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SUBJECT: Forwards marked-up pages of Chapter 14 FSAR Amend 28, representing changes to initial startup test program. Util advises that changes to appropriate procedures will be made. SER encl.

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September 9, 1987
NMP2L 1074

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Re: Nine Mile Point Unit 2
Docket No. 50-410

Gentlemen:

Pursuant to Section 2.C.6 of the Operating License for Nine Mile Point Unit 2, please find enclosed revised Final Safety Analysis Report pages from Chapter 14 that represent recent changes made to the Initial Startup Test Program. These program changes are reflected on the existing Final Safety Analysis Report pages thru Amendment 28. Changes to the appropriate procedures will be made to reflect the enclosed program changes. Also enclosed is a copy of the safety evaluation for the program changes.

Very truly yours,

NIAGARA MOHAWK POWER CORPORATION

C. V. Mangan
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xc: Regional Administrator, Region I
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TABLE 14.2-213 (Cont)

Action	Test Conditions
28 |	b. 150 psig reactor pressure, final controller settings, RCIC discharge ~~approximately~~ ≥100 ~~(+20, -0)~~ psi above RPV.

Acceptance Criteria

Level 1:

1. The average pump discharge flow is equal to or greater than the 100-percent rated value after 30 sec have elapsed from automatic initiation at any reactor pressure between 150 psig and rated.

2. The RCIC turbine does not trip on overspeed during auto or manual starts.

If any Level 1 criteria are not met, the reactor is only allowed to operate up to a restricted power level defined by Figure 14.2-213-1 until the problem is resolved. Also, consult the plant Technical Specifications for actions to be taken.

Level 2:

28 | 1. In order to provide an overspeed trip avoidance margin, the transient start first and subsequent speed peaks must not exceed 5 percent above the rated RCIC turbine speed.

2. The speed and flow control loops are adjusted so that the decay ratio of any RCIC system-related variable is not greater than 0.25.

3. The turbine gland seal condenser system is capable of preventing steam leakage to the atmosphere.

4. The ΔP switch for the RCIC steam supply line high-flow isolation trip is calibrated to actuate at 300 percent of the maximum required steady-state flow.

TABLE 14.2-213 (Cont)

Action	Test Conditions	
3. CST injection, extended operation demonstration.	In conjunction with 2.	
4. CST injection, second phase. Hot quick start followed by stability demonstration.	a. Rated reactor pressure, RCIC discharge≥100 ~~(+20, -0)~~ psi above RPV. b. 150 psig reactor pressure RCIC discharge≥100 ~~(+20, -0)~~ psi above RPV.	28 28
5. Reactor vessel injection, manual start, step changes for controller adjustments.	Rated reactor pressure, manual and automatic modes.	
6. Reactor vessel injection hot quick start.	Rated reactor pressure, automatic mode.	
7. Reactor vessel injection, hot or cold quick start followed by stability demonstration.	150 psig reactor pressure, manual and automatic modes.	
8. Confirmatory reactor vessel injection, cold quick start.	Rated reactor pressure, final RCIC controller settings.	
9. Second consecutive confirmatory reactor vessel injection, cold quick start.	Same as 8.	
10. Condensate storage tank injection for surveillance test base data, cold quick start.	a. Rated reactor pressure, final controller settings, RCIC discharge ~~approximately~~ ≥100 ~~(+20, -0)~~ psi above RPV.	28

TABLE 14.2-213 (Cont)

After all final controller and system adjustments have been determined, a defined set of demonstration tests must be performed with that one set of adjustments. Two consecutive reactor vessel injections starting from cold conditions in the automatic mode must satisfactorily be performed to demonstrate system reliability. Following these tests, a set of CST injections are done to provide a benchmark for comparison with future surveillance tests.

After the auto start portion of certain of the above tests is completed, and while the system is still operating, small step disturbances in speed and flow command are input (in manual and automatic mode respectively) to demonstrate satisfactory stability. This is done at both low (above minimum turbine speed) and near rated flow initial conditions to span the RCIC operating range.

A demonstration of expanded operation of up to 2 hr (or until pump and turbine oil temperature are stabilized) of continuous running at rated flow is scheduled at a convenient time during the test program.

Differential pressures measured during rated steam flow will be used to establish appropriate high steam flow setpoints.

The following tests are performed:

Action	Test Conditions
1. CST injection first phase manual start.	a. For all RCIC testing; recirculation in POS mode and all other controllers in NORM mode. b. Demonstration at 150 psig reactor pressure. c. Rated reactor pressure RCIC discharge $\geq$100 psi above RPV.
2. CST injection, step changes in flow for controller adjustments.	Immediately after 1c with RCIC discharge to condensate storage tank. Manual and automatic control modes.

