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REGION I

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Licensee: Niagara Mohawk Power Corporation  
P. O. Box 63  
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Facility: Nine Mile Point, Units 1 and 2

Location: Scriba, New York

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**ATTACHMENT**

- Attachment 1 - Partial List of Persons Contacted
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  - Items Opened, Closed, and Updated
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## EXECUTIVE SUMMARY

Nine Mile Point Units 1 and 2  
50-220/97-11 & 50-410/97-11  
October 5 - November 8, 1997

This integrated NRC inspection report includes reviews of licensee activities in the functional areas of operations, engineering, maintenance, and plant support. The report covers a five-week period of inspections and reviews by the resident staff, and a regional specialist in the area of operator requalification. In addition, the results of a security program inspection performed September 22-26, 1997, are included in this report.

### PLANT OPERATIONS

- Operator response to an NMP2 reactor recirculation system flow control valve lock-up was appropriate. Control room activities during the shutdown were well-coordinated, with good supervisory command and control. However, the leakage of contaminated water from the scram discharge volume onto the reactor building floor following reset of the scram is a recurring problem. (URI)
- Material condition of the NMP1 control rod drive housing support and the main steam line flow restrictor piping and instrumentation was very good. However, the inspectors identified an inconsistency in the NMP1 UFSAR with respect to the main steam line break high flow setpoint. (URI)
- The NMP2 operator training requalification program was effective, with the remedial training program remaining strong. Management oversight was meaningful and effective. The level of difficulty of the written examinations was good; this was an improvement, since level of difficulty was considered a weakness during the last examination cycle at NMP1. Job performance measures (JPMs) were acceptable; but, similar to the NMP1 requalification examinations, there was limited use of faulted path JPMs. The facility evaluators' assessments were objective and thorough. The performance of the operators during the examinations was generally good; however, communications and command/control were noted weaknesses. Performance in the areas of event recognition and diagnosis, understanding and interpreting alarms, board manipulations, TS usage, and event classification was good.

### MAINTENANCE

- The work scope for the NMP1 forced outage work scope was adequately managed and appropriately focused on safety.
- Surveillance tests of the NMP2 service water system were performed in a controlled manner. The ASSS effectively coordinated the testing activities and provided a detailed pre-test brief. Operators and technicians consistently used clear three-part communications and adhered to the test procedures.





### Executive Summary (cont'd)

- The inspectors identified that the wrong average power range monitor was inadvertently adjusted during the NMP2 reactor shutdown. The failure to follow procedures has been a recurring problem at Nine Mile, and corrective actions to preclude recurrence have been fully implemented or effective. (UPDATE TO VIO 50-410/97-06-01)
- The inspectors identified that a 1995 procedure change for a NMP1 main steam break instrument trip channel calibration procedure was in error and received an inadequate review. In addition, the inspectors identified that, in 1997, an I&C technician failed to identify the procedure error and performed a step in the calibration procedure incorrectly; this was not identified during the subsequent supervisory review. (UPDATE TO VIO 50-220/97-06-01)

### ENGINEERING

- NMPC's self-assessment of procurement activities was critical and in-depth, areas noted as needing improvement were personnel attention-to-detail and self-checking.
- NMP2 system engineers discovery of missed surveillances associated with the average power range monitors (APRMs) indicated a good questioning attitude. (VIO) The discovery, by the design review team, that the positive pressure surveillance test for the NMP2 control room envelope did not include the relay room also indicated a good questioning attitude. (VIO) These issues are additional examples of the continuing problem with the technical adequacy of the surveillance procedures at Nine Mile Point.
- An NMP2 SSS's oversight and questioning attitude was good and resulted in identification of improper average power range monitor gain setting adjustments at both units. The average power range monitor gain setting adjustments had not performed in accordance with the respective technical specifications. (NCV)
- An initial operability evaluation by NMP1 operations staff for the channel 12 GEMAC level instrumentation was reasonable, but it did not probe deep enough into all potential reference leg leakage paths. An engineering safety analysis was appropriate and identified the alternate leakage path. Once the drain valve leakage was identified, appropriate actions were taken in the TS allowable time.

### PLANT SUPPORT

- Inattentiveness to postings within the radiologically control area resulted in an NMP2 employee, and three visitors, entering a posted high radiation area without authorization. (NCV)
- The security and safeguards programs at Nine Mile are effective and receive management support. The equipment and personnel training met the licensee's



Executive Summary (cont'd)

commitments and NRC requirements. The quality assurance audit of the security program was comprehensive in scope and depth.

- A breach permit allowed a fire-door in the NMP2 radwaste facility to be removed for over three years without being evaluated as a permanent modification. (URI) Furthermore, the licensee procedures were weak, in that the procedures do not prevent this from occurring.



## REPORT DETAILS

Nine Mile Point Units 1 and 2  
50-220/97-11 & 50-410/97-11  
October 5 - November 8, 1997

## SUMMARY OF ACTIVITIES

### Niagara Mohawk Power Corporation (NMPC) Activities

#### NMP1

Nine Mile Point Unit 1 (NMP1) was in cold shutdown throughout the inspection period to repair the emergency cooling (EC) condensers.

#### NMP2

Nine Mile Point Unit 2 (NMP2) started the inspection period at 95% power, limited to 95% due to the moisture separator reheaters being isolated. This power level was essentially maintained until November 5, when the unit was shutdown to repair a malfunctioning reactor recirculation flow control valve. The unit was in cold shutdown at the end of the inspection period.

### Nuclear Regulatory Commission (NRC) Staff Activities

#### Inspection Activities

The NRC conducted inspection activities during normal, backshift, and deep backshift hours. In addition to the inspection activities completed by the resident inspectors, regional specialists conducted inspections and reviews in the areas of physical security and NMP2 operator requalification. The results of the specialist inspections are contained in the applicable sections of this report.

#### Updated Final Safety Analysis Report Reviews

While performing the inspections discussed in this report, the inspectors reviewed the applicable portions of the Updated Final Safety Analysis Report (UFSAR) related to the areas inspected. The inspectors verified that the UFSAR wording was consistent with the observed plant practices, procedures and/or parameters, with the exception of the main steam line break high flow setpoint described in Section O2.1 of this report. Since the UFSAR does not specifically include security program requirements, the inspectors compared licensee activities to the NRC-approved physical security plan, the applicable document.



## I. OPERATIONS

### O1 Conduct of Operations (71707)<sup>1</sup>

#### O1.1 General Comments

Using NRC Inspection Procedure 71707, the resident inspectors conducted frequent reviews of ongoing plant operations to verify that the units were operated safely and in accordance with licensee procedures and regulatory requirements. The reviews included tours of both accessible and normally inaccessible areas of both units, verification of engineered safeguards features (ESF) system operability, verification of adequate control room and shift staffing, verification that the units were operated in conformance with technical specifications, and verification that logs and records accurately identified equipment status or deficiencies. In general, the conduct of operations was professional and safety-conscious; specific events and noteworthy observations are detailed in the sections below.

#### O1.2 NMP2 Reactor Shutdown to Repair Reactor Recirculation Flow Control Valve

##### a. Inspection Scope

The inspectors assessed the licensee's actions in response to a reactor recirculation system (RCS) flow control valve (FCV) malfunction. The assessment included a review of the station shift supervisor's (SSS) logs, applicable procedures and technical specifications (TS), and discussions with the operators on-duty during the event. The inspectors observed control room activities during the subsequent reactor shutdown, including a review of the applicable procedures and the performance of required surveillance testing.

##### b. Observations and Findings

On November 4, at 7:48 a.m., the "A" RCS FCV locked-up, as designed, in response to a rapid change in valve position indication. Although no actual change in recirculation flow occurred, the indicated FCV position changed from approximately 65% to 44% open. Subsequently, the "A" FCV drifted closed slightly, and operators took actions, in accordance with approved procedures, to hydraulically lock the valve in place. After stabilizing plant conditions, the operators evaluated the unexpected equipment failure with respect to ongoing and scheduled maintenance, in accordance with Title 10 of the Code of Federal Regulations Part 50.65 (10 CFR 50.65), "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," (the Maintenance Rule). Certain ongoing activities were secured and other scheduled activities were postponed.

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<sup>1</sup> Topical headings such as O1, M8, etc., are used in accordance with the NRC standardized reactor inspection report outline. Individual reports are not expected to address all outline topics. The NRC inspection manual procedure or temporary instruction (TI) that was used as inspection guidance is listed for each applicable report section.





