NRC FORM 195 (2-76)

U.S. NUCLEAR REGULATORY COMMISSION

DOCKET NUMBER 50-220

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PLANT NAME:
Nine Mile Point Unit No. 1

RJL

ENCLOSURE

Amdt. to OL/change to Appendix A tech specs...notorized 4/12/77...relates to partial loop operation on the Emergency Core Cooling System with supporting info...

(9-P)

FOR ACTION/INFORMATION

SAFETY		ENVIRO	
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✓ BRANCH CHIEF:	Lear (5)	BRANCH CHIEF:	
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NRC FORM 195 (2-76)

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April 14, 1977

Mr. Ben C. Rusche
Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

File Cy.

Regulatory

Re: Niagara Mohawk Power Corporation
Nine Mile Point Nuclear Station
Unit No. 1--Docket No. 50-220

Dear Mr. Rusche:

As counsel for Niagara Mohawk, I hereby enclose the following:

(1) Three (3) originals and nineteen (19) copies of a pleading requesting a change in the above-numbered facility's operating license DPR-63;

(2) Forty (40) copies of the proposed Technical Specifications filed herewith as Attachment A; and

(3) Forty (40) copies of the supporting information as set forth in Attachment B.

7710080303

The proposed Technical Specification change relates to partial loop operation on the Emergency Core Cooling System.

Very truly yours,

LEBOEUF, LAMB, LEIBY & MACRAE
Attorneys for Niagara Mohawk Power Corporation

By E. B. Thomas, Jr.
Eugene B. Thomas, Jr.
Partner

Enclosure

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
	)	
NIAGARA MOHAWK POWER CORPORATION	)	Docket No. 50-220
(Nine Mile Point Nuclear Station	)	
Unit No. 1)	)	

APPLICATION FOR AMENDMENT

TO

OPERATING LICENSE

Pursuant to Section 50.90 of the regulations of the Nuclear Regulatory Commission, Niagara Mohawk Power Corporation, holder of Facility Operating License No. DPR-63, hereby requests that Specification 3.1.7 and 4.1.7 of the Technical Specifications and Bases set forth in Appendix A to that License be amended. These proposed changes have been concurred with by the Site Operations Review Committee and Safety Review and Audit Board.

The proposed Technical Specification changes are set forth in Attachment A to this application. Supporting Information, which demonstrates that the proposed changes do not involve a significant hazards consideration, is set forth in Attachment B. The proposed change would not authorize any change in the types or any increase in the amounts of effluents or any change in the authorized power level of the facility.

WHEREFORE, Applicant respectfully requests that Appendix A to Facility Operating License No. DPR-63 be amended in the form attached hereto as Attachment A.

NIAGARA MOHAWK POWER CORPORATION

By _____

Gerald K. Rhode
Vice President-Engineering

Subscribed and sworn to
before me on this 12th
day of April, 1977.

Hazel J. Carrick
NOTARY PUBLIC

HAZEL J. CARRICK
Notary Public in the State of New York
Qualified in Onon. Co. No. 4524460
My Commission Expires March 30,1978

Attachment A

Niagara Mohawk Power Corporation

License No. DPR-63

Docket No. 50-220

Proposed Changes To Facility Operating License

The attached pages 63, 70 and 70c are revisions to Appendix A of DPR-63.

3.1.7 FUEL RODS

Applicability:

The Limiting Conditions for Operation associated with the fuel rods apply to those parameters which monitor the fuel rod operating conditions.

Objective:

The objective of the Limiting Conditions for Operation is to assure the performance of the fuel rods.

Specification:

a. Average Planar Linear Heat Generation Rate (APLHGR)

During power operation, the APLHGR for each type of fuel as a function of average planar exposure shall not exceed the limiting value shown in Figures 3.1.7.a, 3.1.7.b, 3.1.7.c, 3.1.7.d and 3.1.7.e. If at any time during power operation it is determined by normal surveillance that the limiting value for APLHGR is being exceeded, action shall be initiated within 15 minutes to restore operation to within the prescribed limits. If the APLHGR is not returned to within the prescribed limits within two (2) hours, the reactor shall be brought to the Cold Shutdown condition within 36 hours. Surveillance and corresponding action shall continue until reactor operation is within the prescribed limits.

During power operation with one recirculation line isolated, the APLHGR for each fuel type as a function of average planar exposure shall not exceed 98% of limiting value shown in Figures 3.1.7.a, 3.1.7.b, 3.1.7.c, 3.1.7.d and 3.1.7.e.

4.1.7 FUEL RODS

Applicability:

The Surveillance Requirements apply to the parameters which monitor the fuel rod operating conditions.

Objective:

The objective of the Surveillance Requirements is to specify the type and frequency of surveillance to be applied to the fuel rods.

Specification:

a. Average Planar Linear Heat Generation Rate (APLHGR)

The APLHGR for each type of fuel as a function of average planar exposure shall be determined daily during reactor operation at $\geq$ 25% rated thermal power.

Average Planar Linear Heat Generation Rate (APLHGR)

This specification assures that the peak cladding temperature following the postulated design basis loss-of-coolant accident will not exceed the limit specified in 10CFR50, Appendix K.

The peak cladding temperature following a postulated loss-of-coolant accident is primarily a function of the average heat generation rate of all the rods of a fuel assembly at any axial location and is only dependent secondarily on the rod-to-rod power distribution within an assembly. Since expected local variations in power distribution within a fuel assembly affect the calculated peak clad temperature by less than ± 20 F relative to the peak temperature for a typical fuel design, the limit on the average linear heat generation rate is sufficient to assure that calculated temperatures are within the 10CFR50, Appendix K limit. The limiting value for APLHGR is shown in Figure 3.1.7. These curves are based on calculations using the models described in References 1, 2, 3, 5 & 6.

