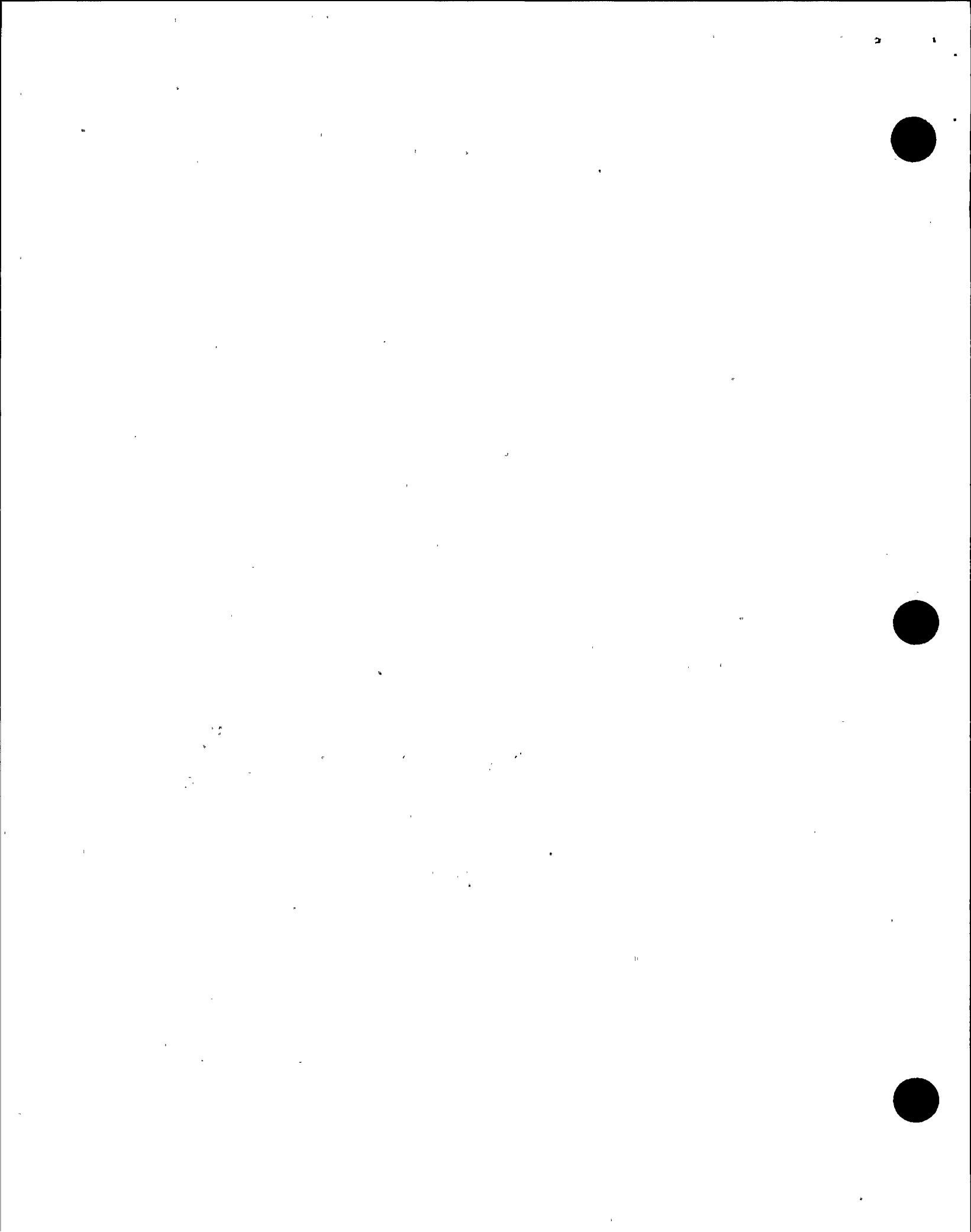
A briefing of the NRC Commissioners took place in Bethesda, Maryland on May 14, 1990. At the meeting, Niagara Mohawk management provided information relative to their readiness and ability to restart and operate Unit 1. The NRC staff also presented their assessment of Niagara Mohawk's readiness to restart the unit.

On May 23, 1990, Commissioner Kenneth Rogers visited the Nine Mile Site. He toured both units with the respective unit superintendents and conducted a series of one-on-one interviews with various site management personnel.

