

REGULATORY DOCKET FILE COPY

MARCH 31 1980

Docket No. 50-220

Signed by
T. A. Ippolito

Mr. Donald P. Dise
Vice President - Engineering
Niagara Mohawk Power Corporation
300 Erie Boulevard West
Syracuse, New York 13202

Dear Mr. Dise:

The Commission has issued the enclosed Amendment No. 36 to Facility License No. DPR-63 for Unit No. 1 of the Nine Mile Point Nuclear Station. The amendment consists of changes to the license and Technical Specifications in response to your request forwarded by letter dated June 28, 1979.

The amendment consists of changes to the Technical Specifications to modify the power-to-flow curve and allow additional operational flexibility during plant load changes. In addition, corrections have been made to the license to reflect the present power limitations at the end of cycle. These corrections were verbally agreed to by members of your staff.

A copy of the Safety Evaluation and the Federal Register Notice are also enclosed.

Sincerely,

Original Signed by
T. A. Ippolito

Thomas A. Ippolito, Chief
Operating Reactors Branch #3
Division of Operating Reactors

Enclosures:

1. Amendment No. 36
2. Safety Evaluation
3. Notice

cc w/enclosures:
See page 2

8004180253

CP

AS TO FIRM AND
CONTENT OF FIRM FILE
AND AMENDMENT ONLY
(AS REQUESTED)

OFFICE	ORB #3	ORB #3	AD-ORR	OELD	ORB #3
SURNAME	SNorris:mjf	PPolk	WGammill	Bm. Bondaruk	Tippolito
DATE	3/25/80	3/25/80	3/25/80	3/27/80	3/27/80

Mr. Donald P. Dise
Niagara Mohawk Power Corporation

- 2 -

March 28, 1980

cc:

Eugene B. Thomas, Jr., Esquire
LeBoeuf, Lamb, Leiby & MacRae
1757 N Street, N.W.
Washington, D. C. 20036

T. K. BeBoer, Director
Technological Development Programs
State of New York
Energy Office
Swan Street Building
CORE 1 - Second Floor
Empire State Plaza
Albany, New York 12223

Mr. Robert P. Jones, Supervisor
Town of Scriba
R. D. #4
Oswego, New York 13126

Niagara Mohawk Power Corporation
ATTN: Mr. Thomas Perkins
Plant Superintendent
Nine Mile Point Plant
300 Erie Boulevard West
Syracuse, New York 13202

Director, Technical Assessment Division
Office of Radiation Programs (AW 459)
US EPA
Crystal Mall #2
Arlington, Virginia 20460

U. S. Environmental Protection Agency
Region II Office
ATTN: EIS COORDINATOR
26 Federal Plaza
New York, New York 10007

State University at Oswego
Penfield Library - Documents
Oswego, New York 13126



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

NIAGARA MOHAWK POWER CORPORATION

DOCKET NO. 50-220

NINE MILE POINT NUCLEAR STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 36
License No. DPR-63

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Niagara Mohawk Power Corporation (the licensee) dated June 28, 1979, 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, paragraphs 2.C.(2) and 2.C.(3) of Facility Operating License No. DPR-63 are hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 36, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

8004180258

- (3) Beyond the point in the Cycle 6 fuel cycle at which the reactivity reduction rate during a scram is less than that of the curve marked EOC 6 minus 1500 Mwd/T in Figure 2C of "Supplemental Reload Licensing Submittal for Nine Mile Point Nuclear Power Station Unit 1 Reload No. 1, Ring Reanalysis Supplement," NEDO 24155-1 Supplement 1 dated December 1978, operation of the reactor shall not exceed a core thermal power of 1813 megawatts (98% of rated) at rated flow conditions.

Beyond the point in the Cycle 6 fuel cycle at which the reactivity reduction rate during a scram is less than that of the curve marked EOC 6 minus 1000 Mwd/T in Figure 2B of "Supplemental Reload Licensing Submittal for Nine Mile Point Nuclear Power Station (Unit 1) Reload No. 7," NEDO 24155, 78NED291, dated November 1978, operation of the reactor shall not exceed a core thermal power of 1757 megawatts (95% of rated) at rated flow conditions.

Operation beyond the end-of-cycle (all rods out condition) thermal power is limited to seventy (70) percent minimum.