Analysis has been performed (Reference 7) which shows for isolation of 1 loop, operation limited to 98% of the limiting APLHGR shown in Figure 3.1.7 conservatively assures compliance with 10CFR50, Appendix K.

Linear Heat Generation Rate (LHGR)

This specification assures that the linear heat generation rate in any rod is less than the design linear heat generation even if fuel pellet densification is postulated. The power spike penalty specified is based on the analysis presented in Section 3.2.1 of Reference 1 and in References 2, 3 and 4, and assumes a linearly increasing variation in axial gaps between core bottom and top, and assures with a 95% confidence, that no more than one fuel rod exceeds the design linear heat generation rate due to power spiking. The LHGR as a function of core height shall be checked daily during reactor operation at ≥ 25% power to determine if fuel burnup or control rod movement has caused changes in power distribution.

Minimum Critical Power Ratio (MCPR)

At core thermal power levels less than or equal to 25%, the reactor will be operating at a minimum recirculation pump speed and the moderator void content will be very small. For all designated control rod patterns which may be employed at this point, operating plant experience and thermal-hydraulic analysis indicated that the resulting MCPR value is in excess of requirements by a considerable margin. With this low void content, any inadvertent core flow increase would only place operation in a more conservative mode relative to MCPR. During initial startup testing

(1) "Fuel Densification Effects on General Electric Boiling Water Reactor Fuel," Supplements 6, 7 and 8, NEDM-10735, August 1973.

(2) Supplement 1 to Technical Report on Densifications of General Electric Reactor Fuels, December 14, 1974 (USA Regulatory Staff).

(3) Communication: V. A. Moore to I. S. Mitchell, "Modified GE Model for Fuel Densification," Docket 50-321, March 27, 1974.

(4) "General Electric Boiling Water Reactor Generic Reload Application for 8 x 8 Fuel," NEDO-20360, Supplement 1 to Revision 1, December 1974.

(5) "General Electric Company Analytical Model for Loss of Coolant Analysis in Accordance with 10CFR50 Appendix K," NEDO-20566.

(6) General Electric Refill Reflood Calculation (Supplement to SAFE Code Description) transmitted to the USAEC by letter, G. L. Gyorey to Victor Stello Jr., dated December 20, 1974.

(7) September 26, 1975 letter, G. K. Rhode, Niagara Mohawk Power Corporation to G. Lear, United States Nuclear Regulatory Commission.

Attachment B

Niagara Mohawk Power Corporation

License No. DPR-63

Docket No. 50-220

Supporting Information

In responding to the Nuclear Regulatory Commission (NRC) letter of June 18, 1975, Niagara Mohawk addressed the effect of partial loop operation on Emergency Core Cooling System (ECCS) analyses assuming the idle loop is not isolated and that recirculation flow was adjusted to be equivalent to five loop flow. The conclusion was that no safety analysis was affected by partial loop operation (four recirculation pumps in service with the inoperative loop not isolated).

This document discusses the effect on safety analyses of partial loop operation with the idle loop isolated. The models used in this analysis are described in References 1 and 2.

Core flow is unaffected by isolation of the idle loop, thus the bases for the conclusions of the previous partial loop analysis (Reference 3) concerning the pump seizure accident and the transient analysis are applicable with the idle loop isolated. The total vessel inventory is affected by isolation of the idle loop, thus an analysis of the isolation of an idle recirculation line was performed to determine the effect upon the Maximum Average Planar Linear Heat Generation Rate (MAPLHGR).

The blowdown analysis was performed with one recirculation pump inoperative and the mass between the recirculation suction and discharge isolation valves subtracted from the total vessel inventory. The two worst small breaks (0.07 and 0.5 ft^2) and the Design Basis Accident (Reference 4) were considered.. Recirculation flow was assumed to be at rated conditions with the four operating pumps appropriately compensated. The mass removed due to the isolated loop is small compared to the total vessel coolant inventory, and therefore, the hot node uncovered only seconds earlier than the case with all recirculation loops operating. The core heat-up analysis was calculated assuming this earlier uncovery time and results indicate an increase in the peak cladding temperature of 30 F, which is approximately equivalent to a 1.5 percent reduction in the Maximum Average Planar Linear Heat Generation Rate (MAPLHGR).

To assure that the peak clad temperature will remain below the 2200 F Appendix K limit during steady state power operation with one recirculation line isolated, the average linear heat generation rate (LHGR) of all the rods in any fuel assembly, as a function of average planar exposure, at any axial location shall be limited to 98% of the maximum average planar LHGR applicable to 5 pump operation.

REFERENCES

1. General Electric Company Analytical Model for Loss-of-Coolant Analysis in Accordance with 10CFR50 Appendix K, NED-20566 (Draft), submitted August 1974, and General Electric Refill Reflood Calculation (Supplement to SAFE Code Description) transmitted to the USAEC by letter, G. L. Gyorey to Victor Stello, Jr., dated December 20, 1974.

2. GEGAP-III: A Model for the Prediction of Pellet-Cladding Thermal Conductance in BWR Fuel Rods, NEDO-20181, November 1973.

3. Letter, G. K. Rhode, Niagara Mohawk Power Corporation to G. Lear, United States Nuclear Regulatory Commission dated September 26, 1975.

4. Letter, G. K. Rhode, Niagara Mohawk Power Corporation to G. Lear, United States Nuclear Regulatory Commission dated October 31, 1975.