

June 9, 1990

Docket No. 50-410

Mr. Lawrence Burkhardt III
Executive Vice President, Nuclear Operations
Niagara Mohawk Power Corporation
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Dear Mr. Burkhardt:

JLinville

SUBJECT: ISSUANCE OF AMENDMENT (TAC NO. 75495)

The Commission has issued the enclosed Amendment No. 16 to Facility Operating License No. NPF-69 for the Nine Mile Point Nuclear Station Unit No. 2 (NMP-2). The amendment consists of changes to the Technical Specifications in response to your application transmitted by letter dated December 8, 1989.

This amendment revises Section 2.1, Safety Limits, the associated Bases, and Section 3/4.4.1, Recirculation System to increase the Safety Limit Minimum Critical Power Ratio for cycle 2 reload.

A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular bi-weekly Federal Register notice.

Sincerely,

ORIGINAL SIGNED BY:

Robert E. Martin, Senior Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:

- 1. Amendment No. 16 to NPF-69
- 2. Safety Evaluation

cc: w/enclosures
See next page

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DOCUMENT NAME: ISSUANCE OF AMENDMENT 75495

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Mr. Lawrence Burkhardt I
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Nine Mile Po Nuclear Station
Unit 2

cc:

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

NIAGARA MOHAWK POWER CORPORATION

DOCKET NO. 50-410

NINE MILE POINT NUCLEAR STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 16
License No. NPF-69

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Niagara Mohawk Power Corporation (the licensee) dated December 8, 1989, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-69 is hereby amended to read as follows:

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(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, as revised through Amendment No. 16 are hereby incorporated into this license. Niagara Mohawk Power Corporation shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment will become effective prior to startup following the first refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION



Robert A. Capra, Director
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: June 19, 1990

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 16 TO FACILITY OPERATING LICENSE NO. NPF-69

DOCKET NO. 50-410

Revise Appendix A as follows:

Remove Pages

2-1

B2-1

B2-3

3/4 4-1

Insert Pages

2-1

B2-1

B2-3

3/4 4-1

2.0 SAFETY LIMITS AND LIMITING SAFETY SYSTEM SETTINGS

2.1 SAFETY LIMITS

THERMAL POWER, Low Pressure or Low Flow

2.1.1 THERMAL POWER shall not exceed 25% of RATED THERMAL POWER with the reactor vessel steam dome pressure less than 785 psig or core flow less than 10% of rated flow.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2.

ACTION:

With THERMAL POWER exceeding 25% of RATED THERMAL POWER and the reactor vessel steam dome pressure less than 785 psig or core flow less than 10% of rated flow, be in at least HOT SHUTDOWN within 2 hours and comply with the requirements of Specification 6.7.

THERMAL POWER, High Pressure and High Flow

2.1.2 The MINIMUM CRITICAL POWER RATIO (MCPR) shall not be less than 1.07 with two recirculation loop operation and shall not be less than 1.08 with single recirculation loop operation with the reactor vessel steam dome pressure greater than 785 psig and core flow greater than 10% of rated flow.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2.

ACTION:

With MCPR less than 1.07, with two recirculation loop operation or less than 1.08 with single loop operation, the reactor vessel steam dome pressure greater than 785 psig, and core flow greater than 10% of rated flow, be in at least HOT SHUTDOWN within 2 hours and comply with the requirements of Specification 6.7.

REACTOR COOLANT SYSTEM PRESSURE

2.1.3 The reactor coolant system pressure, as measured in the reactor vessel steam dome, shall not exceed 1325 psig.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, 3, and 4.

ACTION:

With the reactor coolant system pressure as measured in the reactor vessel steam dome above 1325 psig, be in at least HOT SHUTDOWN with reactor coolant system pressure less than or equal to 1325 psig within 2 hours and comply with the requirements of Specification 6.7.