Increasing core power level via reduced feedwater heating, once operation in the coastdown mode has begun, is not allowed.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION


Thomas A. Ippolito, Chief
Operating Reactors Branch #3
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 28, 1980

ATTACHMENT TO LICENSE AMENDMENT NO. 36

FACILITY OPERATING LICENSE NO. DPR-63

DOCKET NO. 50-220

Revise Appendix A by removing the following pages and replacing with the attached identically numbered pages. Marginal lines indicate area of change.

15
20
64c
70a
70c

BASES FOR 2.1.2 FUEL CLADDING - LS³

chambers provide the basic input signals, the APRM system responds directly to average neutron flux. During transients, the instantaneous rate of heat transfer from the fuel (reactor thermal power) is less than the instantaneous neutron flux due to the time constant of the fuel. Therefore, during abnormal operational transients, the thermal power of the fuel will be less than that indicated by the neutron flux at the scram setting. Analyses (5,6,8,9,10,11,13) demonstrate that with a 120% scram trip setting, none of the abnormal operational transients analyzed violate the fuel safety limit and there is a substantial margin from fuel damage.

However, in response to expressed beliefs (7) that variation of APRM flux scram with recirculation flow is a prudent measure to assure safe plant operation during the design confirmation phase of plant operation, the scram setting will be varied with recirculation flow.

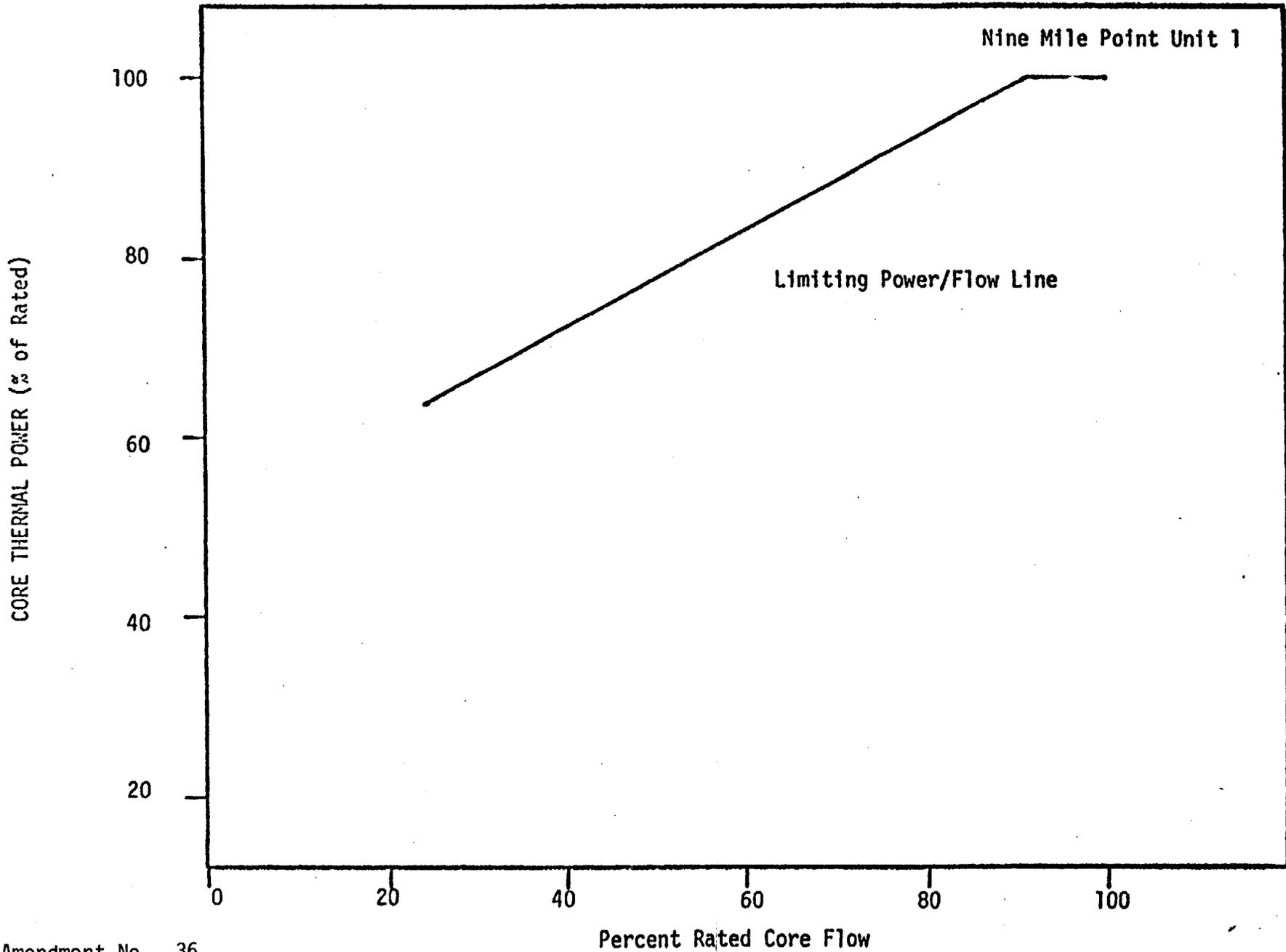
An increase in the APRM scram trip setting would decrease the margin present before the fuel cladding integrity safety limit is reached. The APRM scram trip setting was determined by an analysis of margins required to provide a reasonable range for maneuvering during operation. Reducing this operating margin would increase the frequency of spurious scrams which have an adverse effect on reactor safety because of the resulting thermal stresses. Thus, the APRM scram trip setting was selected because it provides adequate margin for the fuel cladding integrity safety limit yet allows operating margin that reduces the possibility of unnecessary scrams.