1.1 Unit 1

- a. As mentioned in inspection report 50-220/90-03, problems were encountered on March 29 when the Nos. 11 and 12 motor-driven feed pumps were operated. During this inspection period, the following corrective actions for that event occurred:

-- The damaged pipe restraints were repaired. Two additional restraints were added to the No. 12 recirculation line.



- A root cause evaluation (IRC-90030) was completed which identified procedural (OP-16), as well as, equipment (pressure switch 29-42) calibration problems as the root causes. As a result, changes were made to OP-16 to address pump start and run-in under the Off-normal Operations Section and to address venting of the 6" recirculation piping. A Lessons Learned Transmittal was issued detailing the need for better assessment of impact to the unit when tests are to be performed on systems which have been shut-down for extended periods of time, and normal operating conditions are not established.
- A modification removed the pressure switch input (interlocked with the recirculation line flow control valve) to the non-HPCI mode control circuitry.

The inspector reviewed the root cause evaluation and determined that it appeared to be thorough and comprehensive with good recommendations for procedural and equipment changes.

- b. Following the above stated corrective actions, the No. 11 pump was operated on May 21 in preparation for the HPCI pump curve validation test, N1-88-7.11. When started, the pump ran smoothly and no cavitation was observed. Pump flow was being diverted back to the condenser via the 2 inch and 6 inch recirculation lines. However, when efforts were made to increase pump flow by slowly opening the low-flow control valve, (initiating flow via long-path recycle), the pump started vibrating and was secured. High pump amperage was noted in the control room prior to securing the pump. Based on these observations, Niagara Mohawk concluded that the combination of flow through the recirculation lines and long-path recycle were causing pump runout to occur.
- c. Another attempt was made to run the pump on May 23; however, when the No. 11 pump was started, there were visual and audible indications that the pump was not operating properly and it was promptly secured. Immediate investigation revealed that the suction valve to the pump had been shut on the evening of May 21 and was not reopened prior to running the pump. The pump was not damaged as a result of this valve misalignment.

Subsequent Niagara Mohawk investigations revealed that the mark-up system was not properly used when the suction valve was shut under a testing blue markup (BMU). There were discrepancies in pressure gauge indications in the field and control room, which if properly interpreted, would have keyed the operators to the fact that the valve was shut. All further testing of the HPCI



system was suspended pending a full root-cause evaluation of the incident and implementation of corrective actions. This valve misalignment event remains unresolved pending completion of Niagara Mohawk's root cause evaluation and review and assessment by the inspector of the actions taken. UNRESOLVED ITEM (50-220/90-04-01)

- d. Problems discussed in the last inspection report (50-220/90-03) concerning motor generator set and reactor building closed loop cooling heat exchanger problems have been largely resolved. Review and assessment of these two problems are contained in the RATI report..(50-220/90-80)

1.2 Unit 2

The unit operated at or near full power until May 14 when a reactor scram occurred caused by a turbine building instrument air line rupture. The line was repaired and the unit was returned to power on May 29.

- a. On May 14, with the reactor operating at 100% power, main condenser vacuum began to steadily decrease. In response, the control room operators initiated a reactor power reduction. With reactor power reduced to 45% and condenser vacuum reduced to 23 inches Hg, the operators initiated a manual scram. This action was in anticipation of automatic turbine trip which occurs at 22 inches Hg vacuum and would have resulted in an automatic reactor scram due to reactor power being greater than 30%.

Post scram review determined the loss of vacuum was caused by a rupture in the turbine building instrument air piping. The line break caused the offgas condenser level control valves to fail shut, as designed, causing the offgas condenser to flood. This resulted in air and noncondensable gases in the main condenser backing up and thus, the loss of vacuum.

The air line section which failed was 2 inch, schedule 80, red brass, seamless tubing located within the low conductivity waste room. Failure analysis on the ruptured pipe revealed ammonia initiated inter-granular stress corrosion. Ammonia was used in this room during the startup testing phase for recharging resins, but has not been used for over a year. As corrective action, Niagara Mohawk replaced all air line piping located in this waste tank room.



The inspector concluded that the operators quickly assessed the event and took the necessary actions to minimize the impact of the pipe failure on the plant. Their actions precluded a more severe plant transient (automatic reactor scram from 100% power) and ensured a more controlled unit shutdown. It was also noteworthy that Niagara Mohawk decided to replace the entire run of piping in the waste room rather than just the failed section.