At no time during the event did the recirculation loop flow mismatch exceed TS limits. NMPC's initial troubleshooting determined the problem was associated with the valve position feedback loop, located within the drywell; this required a plant shutdown to repair. Based on the inspectors' review of the event, operator actions were appropriate and in accordance with licensee-approved procedures, the TSs, and the Maintenance Rule.

At 9:49 a.m., on November 5, operators commenced lowering reactor power. Since the "A" RCS FCV was locked in position, operators reduced power by inserting control rods. The operators reduced power to 55% and, at 4:59 p.m., they manually scrammed the reactor to complete the shutdown. The inspectors observed the control room activities during the shutdown and considered the operators' efforts to be well coordinated, and the assistant station shift supervisor's (ASSS) command and control to be good.

The shutdown was completed without incident; however, when the operators reset the scram, a radiation protection (RP) technician identified contaminated water leaking from the overhead onto the floor of the bottom elevation in the reactor building. RP technicians immediately established boundaries for the contaminated area, and decontamination efforts were still in progress at the close of this inspection period. The licensee documented this in Deviation/Event Report (DER) 2-97-3083. According to NMPC, this has occurred previously when, after resetting a scram, contaminated water from the scram discharge volume splashed out of the reactor building drain cooler vent line during drain-down. The inspectors considered this issue unresolved pending further inspection of the event, including a review of previous licensee actions to correct this condition. (URI 50-410/97-11-01)

c. Conclusions

The operators' response to the NMP2 reactor recirculation system flow control valve lock-up was appropriate. The control room activities during the subsequent shutdown were well-coordinated, with good command and control. The leaking of contaminated water from the scram discharge volume, following a scram reset, is a repetitive problem. (URI)

O2 **Operational Status of Facilities and Equipment (71707)**

O2.1 Engineered Safety Feature Walkdown of the NMP1 Control Rod Drive Housing Support and the Main Steam Line Flow Restrictor

System Descriptions

The NMP1 control rod drive (CRD) housing support, commonly referred to as "shootout steel," is a structure below the reactor vessel and consists of horizontal beams placed between the rows of CRD housings. The criteria for design of the CRD housing support system are: (1) to absorb the dynamic loading resulting from a complete instantaneous circumferential failure of a single CRD housing and to limit the resulting control rod ejection; (2) to provide clearance between the housing



support grid plates and the housings to prevent contact due to their respective expansions; and (3) to allow access to and removal of CRD mechanisms, position indicators, and in-core housings for maintenance and inspection.

The NMP1 main steam line (MSL) flow restrictors are located in each MSL between the reactor vessel and the inboard main steam isolation valves (MSIV). In the event of a complete severing of a MSL outside of primary containment, the flow restrictors serve: (1) to limit the loss of coolant inventory, such that reactor vessel water level will not lower to the point where core cooling will be ineffective; 2) to reduce the amount of moisture carryover before closure of the MSIVs; and (3) to reduce the possibility of forming water slugs of high velocity in the steam line.

a. Inspection Scope

The inspectors performed a visual inspection (walkdown) of the NMP1 CRD housing support and MSL flow restrictor piping and instrumentation to assess material condition and evaluate the ability of each system to perform the intended function. Walkdown results were discussed with the respective system engineers. The inspectors reviewed the applicable sections of the NMP1 UFSAR and TSs. The inspectors also reviewed completed MSL flow restrictor calibration data for the last year and discussed the results with instrument and control (I&C) supervision (see Section M8.1).

b. Observations and Findings

The overall material condition of the both systems was very good. The inspectors examined the CRD housing support assembly with the system engineer. The structure appeared sound and capable of performing its design function. The inspectors independently measured the "cold" gap between the CRD housing support and CRD mechanisms, and identified no discrepancies.

The accessible portions of the MSL flow restrictors included instrument lines and associated pressure instrumentation both inside and outside the drywell (DW). The instrument lines were adequately supported, and the pressure instrumentation was well-maintained.

The inspectors reviewed the NMP1 UFSAR with respect to the MSL flow restrictors (venturis) and a MSL break event. The NMP1 UFSAR, Chapter XV, "Safety Analysis," Section 1.2.1, discusses a MSIV closure initiation in the event of a MSL break outside of the DW. The inspector determined, based on discussions with control room operators and a review of I&C calibration procedures, that the pressure differential across the venturi varies from 55 to 70 pounds per square inch (psi) during full power operation. The UFSAR states that (1) if the break occurred close to the reactor, the pressure differential would increase by at least 400 psi; and (2) if the break occurred close to the turbine, the differential pressure increase would be slightly higher than 20 psi. The UFSAR, Section VIII, "Instrumentation and Control," states that the MSIV closure setpoint from high flow was to be less than 105 psid, TS Table 3.6.2b specifies a setpoint of less than or equal to 105 psid.



The I&C calibration procedures require the setpoint to be  $102 \pm 2$  psid. The inspectors questioned whether a MSL break near the turbine would cause an automatic isolation signal for MSIV isolation, since the high differential pressure setpoint may not be reached. The inspectors discussed the concern with the system engineer, who initiated DER 1-97-2981. This issue will remain unresolved pending completion of NMPC's engineering evaluation and subsequent NRC review. (URI 50-220/97-11-02)

c. Conclusions

Material condition of the NMP1 control rod drive housing support and main steam line flow restrictor piping and instrumentation was very good. The inspectors identified a potential inconsistency in the NMP1 UFSAR with respect to the MSL high flow setpoint. (URI)

O2.2 NMP1 Drywell Inspection

a. Inspection Scope

The inspectors conducted a thorough tour of the drywell (DW), an area normally inaccessible during power operation.

b. Observations and Findings

The inspectors, accompanied by an RP technician, toured all accessible levels of the NMP1 DW; overall material condition of components appeared good. The inspectors identified leakage under the reactor vessel from one of the CRDs. The inspectors discussed the leakage with the CRD system engineer. The system engineer noted the leakage was about one drop every five minutes and was from a CRD flange. The system engineer stated that the leakage was not uncommon during cold shutdown conditions; in addition, he issued a problem identification (PID) report to evaluate the leakage and to initiate any needed repairs prior to reactor startup.

The inspectors also identified two snubbers which appeared to have insufficient oil in the reservoir. The inspectors questioned NMP1 maintenance and system engineering department staff about the operability of the snubbers. The system engineer stated any amount of oil present in the reservoir, if it covered the discharge port, maintained the snubber operable. This was confirmed by the inspectors through a review of the applicable technical manual and NMP1 maintenance surveillance Procedure N1-MSP-GEN-353, "Snubber Visual Inspection." NMP1 maintenance personnel subsequently inspected all DW snubbers and determined that all were operable; however, the licensee identified four additional snubbers having either low oil levels or worn o-rings, and all six snubbers were subsequently repaired prior to reactor startup.



c. Conclusions

Overall material condition of components within the NMP1 drywell was good.

O5 Operator Training and Qualification (71001)

O5.1 Unit 2 Licensed Operator Requalification Training Program

a. Inspection Scope

The inspectors evaluated the NMP2 licensed operator requalification training (LORT) program using NRC Inspection Procedure 71001, "Licensed Operator Requalification Program Evaluation." The inspectors evaluated the adequacy of the annual operating test and biennial written exams, and the administration of the exams to one staff crew and one operating crew using NUREG 1021, "Operator Licensing Examination Standards for Power Reactors." In addition, the inspectors reviewed the procedures for maintenance and activation of operator licenses and verified that the requirements to reactivate inactive licenses were met. Administrative procedures and documents associated with the training program and its implementation were also reviewed.

b. Observations and Findings

The inspectors reviewed simulator scenarios written and administered by the NMP2 staff during the week of the inspection. The inspectors also reviewed six written annual exams administered during this examination cycle. The inspectors concluded that the scenarios and written exams met the guidelines established in NUREG 1021. The inspectors noted that the level of difficulty of the written exams was good, which was an improvement since the level of exam difficulty was considered a weakness by the NRC during the last examination cycle at NMP1 (May - June 1997).

The job performance measures (JPMs) met the guidelines in NUREG 1021. However, the inspectors identified that the NMP2 exam bank contained a limited number (5) of faulted/alternate path JPMs. Through discussions with NMP2 training staff, it was determined that this was due to an overly restrictive interpretation of the NUREG 1021 guidance for such JPMs.

The inspectors concluded that the two sample plans developed by NMP2 for the exams administered during the week of the inspection provided appropriate sampling of the material taught throughout the two year training cycle.

The inspectors observed the administration of operating exams (scenarios and JPMs) to one operating crew and one staff crew. The operating exam consisted of 2 or 3 scenarios for each crew and 5 JPMs for each crew member. Exam administration was generally good. The evaluations were objective and thorough. The inspectors agreed with the facility evaluators' assessments.