The scram trip setting must be adjusted to ensure that the LHGR transient peak is not increased for any combination of MTPF and reactor core thermal power. The scram setting is adjusted in accordance with the formula in Figure 2.1.1 when the maximum total peaking factor is greater than the limiting total peaking factor.

- b. Normal operation of the automatic recirculation pump control will be in excess of 30% rated flow; therefore, little operation below 30% flow is anticipated. For operation in the start-up mode while the reactor is at low pressure, the IRM scram setting is 12% of rated neutron flux. Although the operator will set the IRM scram trip at 12% of rated neutron flux or less, the actual scram setting can be as much as 2.5% of rated neutron flux greater. This includes the margins discussed above. This provides adequate margin between the setpoint and the safety limit at 25% of rated power. The margin is adequate to accommodate anticipated maneuvers associated with power plant startup. There are a few possible sources of rapid reactivity input to the system in the low power flow condition. Effects of increasing pressure at zero or low

REFERENCES FOR BASES 2.1.1 AND 2.1.2 FUEL CLADDING

- (1) General Electric DWR Thermal Analysis Basis (GETAB) Data, Correlation and Design Application, NEDO-10958 and HEDE-10958.
- (2) Linford, R. B., "Analytical Methods of Plant Transient Evaluations for the General Electric Boiling Water Reactor," NEDO-10801, February 1973.
- (3) FSAR, Volume II, Appendix E.
- (4) FSAR, Second Supplement.
- (5) FSAR, Volume II, Appendix E.
- (6) FSAR, Second Supplement.
- (7) Letters, Peter A. Morris, Director of Reactor Licensing, USAEC, to John E. Logan, Vice-President, Jersey Central Power and Light Company, dated November 22, 1967 and January 9, 1968.
- (8) Technical Supplement to Petition to Increase Power Level, dated April 1970.
- (9) Letter, T. J. Brosnan, Niagara Mohawk Power Corporation, to Peter A. Morris, Division of Reactor Licensing, USAEC, dated February 28, 1972.
- (10) Letter, Philip D. Raymond, Niagara Mohawk Power Corporation, to A. Giambusso, USAEC, dated October 15, 1973.
- (11) Nine Mile Point Nuclear Power Station Unit 1 Load Line Limit Analysis, NEDO 24012, May, 1977.
- (12) Licensing Topical Report General Electric Boiling Water Reactor Generic Reload Fuel Application, HEDE-24011-P-A, August, 1978.
- (13) Nine Mile Point Nuclear Power Station Unit 1, Extended Load Line Limit Analysis, License Amendment Submittal (Cycle 6), NEDO-24185, April 1979.



Amendment No. 36

Figure 3.1.7.aa LIMITING POWER FLOW LINE

BASES FOR 3.1.7 AND 4.1.7 FUEL RODS

of the plant, a MCPR evaluation will be made at the 25% thermal power level with minimum recirculation pump speed. The MCPR margin will thus be demonstrated such that future MCPR evaluations below this power level will be shown to be unnecessary. The daily requirement for calculating MCPR above 25% rated thermal power is sufficient since power distribution shifts are very slow when there have not been significant power or control rod changes. The requirement for calculating MCPR when a limiting control rod pattern is approached ensures that MCPR will be known following a change in power or power shape (regardless of magnitude) that could place operation at a thermal limit.

