



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 41 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 April 21, 1980 (Reference 1) as supplemented by references 2 and 3, Niagara Mohawk Power Corporation (NMPC), the licensee, proposed changes to Technical Specifications for Nine Mile Point Unit 1 (NMP-1). NMPC has proposed these modifications to support its review of future reloads for NMP-1 under the provision of 10 CFR 50-59. This evaluation is only for the proposed changes to the Technical Specifications which will allow NMPC to conduct future refuelings without prior NRC approval if the conditions delineated in 10 CFR 50.59 are satisfied. Documentation regarding future reload evaluations shall be retained on-site, in accordance with Technical Specification Section 6.10, available for review by personnel from the NRC Office of Inspection and Enforcement. Please note that the evaluation contained in Section 2 does not constitute approval of NMPC's future reloads.

By letter dated September 13, 1979, the licensee was requested to submit Standard Administrative Controls which required direct supervision of core alterations by a licensed Senior Reactor Operator (SRO) who had no concurrent duties. The evaluation of the Niagara Mohawk commitment is provided in Section 3.

2.0 10 CFR 50.59 Reload Evaluation

The main changes to the Technical Specifications and our evaluations are discussed below:

2.1 Safety Limit Critical Power Ratio (SLCPR)

The proposed change is to delete the quantitative value of safety limit critical power ratio (SLCPR) from the Technical Specifications. The licensee indicates that the SLCPRs are bounded by the values specified in reference 4 (reference 12 of the Technical Specifications) which are 1.07 for 8 x 8 retrofit fuel and 1.06 for 8 x 8 fuel. These SLCPR values have previously been accepted in Reference 4. In the future if the SLCPRs change in the referenced document, the licensee is required to update the Technical Specifications reflecting the change for the SLCPRs in the revision to the referenced document. On this basis, we conclude that the proposed change is editorial in nature and is acceptable.

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2.2 Total Peaking Factor

The total peaking factor (TPF) has been changed from its limit of 3.02 for 8 x 8 fuel and 3.00 for 8 x 8R fuel to a common limit for all 8 x 8 fuel. Since the proposed value of TPF (3.00) is less than or equal to the present TPF limit, the change in the TPF limit is acceptable..

2.3 Exposure Dependent Minimum Critical Power Ratio (MCPR)

The steady state operating limit for the minimum critical power ratio (MCPR) has been changed to exposure dependent MCPR limits as shown in reference 3.

The previous MCPR limit was determined based on calculations using the REDY model described in NEDO-10802 (reference 6). As part of the evaluation of the REDY model, three turbine trip tests were performed at the Peach Bottom, Unit 2 Plant. The purpose of the test was to provide experimental data for code verification and to improve the understanding of integral plant behavior under transient conditions. The results from the program have revealed that in certain cases the results predicted by the REDY model are nonconservative. Taking into account these results and discussion with the General Electric Company, we therefore reviewed the General Electric Company's new ODYN methods. The ODYN methods have been approved and accordingly, we required the licensee to reanalyze for the reload fuel the following transients (reference 7) for the thermal limit determination: (1) feedwater controller failure - maximum demand, (2) generator load rejection and (3) turbine trip.

We have reviewed the results in reference 2 submitted to support the changes to the MCPR limit in the Technical Specifications. From our evaluation, we conclude that, (1) the methods used and the transients reanalyzed to determine the thermal limits meet the requirements specified in reference 7, (2) the resulting MCPR limits do not violate the criteria specified in Section 4.4 of the Standard Review Plan and, therefore, the proposed change is acceptable.

2.4 Linear Heat Generation Rate Power Spiking Penalty

The linear heat generation rate (LHGR) power spiking penalty has been removed from the Technical Specifications. For the Cycle 6 predicted worse case, the maximum transient LHGRs, including the power spiking penalty, have demonstrated that the exposure dependent safety limit LHGRs (reference 4) are not violated. Analyses for future cycles should be performed to assure worse case transient LHGRs are within the exposure dependent safety limit LHGRs. This change has been accepted by reference 5.