Operator performance in the simulator portion of the operating exam was generally good. One individual failed the simulator portion for failing to correctly secure containment spray. The operator was directed by the ASSS to terminate containment spray when containment pressure was reduced below 1.68 pounds per square inch gauge (psig). The operator secured containment spray at 1.8 psig, which was contrary to direction and in violation of the emergency operating procedure requirements. The NMP2 evaluators did not fail the crew, since the operator acted independently and other crew members did not have an opportunity to correct the operator before he acted. The inspectors agreed with this evaluation.

Performance of both crews was good in event recognition and diagnosis, understanding and interpreting alarms, board manipulations, TS usage, and event classification. However, the inspectors noted that both crews were weak in communications and command. Examples included:

- the operating crew ASSS was unaware that some activities he directed to one reactor operator (RO) had been completed by a different RO on the crew;
- during transient conditions the operating crew conducted simultaneous conversations which could have caused confusion;
- during one staff crew scenario, the RO given the responsibility of tracking and trending level indication during an anticipated transient without scram (ATWS) did not coordinate well with another RO who was controlling feedwater flow.

Assignment of crew responsibilities was weak, in that an extra RO on-shift was not well utilized to assist in maintaining an overall awareness of plant conditions during the operating crew evaluation. In addition, during one scenario by the operating crew, the SSS briefs were at times ineffective; in that, the crew was not fully attentive due to talking on the phones or reading procedures during the briefs.

Written exam performance was satisfactory for the first two weeks of this exam cycle. One RO failure occurred. Performance on JPMs was mixed. Operators were unable to locate the tools and procedures for the emergency restoration of the uninterruptable power supply. Additionally, another operator failed to properly synchronize the emergency diesel generator to the grid during a simulator JPM. The NMP2 evaluator determined that the failure was due to improper self-checking; the inspectors agreed with this conclusion.

The inspectors reviewed management observation critiques/feedback reports for 1996 and 1997. The critiques generally provided objective feedback that was both positive and self-critical, with recommendations for improvement. The inspectors also reviewed end-of-cycle training reports, which were concise and covered areas of importance to the requalification program. The reports indicated that a high percentage of operators completed the necessary training by the end-of-cycle.



Reports covered missing training, areas for improvement, corrective actions taken, and scheduled physicals examinations. Simulator deviation reports (DRs) were reviewed for the previous two years. The problems identified were resolved in a timely manner with appropriate management input; few open items existed at the time of the inspection.

The inspectors reviewed a sample of remediation records for individuals and crews who had failed weekly and annual exams, and determined that this area has remained strong. The remediation packages were thorough and appropriate for the weaknesses demonstrated. When an annual test was failed, the remediation program included a record review of all previously identified weaknesses for the entire 2-year training cycle for that operator or the crew, which resulted in the generation of a comprehensive training and testing remedial program. The inspectors concluded that NMPC evaluators and management were objective in their evaluation of individuals and crews, and did not appear to be reluctant to consider remediation when performance did not meet expectations.

The inspectors noted that the remediation exams administered to two individuals who had failed the 1996 annual written exam contained 30% (9 of 30) of the exam questions that were on the original 1996 exam. The inspectors considered this a poor practice, but noted that it did not violate NMPC guidelines.

The inspectors reviewed security measures taken by the facility for exam development and administration and concluded that programmatic controls were satisfactory, with no indications of exam compromise.

The inspectors reviewed NMP2's programmatic controls for maintaining an active license and for reactivating a license, as required by 10 CFR 55.53. The inspectors reviewed various training attendance records, examination grades, operations records and logs, and biennial medical records. In addition, records were reviewed for ten individuals who re-activated their licenses in the past year. No weaknesses or problems were identified. The inspectors determined that controls for maintenance and reactivation of operator licenses were good and biennial physical examinations were performed as required.

c. Conclusions

Overall, the inspectors concluded that the NMP2 operator training requalification program was effective. The remedial training program has remained strong. Management oversight appeared to be meaningful and effective. The level of difficulty of the written examinations was considered good, which was considered an improvement since the level of difficulty of written examinations administered during the last examination cycle at NMP1 (May-June 1997) was a weakness. JPMs were acceptable, but there was limited use of faulted/alternate path JPMs. Exam administration was generally good. The inspectors generally agreed with the facility evaluators' assessments, which were objective and thorough.



Operator exam performance was generally good; however, communications and command/control were noted weaknesses. Performance in the areas of event recognition and diagnosis, understanding and interpreting alarms, board manipulations, TS usage, and event classification was good.

O5.2 (Updated) IFI 50-220/97-04-04: Weaknesses in the NMP1 Licensed Operator Regualification Training Program

a. Inspection Scope

The inspectors previously noted weaknesses in the NMP1 licensed operator requalification training (LORT) program, in that the written exam level of difficulty was low, the reliability of the control rod position indication system in the simulator was degraded to the extent that it could negatively affect training, and NMP1 did not have specific procedural guidance for determining that the reactor is shutdown under all conditions. The inspectors reviewed NMP1's corrective actions to address the NRC's concerns.

b. Observations and Findings

The inspectors verified that the simulator had been upgraded to modify the electrical connections and correct the rod position indication problem. Additionally, procedural changes were made to ensure that all simulator minor maintenance was documented to maintain management awareness.

The inspectors reviewed a draft administrative procedure for written exam development, designed to provide more specific guidance for written exam preparation and to resolve weak management oversight previously identified for written exam development. The inspectors concluded that once this procedure is issued, better guidance should be available for preparing written exams; however, close management review and oversight will be necessary to ensure improvements are made.

The inspectors noted that the reactor scram procedure (N1-SOP-1) was revised in August 1997 to provide procedural guidance to determine when the reactor is shutdown. The guidance is similar to that contained in the NMP2 reactor scram procedure.

c. Conclusions

The actions taken to address weaknesses in the NMP1 LORT program appear appropriate. However, this item will remain open until the new administrative procedure for written exam development is issued and the ongoing exam bank upgrade is sufficiently completed (scheduled completion June 30, 1998) and reviewed by the NRC.



## II. MAINTENANCE <sup>2</sup>

### M1 Conduct of Maintenance (61726, 62707)

#### M1.1 General Comments

Using NRC Inspection Procedures 61726 and 62707, the resident inspectors periodically observed plant maintenance activities and the performance of various surveillance tests. As part of the observations, the inspectors evaluated the activities with respect to the requirements of the Maintenance Rule, as detailed in Title 10 of the Code of Federal Regulations, Part 50.65 (10 CFR 50.65). In general, maintenance and surveillance activities were conducted professionally, with the work orders (WOs) and necessary procedures in use at the work site, and with the appropriate focus on safety. Specific activities and noteworthy observations are detailed in the inspection report. The inspectors reviewed procedures and observed all or portions of the following maintenance/surveillance activities:

- N1-ISP-001-026 Main Steam High Flow Instrument Trip Channel Test/Calibration
- N1-ISP-001-126 Main Steam Line Break Instrument Trip Channel Calibration
- N2-OSP-NMS-@004 APRM Gain Adjustment
- N2-OSP-SWP-Q002 Service Water Pump and Valve Operability Test
- N2-OSP-SWP-Q004 Division 2 Service Water Operability Test
- N2-OSP-EGS-M@001 Diesel Generator and Diesel Air Start Valve Operability Test - Division I and II
- WO 97-12351-00 N2-MPM-HVK-U557 Control Building Chiller PM - Annual Inspection of Chiller
- WO 97-12351-01 Replace Condenser Tubes on Chiller

#### M1.2 NMP1 Forced Outage and Emergency Cooling Condenser Repairs

##### a. Inspection Scope

During the NMP1 forced outage to repair tube leaks in the four emergency cooling (EC) condensers, the inspectors monitored the repair activities, met with licensee management, attended meetings related to outage activities, and conducted tours of facility areas normally inaccessible during power operation.

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<sup>2</sup> Surveillance activities are included under "Maintenance." For example, a section involving surveillance observations might be included as a separate sub-topic under M1, "Conduct of Maintenance."





b. Observations and Findings

During the inspection period, NMPC management evaluated various options for repairing the tube leaks identified in the four EC condensers at NMP1. The option selected was replacement of all four tube bundles and hemiheads. The tube bundles were ordered, with receipt of the first tube bundle scheduled for late November. The inspectors considered tube bundle replacement to be the most conservative option.