Figure 3.1.7-1 is used for calculating MCPR during operation at other than rated conditions. For the case of automatic flow control, the K_f factor is determined such that any automatic increase in power (due to flow control) will always result in arriving at the nominal required MCPR at 100% power. For manual flow control, the K_f is determined such that an inadvertent increase in core flow (i.e., operator error or recirculation pump speed controller failure) would result in arriving at the 99.9% limit MCPR when core flow reaches the maximum possible core flow corresponding to a particular setting of the recirculation pump MG set scoop tube maximum speed control limiting set screws. These screws are to be calibrated and set to a particular value and whenever the plant is operating in manual flow control the K_f defined by that setting of the screws is to be used in the determination of required MCPR. This will assure that the reduction in MCPR associated with an inadvertent flow increase always satisfies the 99.9% requirement. Irrespective of the scoop tube setting, the required MCPR is never allowed to be less than the nominal MCPR (i.e., K_f is never less than unity).

Power/Flow Relationship

The power/flow curve is the locus of critical power as a function of flow from which the occurrence of abnormal operating transients will yield results within defined plant safety limits. Each transient and postulated accident applicable to operation of the plant was analyzed along the power/flow line. The analysis (7,8,9) justifies the operating envelope bounded by the power/flow curve as long as other operating limits are satisfied. Operation under the power/flow line is designed to enable the direct ascension to full power within the design basis for the plant.

Reactor power level in the one-loop-isolated mode is restricted to a power level which has been analyzed and found acceptable.

REFERENCES FOR BASES 3.1.7 AND 4.1.7 FUEL RODS

- (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) "Nine Mile Point Nuclear Power Station Unit 1, Load Line Limit Analysis," NEDO-24012.
- (8) Licensing Topical Report General Electric Boiling Water Reactor Generic Reload Fuel Application, NEDE-24011-P-A, August, 1978.
- (9) Nine Mile Point Nuclear Power Station Unit 1, Extended Load Line Limit Analysis, License Amendment Submittal (Cycle 6), NEDO-24185, April 1979.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 36 TO FACILITY LICENSE NO. DPR-63

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR POWER STATION UNIT NO. 1

DOCKET NO. 50-220

1.0 Introduction

By letter dated June 28, 1979, (1) Niagara Mohawk Power Corporation (the licensee) proposed changes (2) to the limiting power-to-flow line appearing in the Technical Specifications for Nine Mile Point 1 (NMP-1). The requested change to the power-to-flow curve is intended to provide additional operational flexibility during plant load changes. The safety analyses supporting the proposed technical specification change is provided in Reference 3. The proposed modification to the operating limit is substantially similar to an earlier approved revision to the power-to-flow line. However, the new proposal does not require or include changes to any other plant operating limits or limiting safety-system settings which was the case in the previously approved revision.

2.0 Evaluation

The limiting power-to-flow curve represents the maximum permissible operating steady-state core thermal power as a function of core flow. Increasing the power-to-flow curve would allow reactor operation at a correspondingly higher power for the same flow. Accordingly, the initial steady-state condition for events postulated for NMP-1 would be affected by the proposed change. To show that the limiting transients and accidents will not violate related plant safety criteria, the events which could be affected by the proposed change were re-analyzed by the licensee for this application. The analytical codes and methods used for the revised safety analyses are described in Reference 4. As described in Reference 5 these analytical procedures have been previously reviewed and accepted by the staff. The plant and cycle-specific inputs to these analyses are consistent with the revised power-to-flow curve and the most recent reload safety analyses (6, 7) for NMP-1.

As shown in References 3, 6 and 7, the most limiting abnormal operational transients for NMP-1, (which could be adversely affected by the proposed change) are turbine trip without bypass (TT w/o BP) and control rod withdrawal error (RWE). Previously for the most recent reload submittal, these events were analyzed for 100% power

8004180277

and 100% flow. This power flow condition would not be changed by the new curve. Accordingly transients initiated from this condition are covered by the previous reload analysis(6, 7) results. For this application the transients were reanalyzed for an initial steady-state flow condition of 91 percent. This represents the lowest flow for which 100% power would be allowed by the proposed curve. The results of the revised TT w/o BP analysis show that power level reductions are required near and at the end of cycle 6 in order to maintain a 25 psi pressure margin to the lowest safety valve set point. At the end of the current cycle (Cycle 6) a core power reduction to 94.3% would be required while at an exposure equal to 1000 MWd/T before the end of cycle, a derate to 98% power would be required to maintain a 25 psi margin. No power derate is necessary between the beginning of the current cycle and 2000 MWd/T before the end of cycle.

