U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-410/87-23

Docket No. 50-410

License No. NPF-54

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

Facility Name: Nine Mile Point Nuclear Station, Unit 2

Inspection At: Scriba, New York

Inspection Conducted: June 22 - June 30, 1987

Inspectors: M. Evans — 7/28/87
M. Evans, Reactor Engineer — date

L. Wink — 7/28/87
L. Wink, Reactor Engineer — date

Approved by: for P. Eselgroth, Chief — 7/29/87
P. Eselgroth, Chief, Test Programs Section, DRS — date

Inspection Summary: Inspection on June 22-June 30, 1987 (Report No. 50-410/87-23)

Areas Inspected: Routine, unannounced inspection by two region-based inspector of the overall power ascension test program including test witnessing and test results evaluation, operations and I&C surveillance test witnessing, QA interfaces and independent measurements and verifications.

Results: No violations were identified.

Note: For acronyms not defined, refer to NUREG-0544 "Handbook of Acronyms and Initialisms."

Details

1.0 Persons Contacted

Niagara Mohawk Power Corporation

R. Abbott, Station Superintendent
G. Carlisle, Lead STD & A Engineer
*J. Conway, Power Ascension Manager
E. Davey, Station Shift Supervisor
*B. Drews, Technical Superintendent
*P. Eddy, Site Representative, New York State, PSC
J. Harris, Shift Test Supervisor
*T. Perkins, General Superintendent
*D. Pike, Manager, Engineering/Operations Interface
A. Pinter, Site Licensing Engineer
L. Prunotto, Lead Senior Structural Engineer, Unit 2

Other NRC Personnel

*W. Cook, Senior Resident Inspector
*N. Perry, Reactor Engineer
W. Schmidt, Resident Inspector

*Denotes those present at the exit meeting on June 30, 1987.

The inspector also contacted other members of the Licensee's Operations, Technical, Test and QA Staffs.

2.0 Power Ascension Test Program (PATP)

2.1 References

- Regulatory Guide 1.68, Revision 2, August 1978 "Initial Test Program for Water Cooled Nuclear Power Plants."
- ANSI N18.7-1976 "Administrative Controls and Quality Assurance for Operations Phase of Nuclear Power Plants."
- Nine Mile Point Unit 2 (NMP-2) Technical Specifications, October 31, 1986.
- NMP-2 Final Safety Analysis Report (FSAR) Chapter 14 "Initial Test Program."
- NMP-2 Safety Evaluation Report
- NMP-2 AP-1.4, Startup Test Phase, Revision 3

2.2 Overall Power Ascension Test Program

The inspector held discussions with the Power Ascension Manager (PAM), the Lead Startup, Design and Analysis (STD&A) Engineer and other members of the PATP staff to assess the status of low power testing, the test results evaluation process and the preparation and approval of the remaining test procedures. The inspector also attended daily power ascension management meetings.

At the beginning of the inspection period the plant was undergoing heatup to rated temperature and pressure following resolution of the problems discussed in Inspection Report 50-410/87-21. The unit reached rated conditions for the first time on June 24, 1987. Following testing at rated conditions, a planned manual scram was initiated on June 27, 1987 to satisfy technical specification requirements to determine scram discharge volume vent and drain valve closure times and to obtain individual control rod scram times for all rods that were fully withdrawn in the "B" sequence. During the plant restart on June 28, 1987 problems were encountered with RWCU pump seal leakage and EHC pressure regulator setpoint for bypass valve operation. The unit was brought subcritical and pressure reduced to atmospheric to await repairs. At the conclusion of the inspection, repairs were in progress on the RWCU pump seals and troubleshooting was ongoing on the EHC pressure regulator.

2.3 Power Ascension Test Witnessing

2.3.1 Scope

The inspector witnessed the performance of the power ascension tests discussed below. The performance of these test was witnessed to verify the attributes previously defined in Inspection Report 50-410/86-64, Section 2.3.

2.3.2 Discussion

N2-SUT-5-HU, Control Rod Drive System

This startup test includes friction and functional testing at rated reactor pressure and scram time testing at rated reactor pressure with zero pressure in the accumulator for 4 selected control rods.

The inspector witnessed friction and functional testing for control rods 22-31 and 38-47 and scram time testing of control rod 38-47. The overall test crew performance and interface with operations personnel was satisfactory. The inspector observed pre-scram data taking, initiation of

testing for each rod and data reduction following the testing of each rod. The test results were well within acceptance criteria limits.

N2-SUT-B-HU, Process Computer Heatup

This startup test includes the Traversing In-Core Probe (TIP) alignment at rated temperature.