The inspectors discussed the tube failures with the NMP1 Engineering Manager. The preliminary root cause evaluation indicated that the failure mechanism was the result of thermal cycling, caused by leakage through the EC condensate return isolation valves. Due to piping configurations, the leakage allowed steam void formation in the upper portions of the inlet hemihead. By design, the inlet hemihead should be completely filled with water. The NMP1 Engineer Manager indicated that this steam/water mixture in the upper tubes created the thermal cycling effect. To address the thermal cycling effect, the licensee was considering installation of a keepfull line, to be installed prior to plant startup, to maintain an adequate water level in the inlet hemihead and piping. The inspectors considered the failure mechanism described by the Engineering Manager to be reasonable, and the need to eliminate the thermal cycling effect to be prudent.

The inspectors discussed with the NMP 1 Outage Manager the additional major work items to be completed during the outage. The Outage Manager informed the inspectors that the following additional work had been, or would be, completed, prior to plant startup:

- repairs to reduce seat leakage past #12 feedwater flow control valve
- numerous valve repacks within the drywell
- hydraulic control unit repairs
- reactor water cleanup system repairs
- motor refurbishment on #11 and #13 feedwater booster pump motors

The inspectors observed management and work control meetings where work prioritizing was discussed. The licensee maintained an appropriate safety focus during the prioritization of work. Due to an earlier than initially expected delivery date for the new tube bundles, NMP1 significantly decreased the forced outage duration. The inspectors reviewed the resulting change in the work scope and considered the work items proposed for deletion had no safety consequence.

c. Conclusions

The inspectors considered that the NMP1 emergency condenser tube bundle replacement appeared to be the most conservative repair option. In addition, the determination that the tube failure was due to thermal cycling appeared reasonable. The forced outage work scope was adequately managed and appropriately safety-focused.



**M4 Maintenance Staff Knowledge and Performance (61726)****M4.1 NMP2 Service Water System Pump and Valve Operability Test****a. Inspection Scope**

The inspectors observed performance of the NMP2 Division II service water system pump and valve quarterly surveillance tests. The inspectors reviewed the relevant surveillance test procedures, observed the pre-test brief, and observed testing activities performed in the service water pump bay and the Unit 2 control room.

**b. Observations and Findings**

Operations and maintenance personnel performed a quarterly surveillance test of the NMP2 Division II (B, D and F) service water pumps (SWPs) and associated valves. The tests were performed using operations Procedures N2-OSP-SWP-Q002, "Service Water Pump and Valve Operability Test," and N2-OSP-SWP-Q004, "Division 2 Service Water Operability Test." Prior to beginning the test, the ASSS briefed operations and maintenance personnel on precautions to be taken, prerequisites to be completed, and the details of sequencing pumps during testing. The ASSS provided guidance on the proper methods of stroke-timing valves and on the role of the independent verifier.

In the SWP bay, the inspectors observed stroke-timing of the "F" strainer backwash valve (SWP\*MOV1F) and diagnostic testing of the "B" and "D" SWPs. Diagnostic testing included video infrared thermography and full spectrum vibrational measurements. The inspectors observed that the I&C technicians adhered to procedures, and that test instrumentation was within calibration periodicity. The technicians and control room operators used clear communications, with expected repeat backs.

In the control room, the inspectors observed stroke-timing of the "D" SWP discharge valve (SWP\*MOV74D). The inspectors observed good self-checking by the operators, the correct control switch was independently verified by a second operator, three-way communications were used, and verbal communications stating anticipated system response and actual valve position were clear. Good coordination between individual operators recording valve opening and closing times was also evident. Upon test completion, operators independently verified the proper position of all Division II discharge valves. The inspector reviewed the completed surveillance procedures and confirmed that test results were satisfactory.

**c. Conclusions**

NMP2 service water system surveillance tests were performed in a controlled manner and the equipment tested met the acceptance criteria. The ASSS effectively coordinated the testing activities and provided a detailed pre-test brief. Operators and technicians consistently used clear three-part communications and closely adhered to the test procedures.



**M8 Miscellaneous Maintenance Issues (92700, 92902)****M8.1 (Update) VIO 50-220 & 50-410/97-06-01: Multiple Examples of Failure to Follow Procedures****a. Inspection Scope**

During the inspection period, the inspectors identified two additional examples of licensee failure to adequately follow procedures. During the NMP2 shutdown discussed in Section O1.2, the inspectors identified that during an average power range monitoring (APRM) gain adjustment, the incorrect APRM had been adjusted. In conjunction with the ESF walkdown discussed in Section O2.1, the inspectors reviewed completed MSL flow restrictor calibration data for the last year and discussed the results with instrument and control (I&C) supervision.

**b. Observations and Findings****NMP2 APRM Gain Adjustment**

As part of the NMP2 reactor shutdown on November 5, the licensee was required to adjust the gain of the APRM to compensate for full-power-adjusted-power-density-ratio (FPADPR) being greater than 1.0. Reactor engineering staff performed the APRM gain adjustment in accordance with Procedure N2-OSP-NMS-@004, "APRM Gain Adjustment," Revision 00. After determining the desired gain and obtaining permission from the ASSS, the reactor engineer requested the chief station operator to bypass APRM "B," in accordance with step 8.3.9.a of the procedure. With APRM "B" in bypass, the reactor engineer, with the shift technical advisor (STA) as an independent verifier, inadvertently adjusted APRM "A" instead of APRM "B." Upon completion of the gain adjustment, the inspectors noted that the incorrect APRM had been adjusted, and informed the STA of the error; the STA immediately stopped the work and notified the ASSS and SSS. The SSS counseled the individuals involved and allowed them to finish the task, which was completed without further incident. A DER was written to evaluate the event.

Although the adjustment of the wrong APRM did not adversely impact the plant, it indicated a lack of attention to the task at hand by both the reactor engineer and the STA. The failure to follow procedures has been a recurring problem at Nine Mile Point; furthermore, some of the previously cited issues were specifically related to work being performed on the wrong equipment. The inspectors considered that this additional example of failure to follow procedure caused by personnel inattention-to-detail, indicates corrective actions have not been fully effective or implemented. Management attention is still warranted in the area and this example will be an update to Violation 50-410/97-06-01.



### NMP1 Main Steam Line Flow Restrictor Calibration Review

The inspectors reviewed MSL high flow instrument channel calibration and instrument channel checks performed during the past year. The surveillance tests included Procedures N1-ISP-001-026, "Main Steam High Flow Instrument Trip Channel Test/Calibration," Revision 02, and N1-IS-001-126, "Main Steam Line Break Instrument Trip Channel Calibration," Revision 01. The surveillance tests were performed within required frequency, and the completed test results were satisfactory and received timely supervisory review. However, the inspectors identified discrepancies associated with a March 14, 1997, surveillance test, and discussed the issue with an I&C supervisor. Specifically, N1-IS-001-126, Attachment 4, Step 7.3.1.b, required the I&C technician to confirm the status of a control room annunciator, based upon the position of the reactor mode switch. The reactor mode switch position at the time of the calibration was in REFUEL, but the technician "checked" the box for an annunciator condition had the reactor mode switch been in RUN. The subsequent step reflected the annunciator condition with the reactor mode switch in REFUEL or SHUTDOWN.

The inspectors noted that Step 7.3.1.b, as written, appeared to be in error, as compared with the other seven attachments; this was subsequently confirmed by the I&C supervisor. The supervisor informed the inspectors that a 1995 procedure change evaluation (PCE) failed to modify Step 7.3.1.b of Attachment 4; the inspectors reviewed the PCE and agreed with the supervisor's conclusion. The supervisor issued a DER (1-97-2989) to address the deficiency. The inspectors considered I&C supervisions' inadequate development and review of the 1995 PCE a weakness. The I&C technician's failure to properly perform the procedural step in March 1997, and an inadequate supervisory review of the 1997 completed surveillance test results are additional examples of procedural violations resulting from personnel inattention-to-detail. As such, these examples are additional failures to follow procedure, and will be an update to Violation 50-220/97-06-01.

#### c. Conclusions

The inspectors identified that an NMP2 reactor engineer, with shift technical advisor peer verification, performed an APRM gain change on the incorrect channel. Additionally, the inspectors considered that a 1995 procedure change evaluation for the NMP1 main steam break instrument trip channel calibration to be weak, in that the evaluation was incomplete and received an inadequate supervisory review. The inspectors identified that an NMP1 I&C technician failed to identify a procedure error and inappropriately performed a step in a technical specification required calibration procedure, and this error was not identified during supervisory review.





### III. ENGINEERING

#### E1 Conduct of Engineering (37551)

##### E1.1 General Comments

Using NRC Inspection Procedure 37551, the resident inspectors frequently reviewed design and system engineering activities, including justifications for operability determinations, and the support by the engineering organizations to plant activities.