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2.5 Maximum Average Planar Linear Heat Generation Rate (MAPLHGR)

The proposed new MAPLHGR limits are calculated out to higher exposures (from 30,000 MWD/STU to 40,000 MWD/STU) by the previously approved methods initially used for the fuel with exposures up to 30,000 MWD/STU. The changes in the four figures (Figures 3.17 a, b, c, and d) are the result of extending the MAPLHGR limits to 36,000 MWD/STU for 8DB250 fuel, 8DB274L and 9DB274H fuel, 8DNB277 fuel and P8NDB277 fuel, respectively.

Although the methodology used is generally applicable for an average planar exposure up to 36,000 MWD/t, the staff believes the effects of enhanced fission gas release in high burnup fuel (above 30,000 MWD/t) are not adequately accounted for in your submittals. To compensate for this deficiency, the staff has estimated the amount of MAPLHGR limits in Figures 3.1.7a to 3.1.7d of the proposed Technical Specifications should be reduced to assure the peak cladding temperature and local oxidation are below the limits allowed by 10 CFR 50.46. The reduction imposed is based on the results of comparative calculations of fuel volume average temperature performed by General Electric using GEGAP III with and without an NRC correction for enhanced fission gas release and the relationship between peak cladding temperature and MAPLHGR increased presented in NEDE-23786-1-P. In estimating the MAPLHGR reduction, the staff conservatively assumed the change in volume average temperature can be translated directly into a peak cladding temperature change. Table 1 gives the percent reduction in MAPLHGR as a function exposure above 30,000 MWD/t for the types 8DB250, 8DN274L, H, 8DNB277 and P8DNB277 fuel in your submittals. We have limited the extension of the MAPLHGR to 36,000 MWD/t to account for the uncertainties in enhanced fission gas release above this exposure.

TABLE 1 - REDUCTION IN MAPLHGR AS A FUNCTION OF EXPOSURE

Exposure MWD/t	30,000	32,000	34,000	36,000
Reduction MAPLHGR, %	10.0	13.33	16.67	20.0

These MAPLHGR reductions to the licensee's proposed Technical Specifications in Figures 3.1.7a to 3.1.7d assures that the cladding temperature and local cladding oxidation would remain below the 2200°F (peak cladding temperature) and 17 percent (local cladding oxidation) limit allowed by 10 CFR 50.46 when the effects of enhanced fission gas release above 30,000 MWD/t are conservatively accounted for.

2.6 Conclusion

We have concluded that the changes to NMP-1 Technical Specifications are acceptable.



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3.0 SRO Responsibility Evaluation

In 1974, the NRC requested that all power reactor licensees submit standard administrative control requirements. By subsequent letter dated July 6, 1979, the licensee was requested to comply with the prior NRC request (Reference 8). One of these requirements called for the direct supervision of core alterations by a licensed Senior Reactor Operator (SRO) who had no concurrent duties.

The licensee has forwarded a Technical Specification page change which complies with the NRC requirements. We conclude that these changes are acceptable.

4.0. Environmental Consideration

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

5.0 Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: March 19, 1981



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References

1. Letter from J. Bartlett (Niagara Mohawk Power Corporation) to H. R. Denton (NRC), "Application for Amendment to Operating License," dated April 21, 1980.
2. Supplemental Reload Licensing Submittal for Nine Mile Point Nuclear Power Station - Unit 1 Reload No. 8, Y1003 J01A14, General Electric, November 1980.
3. Letter from M. G. Mosier (Niagara Mohawk Power Corporation) to P. Polk (NRC), January 23, 1981.
4. Generic Reload Fuel Application, NEDE-24011-P-A-1, General Electric Topical Report.
5. Letter from D. G. Eisenhut (NRC) to R. Gridly (GE) date June 9, 1978.
6. Analytical Methods of Plant Transient Evaluations for General Electric Boiling Water Reactors, NEDO-10802.
7. Letter from D. Eisenhut to All Holders of Construction Permits and Operating Licenses for Boiling Water Reactors, November 4, 1980.
8. Letter to Mr. Donald P. Dise (Niagara Mohawk Power Corp.) from Mr. Thomas A. Ippolito (NRC) dated July 6, 1979.



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