On June 25, 1987, the inspector witnessed portions of this power ascension test in which the TIP guide tube runs are manually probed to determine the distance to the end of the guide tube so that the core top limits can be programmed. The testing was being conducted per Reactor Analyst Procedure, N2-RAP-4, "Axial Alignment Traversing In-Core Probe System."

During the testing, a problem occurred when the hand crank of one TIP drive control unit fell off while workers were manually retracting the TIP from the top of the core through the guide tube. The TIP proceeded to freewheel out of the core and the TIP guide tube, into the outer TIP room where the drive control units are located. A high Radiation Alert was received in the control room and the operators proceeded to take the steps necessary to assure the area was evacuated. The inspector was in the control room at this time and noted excellent response by the operations personnel.

The Startup Test was subsequently placed in a hold condition pending recovery from the event.

2.3.3 Findings

No unacceptable conditions were identified.

2.4 Power Ascension Test Results Evaluation

2.4.1 Scope

The power ascension test results discussed below were evaluated for the attributes identified in inspection report 50-410/86-64, Section 2.1.

2.4.2 Discussion

NZ-SUT-5-HU, Control Rod Drive System

The test was still in progress during the inspection. The inspector reviewed the results of those sections of the test which have been completed.

Section 6.4, Functional Testing of Selected Rods, was completed on June 25, 1987. All acceptance criteria were satisfied. The maximum and minimum withdrawal and insertion times were measured for four rods and verified to be between 60 and 40 seconds.

Section 6.5, Friction Testing of Selected Rods, was completed on June 26, 1987. All acceptance criteria were satisfied. The maximum variation in differential pressure measured during continuous rod insertion was 12.9 psid (criterion $\leq$ 15 psid).

Section 6.6, Scram Testing of Selected Rods at Rated Reactor Pressure with Zero Pressure in the Accumulator, was completed on June 26, 1987. The maximum scram time to notch position 05 was measured to be 2.715 seconds (rod 38-15). This was well within the acceptance criterion and technical specification limit of $\leq$ 7.0 seconds.

NZ-SUT-14-HU, RCIC System

The test was still in progress during the inspection. The inspector reviewed the results of section 6.1, CST Injection at Rated Pressure, which was completed on June 27, 1987.

The test was performed at a reactor pressure of 953 psig. The inspector verified from GETARS traces that the RCIC system was capable of reaching and maintaining rated flow (600 GPM) within 30 seconds. The actual time was measured to be 24 seconds. The inspector also verified that the maximum turbine speed (4698 RPM) was less than the acceptance criterion limit of 4777 RPM (overspeed trip avoidance margin).

Two Level 2 test exceptions (TEs) were identified. TE#1 involved limit cycle behavior in a number of system variables while in manual control at low system flows (280-300 GPM). The magnitude of the limit cycles was small, producing a variation in flow of approximately

10 GPM (peak-to-peak). TE #2 documented a number of minor steam leaks from the RCIC turbine and valves. The inspector will review the resolutions of these test exceptions during a future routine inspection.

N2-SUT-16-HU, Selected Process Temperatures and Water Level Measurements Test Condition Heatup

The test was still in progress during the inspection. The inspector reviewed the results of those sections which have been completed.

Section 6.1, Shutdown Range Calibration Conditions Check, was completed on May 22, 1987. With the reactor in cold shutdown, the environmental conditions in the drywell and reactor building were compared to assumed conditions for the shutdown range reactor water level calibration. A calibration calculation was performed with the measured drywell and reactor building temperatures to verify that the scale end point error was $\leq$1%. The maximum error computed was .157%, satisfying the acceptance criterion.

Section 6.2, Water Level Measurements, was completed on June 24, 1987. With the reactor at rated conditions (pressure=951 psig and recirculation loop suction temperature = 535° F) the environmental conditions in the drywell and reactor building were measured and calibration calculations performed for the wide, narrow and upset range water level instrumentation to verify that the scale end point error was $\leq$1%. The acceptance criterion was met for the wide and narrow range instrumentation but a Level 2 test exception was found for the upset range instrumentation with an endpoint error of 1.1%. The upset range instrumentation does not perform any automatic safety functions and is used only for indication. The inspector will review the resolution of this test exception during a future routine inspection. In addition two Level 3 test exceptions were documented for several individual wide and narrow range instruments which deviated more than the expected amount from the average of their range.

NZ-SUT-17-HU, System Expansion

The test was still in progress during the inspection. The inspector reviewed the results of Section 6.1 and 6.2, Recirculation Piping Expansion Monitoring, which were performed during the initial heatup (completed June 15, 1987) and a subsequent heatup (completed June 23, 1987), respectively.

