NIAGARA MOHAWK

NIAGARA MOHAWK POWER CORPORATION/300 ERIE BOULEVARD WEST, SYRACUSE, N.Y. 13202/TELEPHONE (315) 474-1511

July 11, 1986
(NMP2L 0781)

Ms. Elinor G. Adensam, Director
BWR Project Directorate No. 3
U.S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Washington, DC 20555

Dear Ms. Adensam:

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

Niagara Mohawk plans to implement an accelerated power ascension test program for Nine Mile Point Unit 2. Certain aspects of the accelerated test program change current commitments in the Final Safety Analysis Report and require Nuclear Regulatory Commission approval. This was provided in our May 30, 1986 letter. Subsequently, additional comments were made by the Nuclear Regulatory Commission staff. Attachment 1 provides marked-up changes to Chapter 14 showing the change requested by Mr. G. Thomas. Justification for these changes is provided in Attachment 2.

Further, Mr. R. Becker requested additional information on the automatic load following design at Unit 2. The response to this question is shown in Attachment 3.

Finally, Mr. R. Gruel requested additional information on our other changes to the Startup Test Program, also provided in our May 30, 1986 letter. The response to these questions is shown in Attachment 4. Marked-up changes to Chapter 14 are also provided in Attachment 5 which supersede those changes identified earlier in our May 30, 1986 letter.

Very truly yours,

T. E. Lempges
Vice President
Nuclear Generation

TEL/NLR:ja
1756G

Attachments

xc: M. Haughey
R. A. Gramm, NRC Resident Inspector
R. W. Starostecki
Project File (2)

B001
1/1

ATTACHMENT 1

TABLE 14.2-208 8

CONTROL ROD SEQUENCE EXCHANGE

Startup Test (SUT-8) 8

Test Objectives

To perform a representative sequence adjustment of control rod patterns at a significant power level.

Prerequisites

The preoperational tests have been completed, the SORC has reviewed and approved the test procedure and the initiation of testing. All system instrumentation is installed and calibrated. All system controls and interlocks have been checked.

Test Procedure

Rod patterns will be periodically adjusted during plant operations to more nearly equalize fuel assembly exposures. This test is performed as an example of the adjustments that will be made throughout plant life and is provided to illustrate the principles involved. The control rod sequence adjustment begins on the 100 percent load line by reducing core flow and reducing thermal power to between the low power set point of the rod worth minimizer (or the rod sequence control system) and the thermal power necessary to keep nodal powers below the preconditioning cladding interim operating management recommendation (PCIOMR) threshold. Also, in reducing thermal power, care should be taken to avoid exceeding the design limits of the core total peaking factor. The ensuing steps involve utilizing the system process computer and TIP machines. The adjustment is made by withdrawing or inserting control rods until target is achieved.

TABLE 14.2-208 (Cont)

The following test is performed:

Action	Test Conditions
22 Demonstrate the rod sequence adjustment procedure	a. Reduce recirculation flow. b. Sufficient margin available to PCIOMR envelope and core operating limits.

Acceptance Criteria

Level 1:

Completion of the adjustment of one rod pattern for the complementary pattern with continual satisfaction of all licensed core limits constitutes satisfaction of the requirements of this procedure.

Level 2:

All nodal powers will remain below their PCIOMR threshold limit during this test.

ATTACHMENT 2

STARTUP TEST 8 - CONTROL ROD SEQUENCE EXCHANGE
JUSTIFY TEST DELETION

OBJECTIVE:

Regulatory Guide 1.68 (Revision 2; August 1978), Appendix A, paragraph 5.c requires that the licensee "demonstrate that core limits will not be exceeded during or following exchange of control rod patterns that will be permitted during operation (the demonstration test should be conducted at the highest power level at which control rod pattern exchanges will be allowed during plant operation)." Startup Test 8, Control Rod Sequence Exchange performs a representative sequence exchange of control rod patterns at a significant power level. It is proposed to delete Startup Test 8, and alternatively, adhere to applicable generic sequence exchange procedures when required.

DISCUSSION:

Rod patterns will be periodically exchanged during plant operations to more nearly equalize fuel assembly exposures. These sequence exchanges are typically performed every 1000 MWD/st in core average exposure. The control rod sequence exchange begins on the 100 percent load line by reducing core flow to minimum and reducing thermal power to between the low power setpoint of the rod pattern control system and the thermal power necessary to keep nodal powers below the PCIOMR threshold (typically between 35% and 50% of rated thermal power). The control rod sequence exchange is performed a row or column at a time, starting at one side of the core and working row by row or column by column across the entire width of the core.