#### E7 Quality Assurance in Engineering Activities (37551)

##### E7.1 NMPC Self-Assessment of Procurement Activities

###### a. Inspection Scope

The inspectors reviewed the report of NMPC's self-assessment of procurement activities.

###### b. Observations and Findings

NMPC conducted a self-assessment of the procurement department to determine if the requirements of the Nuclear Division Directives (NDDs) had been incorporated into lower tier procedures, and if the procedure requirements were being properly implemented. The self-assessment determined that all procurement procedures were in accordance with the requirements of the NDDs, although several of the procedures could be improved. In addition, the assessment concluded that implementation of the procedure requirements, while generally acceptable, indicated a need for improvement in attention-to-detail and work practices. Many personnel in the department were unclear or unaware of the concept of self-checking when completing tasks.

The inspectors reviewed the DERs generated as a result of the assessment and noted that they were mainly administrative in nature. The assessment appeared in-depth and critical, with several good recommendations for improvement.

###### c. Conclusion

NMPC's self-assessment of procurement activities was critical and in-depth, areas noted as needing improvement were personnel attention-to-detail and self-checking.



**E8 Miscellaneous Engineering Issues (90712, 92700, 93903)****E8.1 (Closed) LER 50-410/97-11: Technical Specification Violation of APRM Testing Requirements****a. Inspection Scope**

The inspectors reviewed the details associated with Licensee Event Report (LER) 50-410/97-11 and the applicable DER. The issues related to the event were discussed with the ASSS, system engineers and the NMP2 Maintenance Manager. In addition, the inspectors reviewed the LER to verify completion in accordance with 10 CFR 50.73.

**System Background**

NMP2 has six APRM channels: A, B, C, D, E and F. Channels A and C input to trip system "A" logic channels A1 and A2, respectively; and channel E inputs to both trip system "A" logic channels A1 and A2. Channels B and D input to trip system "B" logic channels B1 and B2, respectively; and channel F inputs to both trip system "B" logic channels B1 and B2.

**b. Observations and Findings**

On September 12, 1997, during the design review for a neutron monitoring system modification, NMP2 system engineering identified that the technical specification surveillance requirements (TSSR) for APRMs E and F were not being met. Specifically, procedures for the NMP2 TSSR channel calibration and function test (TSSR 4.3.1.1-2.a, 4.3.1.1-2.b, 4.3.1.1-2.c), logic system functional test (TSSR 4.3.1.2), and response time testing (TSSR 4.3.1.3) for APRM channels E and F did not contain steps to test the individual trip systems. The inspectors considered the eventual identification of the missed TSSRs indicated a good questioning attitude. However, the failure to perform these surveillance tests is a violation of the applicable TSSRs. (VIO 50-410/97-11-03)

Upon identification of the missed TSSRs, the licensee declared APRM channels E and F inoperable. The applicable procedures were revised and the TSSRs were completed satisfactorily within the time allowed by the TS action statement. The inspectors discussed the issue with the ASSS on duty when the issue was identified, and reviewed the applicable DER (2-97-2673) and considered the approach to resolve the problem to be sound. The results of the surveillance test indicated that both trip systems for APRMs E and F were within specification. In addition, even if the previously untested trip systems would have been found out-of-specification, the neutron monitoring system would have performed the intended safety function due to the robust system design.



The inspectors verified that the LER was completed in accordance with the requirements of 10 CFR 50.73. Specifically, the description and analysis of the event, as contained in the LER, were consistent with the inspectors' understanding of the event. The root cause and corrective and preventive actions as described in the LER were reasonable. This LER is closed.

c. Conclusion

The discovery by NMP2 system engineers of missed TSSRs for APRMs indicated a good questioning attitude; however, the failure to perform these surveillance tests is a violation of the applicable TSSRs. (VIO)

E8.2 (Closed) LER 50-410/97-09: Missed Technical Specification Surveillance of the Control Room Envelope

a. Inspection Scope

The inspectors reviewed the details associated with LER 50-410/97-09 and the applicable DER. The issues related to the event were discussed with the NMP2 Plant Manager. In addition, the inspectors reviewed the LER to verify completion in accordance with 10 CFR 50.73.

b. Observations and Findings

On August 27, 1997, during the design review for the transition to integrated TSs, a good questioning attitude allowed NMPC to identify that an NMP2 TSSR for the control room outside air special filter train system (CRSFTS) was not being met. Specifically, NMP2 TSSR 4.7.3.e.2 requires that the CRSFTS maintain the control room at a positive pressure of 1/8 inch water gauge (WG), but the procedure did not include testing of the control building relay room, which is part of the control room envelope, as described in the NMP2 UFSAR. In addition, NMPC determined that procedures failed to test the redundant air-conditioning units in the required lineups. These procedural deficiencies resulted in a violation of NMP2 TSSR 4.7.3.e.2. (VIO 50-410/97-11-04)

Upon identification of the missed TSSR, the licensee declared both divisions of the CRSFTS inoperable. The applicable procedure was revised, and the surveillance test was completed satisfactorily. During performance of the revised surveillance test, the Division II special filter train successfully met the TSSR acceptance criteria; however, Division I initially failed to meet the acceptance criteria. Subsequently, the licensee adjusted a damper within the CRSFTS and retested both divisions satisfactorily. The purpose of maintaining the control room envelope at a positive pressure is to prevent infiltration of radioactivity or other harmful gases into the control room environment. Even though Division I initially failed to meet the



acceptance criteria, it did maintain the control room envelope at a positive pressure. The equipment was returned to an operable status within the time allowed by the applicable TS action statements. The inspectors discussed the issue with the NMP2 Plant Manager and reviewed the applicable DER and considered the licensee approach to resolve the problem to be sound.

The inspectors verified that the LER was completed in accordance with the requirements of 10 CFR 50.73. Specifically, the description and analysis of the event, as contained in the LER, were consistent with the inspectors' understanding of the event. The root cause and corrective and preventive actions as described in the LER were reasonable. This LER is closed.

c. Conclusion

The discovery of the missed TSSR for NMP2 control room outside air special filter train system indicated a good questioning attitude. However, surveillance test procedure deficiencies resulted in a violation of NMP2 TSSR. (VIO)

E8.3 (Closed) LERs 50-220/97-08 and 50-410/97-10: Non-Conservative APRM Gain Adjustments Result in Technical Specification Violation

a. Inspection Scope

The inspectors reviewed the details associated with LERs 50-220/97-08 and 50-410/97-10. The issues related to the event were discussed with the NMP1 reactor engineering supervisor and the reactor engineering technician conducting the gain adjustments. In addition, the inspectors reviewed the LER to verify completion in accordance with 10 CFR 50.73.

b. Observations and Findings

During a NMP2 reactor startup on August 11, 1997, the SSS questioned a reactor engineering technician regarding APRM gain setting adjustments. The reactor technician was performing APRM gain adjustments in accordance with an approved procedure; however, the procedural steps governing the gain adjustments did not agree with the TSSRs. The inspectors considered the oversight and questioning attitude of the SSS to be very good.

The licensee's root cause evaluation attributed the procedure deficiency to an inadequate technical review during procedure revisions. Personnel incorrectly applied the  $\pm 2\%$  tolerance provided in TS (Table 4.3.1.1-1, Note g) when setting the APRMs for core maximum fraction of limiting power density (CMFLPD), as required by TS 3.2.2. The TS 3.2.2 required gain adjustment was to be made such that the APRM readings were greater than or equal to 100% times CMFLPD. The licensee noted that the procedure deficiency had existed since May 1987, and that several violations had occurred since that time.





On August 20, 1997, as a result of the NMP2 issue, the NMP1 reactor engineering supervisor concluded that several past instances had occurred where NMP1 TSs had not been complied with during reactor startup and other power maneuvers. Specifically, personnel did not adjust APRM gain settings in accordance with NMP1 TS 2.1.2a, due to improper application of TS Table 3/4.6.2a, Note m. On August 28, NMPC determined that a TS violation had also occurred at Unit 1 due to non-conservative APRM gain adjustments.