REACTOR VESSEL WATER LEVEL

2.1.4 The reactor vessel water level shall be above the top of the active irradiated fuel.

2.1 BASES FOR SAFETY LIMITS

2.1.0 INTRODUCTION

The fuel cladding, reactor pressure vessel, and primary system piping are the principal barriers to the release of radioactive materials to the environs. Safety Limits are established to protect the integrity of these barriers during normal plant operations and anticipated transients. The fuel cladding integrity Safety Limit is set so that no fuel damage is calculated to occur if the limit is not violated. Because fuel damage is not directly observable, a step-back approach is used to establish a Safety Limit so that the MCPR is not less than 1.07 for two recirculation loop operation and 1.08 for single recirculation loop operation. MCPR greater than 1.07 for two recirculation loop operation and 1.08 for single recirculation loop operation represents a conservative margin relative to the conditions required to maintain fuel cladding integrity. The fuel cladding is one of the physical barriers that separate the radioactive materials from the environs. The integrity of this cladding barrier is related to its relative freedom from perforations or cracking. Although some corrosion or use-related cracking may occur during the life of the cladding, fission product migration from this source is incrementally cumulative and continuously measurable. Fuel cladding perforations, however, can result from thermal stresses that occur from reactor operation significantly above design conditions and the Limiting Safety System Settings. Although fission product migration from cladding perforation is just as measurable as that from use-related cracking, the thermally caused cladding perforations signal a threshold beyond which still greater thermal stresses may cause gross rather than incremental cladding deterioration. Therefore, the fuel cladding Safety Limit is defined with a margin to the conditions that would produce onset of transition boiling, MCPR of 1.0. These conditions represent a significant departure from the condition intended by design for planned operation.

2.1.1 THERMAL POWER, Low Pressure or Low Flow

The use of GEXL correlation is not valid for all critical power calculations at pressures below 785 psig or core flows less than 10% of rated flow. Therefore, the fuel cladding integrity Safety Limit is established by other means. This is done by establishing a limiting condition on core THERMAL POWER with the following basis. Since the pressure drop in the bypass region is essentially all elevation head, the core pressure drop at low power and flows will always be greater than 4.5 psi. Analyses show that with a bundle flow of 28×10^3 lb/hr, bundle pressure drop is nearly independent of bundle power and has a value of 3.5 psi. Thus, the bundle flow with a 4.5-psi driving head will be greater than 28×10^3 lb/hr. Full-scale ATLAS test data taken at pressures from 14.7 psia to 800 psia indicate that the fuel assembly critical power at this flow is approximately 3.35 Mwt. With the design peaking factors, this corresponds to a THERMAL POWER of more than 50% of RATED THERMAL POWER. Thus, a THERMAL POWER limit of 25% of RATED THERMAL POWER for reactor pressure below 785 psig is conservative.

BASES TABLE B2.1.2-1

UNCERTAINTIES USED IN THE DETERMINATION
OF THE FUEL CLADDING SAFETY LIMIT*

| <u>QUANTITY</u> | <u>STANDARD DEVIATION (% OF POINT)</u> |
|-------------------------------------|--|
| Feedwater Flow | 1.76 |
| Feedwater Temperature | 0.76 |
| Reactor Pressure | 0.5 |
| Core Inlet Temperature | 0.2 |
| Core Total Flow | |
| Two Recirculation Loop Operation | 2.5 |
| Single Recirculation Loop Operation | 6.0 |
| Channel Flow Area | 3.0 |
| Friction Factor Multiplier | 10.0 |
| Channel Friction Factor Multiplier | 5.0 |
| TIP Readings | |
| Two Recirculation Loop Operation | 8.7 |
| Single Recirculation Loop Operation | 9.1 |
| R Factor | 1.6 |
| Critical Power | 3.6 |

* The uncertainty analysis used to establish the corewide Safety Limit MCPR is based on the assumption of quadrant power symmetry for the reactor core. The values herein apply to both two recirculation loop operation and single recirculation loop operation, except as noted.

3/4.4 REACTOR COOLANT SYSTEM

3/4.4.1 RECIRCULATION SYSTEM

RECIRCULATION LOOPS

LIMITING CONDITIONS FOR OPERATION

3.4.1.1 Two reactor coolant system recirculation loops shall be in operation with:

- a. Total core flow greater than or equal to 45% of rated core flow, or
- b. THERMAL POWER within the unrestricted zone of Figure 3.4.1.1-1.