- b. While performing a daily control rod position indication surveillance on May 29, a reactor operator noted that control rod 26-55 position indication was inoperable. A review determined this condition existed for approximately 8 hours. During the previous shift, reactor power was increased using control rod withdrawal from about 18% to 30%. During the power increase, the reactor operator at the controls withdrew rod 26-55 and observed the lack of position indication. However, the operator failed to take the compensatory actions required by Technical Specification (TS) 3.1.3.7.a and resumed control rod withdrawal for power ascension. During this event the rod worth minimizer was bypassed. The independent human verifier also failed to adequately evaluate this lack of rod position indication and take appropriate action.

TS 3.1.3.7.a requires that with one or more control rod position indicator inoperable, move the rod to a position with an operable position indicator within one hour. This action was not performed within the one hour limit and is a Technical Specification violation.

The safety significance of this event was minimal in that the control rod was in the correct rod sequence position and verified as such when notched to the next lower operable rod position. The inspector was concerned that the reactor operator and reactor analyst (independent verifier) did not fully understand control rod operability requirements and that the operator did not communicate the rod position indication problem to the Chief Shift Operator (CSO) or Station Shift Supervisor (SSS) for proper resolution.

Niagara Mohawk took the following corrective actions:

- Restored the control rod to an operable status per TS 3.1.3.7.a.
- Removed the reactor operator from licensed duties for remediation.



- Conducted a lessons learned meeting with all crews stressing control rod operability requirements, communication repeat backs, accountability for human control rod worth minimizers and increased SSS oversight of all control rod changes. The inspector attended two of these sessions and found them to be appropriate.

In that, this TS violation was identified promptly by the next operations shift, the safety significance was minimal, it is not a repeat violation and the corrective actions taken were prompt and comprehensive, no Notice of Violation is being issued in accordance with the Enforcement Policy criteria of 10 CFR 2, Appendix C, Section V.A.. NON-CITED VIOLATION (50-410/90-04-01).

- c. Safety System Operability Verification: The inspectors directly examined portions of selected safety system trains to verify that the systems were properly aligned in the standby mode. The following systems were examined.
 - Standby Liquid Control
 - Standby Gas Treatment

The inspectors found the systems to be properly aligned and fully operational.

2. Radiological Protection (Module 71707)

2.1 Unit 1

- a. On May 22, the first of three batch radioactive waste discharges to the lake was performed at Unit 1. Prior to the discharge, the resident staff observed preparations for the discharge in the control room and discussed the evolution with the Unit 1 chemistry supervisor. The inspector determined that:
 - Three batch discharges of 25,000 gallons each were to be performed.
 - The discharges were being made as a result of increased water inventories since the last discharge in 1986 and in anticipation of future storage needs as a result of scheduled heatup of the plant.
 - The water contained no principal gamma emitters and all levels measured were less than Lowest Limit of Detection (LLD). The water contained tritium at a level of $2.1E-3$ uCi/ml. Calculations for the scaling of Fe-55, Sr-89 and 90 (beta-emitters) to Co-60 and Cs-137 were performed per the Off Site Dose Calculation Manual (ODCM) as required by the unit Technical Specifications (TS).



The three discharges occurred on May 22, 23 and 25 with no problems encountered. The inspector's assessment of the evolution was that it was performed in accordance with unit TS and approved procedures and that personnel involved were knowledgeable and carried out the evolution in a competent manner. The chemistry supervisor was familiar with the discharge process and with the analytical techniques for determining the activity in the water and for ensuring compliance with State and Federal requirements governing discharges. Good cooperation was noted in the control room between the groups involved in the evolution.

- b. The inspector became aware of a licensing staff determination that concluded a 10 CFR 50.59 safety evaluation should have been performed for the use of auxiliary sampling equipment in place of installed stack effluent monitors. Followup by the inspector determined that the licensing determination was requested by the station chemistry staff following a corporate Quality Assurance (QA) staff audit (Audit No. 90.3010). The QA audit identified a potentially inadequate safety review and potentially nonrepresentative alternate sampling method.

The alternate sampling method is authorized by the unit Technical Specifications in the event the installed systems should become inoperable. The inspector noted that the alternate sampling system was installed per an approved station procedure (N1-CSP-7X) which receives a standard administrative review (per AP-2.0) which includes a safety analysis review in accordance with 10 CFR 50.59 and unit Technical Specifications. The auxiliary sample system was not installed as a temporary modification, which by procedure would have also stipulated a 10 CFR 50.59 safety evaluation be performed.

