

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report No. 50-220/84-20

Docket No. 50-220

License No. DPR-63 Priority - Category C

Licensee: Niagara Mohawk Power Corporation  
300 Erie Boulevard West  
Syracuse, New York 13202

Facility Name: Nine Mile Point Nuclear Station, Unit 1

Inspection At: Scriba, New York

Inspection Conducted: September 24-28, 1984

Inspector: L H Bettenhausen for  
P. C. Wen, Reactor Engineer

11/7/84

date

Approved by: L H Bettenhausen  
L. H. Bettenhausen, Chief, TPS

11/7/84

date

Inspection Summary:

Inspection on September 24-28, 1984 (Inspection Report No. 50-220/84-20)

Areas Inspected: Routine, unannounced inspection of startup testing following refueling of Cycle 8. The inspection included the testing program, pre-critical tests and power ascension tests. The inspection involved 28 hours onsite by one region-based inspector.

Results: In the areas inspected, no items of noncompliance were identified.

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## DETAILS

### 1. Persons Contacted

\*J. Conway, Unit Supervisor, Reactor Analysis  
\*R. Smith, Supervisor, Reactor Analysis  
W. Connolly, Supervisor, QA Operations  
J. Spadafore, Superintendent, Technical Services  
W. Drews, Technical Superintendent  
T. W. Roman, Unit 1 Station Superintendent  
\*T. J. Perkins, General Superintendent, Nuclear Generation

### USNRC

\*S. Hudson, Senior Resident Inspector

\*Denotes those present at the exit interview on September 28, 1984.

The inspector also contacted other licensee employees in the course of the inspection.

### 2. Cycle 8 Reload Safety Evaluation and Core Verification

The cycle 8 reload contains 200 new fuel bundles which are GE P8x8R fuel design. Since cycle 8 uses fuel essentially the same as that used in cycle 7, the cycle 7/8 refueling was conducted under 10 CFR 50.59. The inspector reviewed the licensee's Safety Evaluation Report (84-23). The safety analyses performed to support this cycle's operation concluded that there was no unreviewed safety question involved. The result was presented to the Site Operations Review Committee (SORC) and subsequently received its approval on March 20, 1984.

The Reactor Engineering group performed core post-alteration inspection and verification in accordance with procedure RPSTP-6, Revision 1. The inspector reviewed the record and verified that the fuel loading agreed with the intended core loading plan.

No unacceptable conditions were identified.

### 3. Cycle 8 Startup Testing

The inspector reviewed selected test programs and their results to verify the following:

- Procedures were provided with the detailed stepwise instructions, including Precautions, Limitations, and Acceptance Criteria;
- Technical content of the procedures was sufficient to result in satisfactory calibration and test;

- Provisions for recovering from anomalous conditions were provided;
- Methods and calculations were clearly specified and tests were conducted accordingly;
- Review, approval, and documentation of the results were in accordance with the requirements of the TS and the licensee's administrative controls.

The following tests were reviewed:

### 3.1 Control Rod Drive Scram Time Test

The control rod drive (CRD) scram time test was performed in accordance with procedure RPSTP-2, Full Core Control Rod Scram Timing Sequence, Revision 2. The inspector verified by review of the recorder traces and data obtained on June 10, 1984 that the average and the maximum scram times at various insertion levels were all within the TS limits.

No unacceptable conditions were identified.

### 3.2 Shutdown Margin (SDM)

The Shutdown Margin Demonstration was performed in accordance with procedure RPSTP-5, Reactivity Margin - Core Loading, Revision 4. The test was performed on June 13, 1984, with moderator temperature of 109°F. A shutdown margin of at least 1.53%  $\Delta K/K$  was demonstrated by pulling margin rod (34-15) to position 28, with the strongest rod (38-19) fully withdrawn.

The TS requirement is a margin greater than  $R+0.25\% \Delta K/K$ , where  $R (=0.94\%)$  is additional reactivity margin required for this demonstration due to increase in reactivity later in cycle. The demonstrated SDM of 1.53%  $\Delta K/K$  included temperature correction factor and 10% overall calculational margin to account for uncertainty in the rod worth curve.

No unacceptable conditions were identified.

### 3.3 Critical Configuration and Anomaly Check

The inspector reviewed test procedure RPSTP-1, Cold Critical Comparison, Revision 0, and test results of June 13, 1984. The inspector verified that the critical rod configuration was within  $\pm 1\% \Delta K/K$  of the predicted critical pattern.