Both tests involved the remote displacement of the recirculation system piping from cold shutdown to rated conditions. The measured displacements were compared against acceptance criterion: Level 1 - allowable expansion limits and Level 2 - expected expansion. In addition, during the initial heatup a visual inspection was made of the accessible portions of the piping system to verify that no obstructions existed that would interfere with the thermal expansion of the system.

Two Level 2 test exceptions were noted. During the initial heatup, ten points exceeded their expected displacements. During the subsequent heatup, nine points exceeded these limits (eight points were a confirmation of data obtained during the initial heatup). In both cases, the data was transmitted to General Electric Engineering which recommended that the results be accepted "as-is."

N2-SUT-78-HU, BOP System Expansion

The test was still in progress during the inspection. The inspector had previously evaluated the results of this test and the test exceptions identified during testing up to rated reactor temperature during Inspection 50-410/87-21. As a result of test exceptions identified during the initial heatup to rated temperature, additional walkdowns were conducted at several temperature plateaus during a subsequent heatup. The current review involved the results obtained during the subsequent heatup and included test exceptions (TEs) identified and the corrective actions taken to resolve them.

The licensee identified one Level 2 test exception at the 400° temperature plateau (TE #17) and four Level 1 test exceptions at the rated temperature plateau (TE#18, 19, 20 and 21) involving a snubber with insufficient travel, movement of a spring support out of the operable range and three instances of interference. All identified problems were evaluated by engineering and either "accepted-as-is" or reworked prior to continuation of heat-up.

On June 24, 1987 the Station Operations Review Committee (SORC) accepted the engineering evaluations for the Level 1 test exceptions and authorized the continuation of heatup. The inspector reviewed the above test exceptions and discussed the resolutions with the Lead Senior Structural Engineer. The resolutions were found to be appropriate.

Test Exception Review for Test Condition Heatup

In addition to the results of individual test as discussed above, the inspector reviewed the forty (40) test exceptions generated during low power testing. The inspector verified that they had been properly documented and that appropriate plans had been formulated to resolve them.

2.4.3 Findings

No unacceptable conditions were noted.

3.0 Surveillance Test Witnessing

During this inspection, the inspector witnessed Instrumentation and Control's performance of portions of three neutron monitoring system surveillance tests: N2-ISP-NMS-W@007, APRM/LPRM Channel Functional Test; N2-ISP-NMS-W@008, SRM and ROD Block Trip Channel Functional Test; and N2-ISP-NMS-W@009, IRM Channel Functional Test. The tests were performed satisfactorily and all technical specification acceptance criteria were met.

On June 25, 1987, the inspector witnessed operations reperformance of surveillance testing to determine RCIC operability (N2-OSP-ICS-Q002). Technical specifications require this testing to be performed within 12 hours after achieving rated pressure. The test was initially performed on June 24, 1987, however RCIC turbine speed indication was lost during testing and the RCIC system was declared inoperable. During the reperformance of the surveillance the RCIC pump developed flow of greater than 600 gpm, however the system remained inoperable due to hunting of the RCIC Turbine Governor Valve. The inspector noted that operations personnel planned and coordinated the testing prior to initiation. During the testing, operations personnel monitored several plant parameters including suppression pool temperature, bypass valve position and all RCIC parameters. Shift supervisory personnel effectively controlled the conduct of testing.

Findings

No unacceptable conditions were identified.

4.0 QA Interfaces with PATP and Surveillance Activities

During witnessing of RCIC surveillance testing and power ascension testing of the CRD system, as discussed in paragraphs 3.0 and 2.3 respectively, the inspector observed continuous QA surveillance of the testing activities in the control room.

No unacceptable conditions were identified.

5.0 Independent Measurements and Verifications

The inspector independently verified conformance with acceptance criteria for control rod insert and withdraw and scram times during the witnessing of power ascension test N2-SUT-5-HU, Control Rod Drive System, as discussed in paragraph 2.3. In addition, during the evaluation of the results of power ascension test N2-SUT-14-HU, RCIC System, as discussed in paragraph 2.4, the inspector independently calculated the time for the system to reach rated flow and the margin to the overspeed trip setpoint, using GETARS traces, and verified that the associated acceptance criteria were satisfied. In all cases the inspector's measurements and verifications agreed with those of the licensee.

No unacceptable conditions were noted.

6.0 Exit Interview

At the conclusion of the inspection on June 30, 1987, an exit meeting was held with licensee personnel (identified in Section 1.0) to discuss the inspection scope, findings and observations as detailed in this report. At no time during the inspection was written materials provided to the licensee by the inspector. Based on the NRC Region I review of this report and discussions held with licensee representatives during the inspection, it was determined that this report does not contain information subject to 10 CFR 2.790 restrictions.