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

October 14, 1992

Docket No. 50-220

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. M81731)

The Commission has issued the enclosed Amendment No. 133 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 in response to your application transmitted by letter dated September 20, 1991, as supplemented March 12, 1992, and September 17, 1992.

The amendment revises Technical Specifications 3.1.4/4.1.4 (Core Spray System), 3.3.2/4.3.2 (Pressure Suppression System Pressure and Suppression Chamber Water Temperature and Level), 3.3.7/4.3.7 (Containment Spray System), and associated Bases to authorize an increase in the maximum allowable water temperature limit of Lake Ontario (ultimate heat sink) from 77 °F to 81 °F.

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,

Donald S. Brinkman

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. 133 to DPR-63
2. Safety Evaluation

cc w/enclosures:
See next page

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1/1

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Original Signed By:

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Project Directorate I-1
Division of Reactor Projects - I/II
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cc w/enclosures:
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DATED: October 14, 1992

AMENDMENT NO. 133 TO FACILITY OPERATING LICENSE NO. DPR-63-NINE MILE POINT UNIT 1

Docket File
NRC & Local PDRs
PDI-1 Reading
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cc: Plant Service list

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. 133
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 September 20, 1991, as supplemented March 12, 1992, and September 17, 1992, 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. DPR-63 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No.133 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance to be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert A. Capra

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: October 14, 1992

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 133 TO FACILITY OPERATING LICENSE NO. DPR-63

DOCKET NO. 50-220

Revise Appendix A as follows:

Remove Pages	Insert Pages
53	53
129	129
130	130
132	132
133	133
134	134
160	160
162	162
163	163

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
h. If both of the above required subsystems become inoperable, suspend core alterations and all operations that have a potential for draining the reactor vessel. Restore at least one subsystem to operable status within 4 hours or establish secondary containment integrity within the next 12 hours.	
i. With the downcomers in the suppression chamber having less than three and one half foot submergence, two core spray subsystems and the associated raw water pumps shall be operable with the core spray suction from the condensate storage tanks (CST), and the CST inventory shall not be less than 300,000 gallons.	

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
3.3.2 PRESSURE SUPPRESSION SYSTEM PRESSURE AND SUPPRESSION CHAMBER WATER TEMPERATURE AND LEVEL	4.3.2 PRESSURE SUPPRESSION SYSTEM PRESSURE AND SUPPRESSION CHAMBER WATER TEMPERATURE AND LEVEL
Applicability:	Applicability:
Applies to the interrelated parameters of pressure suppression system pressure and suppression chamber water temperature and level.	Applies to the periodic testing of the pressure suppression system pressure and suppression chamber water temperature and level.
Objective:	Objective:
To assure that the peak suppression chamber pressure does not exceed design values in the event of a loss-of-coolant accident.	To assure that the pressure suppression system pressure and suppression chamber water temperature and level are within required limits.
Specification:	Specification:
a. The downcomers in the suppression chamber shall have a minimum submergence of three and one half feet and a maximum submergence of four and one quarter feet whenever the reactor coolant system temperature is above 215F.	a. At least once per day the suppression chamber water level and temperature and pressure suppression system pressure shall be checked.
b. During normal power operation, suppression chamber water temperature shall be less than or equal to 85F.	b. A visual inspection of the suppression chamber interior, including water line regions, shall be made at each major refueling outage.

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
c. If Specifications a and b above are not met within 24 hours, the reactor shall be shut down using normal shutdown procedures.	c. Whenever heat from relief valve operation is being added to the suppression pool, the pool temperature shall be continually monitored and also observed and logged every 5 minutes until the heat addition is terminated.
d. During testing of relief valves which add heat to the torus pool, bulk pool temperature shall not exceed 10F above normal power operation limit specified in b above. In connection with such testing, the pool temperature must be reduced within 24 hours to below the normal power operation limit specified in b above.	d. Whenever operation of a relief valve is indicated and the bulk suppression pool temperature reaches 160F or above while the reactor primary coolant system pressure is greater than 200 psig, an external visual examination of the suppression chamber shall be made before resuming normal power operation.
e. The reactor shall be scrammed from any operating condition when the suppression pool bulk temperature reaches 110F. Operation shall not be resumed until the pool temperature is reduced to below the normal power operation limit specified in b above.	e. Whenever there is indication of relief valve operation with the local temperature of the suppression pool reaching 200F or more, an external visual examination of the suppression chamber shall be conducted before resuming power operation.
f. During reactor isolation conditions, the reactor pressure vessel shall be depressurized to less than 200 psig at normal cooldown rates if the pool bulk temperature reaches 120F.	

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BASES FOR 3.3.2 AND 4.3.2 PRESSURE SUPPRESSION SYSTEM PRESSURE AND SUPPRESSION CHAMBER WATER TEMPERATURE AND LEVEL

The combination of three and one-half foot downcomer submergence, 85F suppression chamber water temperature at lake water temperature defined by specification 3.3.7/4.3.7 will maintain post-accident system temperature and pressure within FSAR design limits (FSAR Section VI, XV, XVI).