The inspector concluded that the licensing staff determination was conservative, but not absolutely necessary. The administrative review of the installation procedure appears to have adequately satisfied the 10 CFR 50.59 review and Technical Specification recognizes the alternate sample method. The QA audit finding is viewed as conservative and appropriate. More importantly, the question raised by QA of the representativeness of the sampling method was a good finding and appears to have been adequately addressed by the chemistry staff. Overall, the Niagara Mohawk staff appears to be properly addressing the identified audit findings and the QA audit represented a thorough review of the issues.



2.2 Unit 2

During a routine tour of the reactor building, the inspector observed several poor radiological control practices at the entrance area to the Reactor Core Isolation Cooling (RCIC) room. In particular, used anti-contamination clothing bins were full and overflowing; some used gloves were laying outside the access point; a hose containing potentially radioactive water was laying across the step off pad and leaking onto the step-off pad; and the entire area was dirty and cluttered. These concerns which reflected poor radiological work practices were discussed with the Unit 2 assistant radiation protection supervisor who subsequently toured the area with the inspector. The area was promptly cleaned up. The safety significance of this condition was low because no personnel contaminations occurred and contamination levels were low.

3. Surveillance and Maintenance (Module 71707, 61726, 62703)

The inspectors observed portions of the surveillance testing and maintenance activities listed below to verify that the test instrumentation was properly calibrated, approved procedures were used, the work was performed by qualified personnel, limiting conditions for operations were met, appropriate system or component isolation was provided and the system was correctly restored following the testing or maintenance activity.

3.1 Unit 1

- a. The following maintenance/surveillance and testing activities were observed or reviewed:
 - Cutting and pulling of partial lengths of the tubes on the No. 11 RBCLC heat exchanger as part of the corrective actions taken to address the flow induced vibration problems. No concerns were identified.
 - N1-ST-Q1, Revision 24, "Core Spray Pumps and Valves Operability Test." The inspector observed the testing of the No. 11 core spray and core spray topping pump in the control room. Coordination of the test from the control room was good. Good cooperation and support of the test by the Electrical and Instrumentation and Controls Departments were also noted. No concerns were identified.



-- N1-RPSTP-7, Rev. 0, "In Sequence Shutdown Margin Test." The inspector reviewed the test and discussed various aspects of the test methodology with representatives of the Reactor Analyst Group. Prerequisites were independently verified by the inspector and determined to have been satisfactorily met. The inspector also witnessed the satisfactory performance of N1-ST-V3, Rod Worth Minimizer Operability Test, a prerequisite to the N1-RPSTP-7 test. The inspector witnessed a pre-briefing on the test by the unit reactor analyst and operations superintendent. A portion of the shutdown margin test was observed. The inspector noted good procedural adherence, communications, independent verification and supervisory oversight. No concerns were identified.

-- As discussed in Section 1.1 of this report, testing of the feedwater pumps was observed on two occasions.

- b. (Closed) Unresolved Item (50-220/89-81-03): This item was opened during the Integrated Assessment Team Inspection (IATI) and remained open pending corrective actions by Niagara Mohawk to ensure that all vendor manuals were controlled and updated. Based on the inspector's concern, Niagara Mohawk reviewed, on a sample basis, safety- and non-safety related vendor manuals. A level of less than 5% errors was established as the acceptance level. Errors were defined as pages missing, altered pages, missing manuals or updates not incorporated. Based on this audit, the following statistics were generated for the Unit 1 Maintenance Department.

<u>Maintenance Group</u>	<u>Total Error Rate</u>	<u>Non-Safety Related Error Rate</u>	<u>Safety Related Error Rate</u>
Instrumentation and Controls	15%	21%	3.7%
Electrical	19%	25.4%	4%
Mechanical	9.4%	14%	2.9%

The overall error rate for manuals audited was determined to be unsatisfactory, however, this was due to the poor results for the non-safety related manuals. The safety related manuals that had been through the engineering review, as part of the Vendor Manual Upgrade Program, had a satisfactory acceptance level. Based on the results for non-safety manuals, Niagara Mohawk



decided to perform an inventory of all controlled non-safety related manuals, which, while not including a page by page check, would require verification of holder number and record of revision sheet which would ensure that all changes up to that point had been incorporated. Based on the fact that the safety related manuals had satisfactory results (less than 5% errors) and that the non-safety related manuals were going through the engineering review process during which discrepancies will be resolved, this item is closed.

