



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 143 TO FACILITY OPERATING LICENSE NO. DPR-63

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION UNIT NO. 1

DOCKET NO. 50-220

1.0 INTRODUCTION

By letter dated November 24, 1992, as supplemented June 30, 1993, Niagara Mohawk Power Corporation (the licensee) submitted a request for changes to the Nine Mile Point Nuclear Station Unit No. 1 (NMP1), Technical Specifications (TSs). The requested changes would revise the TSs to utilize a revised correlation for the Flow Biased Scram and Average Power Range Monitors (APRMs) Rod Block functions. The revisions are an integral part of the process computer upgrade that was implemented during the 1993 refueling outage (Reload 13). The process computer upgrade utilizes the "3D Monicore" software which was supplied as part of the computer upgrade. The June 30, 1993, letter provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

2.0 EVALUATION

The proposed changes are necessitated by new fuel bundle designs and new core monitoring techniques introduced by General Electric. New fuel designs with different active fuel lengths and variable enrichments require monitoring of parameters different from those required with simpler fuels. Consequently, the licensee is proposing revisions to the Limiting Safety System Settings associated with the APRMs as well as to the definitions of the parameters used in the determination of the Limiting Safety System Settings. In addition, the proposed amendment would replace the visual representation of the APRM Limiting Safety System Settings with the actual correlation used to determine the settings. The licensee also proposed to enhance the calculation of the average planar linear heat generation rate (APLHGR) by including axial location as an input parameter to the calculation.

The proposed changes are consistent with guidance contained in the approved NRC Safety Evaluation, Amendment No. 19 to GESTAR II. The proposed TSs will result in the same operating power distribution limits and safety margins as the current TSs. In addition, the proposed TS changes will reduce TS complexity and will preclude the need for inclusion of numerous lattice specific MAPLHGR curves.

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2.1 Replacement of Figure 2.1.1

APRM Flow Biased Scram and Rod Block Safety Limits are provided in TS Figure 2.1.1. Analysis and data provided by the licensee shows that during operation at 100 percent rated thermal power, and 100 percent core flow with a 120 percent scram trip setting, none of the operational transients analyzed violate the fuel safety limit and that there is a substantial margin from fuel damage. The scram and rod block settings are varied with circulation flow to account for lower thermal margins at lower flows. Furthermore, the licensee showed in their submittal that to ensure that actual setpoints are not exceeded, the scram and rod block settings are clamped at their 100 percent core flow values.

To take advantage of current advances in human factor engineering, the licensee has replaced TS Figure 2.1.1 with the actual correlation used to determine the settings. References to TS Figure 2.1.1 are revised to refer to TS 2.1.2a, the location of the correlation. However, TS Figure 2.1.1 is retained in the NMP1 Updated Final Safety Analysis Report as Figure VIII-14, "Trip Logic for APRM Scram and Rod Block."

The licensee's APRM flow biased scram and rod block settings are adjusted ("setdown") to assure that the peak linear heat generation rate (LHGR) during a postulated transient event, is not increased for any combination of the maximum total peaking factor and reactor thermal power. The setdown factor adjusts the scram and rod block settings whenever that factor is less than one. Consequently, whenever calculated peaking factors exceed design values, the scram setpoints are reduced to maintain an equivalent margin of safety.

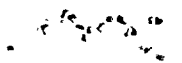
The NMP1 plant process computer assumes an active fuel length of 144 inches for calculation of the maximum total peaking factor. The utilization of advanced fuel design, with different fuel lengths, has necessitated the calculation of the scram and rod block setdown requirements in a different way. In essence, the existing setdown factor calculation is replaced with an equivalent factor "T" to accommodate the different fuel length designs.

$$T = \text{FRTP}/\text{CMFLPD}$$

Where:

FRTP = Fraction of Rated Thermal Power, and
CMFLPD = Core Maximum Fraction of Limiting Power Density

The correlation for the APRM scram and rod block Limiting Safety System Setting is being revised (as part of this submittal) to include this new setdown factor. The revisions to implement this change have been included in the proposed amendment, along with the revised Bases sections relating to the scram and rod block Limiting Safety System Settings.



2.2 Thermal Performance Parameters

In this submittal, the licensee has requested that axial location be added as parameter to use when determining the average planar linear heat generation rate (APLHGR) for a fuel bundle.

Until now, NMP1 obtained APLHGR by averaging the linear heat generation rate (LHGR) for each of the fuel rods of a particular fuel bundle type and selecting a limiting value maximum average planar linear heat generation ratio (MAPLHGR) as a function of fuel burnup. Newer GE fuel bundles have MAPLHGRs that vary axially depending upon the specific combination of enriched uranium and gadolinia that comprises a fuel bundle lattice cross section at a particular axial node. Each particularly enriched bundle is called a lattice type, having a MAPLHGR that varies axially and with fuel burnup. TS 3.1.7a has been revised to include the axial location as a parameter to be used when determining APLHGR and the definition of the APLHGR has been added to Section 1.0, "Definitions."

To minimize the probability of errors during hand calculations of the APLHGR, the licensee has provided additional directions, such that the allowed APLHGR for any bundle will not be allowed to exceed the limiting lattice APLHGR for that bundle. These changes are consistent with the guidance provided in the NRC Safety Evaluation of Amendment No. 19 to GESTAR II.

The NRC staff has reviewed the licensee's proposed TS changes necessitated by new fuel bundle designs and new core monitoring techniques introduced by GE. Based on this review, we conclude that the proposed changes satisfy staff positions and requirements in these areas and are therefore acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New York State official was notified of the proposed issuance of the amendment. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the 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 the amendment involves no significant hazards consideration, and there has been no public comment on such finding (57 FR 61116). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or

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environmental assessment need be prepared in connection with the issuance of the amendment.

5.0 CONCLUSION

The Commission has 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor:

A. Attard

Date: July 26, 1993



Docket No. 50-220

July 26, 1993

Mr. B. Ralph Sylvia
Executive Vice President, Nuclear
Niagara Mohawk Power Corporation
301 Plainfield Road
Syracuse, New York 13212

Dear Mr. Sylvia:

SUBJECT: ISSUANCE OF AMENDMENT FOR NINE MILE POINT NUCLEAR STATION UNIT NO. 1
(TAC NO. M85074)

The Commission has issued the enclosed Amendment No. 143 to Facility Operating License No. DPR-63 for the Nine Mile Point Nuclear Station Unit No. 1 (NMP-1). The amendment consists of changes to the Technical Specifications (TSs) in response to your application transmitted by letter dated November 24, 1992, as supplemented June 30, 1993.

The amendment revises the TSs to utilize a revised correlation for the Flow Biased Scram and Average Power Range Monitors Rod Block functions. The revisions are an integral part of the process computer upgrade that was implemented during the recent refueling outage (Reload 13). The process computer upgrade utilizes the "3D Monicore" software which was supplied as part of the computer upgrade.

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

Sincerely,
Original Signed By:

Donald S. Brinkman, Senior Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 143 to DPR-63
2. Safety Evaluation

cc w/enclosures:
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