The purpose of the control rod sequence exchange test during the power ascension program is to assure that several objectives are met. Such objectives can be met by the use of generic procedures. Regulatory Guide 1.68 requires a demonstration that core limits (MCPR, MAPLHGR, MLHGR for example) will not be exceeded during the sequence exchange. Performing a sequence exchange establishes an asymmetric state of the

core. Core calculations performed by the process computer during an asymmetric core state involve higher uncertainties than calculations performed during a symmetric state. Generic procedures are available which do not depend on the asymmetric calculations performed by the process computer. Currently recommended sequence exchange procedures (Reference 1) establish sufficient margin to core limits, such that the exchange procedures themselves assure that core limits will not be exceeded during the exchange. Backup 3-D analytical calculations (that do not require core symmetry) established that a large margin was maintained to core limits during the exchange.

These procedures have been widely used during startup test programs to successfully perform sequence exchanges. Table 1 lists the most recent startup tests where the control rod sequence exchange methods outlined in Reference 1 were used. For all nine plants, the acceptance criteria were consistently satisfied (thermal limits compliance and PCIOMR threshold power compliance) for the sequence exchange test. As a further example of the use of the recommendations in Reference 1, the LaSalle County Nuclear Station Units 1 and 2 have successfully demonstrated the "row-by-row" and "column-by-column" sequence exchange methods during approximately 10-12 sequence exchanges during the operation of Units 1 and 2. These examples of the use of the recommended sequence exchange procedures provide adequate assurance that the procedures are generically applicable and that the objectives of Startup Test 8 will be met while using the recommended procedures.

Therefore, the generic procedures have been successfully demonstrated and assure that core limits are not exceeded during sequence exchanges at power. During startup, although a representative sequence exchange using the generic procedures may optionally be performed for the purpose of familiarizing the plant operating and technical staff with the operation of the facility, the test is not required to further qualify the generic procedures.

CONCLUSION:

Control rod sequence exchanges are performed using generic procedures that have been demonstrated at operating plants. Sufficient actual reactor data and analytical back up calculations along with the wide margin to core limits that must be established before starting the exchange, give adequate confidence that the procedures are generically applicable and do not require a qualification test for the startup of each new plant. These generic procedures therefore, satisfy the objectives of Regulatory Guide 1.68 (Revision 2; August 1978), Appendix A, paragraph 5.c, and a demonstration during startup testing that implicitly demonstrates the acceptability of the sequence exchange procedures is not required. Therefore, Startup Test 8, Control Rod Sequence Exchange, can be deleted from the power ascension program. This change will not adversely affect any safety systems or the safe operation of the plant and thus does not involve an unreviewed safety question.

REFERENCES:

1. "Preconditioning Interim Operating Management Recommendations," General Electric Company Proprietary, February 1982 (NEDE-21493, Revision 5).

Table 1
Control Rod Sequence Exchange Procedure Demonstrations
Recent Startup Test Programs

Plant
Fukushima-6
Chinshan-1,2
Hatch-2
LaSalle-1
Susquehanna-1
Kuosheng-1,2
Leibstadt

ATTACHMENT 3

Question: Describe the operations of the Automatic Load Following Capability at Unit 2.

Response: The Automatic Load Following Capability has been disconnected. Nine Mile Point Unit 2 does not intend to use this design feature. The change has been made by a simple wiring change which prevents the master controller from switching to the auto mode. Any decision to alter the circuit requires a plant modification and safety evaluation prior to implementation.

ATTACHMENT 4

Question 1:	Table 14.2-237, "Recirculation System Performance" - Should delete Level 3 acceptance criteria from test or modify FSAR Section 14.2.12.2, General Discussion, to specify Level 3 acceptance criteria.
Response 1:	Level 3 acceptance criteria are present in the startup test procedure and are described in the site administrative procedures. Since the Level 3 acceptance criteria do not represent a safety concern, they are not described in the FSAR and will be deleted from the Table 14.2-237 abstract. Attachment 5 shows a marked up change to Table 14.2-237.
Question 2:	Table 14.2-243, "Reactor Water Cleanup" - Should reinstate testing in blowdown mode. (This modification was not accepted for Hope Creek.)
Response 2:	Reactor Water Cleanup System testing is performed during what has sometimes been termed the "Blowdown" or "Flow Rejection" mode of operation. This system configuration is termed the "Hot Standby" mode in Table 14.2-243. This change in terminology was made to make Table 14.2-243 consistent with note E) on FSAR Figure 5.4-17, which describes the system configuration in the "Hot Standby" mode. Therefore, the blowdown mode is being tested.
Question 3:	Table 14.2-244, "RHR System" - Should reinstate testing of shutdown cooling mode as insufficient justification is provided.
Response 3:	Niagara Mohawk withdraws this change. Attachment 5 shows a marked up change to Table 14.2-244.