3.2 Unit 2

- a. The inspector witnessed various safety related activities associated with the Division I Emergency Diesel Generator (EDG) outage, including changing EDG valve cover gaskets, and troubleshooting of the low lube oil pressure switch.

In both jobs, the maintenance technicians were experienced and properly used the new Work In Progress forms which clearly identify the work scope and plant impact, including the post maintenance test requirements.

- b. After initial repair of the ruptured turbine building instrument air line discussed in Section 1.2.a, mechanical maintenance personnel identified that an incorrect filler material was used for the weld joints. The procedure clearly specified the required material, but the maintenance staff determined that the welder relied on his experience rather than looking at the procedure. Although this repair effort was non-safety-related, the inspector was concerned that the maintenance man did not follow the available repair procedure.
- c. Portions of the following surveillances were observed by the inspector:

-- Division II fuel oil transfer pump and valve test.

-- Division II battery quarterly functional test.

Performance of these tests was acceptable.

- d. (Closed) Unresolved Item (50-410/89-05-04): Maintenance technicians knowingly violated procedural requirements during the independent verification of valve positions for drywell pressure detectors. Initial inspector review was documented in Inspection Report 50-410/89-05 and concluded that Niagara Mohawk took appropriate corrective actions. The NRC staff has determined that no further NRC followup is warranted. This item is closed.



4. Engineering and Technical Support (Module 71707)

4.1 Unit 1

- a. (Closed) Unresolved Item (50-220/88-20-001): This item provided initial NRC staff tracking of the 125 VDC system design concerns identified by Niagara Mohawk. The issue was reviewed by region based specialist inspectors as documented in inspection reports 50-220/89-01, 89-02 and 89-23. Further, the inspector reviewed the Supplement 1 to Niagara Mohawk's Licensee Event Report No. 88-20 in inspection report 50-220/90-03 and found the Niagara Mohawk corrective actions satisfactory. Final closeout of this item will be tracked by Unresolved Item 50-220/89-23-002. This item is closed.
- b. (Closed) Unresolved Item (50-220/89-07-02): Niagara Mohawk to provide additional information on emergency ventilation system walkdown observations. In the subsequent inspection period, Niagara Mohawk provided additional design and modification information to the inspector for review. Consequently, four apparent violations were identified and an Enforcement Conference was held in the NRC Region I office on March 9, 1990. A Notice of Violation (EA No. 90-025) was issued on April 10, 1990 identifying two violations of NRC regulations. These violations are being tracked under violation numbers 50-220/89-08-001 and 50-220/89-08-003. This unresolved item is superseded by these violations and is closed.
- c. (Closed) Unresolved Item (50-220/89-08-04): Apparent violation of 10 CFR 50.59 for the deluge system modification to the reactor building emergency ventilation system. During the enforcement conference held on March 9, 1990, Niagara Mohawk presented a historical perspective of the development of this deluge system modification with respect to several associated fire protection system modifications required by 10 CFR 50, Appendix R. Niagara Mohawk stated that at the time this modification was proposed in the late 1970's, a formal 10 CFR 50.59 safety evaluation was not developed by the Niagara Mohawk engineering staff, due to personnel oversight. However, an NRC Safety Evaluation Report (SER) was docketed on July 26, 1979, which concluded the deluge system design satisfied Branch Technical Position 9.5.1 objectives. In the opinion of the Niagara Mohawk staff, this SER satisfied the legal intent of the 10 CFR 50.59 regulation. While Niagara Mohawk representatives admitted there was no excuse for the personnel error made in 1979, they noted that an occurrence of this type under their current administrative controls was highly unlikely.



The NRC staff acknowledged Niagara Mohawk's contention that the regulation was satisfied by an NRC safety evaluation. However, the staff cautions that the onus is on Niagara Mohawk for the safe operation and detailed modification of their facility and that the regulatory processes are limited to principally audit functions. The inspectors verified that adequate administrative processes are in place to reasonably prevent the installation of a facility modification without appropriate evaluation and technical review. This item is resolved.