The inspector also reviewed the reactivity anomaly surveillance procedure, RPSP-3, and the surveillance performed since the operation of this cycle. The inspector noticed that the observed control rod inventories were all within  $\pm 1\% \Delta K/K$  of the predicted value, and the

frequency of evaluation was performed within the requirements as prescribed by the TS.

No unacceptable conditions were identified.

### 3.4 Core Thermal Power and APRM Calibration

The APRM calibration was performed daily per reactor physics surveillance procedure RPSP-1. The inspector reviewed the calibration results of September 1 through 23, 1984, and verified that the APRM readings were adjusted in agreement with the core thermal power. The inspector witnessed the APRM calibration performed on September 26, 1984, and noted that the required procedure was in use and the calibration was performed by a qualified technician.

The inspector also reviewed procedure RCPCP-8, Revision 4. This procedure provides an alternative method to calculate core thermal power. The heat balance comparisons between the process computer OD-3 and this alternative method were generally in good agreement as shown in the following:

<u>Test Date</u>	<u>METHOD</u>		
	<u>OD-3 (MWT)</u>	<u>RCPCP-8 (MWT)</u>	<u>% Difference</u>
7/16/84	1839.0	1847.9	0.48
7/18/84	1844.7	1852.1	0.40
8/16/84	1778.1	1784.4	0.35
8/30/84	1841.3	1846.4	0.28
9/18/84	1846.7	1852.1	0.29

The inspector identified that the acceptance criterion of 10% used in the comparison of these two methods is unrealistic. Based on the plant operating experience and on consistency with plant transient analysis assumptions, a licensee representative stated that the acceptance criterion will be changed to 2%. This change will be implemented in the next procedure revision.

The inspector had no further questions.

### 3.5 Thermal Hydraulic Limits and Power Distribution

The inspector reviewed the test procedure RPSP-1, Daily Surveillance, Revision 9, and surveillance results of September 1 through 23, 1984. The inspector verified by review of the computer program OD-6, Option 4, and P-1 results that the thermal limits, LHGR, MAPLHGR, and MCPR were all within the TS limits during this period.

The inspector determined from the core limit data of September 18, 1984, that the backup computer program BUCLE results and the P-1 results were identical.

No unacceptable conditions were identified.

### 3.6 Local Power Range Monitor (LPRM) System Calibration

The inspector reviewed test procedure RPSP-7, LPRM Calibration, Revision 3, for technical adequacy. The calibration of an LPRM system involves the combination of calculated and measured quantities to determine the local average heat flux at the location of each LPRM chamber. The actual LPRM console meter reading is compared with the calculated average heat flux of the four adjacent fuel rods. The calculated value is derived from normalized TIP data. The gain of each LPRM amplifier is then adjusted to produce the desired reading.

In accordance with the plant procedures, the LPRM calibrations were to be performed once every full power month. The inspector reviewed the calibration data which were performed since this cycle's operation. The inspector identified the following items:

- In the step after the second OD-1 run which verifies the LPRM GAF array, no administrative guidance was provided. This LPRM guidance would ensure that the person who performs the test takes appropriate actions in case of any unacceptable calibration conditions.
- The calibration for the month of July was missed. To assess the impact of this missed calibration on the plant operating limits and Technical Specifications, the inspector reviewed the thermal hydraulic limits of July 20 through August 10, 1984. These limits, LHGR, MAPLHGIR, and MCPR were all within the TS limits during this period. The inspector noticed that three OD-1 runs were made on July 10, 19 and 30, 1984. As a result of these OD-1 runs, the LPRM calibration constants (C array) were automatically updated insuring that computer calculations were based on current calibrations. The power distribution calculation was therefore not affected. The result of the missed calibration was thus limited in that console LPRM readings may not have been current. This matter was brought to the attention of licensee's management. The inspector was told that the plant surveillance schedule is now being computerized. Any similar instance is expected to be minimized.

The inspector had no further questions.

### 4. QA Role in Cycle 8 Startup Testing

The inspector discussed the subject of QA's role in Cycle 8 startup testing with cognizant licensee QA personnel. The inspector was told that QA

independently verified the core loading and performed QA audit on TS surveillance requirements. The inspector reviewed QA surveillance reports RS-84-0'1 (Whole Core Off Load - Reload) and RS-84-038 (LPRM Removal and Installation) and noted the QA verification of these activities.

The inspector had no further questions.

5. Exit Interview

Licensee management was informed of the purpose and scope of the inspection at the entrance interview. The findings of the inspection were periodically discussed and were summarized at the conclusion of the inspection on September 28, 1984. Attendees at the exit interview are listed in paragraph 1.

No written material was provided to the licensee by the inspector at any time during this inspection.