ATTACHMENT 5

TABLE 14.2-237

RECIRCULATION SYSTEM PERFORMANCE

Startup Test (SUT-30C)

Test Objective

To record recirculation system parameters during the power test program.

Prerequisites

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

Test Procedure

Recirculation system parameters are recorded at several power-flow conditions and in conjunction with single pump trip recoveries.

The following test is performed:

Action	Test Conditions
Record steady-state operating data.	a. At TC-2, 3, ~~3~~ 5*, and 6. b. During recovery from single pump trips of SUT-30A.

Acceptance Criteria

Level 1:

Not applicable.

~~Level 2:~~ 3

---DELETE---

~~1. The core flow shortfall shall not exceed 5 percent at rated power.~~

~~2. The measured core plate ΔP shall not be >0.6 psi above prediction.~~

~~3. The calculated jet pump M ratio shall not be <0.2 points below prediction.~~

Level 2:

1. The measured core plate ΔP shall ~~not~~ be ≥ 3.0 psi above prediction.

* At natural circulation

TABLE 14.2-237 (Cont)

---DELETE---

~~4.~~ 3. ~~The drive flow shortfall shall not exceed 5 percent at rated power.~~

~~5.~~ 4. ~~The measured recirculation pump efficiency shall not be >8 percent points below the vendor-tested efficiency.~~

~~6. The nozzle and riser plugging criteria shall not be exceeded.~~

TABLE 14.2-244

RESIDUAL HEAT REMOVAL SYSTEM

Startup Test (SUT-71)

Test Objective

To demonstrate the ability of the RHR system to:

1. Remove heat from the reactor system so that the refueling and nuclear system servicing can be performed.

2. Condense steam while the reactor is isolated from the main condenser.

Prerequisites

The appropriate 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 a convenient thermal power, the steam condensing mode of the RHR system is tuned and demonstrated. | 22
Condensing heat exchanger performance characteristics are demonstrated. Final demonstration of the condensing mode is done from an isolated condition. During the first suitable reactor cooldown, the shutdown cooling mode of the RHR system is demonstrated. Unfortunately, the decay heat load is insignificant during the startup test period. Use of this mode with low core exposure could result in exceeding the 100°F/hr cooldown rate of the vessel if both RHR heat exchangers are used simultaneously. Late in the test program after accumulating significant core exposure, this demonstration would more adequately demonstrate the heat exchanger capacity. The RHR heat exchangers will also be tested in the suppression pool cooling mode.

The following tests are performed:

TABLE 14.2-244 (Cont)

Action	Test Conditions
1. Controller adjustment based on subsystem perturbations	a. Reactor not isolated above 10% rated power but ≤25% rated power. b. RHR system in steam condensing mode. c. RCIC flow to CST.
2. Demonstration of steam condensing mode.	a. Reactor at hot standby and isolated. b. RCIC flow to RPV.
3. Take heat exchanger capacity data.	a. RHR in shutdown cooling mode. b. After trip or cooldown from TC-6 in order to provide sufficient decay heat. c. RHR in suppression pool cooling mode.

Acceptance Criteria

Level 1:

The transient response of any system-related variable to any test input must not diverge.

Level 2:

1. The RHR system must be capable of operating in the steam condensing, suppression pool cooling, and shutdown cooling modes (with both one and two heat exchangers) at the flow rates and temperature differentials indicated on the process diagrams.

22 2. System-related variables may contain oscillatory modes of response. In these cases, the decay ratio for each controlled mode of response must be less than or equal to 0.25.

TABLE 14.2-244 (Cont)

22

NOTE: If decay heat is not sufficient to demonstrate shutdown cooling mode heat rejection capacity, then heat exchanger capacity may be inferred from data taken in the suppression pool cooling mode, provided that the data were taken with the system as close as possible to the process diagram flows and temperatures.

22