- d. (Closed) Unresolved Item (50-220/89-08-05): Apparent violation of 10 CFR 50, Appendix B, Criterion V, involving inadequate procedures for the safe operation of the emergency ventilation system. At the enforcement conference held on March 9, 1990 to discuss this and other apparent violations, Niagara Mohawk stated that they did not agree that the operating procedures written for the reactor building normal and emergency ventilation systems (OP-10 and OP-21, respectively) were inadequate. However, Niagara Mohawk did agree that there were human factors deficiencies with the procedures which were addressed after being brought to their attention by the inspector. They contended that these human factors type deficiencies did not make the current revision to the procedures inadequate for use by trained licensed operators, with in-depth knowledge of the systems' operation and capabilities. After further examination, the NRC staff agrees that the procedural deficiencies identified and documented in inspection report 50-220/89-08, Section 4.b., did not constitute inadequate operating procedures. This item is resolved.
- e. (Closed) Unresolved Item (50-220/89-18-01): When this item was last reviewed, three concerns remained open pending further Niagara Mohawk action and/or NRC staff review. These items included: 1) performance of a special core spray system test to validate: calculated system resistance to confirm LOCA analysis design basis; analytically determined pump performance curves; and dynamic hydraulic load calculations; 2) development of a comprehensive water hammer analysis; and 3) reverification of the net positive suction head for the core spray pumps.

The inspector reviewed and witnessed portions of N1-88-7.12, Core Spray Injection Test, performed on February 22, 1990. Performance testing on both core spray loops was completed satisfactorily and system walkdowns identified no noteworthy discrepancies. System resistance calculations and hydraulic loads analysis were satisfactorily confirmed, as were the pump performance curves.



By external memorandum from R. Capra to J. Wiggins, dated August 9, 1989, the NRC technical staff summarized in a Safety Evaluation their review of the SSFI net positive suction head and water hammer concerns. The staff found the Niagara Mohawk responses to these concerns acceptable and considered these issues closed. The staff's safety evaluation is attached to this report as Attachment A. This item is closed.

- f. (Closed) Unresolved Item (50-220/89-18-02): This item remained unresolved pending NRC review of a Niagara Mohawk decision on the long-term resolution to core spray test line vibration problems during routine surveillance testing. In addition, a proposed interim measure of gagging the core spray relief valve during testing of the pumps at approximately 2200 gpm was questioned by the inspectors and remained unresolved pending review of a 10 CFR 50.59 safety evaluation for this testing methodology.

To address the test return line high vibration concern, Niagara Mohawk contracted with the original valve manufacturer to fabricate new internals for the test line throttle valve. The new internals disc stack was designed to better handle the high pressure differentials and flow rates that the throttle valve is exposed to and thereby reduce valve cavitation and resulting piping vibration. When the new throttle valve internals were tested in place, test line vibrations were significantly reduced even at test line flow rates of between 3000 and 3400 gpm. At the recommendation of their engineering consultant, MPR Associates, Inc., a surveillance test flow rate of 2900 gpm has been established. Test line vibration at this flow rate is acceptable. In addition, the higher flow rates achieved with the new valve internals has resulted in eliminating the need to gag the core spray system relief valves during the surveillance test.

The inspector reviewed the safety evaluation for the core spray drag (throttle) valve internals replacement (Safety Evaluation No. 89-028) and found it to be satisfactory. The inspector also reviewed the recently completed quarterly surveillance tests (N1-ST-Q1) for the core spray system which used the revised test flow values. No discrepancies were noted. This item is resolved.

- g. (Closed) Unresolved Item (50-220/89-18-03): When this item was last reviewed three concerns remained open pending further Niagara Mohawk action and NRC staff review. These items were: 1) validation of pump curves for Technical Specification required pumps listed in Appendix A to pump mechanical design criteria (MDC) specification MDC-11; 2) review of surveillance



procedures developed to verify proper check valve performance in the feedwater system; and, 3) review of the methodology for developing pump and valve acceptance criteria from validated performance curves in accordance with ASME Code Section XI and performance trending.

The inspector reviewed and discussed these items with Niagara Mohawk inservice testing personnel. Niagara Mohawk has completed all Technical Specification pump performance curves validations and has revised their respective inservice testing acceptance criteria. The inspector reviewed a sampling of the validated pump curves and verified that proper ASME Code Section XI acceptance criteria have been applied for inservice testing acceptance values. The inspector considers the Niagara Mohawk pump curve validation methods, existing Site Engineering Instruction for establishing and controlling reference values and IST acceptance criteria, and current performance trending methods to be adequate.

The inspector reviewed Quarterly Surveillance Test N1-ST-Q3, high pressure coolant injection pump and check valve operability test, and verified that Niagara Mohawk had established a reasonable procedure for the periodic monitoring of the safety related aspects of the feedwater system. Although not required by Technical Specification or federal regulations, Niagara Mohawk has accepted a conservative approach to performance monitoring of their feedwater/HPCI system. This item is resolved.