The three and one-half foot minimum and the four and one-quarter foot maximum submergence are a result of Suppression Chamber Heat-up Analysis and the Mark I Containment Program respectively. The minimum submergence provides sufficient water to meet the Suppression Chamber Heat-up Analysis post LOCA and the maximum submergence limits the torus levels to be consistent with the Mark I Plant Unique Analysis.

The 215F limit for the reactor is specified, since below this temperature the containment can tolerate a blowdown without exceeding the 35 psig design pressure of the suppression chamber without condensation.

Actually, for reactor temperatures up to 312F the containment can tolerate a blowdown without exceeding the 35 psig design pressure of the suppression chamber, without condensation.

Some experimental data suggests that excessive steam condensing loads might be encountered if the bulk temperature of the suppression pool exceeds 160F during any period of relief valve operation with sonic conditions at the discharge exit. This can result in local pool temperatures in the vicinity of the quencher of 200F. Specifications have been placed on the envelope of reactor operating conditions so that the reactor can be depressurized in a timely manner to avoid the regime of potentially high suppression chamber loadings.

In addition to the limits on temperature of the suppression chamber pool water, operating procedures define the action to be taken in the event of a relief valve inadvertently opens or sticks open. As a minimum, this action would include: (1) use of all available mea to close the valve, (2) initiate suppression pool water cooling heat exchangers, (3) initiate reactor shutdown, and (4) if other relief valves are used to depressurize the reactor, their discharge shall be separated from that of the stuck-open relief valve to assure mixing and uniformity of energy insertion to the pool.

Because of the large volume and thermal capacity of the suppression pool, the volume and temperature normally changes very slowly and monitoring these parameters daily is sufficient to establish any temperature trends. By requiring the suppression pool temperature to be continually monitored and frequently logged during periods of significant heat addition, the temperature trends will be closely followed so that appropriate action can be taken. The requirement for an external visual examination following any event where potentially high loadings

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
f. The containment spray system shall be considered operable by verifying that lake water temperature does not exceed 81F	f. Lake Water Temperature Record at least once per 24 hours, and at least once per 8 hours when latest recorded water temperature is greater than or equal to 75°F and at least once per 4 hours when the latest recorded water temperature is greater than or equal to 79°F.
g. If specification "f" cannot be met commence shutdown within one hour and be in hot shutdown within 8 hours and cold shutdown within 24 hours.	

For reactor coolant temperatures less than 215F not enough steam is generated during a loss-of-coolant accident to pressurize the containment. For reactor coolant temperatures up to 312F, the resultant loss-of-coolant accident pressure would not exceed the design pressure of 35 psig.

Operation of only one containment spray pump is sufficient to provide the required containment spray cooling flow.[1] The specified flow of 3600 gpm at 87.7 psid primary, 89 psid secondary (approximately 95 percent to the drywell and the balance to the suppression chamber) is sufficient to remove post accident core energy released (FSAR Section VII). Requiring both pumps systems operable (400 percent redundancy) will assure the availability of the containment spray system.[1]

Allowable outages are specified to account for components that become inoperable in both systems and for more than one component in a system.

The containment spray raw water cooling system is considered operable when the flow rate is not less than 3000 gpm and the pressure on the raw water side of the containment spray heat exchangers is 10 psig greater than that on the torus water side (not less than 141 psig). The higher pressure on the raw water side will assure that any leakage is into the containment spray system.

Electrical power for all system components is normally available from the reserve transformer. Upon loss of this service the pumping requirement will be supplied from the diesel generator. At least one diesel generator shall always be available to provide backup electrical power for one containment spray system.

Automatic initiation of the containment spray system assures that the containment will not be overpressurized. This automatic feature would only be required if all core spray systems malfunctioned and significant metal-water reaction occurred. For the normal operation condition of 85F suppression chamber water, containment spray actuation would not be necessary for about 15 minutes.

[1] With two of the containment spray intertie valves open, operation of two containment spray pumps is required to assure the proper flow distribution to the containment spray headers to reduce containment pressure during the first fifteen minutes of the LOCA. Requiring two containment spray pumps to operate reduces the 400 percent redundance of the containment spray system, but there are still six combinations (two out of four pumps) that will assure two pump operation.

BASES FOR 3.3.7 AND 4.3.7 CONTAINMENT SPRAY SYSTEM

In conjunction with containment spray pump operation during each operating cycle, the raw water pumps and associated cooling system performance will be observed. The containment spray system shall be capable of automatic initiation from simultaneous low-low reactor water level and high containment pressure. The associated raw water cooling system shall be capable of manual actuation. Operation of the containment spray system involves spraying water into the atmosphere of the containment. Therefore, periodic system tests are not practical. Instead separate testing of automatic containment spray pump startup will be performed during each operating cycle. During pump operation, water will be recycled to the suppression chamber. Also, air tests to verify that the drywell and torus spray nozzles and associated piping are free from obstructions will be performed each operating cycle. Design features are discussed in Volume I, Section VII-B.2.0 (page VII-19*). The valves in the containment spray system are normally open and are not required to operate when the system is called upon to operate.