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TABLE 14.2-213

RCIC SYSTEM

Startup Test (SUT-14)

Test Objectives

1. To verify the proper operation of the RCIC system over its expected operating pressure and flow ranges.

2. To demonstrate reliability in automatic starting from cold standby when the reactor is at power conditions.

Prerequisites

The appropriate preoperational tests have been completed and the SORC has reviewed and approved the test procedures and the initiation of testing. Initial turbine operation (uncoupled) must be performed to verify satisfactory operation and overspeed trip. The auxiliary steam system is available to supply turbine steam. Instrumentation has been installed and calibrated, and sufficient water is available to meet specified purity requirements. The following systems must be operational to the extent necessary to conduct the test: reactor vessel, suppression pool, condensate supply system, and instrument air.

Test Procedure

The RCIC system is designed to be tested in two ways: flow injection into a test line leading to the condensate storage tank (CST) and flow injection directly into the reactor vessel. The first set of CST injections consists of manual and automatic starts at 150 psig and near rated reactor pressure. The pump discharge pressure during these tests is throttled to ≥100 ~~(+20, -0)~~ psi above reactor pressure to simulate the largest expected pipeline pressure drop. This CST testing is done to demonstrate general system operability and for making most controller adjustments. 28

Reactor vessel injection tests follow to complete the controller adjustments and to demonstrate automatic starting from a cold (ambient temperature for RCIC operation) standby condition. Cold is defined as a minimum 72 hrs without any kind of RCIC operation.

TABLE 14.2-243 (Cont)

Level 2:

28 | 1. The temperature at the tube side of the nonregenerative heat exchangers does not exceed 130°F in the hot standby mode or 120°F in the normal mode.

28 | 2. The pump available NPSH at least 13 ft during the hot standby mode is as defined in the process diagrams.*

28 | 3. The cooling water supplied to the nonregenerative heat exchangers shall be less than 6 percent above the flow corresponding to the heat exchanger capacity (as determined from the process diagram). The outlet temperature shall not exceed 180°F.

~~4. Recalibrate bottem head flow indicator against RWCU flow indicator if the deviation is greater than 25 gpm.~~

~~5.~~ 4. Pump vibration shall be less than or equal to 2 mils peak-to-peak (in any direction) as measured on the bearing housing, and 2 mils peak-to-peak shaft vibration. ~~as measured on the coupling end.~~

28 | *If measurements and calculations made during the system preoperational test show that NPSH requirements for this mode can be met, then this requirement need not be addressed during startup testing.

TABLE 14.2-243

REACTOR WATER CLEANUP SYSTEM

Startup Test (SUT-70)

Test Objective

To demonstrate specific aspects of the mechanical ability of the RWCU. (This test, performed at rated reactor pressure and temperature, is actually the completion of the preoperational testing that could not be done without nuclear heating.)

Prerequisites

The preoperational tests have been completed, and the SORC has reviewed and approved the test procedures and initiation of testing. Instrumentation has been checked or calibrated as appropriate.

Test Procedure

With the reactor at rated temperature and pressure, process variables are recorded during steady-state operation. ~~in the following modes as defined by the system process diagram: hot standby and normal. A comparison of the bottom head flow indicator and the RWCU inlet flow indicator is made during those modes.~~ The RWCU system sample station is tested at hot process conditions as part of SUT 1. | 28

The following test is performed:

Action	Test Conditions	
Record process data.	a. Reactor at rated temperature and pressure ~~during heatup.~~	28
	~~b. Cleanup system operate in hot standby and normal.~~ With the cleanup system operating in a reactor startup alignment (i.e. flow rejection) and in a normal operating alignment.	28

Acceptance Criteria

Level 1:

Not applicable.

SAFETY EVALUATION

1. MODIFICATION TITLE:

   FSAR Chapter 14, changes in Startup Program WCS and RCIC

2. MODIFICATION BACKGROUND AND SCOPE:

   The Operating License requires a Safety Evaluation and reporting of all Chapter 14 changes (marked-up pages are attached). The proposed changes are shown on the attached markups of FSAR Table 14.2-243 (2 pages) for WCS and Table 14.2-213 (4 pages) for RCIC.

   Tests concerning the bottom head flow indicator comparison are deleted because the required testing was done in the pre-op test program.

   Changes in the WCS operating modes/alignments were made because of changes in WCS operation due to feedwater thermal stratification problems.

   To perform the test on the RCIC system, RCIC discharge pressure should be greater than 100 psi above reactor pressure to simulate maximum pipeline pressure drop. Since the amount of pressure over this required 100 psi has no effect on the test, the upper limit was deleted.

3. ANALYSIS OF MODIFICATION:

   The proposed changes do not affect the design of the WCS or RCIC system and the objectives of the test programs are met.

4. CONCLUSION:

   This modification does not change the function of the WCS or RCIC systems and, therefore, no significant safety concern exists.

5. ACTIONS REQUIRED:

   Action must be taken to notify the Commission of the above changes per Section 2.C.6 of the operating license:

   > "Any changes to the Initial Test Program described in Section 14 of the FSAR made in accordance with the provisions of 10CFR50.59 shall be reported in accordance with 50.59(b) within one month of such change."

ATTACHMENTS

1. Marked-up FSAR pages.