- h. (Open) Unresolved Item (50-220/89-18-04): This item identified poor control of the feedwater/HPCI pump curves. Niagara Mohawk subsequently committed to develop and validate individual pump performance curves for the condensate, condensate booster and feedwater pumps. The inspector determined that, although pump curves have been developed, final validation of these pump curves and baseline pump performance data has not been collected due to problems encountered during recent testing. (Reference Section 1.1.a. of this report). This item remains unresolved pending completion of feedwater system testing and inspector review of the results.
- i. (Closed) Unresolved Item (50-220/89-18-05): This item pertains to an apparent failure of Niagara Mohawk to properly report to the NRC the core spray system operability conflict between unit Technical Specifications and 10 CFR 50, Appendix K. This item was reviewed by the NRC staff following Niagara Mohawk's response to a Notice of Violation, Enforcement Action 89-70, dated November 16, 1989. The NRC staff, in their letter dated February 22, 1990, agreed with Niagara Mohawk that there was no



violation of NRC reporting requirements for core spray operability. Further, recent performance has demonstrated that Niagara Mohawk has generally been conservative in both informally and formally notifying the NRC staff of potentially unanalyzed safety conditions. This item is resolved.

- j. (Closed) Unresolved Item (50-220/89-81-09): Niagara Mohawk was to complete a review and determine why a commitment to conduct training in safety evaluations was not entered into the Nuclear Commitment Tracking System (NCTS). The inspector reviewed the root cause evaluation (IRC-89074) for this concern. The evaluation concluded that the primary reason for the failure to enter the training commitment into the NCTS was that entries into the database were usually made after the assigned department had concurred on the entry. Prior to making an assignment to a responsible department, the procedure governing NCTS entries did not instruct the system administrator to immediately enter the commitment into the NCTS database. This procedural deficiency has since been revised to require entry of the item into NCTS prior to assignment to a responsible party. This revision was intended to enhance the overall tracking of NCTS items. This item is closed.

4.2 Unit 2

- a. TI 2500/027: Inspection Requirements For Fastener Testing To Determine Conformance With Material Specifications (Bulletin 87-02).

An inspection was performed of the adequacy of the Niagara Mohawk root cause analyses and the implementation of corrective action in response to NRC Bulletin 87-02. The fastener test results required by Bulletin 87-02 revealed that Niagara Mohawk had several substandard fasteners. For each case, an analysis was performed which justified that the fasteners could still perform their intended design function. The inspector reviewed several of the analyses and found them to be acceptable.

Niagara Mohawk's quality assurance program and the vendor's quality assurance program were not fully effective in identifying the substandard fasteners. Although not mentioned in their response, Niagara Mohawk took the following corrective actions to enhance their procurement process:

- Established administrative controls to purchase fasteners from only reliable vendors.
- Established a dedicated engineering procurement group.



- Test a 5% to 10% sample of new fasteners for proper material and mechanical properties to ensure adherence to fastener standards, as well as the purchase order. The inspector witnessed testing of a nut and bolt for proper material properties using an optical spectrometer. The materials engineering staff appeared very knowledgeable and experienced.

In summary, Niagara Mohawk has made substantial enhancements to their procurement process which was intended to eliminate problems with substandard fasteners, as well as other procured components.

- b. During preparations for the containment integrated leak rate test, a systems support engineer identified a discrepancy between the Updated Safety Analysis Report (USAR) and the Niagara Mohawk Appendix J, Type B test document. Specifically, five Traversing Incore Probe (TIP) containment piping flanges were being tested per the Appendix J Type B program requirements even though the USAR exempted the flanges from testing. The engineer was concerned that these were high dose rate tests that may not need to be done and initiated a Problem Report for resolution.

The Engineering and Licensing staff disposition revealed that testing of the containment TIP flanges was required and the current test methodology was inadequate. The flanges were of the double O-ring design and only one O-ring was being tested via the current test procedure. Based on this, the primary containment was declared inoperable and an Occurrence Report was generated. The flanges were subsequently satisfactorily tested using proper methodology where both O-rings per flange get tested. Niagara Mohawk initiated a Licensee Event Report for this event and the inspector will review final corrective actions after its issuance.

The inspector considered this event noteworthy because Niagara Mohawk engineering and licensing staff performed well in the identification and proper resolution of this safety issue. Further, it is an example of Niagara Mohawk personnel maintaining a questioning attitude.