The inspectors reviewed both LERs and found them to be timely and to accurately describe the event. The inspectors considered both the immediate and long-term corrective actions to be appropriate. Staff at both units completed reviews of procedures associated with the core thermal limit and neutron monitoring TSs, and no further discrepancies were identified. Additionally, the licensee determined that at no time were core thermal limits or transient event analyses challenged by the event. This licensee-identified and corrected violation is being treated as a Non-Cited Violation (NCV), consistent with Section VII.B.3 of the NRC Enforcement Policy. (NCV 50-220/97-11-05 & 50-410/97-11-05)

c. Conclusions

An NMP2 SSS's oversight and questioning attitude was good and resulted in identification of improper average power range monitor gain setting adjustments at both units. The average power range monitor gain setting adjustments had not performed in accordance with the respective technical specifications. (NCV)

E8.4 (Closed) VIO 50-220/96-13-03 & 50-410/96-13-03: Missed Inservice Inspection Augmented Weld Inspections

The inspectors reviewed licensee actions regarding a failure to adequately implement the inservice inspection (ISI) program at NMP1 and NMP2 for piping identified in NRC Generic Letter 88-01, "NRC Position on IGSCC [Intergranular Stress Corrosion Cracking] in BWR [Boiling Water Reactor] Austenitic Stainless Steel Piping." The licensee-provided root cause and corrective actions for the violation, in their February 18, 1997 response to the NRC, appeared appropriate. The inspectors considered the corrective actions at both units to be appropriate, and the actions to prevent recurrence to be adequate. Based upon the inspectors' review, this item is closed.

E8.5 (Closed) LER 50-220/97-09: Technical Specification Violation Due to System Inoperability Caused by Leakage Through Drain Valves

a. Inspection Scope

The inspectors reviewed the details associated with LER 50-220/97-09 and the associated DER. The issues related to the event were discussed with the NMP1 Operations Manager and technical support supervision. In addition, the inspectors reviewed the LER to verify completion in accordance with 10 CFR 50.73.



b. Observations and Findings

On September 3, 1997, during corrective maintenance on the channel 12 reactor water level reference leg continuous backfill system, NMP1 control room staff noticed a disparity between the channel 11 and channel 12 General Electric Measurement and Control (GEMAC) narrow range level instrumentation. The level indications continued to diverge, and the SSS subsequently declared the channel 12 instrumentation and associated systems inoperable, resulting in multiple TS limiting condition for operation (LCO) entries. Specifically, the following systems were declared inoperable:

- the automatic depressurization system (ADS), TS 3.1.5, a 10-hour shutdown LCO;
- the high pressure coolant injection (HPCI) system associated with channel 12, TS 3.1.8, a 15-day shutdown LCO; and
- channel 12 of the fuel zone reactor water level accident monitoring instrumentation TS 3.6.11, a 7-day shutdown LCO.

NMP1 operations and maintenance personnel initially determined that the level divergence was a result of system isolation for scheduled corrective maintenance on the continuous backfill system. The channel 12 GEMAC level divergence corresponded to the backfill system isolation and depressurization. When the maintenance was completed and the backfill system placed back in operation, the level indication returned to normal. The SSS declared the channel 12 GEMAC level instrumentation and associated systems operable, and the LCOs were exited. However, the SSS did request an engineering supporting analysis (ESA) to support the operability decision.

Engineering determined that leakage through valves independent of the backfill system could also have caused the level change. On September 5, thermography performed downstream of the instrument column 12 drain valves revealed slightly elevated temperatures, confirming a potential leakage path. The SSS again declared the channel 12 GEMAC instrumentation and associated systems inoperable and entered the previously mentioned TS LCOs. The drain valves were tightened and the backfill system secured to identify additional leakage. Thermography identified no additional leakage and confirmed system integrity downstream of the drain isolation valves.

Further licensee investigation revealed that the drain valves were last manipulated on May 1, 1997, and that the valves had been verified closed during the pre-startup valve lineup on May 5. The licensee concluded that the drain valve leakage had probably existed since plant startup on May 9, at which time the level instrumentation and associated systems were required to be operable. During normal plant operation, the leakage past these drain valves would be masked by the backfill system, supplied from the control rod drive system, which had always been available. Furthermore, the licensee determined that although the channel 12



GEMAC instrumentation was inoperable due to the leaking drain valves, the system would have performed the associated safety functions as long as the backfill system was operational.

Based on a review of the licensee's evaluation, the inspectors considered that the drain valve leakage, from May 5 through September 5, would not have been readily determinable. The operability determination completed on September 3 was reasonable, and the requested ESA was appropriate and identified the alternate leakage path on September 5. However, the initial operability determination did not probe deep enough into all potential leakage paths. Once the drain valve leakage was identified, the licensee took appropriate actions in the TS-allowable time. Therefore, the inspectors considered that no violation of TSs occurred.

The inspectors reviewed the LER and found it to be timely and to accurately describe the event. Licensee immediate corrective actions were considered appropriate. The inspectors considered the licensee's long-term corrective actions to be sufficient to prevent recurrence. At the end of the inspection period, the inspectors had not completed a thorough evaluation of the licensee's analysis of the event. As such, this issue will remain unresolved pending further inspector followup of the root cause for the event. (URI 50-220/97-11-06)

c. Conclusions

An initial operability determination by NMP1 operations staff for the channel 12 GEMAC level instrumentation was reasonable, but did not probe deep enough into all potential leakage paths. An engineering safety analysis was appropriate and identified the alternate leakage path. Once the drain valve leakage was identified, appropriate actions were taken in the TS-allowable time.

#### IV. PLANT SUPPORT

Using NRC Inspection Procedure 71750, the resident inspectors routinely monitored the performance of activities related to the areas of radiological controls, chemistry, emergency preparedness, security, and fire protection. Minor deficiencies were discussed with the responsible management, significant observations are detailed below. Specialist inspectors in the same areas used other procedures during their reviews of plant support activities; these inspection procedures are listed, as applicable, for the respective sections of the inspection report.

R4 **Staff Knowledge and Performance in RP&C (71750)**

R4.1 Unauthorized Entry into NMP2 High Radiation Area

a. Inspection Scope

An NMPC employee, and three escorted visitors, entered a posted high radiation area (HRA) without approval from the radiation protection (RP) department, as



required by the applicable radiation work permit (RWP). The inspectors reviewed the DER and RWP, and discussed the event with RP management.

b. Observations and Findings

On October 27, 1997, during a plant tour, an NMPC employee escorted three visitors from another nuclear facility into the NMP2 Thermex room, a posted high radiation area. The RWP required personnel to contact the RP department for authorization prior to entry into a HRA. When the individuals were exiting from the radiologically controlled area (RCA), one of the visitors had difficulty in logging out using the electronic dosimetry system. An exposure evaluation was conducted to determine the route taken and the approximate dose received; during this evaluation, it was noted by the NMPC RP technician that they had entered a HRA, but had not received permission. Tracing the route, it was determined that only a small portion of the Thermex room actually met the requirements for a HRA, but NMPC had conservatively posted the entire room as a HRA. In addition, the actual dose rates in the area where the personnel were standing was less than one milliRem per hour (mRem/hr). Following the event, the NMPC individual involved had his authority to enter the RCA withdrawn pending review by NMPC management.

The inspectors discussed the event with the NMP2 RP Manager, and reviewed the RWP and associated DER (2-97-3034); in addition, the inspectors reviewed the dose rates in the Thermex room. NMPC concluded that the individual was inattentive to the postings in the RCA. Failing to adhere to the requirements of RWPs was the issue of a previous NRC violation (see NRC IR 50-410/96-06). The corrective actions from that violation appear to have been adequate, and this event seems to be isolated. Failing to adhere to the requirements of an RWP is a violation 10 CFR 20 and NMPC procedures. However, because the event appears to be isolated and of minimal significance, this is being treated as a Non-Cited Violation in accordance with Section IV of the Enforcement Policy. (NCV 50-410/97-11-07)

c. Conclusion

Inattentiveness to postings within the radiologically control area resulted in an NMP2 employee, and three visitors, entering a posted high radiation area without authorization. (NCV)

S2 Status of Security Facilities and Equipment (81700)

S2.1 Protected Area Detection Aids

The inspectors conducted a physical inspection of the protected area intrusion detection systems (IDSs) to verify that the systems were functional, effective, and met licensee commitments. The inspectors observed the testing of the IDSs, and determined that the IDSs appeared functional and effective, and were installed and maintained as described in the Plan.





## S2.2 Alarm Stations and Communications

### a. Inspection Scope

The inspectors reviewed the Central Alarm Station (CAS) and Secondary Alarm Station (SAS) to determine if they were equipped with appropriate alarm, surveillance and communication capability; continuously manned by operators; and used independent and diverse systems so that no single act could remove the capability of detecting a threat and calling for assistance, or otherwise responding to the threat, as required by NRC regulations.

### b. Observations and Findings

Observations of CAS and SAS operations verified that the alarm stations were equipped with the appropriate alarm, surveillance, and communication capabilities. Interviews with CAS and SAS operators found them knowledgeable of their duties and responsibilities. The inspectors also verified through observations and interviews that the CAS and SAS operators were not required to engage in activities that would interfere with the assessment and response functions, and that the licensee had exercised communication methods with the local law enforcement agencies as committed to in the Plan.