APPLICABILITY: OPERATIONAL CONDITIONS 1* and 2*.

ACTION:

- a. With one reactor coolant system recirculation loop not in operation:
 1. Within four hours:
 - a) Place the recirculation flow control system in the Loop Manual (Position Control) mode, and
 - b) Reduce THERMAL POWER to $\leq 70\%$ of RATED THERMAL POWER, and,
 - c) Increase the MINIMUM CRITICAL POWER RATIO (MCPR) Safety Limit by 0.01 to 1.08 per Specification 2.1.2, and,
 - d) Reduce the Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) limit to a value of 0.81 times the two recirculation loop operation limit per Specification 3.2.1, and,
 - e) Reduce the Average Power Range Monitor (APRM) Scram and Rod Block and Rod Block Monitor Trip Setpoints and Allowable Values to those applicable for single recirculation loop operation per Specifications 2.2.1, 3.2.2 and 3.3.6.
 - f) Reduce the volumetric drive flow rate of the operating recirculation loop to $\leq 41,800^{**}$ gpm.

* See Special Test Exception 3.10.4.

** This value represents the volumetric recirculation loop drive flow which produces 100% core flow at 100% THERMAL POWER.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 16 TO FACILITY OPERATING LICENSE NO. NPF-69
NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT NUCLEAR STATION, UNIT NO. 2
DOCKET NO. 50-410

INTRODUCTION

By letter dated December 8, 1989, Niagara Mohawk Power Corporation (the licensee) submitted a request for amendment to the Technical Specifications for Nine Mile Point, Unit 2, for cycle 2 operation. The cycle 2 reload core will consist of GE fuel type GE8X8NB. The GE8X8NB fuel was approved for reload in Amendment No. 18 to GESTAR II (NEDE-24011-P-A). Due to the use of GE8X8NB fuel, the licensee recalculated the Minimum Critical Power Ratio (MCPR) Safety Limit and proposes changes in the Technical Specifications accordingly.

EVALUATION

Section 2.1.2 Thermal Power

The MCPR Safety Limit for cycle 2 with the GE8X8NB fuel type is proposed to change from 1.06 to 1.07. The proposed MCPR limit is based on an approved methodology described in the approved Amendment No. 18 to NEDE-24011-P-A. The degree of conservatism associated with the proposed new limit is the same as that of the existing MCPR limit in that there is an adequate margin to assure that more than 99.9 percent of the fuel rods in the core will not be expected to experience transition boiling during transient events.

Based on the approved methodology and adequate conservatism, we conclude that the new MCPR limit of 1.07 is acceptable for use in cycle 2.

Section 3.4.1.1 Recirculation Loops

The MCPR Safety Limit for cycle 2 with the GE8X8NB fuel type for operation with one recirculation loop is increased by 0.01. This increase changes the Safety Limit from 1.07 to 1.08. The proposed MCPR limit for operation with one recirculation loop is based on the approved Amendment No. 18 to NEDE-24011-P-A. The degree of conservatism associated with the proposed new limit is the same as the existing limit in that it is representative of a margin relative to the conditions required to maintain fuel cladding integrity for single loop operation.

Based on the approved methodology and adequate conservatism, we conclude that the new MCPR Safety Limit of 1.08 for single loop operation is acceptable for use in cycle 2.

SUMMARY

The staff has evaluated the licensee's request to increase the MCPR Safety Limit associated with cycle 2 operation. Based on the approved methodology and adequate conservatism associated with the use of the approved GE type fuel GE8X8NB, we conclude that the proposed MCPR limit is acceptable for use in cycle 2 operation and poses no undue risk to the public health and safety.

ENVIRONMENTAL CONSIDERATION

This amendment involves a change in a requirement with respect to the installation or use of the facility components located within the restricted areas as defined in 10 CFR 20. The staff has determined that this amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Sec 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Dated: June 19, 1990

PRINCIPAL CONTRIBUTOR:

A. Massey