5. Allegation Followup

RI-89-A-0088 - Closed

On July 24, 1989 the NRC received an anonymous concern alleging an excessive amount of overtime was being worked by members of the Nine Mile Point fire brigade. No specific instances of fatigue related problems were communicated to the NRC staff members, but the individual stated that the fire brigade's ability to effectively implement their program was allegedly being impaired by the frequent and extended periods of overtime being worked.



Followup of this concern was initially conducted by the Niagara Mohawk station staff. The station management was already aware of some overtime and other personnel concerns involving the fire brigade which were brought to their attention via the management chain and the "Tell It to the Superintendent" program. These concerns were being actively pursued and some personnel and management changes had been made to address them. In addition, shift work hours were modified from 8-hour to 12-hour shifts to help alleviate excessive overtime and unpredictable work schedules.

The inspector discussed past and present fire brigade work schedules with fire protection supervision and determined that past scheduling practices were poorly conceived and executed, resulting in fire brigade member dissatisfaction and poor morale. Recent changes in scheduling and improved internal communications has resulted in a reduction in overtime hours worked by the fire brigade and demonstrated improved morale. The inspector reviewed the current overtime tracking system, which properly uses a rolling seven day schedule, and recent employee overtime records. The inspector found the tracking method acceptable and recent overtime hours for all brigade members to be significantly lower than the total overtime hours worked about the time the allegation was made. In addition, those individuals working hours in excess of the station administrative overtime limits were appropriately authorized by their respective unit superintendents.

The inspector concluded that the allegor's concerns about excessive fire brigade overtime were valid, but no directly attributable fatigue related events occurred. In addition, at the time of the allegation Niagara Mohawk management was starting to devote more attention to this concern. Supervisory changes were implemented and improved work tracking methods were used. This allegation is closed.

6. Safety Assessment/Quality Verification (Modules 71707, 40500)

Improving performance was noted in the Unit 2 operations area in the past few months. This assessment is based on the following observations:

- Reduction in personnel errors.
- Prompt and thorough corrective actions taken in response to the control rod position indication operability TS violation.
- Good operator response to the instrument air line break event.
- Good performance during the NRC inspection of the operator requalification program.



- Creation and implementation of an operations department self-assessment program which includes performance trending. .
- Heightened level of the operations department management involvement and oversight of daily activities.

Performance at Unit 1 has been generally good. The pace of testing and maintenance to support restart of the unit has been conservative and safe. The event involving the running of the feedwater pump with its suction valve closed is another example of ineffective configuration control.

9. LER Review (Module 92700)

The following LERs have been reviewed and found satisfactory:

Unit 1

- LER 90-03, April 20, 1990, Reactor building emergency ventilation system actuation due to spurious radiation monitoring signal.
- LER 90-05, April 7, 1990, Reactor building emergency ventilation system actuation due to equipment design problem in conjunction with restricted work conditions.

Unit 2

- LER 89-35, October 13, 1989, Reactor scram caused by an inadequate plant impact of electrical preventive maintenance on a mechanical vacuum pump.
- LER 89-39, November 20, 1989, Primary containment vent and purge valve isolation caused by a lightning strike.
- LER 89-40, December 1, 1989, Reactor scram caused by an electrohydraulic control system malfunction.
- LER 89-41, December 2, 1989, Reactor scram while shutdown caused by use of a deficient electrical diagram during troubleshooting of the electrohydraulic control system.
- LER 89-42, December 17, 1989, Manual initiation of standby gas treatment system due to loss of reactor building differential pressure.



The following LER was reviewed and was found incomplete:

LER 90-08, April 2, 1990, Missed chemistry surveillance. The inspector found this LER well-written except for the previous similar events section. Only one other similar event was referenced which occurred in another department. The inspector identified several other similar events, two of which were in the Chemistry Department (LERs 88-60 and 89-27). Niagara Mohawk agreed to review and possibly revise this section of the report.

8. Management Meetings (Module 30703)

Management Meetings Conducted by Region Based Inspectors During this Inspection Period

<u>Date</u>	<u>Subject</u>	<u>Report No.</u>	<u>Inspector</u>
5/4/90	Operator requalification program - Unit 2	50-410/90-16	Pullani
5/11/90	RATI	50-220/90-80	Meyer
5/30-31/90	AEOD followup to Unit 2 loss of instrument air	N/A	Lanick

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.