Additionally, the inspectors evaluated the effectiveness of the assessment aids, by observing on closed circuit television, a walkdown of the protected area. The inspectors determined that the assessment aids in both alarm stations had excellent picture quality.

### c. Conclusion

The alarm stations and communications met the licensee's security plan commitments and NRC requirements.

## S2.3 Testing, Maintenance and Compensatory Measures

### a. Inspection Scope

The inspectors reviewed security programs to determine whether they were implemented to ensure the reliability of security related equipment, including proper installation, testing and maintenance to replace defective or marginally effective equipment. Additionally, the inspectors reviewed contingencies for when security related equipment failed, such that compensatory measures put in place were comparable to the effectiveness of the security system that existed prior to the failure.



b. Observations and Findings

The inspectors reviewed testing and maintenance records for security-related equipment and found that documentation was on file to demonstrate that the licensee was testing and maintaining systems and equipment as committed to in the security plan. A priority status was assigned to each work request and repairs were normally completed the same day a work request necessitating compensatory measures was generated; there were no open work requests requiring compensatory measures. The inspectors also noted that the working relationship between security, maintenance, and the I&C departments was excellent.

c. Conclusions

The NMPC intrusion detection systems appeared functional and effective, and were installed and maintained as described in the security plan.

S2.4 Vehicle Barrier System and Bomb Blast Analysis

Background

On August 1, 1994, the NRC amended 10 CFR 73, "Physical Protection of Plants and Materials," modifying the design basis threat for radiological sabotage to include the use of a land vehicle for transporting personnel and their hand-carried equipment to the proximity of vital areas and to include the potential of a land vehicle bomb. The amendments required reactor licensees to install vehicle control measures, including vehicle barrier systems (VBSs), to protect against the malevolent use of a land vehicle. NRC Regulatory Guide 5.68 and NUREG/CR-6190 were issued in August 1994 to provide guidance acceptable to the NRC by which the licensees could meet the requirements of the amended regulations.

A letter from NMPC (dated February 19, 1996) to the NRC forwarded Revision 4 to the Nine Mile physical security plan that detailed the actions taken to meet the requirements of 10 CFR 73.55, Sections (c)(7), (8), and (9), and the design goals of the "Design Basis Land Vehicle" and "Design Basis Land Vehicle Bomb." The NRC responded (May 14, 1996) that the changes had been reviewed and were consistent with the provisions of 10 CFR 50.54(p) and were acceptable for inclusion in the NRC-approved security plan.

a. Inspection Scope

This inspection, conducted in accordance with NRC Inspection Manual Temporary Instruction 2515/132, "Malevolent Use of Vehicles at Nuclear Power Plants," assessed the implementation of the licensee's vehicle control measures, including vehicle barrier systems, to determine if they were commensurate with regulatory requirements and the licensee's physical security plan.



The inspectors reviewed documentation that described the VBS and physically inspected the as-built VBS to verify it was consistent with the licensee's summary description submitted to the NRC. The inspectors also reviewed the licensee's documentation of the bomb blast analysis and verified actual standoff distances provided in the summary description of the as-built VBS.

b. Observations and Findings

The inspectors' walkdown of the VBS and review of the VBS summary description disclosed that the as-built VBS was consistent with the summary description and met or exceeded the specifications in NUREG/CR-6190.

The inspectors' review of the licensee's documentation of the bomb blast analysis determined that it was consistent with the summary description submitted to the NRC. The inspectors also verified that the actual standoff distances provided by their as-built VBS were consistent with the minimum standoff distances calculated using NUREG/CR-6190. The standoff distances were verified by review of scaled drawings and actual field measurements.

c. Conclusion

The inspectors determined that there were no discrepancies in the as-built vehicle barrier system or the vehicle barrier system summary description. In addition, no discrepancies were noted in the documentation of bomb blast analysis or actual standoff distances of the as-built vehicle barrier system.

S8.5 Procedural Controls

a. Inspection Scope

The inspectors reviewed applicable procedures to ensure that they had been revised to include the VBS.

b. Observations and Findings

The inspectors reviewed the licensee's procedures for VBS access control measures, surveillance and compensatory measures. The procedures contained effective controls for passage through the VBS, provided adequate surveillance and inspection of the VBS, and provided adequate compensation for any degradation of the VBS.

c. Conclusions

The inspectors' review of the procedures applicable to the vehicle barrier system disclosed no discrepancies.



**S5 Security and Safeguards Staff Training and Qualification (81700, TI 2515/132)****S5.1 Nine Mile Point Security Training and Qualification****a. Inspection Scope**

Determination whether members of the security organization were trained and qualified to perform each assigned security related job task or duty in accordance with the NRC-approved training and qualification plan.

**b. Observations and Findings**

The inspectors randomly selected and reviewed training and qualification (T&Q) records for ten security force members (SFM). Physical and firearms requalification records were inspected for armed SFMs and security supervisors. The inspectors found that training was conducted in accordance with the T&Q Plan and was properly documented. During discussions with the security training specialist, the inspectors were informed that eight new response weapons were purchased to enhance the licensee's tactical response capabilities. However, the new weapons will not be issued until all SFMs have been properly trained on weapon operability. Additionally, the inspectors interviewed a number of SFMs to determine if they possessed the requisite knowledge and ability to carry out their assigned duties. Based on observations and the response by the SFMs to the inspectors' questions, the training provided by the security training staff was considered effective.

**c. Conclusions**

The inspectors determined that security training had been conducted in accordance with the Training and Qualification Plan and was considered effective.

**S6 Security Organization and Administration (81700)****S6.1 Management Support to the Security Organization****a. Inspection Scope**

The inspectors conducted a review of the level of management support for the licensee's physical security program.

**b. Observations and Findings**

The inspectors reviewed several program enhancements made since the last NRC program inspection, conducted in April 1997. These enhancements included the procurement of eight new security response weapons, implementation of a new badging system, procurement of cellular phones to enhance communications capabilities, and the replacement of a security patrol vehicle.





The inspectors reviewed the Security Manager's position in the organizational structure and reporting chain. The Security Manager reports to the Vice-President Nuclear Safety and Support, who reports to the Executive Vice-President and Chief Nuclear Officer. Additionally, the inspectors noted that the access authorization and fitness-for-duty (FFD) programs, being safeguards related, report directly to the Security Manager.

c. Conclusions

The inspectors determined that management support for the physical security program was effective.

S7 Quality Assurance in Security and Safeguards Activities (81700)

S7.1 Quality Assurance Audits

a. Inspection Scope

The inspectors reviewed the licensee's quality assurance (QA) audit report of the security program to determine if the licensee's commitments, as contained in the security plan, were being satisfied.

b. Observations and Findings

The inspectors reviewed the 1997 combined QA audit (Audit No. 97003) of the security and FFD programs, conducted April 1997. The audit was conducted in accordance with the security plan and FFD rule. To enhance the effectiveness of the audit, the audit team included an independent security specialist.

The audit report identified thirteen DERs: nine DERs against the security program and four against the FFD program. All but one of the DERs involved a failure to adhere to procedural requirements, the other DER involved discrepancies with weapons requalification records. The inspectors determined that the findings were not indicative of programmatic weaknesses. The inspectors determined, based on discussions with security management and FFD staff and a review of the responses to the findings, that the corrective actions were effective.

c. Conclusions

The quality assurance audit report of the security program was comprehensive in scope and depth, the findings were reported to the appropriate levels of management, and the audit program was properly administered.



**S8 Miscellaneous Security and Safety Issues (81700)****S8.1 (Closed) VIO 50-220/97-03-07 & 50-410/97-03-07: Improper Use of Access-Controlled Vehicles**

During a previous security inspection (April 1997), the inspectors determined that designated licensee vehicles were not being controlled as required in the Plan and applicable procedures.

The inspectors concluded that the corrective actions described in the licensee's response (August 11, 1997) to the NRC's Notice of Violation, were reasonable, complete, and appeared to be effective. Based on their review, the inspectors consider this item closed.

**S8.2 (Closed) URI 50-220/96-09-01 & 50-410/96-09-01: Behavioral Observation Program for Unescorted Access not Consistent with Industry Standard**

NMPC's behavioral observation program (BOP) allowed personnel with unescorted access (i.e., badged), but who infrequently enter the Nine Mile site, to be absent for up to 60 days before their access is terminated. This was inconsistent with the standard industry practice delineated in NUMARC 91-03, "Nuclear Power Plant Personnel Access Authorization Data Exchange Guidelines," dated October 1993.