A turbine trip without bypass occurring at the end of cycle and the RWE also result in substantial reductions in critical power ratio (CPR). The revised transient analysis(3) shows that a TT w/o BP occurring from 94.3% power and 91% flow would result in a Δ CPR of 0.15 for the 8x8 and 8x8R fuel assemblies. The most severe control rod withdrawal error results in a MCPR reduction of 0.32 for the 8x8 fuel and 0.27 for the 8x8R fuel, with the current 105% rod block setting.

The above MCPR changes exceed the MCPR changes reported in the most recent reload analysis. However, these MCPR changes are bounded by the previously reported(6, 7) results for the fuel loading error event, which established the present MCPR operating limits. Accordingly, the current NMP-1 MCPR operating limits are not affected by the proposed power-to-flow curve.

With regard to the limiting overpressurization analysis, peak transient pressures are reported to be at least 25 psi below the ASME Code allowable limit of 1375 psig. Finally, all other safety analysis results and conclusions reported in the Cycle 6 reload report(6, 7) remain unaffected by the modified power-flow curve.

3.0 Technical Specifications

Based on our review, we find that the proposed modified limiting power-to-flow curve is consistent with and adequately supported by the revised safety analysis. Accordingly operation in accordance with the revised technical specification power-to-flow curve is acceptable.

4.0 Environmental Considerations

We have determined that this 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 this 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.

6.0 References

1. Letter to H. Denton from LeBoeuf, Lamb, Leiby and McRae (Counsel for Niagara Mohawk Power Corporation) dated June 28, 1979.
2. Proposed Changes to the Technical Specifications (Appendix A) appearing as Attachment A to the Letter to H. Denton from LeBoeuf, Lamb, Leiby and McRae, dated June 28, 1979.
3. "Nine Mile Point Nuclear Power Station Unit 1 Extended Load Line Limit Analysis License Amendment Submittal (Cycle 6)," NEDO-24185, April 1979.
4. "Generic Reload Fuel Application," NEDE-24011-P-A, May 1977.
5. USNRC letter (D. Eisenhut) to General Electric (R. Gridley) dated May 12, 1978 transmitting "Safety Evaluation for the General Electric Topical Report, 'Generic Reload Fuel Application' (NEDO-2411-P)."
6. "Supplemental Reload Licensing Submittal for Nine Mile Point Nuclear Power Station Unit 1 Reload No. 7," NEDO-24155, November 1978.
7. Supplemental Reload Licensing Submittal for Nine Mile Point Nuclear Power Station Unit 1, Reload No. 7 Reanalysis Supplement, NEDO-24155-1, December 1978.

Dated: March 28, 1980

UNITED STATES NUCLEAR REGULATORY COMMISSIONDOCKET NO. 50-220NIAGARA MOHAWK POWER CORPORATIONNOTICE OF ISSUANCE OF FACILITY LICENSE AMENDMENT

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 36 to Facility Operating License No. DPR-63 to Niagara Mohawk Power Corporation (the licensee) which revised the License and Technical Specifications for operation of the Nine Mile Point Nuclear Station, Unit No. 1 (the facility) located in Oswego County, New York. The amendment is effective as of its date of issuance.

The amendment consists of changes to the Technical Specifications to modify the power-to-flow curve and allow additional operational flexibility during plant load changes. In addition, corrections have been made to the license to reflect the present power limitations at the end of cycle.

The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I which are set forth in the license amendment. Prior public notice of this amendment was not required since the amendment does not involve a significant hazards consideration.

The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of this amendment.

8004180278

- 2 -

For further details with respect to this action, see (1) the application for amendment dated June 28, 1979, (2) Amendment No. 36 to License No. DPR-63, and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the Oswego County Office Building, 46 E. Bridge Street, Oswego, New York 13126. A copy of items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland this 28th day of March 1980.

FOR THE NUCLEAR REGULATORY COMMISSION


Thomas A. Ippolito, Chief
Operating Reactors Branch #3
Division of Operating Reactors