NMPC security personnel changed their current practice to be consistent with NUMARC 91-03, and revised the associated Procedure NIP-SEC-01, "Protected/Vital Area Access," to incorporate the 30 day guidance. Section 3.10 of the procedure requires the badging office terminate personnel access for those who have not been subject to a BOP during the past 30 days. The inspectors had no questions and consider this item closed.

**F2 Status of Fire Protection Facilities and Equipment****F2.1 Breach Permit for Door in NMP2 Radwaste Building Greater than 3 Years Old****a. Inspection Scope**

During a tour of the NMP2 radwaste facility, the inspectors identified that a fire-door was removed in 1994 as part of a temporary modification.

**b. Observations and Findings**

On October 10, 1997, during a plant tour of the radwaste building, the inspectors identified that a fire-door (# RW-291-3) was removed from its hinges and stored inside the room. The breach permit authorizing the removal of the door was dated September 9, 1994, and noted that the door was removed to allow hoses to pass



through the doorway for the Thermex temporary modification. The inspectors questioned (1) whether the door being removed for over three years was considered in the fire hazards analysis, and (2) whether the excessive time was in essence a permanent modification without the requisite safety evaluation performed. NMPC initiated DER 2-97-3089 to investigate the issue.

The inspectors reviewed the procedures controlling breach permits (GAP-FPP-03) and temporary modifications (GAP-DES-03). GAP-DES-03 specifically excludes breach permits and GAP-FPP-03 does not define how long a fire barrier may be breached. The inspectors considered it a weakness that breach permits could be allowed to remain open for excessive lengths of time. Pending NRC's review of the DER disposition, this will be an unresolved item. (URI 50-410/97-11-08)

c. Conclusion

Although a breach permit allowed a fire-door in the NMP2 radwaste facility to be removed, the door had been removed for over three years without being evaluated as a permanent modification. (URI) Furthermore, the licensee procedures were weak, in that the procedures do not prevent this from occurring.

## V. MANAGEMENT MEETINGS

X1 Exit Meeting Summary

At periodic intervals, and at the conclusion of the inspection period, meetings were held with senior station management to discuss the scope and findings of this inspection. The exit meetings for specialist inspections contained within this report were conducted upon completion of their onsite inspection:

Security Program	September 26, 1997
NMP2 Licensed Operator Requalification Program	October 24, 1997

The final exit meeting occurred on November 21, 1997. During this meeting, the resident inspectors' findings were presented. NMPC did not dispute any of the inspectors' findings or conclusions. Based on the NRC Region I review of this report, and discussions with NMPC representatives, it was determined that this report does not contain safeguards or proprietary information.



## ATTACHMENT 1

### PARTIAL LIST OF PERSONS CONTACTED

#### Niagara Mohawk Power Corporation

R. Abbott	Plant Manager, NMP1 (Acting)
D. Barcomb	Manager, NMP2 Radiation Protection
C. Beckham	Manager, Quality Assurance
D. Bosnic	Manager, NMP2 Operations
J. Burton	Director, ISEG
H. Christensen	Manager, Security
J. Conway	Vice President, Nuclear Engineering
G. Correll	Manager, NMP1 Chemistry
R. Dean	Manager, NMP2 Engineering
A. DeGracia	Manager, NMP1 Work Control
S. Doty	Manager, NMP1 Maintenance
K. Dahlberg	Plant Manager, NMP2 (Acting)
G. Helker	Manager, NMP2 Work Control
P. Mazzafero	Manager, NMP1 Technical Support
L. Pisano	Manager, NMP2 Maintenance
R. Randall	Manager, NMP1 Engineering
P. Smalley	Manager, NMP1 Radiation Protection
R. Smith	Manager, NMP1 Operations
R. Tessier	Manager, Training
C. Terry	Vice President, Nuclear Safety Assessment & Support
K. Ward	Manager, NMP2 Technical Support
C. Ware	Manager, NMP2 Chemistry
D. Wolniak	Manager, Licensing

#### INSPECTION PROCEDURES USED

IP 37551	On-Site Engineering
IP 61726	Surveillance Observations
IP 62707	Maintenance Observation
IP 71707	Plant Operations
IP 71750	Plant Support
IP 90712	In-Office Review of Written Reports of Nonroutine Events at Power Reactor Facilities
IP 92700	Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities
IP 92902	Followup - Maintenance
IP 92903	Followup - Engineering
IP 92904	Followup - Plant Support
IP 93703	Prompt Onsite Response to Events at Operating Power Reactors
TI 2515/132	Malevolent Use of Vehicles at Nuclear Power Plants





Attachment 1

ITEMS OPENED, CLOSED, AND UPDATED

OPENED

50-410/97-11-01	URI	Leakage of contaminated water following reset of reactor scram
50-220/97-11-02	URI	MSL venturi high flow setpoint evaluation
50-410/97-11-03	VIO	Violation of APRM TSSR
50-410/97-11-04	VIO	Missed TS surveillance of control room envelope
50-220 & 50-410/97-11-05	NCV	Non-conservative APRM gain adjustments resulting in TS violation
50-220/97-11-06	URI	Level discrepancy caused by leaking valve
50-410/97-11-07	NCV	Entry into posted high radiation area without authorization
50-410/97-11-08	URI	Breach permits open for excessive lengths of time

CLOSED

50-220/97-08	LER	Non Conservative APRM Gain Adjustments Results in Technical Specification Violation
50-220/97-09	LER	Technical Specification Violation due to System Inoperability Caused by Leakage Through Drain Valves
50-410/97-09	LER	Missed Technical Specification Surveillance of the Control Room Envelope
50-410/97-10	LER	Non Conservative APRM Gain Adjustments Results in Technical Specification Violation
50-410/97-11	LER	Technical Specification Violation of APRM Testing Requirements
50-220 & 50-410/96-13-03	VIO	Missed Inservice Inspection Augmented Weld Inspections
50-220 & 50-410/97-11-05	NCV	Technical specification violation resulting from non conservative APRM gain adjustments
50-220 & 50-410/97-03-07	VIO	Improper use of access-controlled vehicles
50-220 & 50-410/96-09-01	URI	Behavioral observation program for unescorted access not consistent with industry standards



Attachment 1

UPDATED

50-220/97-06-01	VIO	Multiple examples of failure to follow procedures
50-220/97-04-04	IFI	Low difficulty for Unit 1 written exams for licensed operator requalification training

LIST OF ACRONYMS USED

ADS	Automatic Depressurization System
APRM	Average Power Range Monitor
ASSS	Assistant Station Shift Supervisor
ATWS	Anticipated Transient Without Scram
BOP	Behavioral Observation Program
CAS	Central Alarm Station
CFR	Code of Federal Regulations
CMFLPD	Core Maximum Fraction of Limiting Power Density
CRSFTS	Control Room Outside Air Special Filter Train System
CRD	Control Rod Drive
DER	Deviation/Event Report
DR	Deviation Report
DW	Drywell
EC	Emergency Cooling
ESA	Engineering Supporting Analysis
FCV	Flow Control Valve
FFD	Fitness-for-Duty
FPADPR	Full Power Adjusted Power Density Ratio
GEMAC	General Electric Measurement and Control
HPCI	High Pressure Coolant Injection
HRA	High Radiation Area
IDS	Intrusion Detection System
IFI	Inspector Followup Item
IR	Inspection Report
I&C	Instrumentation and Control
JPM	Job Performance Measure
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LORT	Licensed Operator Requalification Training
mRem/hr	milliRem per hour
MSIV	Main Steam Isolation Valve
MSL	Main Steam Line
NCV	Non-Cited Violation
NDD	Nuclear Division Directive
NMPC	Niagara Mohawk Power Corporation



Attachment 1

NMP1	Nine Mile Point Unit 1
NMP2	Nine Mile Point Unit 2
NRC	Nuclear Regulatory Commission
PCE	Procedure Change Evaluation
PDR	Public Document Room
psig	pounds per square inch gage
QA	Quality Assurance
Radwaste	Radiological Waste
RCA	Radiologically Controlled Area
RCS	Reactor Recirculation System
RO	Reactor Operator
RP	Radiation Protection
RWP	Radiation Work Permit
SAS	Secondary Alarm Station
SFM	Security Force Member
SSS	Station Shift Supervisor
STA	Shift Technical Advisor
SWP	Service Water Pump
T&Q	Training and Qualification
TS	Technical Specification
TSSR	Technical Specification Surveillance Requirement
UFSAR	Updated Final Safety Analysis Report
VBS	Vehicle Barrier System
VIO	Violation
WG	Water Gage
WO	Work Order