The test interval between operating cycle results in a system failure probability of 1.1×10^{-6} (Fifth Supplement, page 115*) and is consistent with practical considerations. Pump operability will be demonstrated on a more frequent basis and will provide a more reliable system.

The intent of Specification 3.3.7f is to allow control rod drive maintenance and instrument replacement at the time the suppression chamber is unwatered and to perform normal fuel movement activities in the refuel mode with an unwatered suppression chamber.

*FSAR

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 133 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 September 20, 1991, as supplemented March 12, 1992, and September 17, 1992, Niagara Mohawk Power Corporation (the licensee) submitted a request for changes to the Nine Mile Point Nuclear Station Unit No. 1, Technical Specifications (TS). The requested changes would revise TS 3.1.4/4.1.4 (Core Spray System), TS 3.3.2/4.3.2 (Pressure Suppression System Pressure and Suppression Chamber Water Temperature and Level), TS 3.3.7/4.3.7 (Containment Spray System), and associated Bases to authorize an increase in the maximum allowable water temperature limit of Lake Ontario (ultimate heat sink) from 77 °F to 81 °F. The licensee indicated that the original Final Safety Analysis Report (FSAR) assumed a peak lake temperature of 77 °F for the ultimate heat sink. A 5 year trend showed an increase in the Lake Ontario peak water temperature during the mid-summer months. As a result, the licensee has performed evaluations for affected safety systems to justify plant operability for lake water temperatures up to 81 °F and proposed changes to the subject TS.

The licensee proposed to: (1) revise the minimum downcomer submergence from 3.0 feet to 3.5 feet, (2) increase the maximum allowable torus water operating temperature from 77 °F to 85°F, and (3) decrease initiation of containment spray raw water from 30 minutes to 15 minutes into the event as a result of a new suppression pool heat-up analysis. A new lake water temperature limit is proposed to clarify operability requirements of the containment spray system. TS 3.3.2/4.3.2 is also proposed to be revised to change the maximum submergence level of the downcomers from 4.5 feet to 4.25 feet to conform to that used in the NMP-1 Mark I containment plant unique analysis.

The licensee also proposed a change to the Bases for TS 3.3.7/4.3.7. This revision is required by the change in operation of the containment spray system to provide a water seal for the containment spray system isolation valves. This change is administrative in nature.

The March 12, 1992, and September 17, 1992, letters provided revised TS pages that corrected typographical errors on the TS pages submitted in the

September 20, 1991, letter. These revised pages did not change the initial proposed no significant hazards consideration determination.

2.0 EVALUATION

The licensee indicated that it has performed an analysis supporting containment spray system operation at a design basis temperature of 82 °F which allows for a 1 °F margin to the proposed lake water limit of 81 °F. The design basis requirement for the containment spray system is to assure that the primary containment design pressure and temperature limits are not exceeded. In addition, the containment spray heat removal system must maintain the torus water temperature such that adequate Net Positive Suction Head (NPSH) is provided to the core spray and containment spray pumps. The NPSH is calculated assuming no increase in containment pressure from that present prior to the postulated loss-of-coolant accident (LOCA).

The licensee stated that the analysis was conducted under its Design Basis Reconstitution (DBR) program which analyzed the effects of higher lake temperature using the SHEX-04 computer code with input assumptions consistent with those used by General Electric (GE) to perform this type of licensing analysis. Benchmark cases to compare to the original FSAR methods and input assumptions were developed. These benchmark cases included a case which analyzed the original FSAR input assumptions coupled with new decay heat and metal water reaction assumptions. This case was used to evaluate the relative effects of changing containment spray system parameters (i.e., lake temperature) and torus initial conditions. The LOCA analysis was based on assuming the loss of offsite power, the single failure of one of the emergency diesel generators, and the dynamic effects of the postulated pipe break, which result in one core spray pump set available to provide core cooling. The DBR analysis evaluated the containment suppression chamber heatup assuming the containment spray system was operated in the drywell and wetwell spray mode or with Emergency Operating Procedures (EOP) in the spray and torus cooling modes. The results of the analysis show that the peak torus water temperature was between 158.9 °F and 163 °F, respectively. The DBR analysis profile shows that the temperature increases to 140 °F within 10 minutes because of the design basis accident reactor blowdown. From 10 minutes until the peak temperature is reached, torus heatup is governed by the heat removal capacity of the containment spray system versus that added from decay heat. For the torus bulk pool temperature of less than 165 °F, all the original FSAR design criteria were satisfied. These criteria included core spray NPSH requirements, primary containment temperature limits, torus attached piping stress, and piping supports. The operability requirements imposed upon the suppression chamber to compensate for the increased lake water temperature limit from 77 °F to 81 °F are: (1) maintain 3.5 feet minimum downcomer submergence and 85 °F maximum torus water operating temperature from original operability requirements of 3 feet minimum submergence and 77 °F maximum torus water temperature, and (2) initiate containment spray raw cooling water within 15 minutes of the initiation of the event. The licensee indicated that the

raw cooling water pumps which provide cooling to the torus can be started from the control room and that the 15 minutes is adequate time for operator action.

In response to an NRC staff question about what other operator actions are required within 10 to 15 minutes, the licensee indicated that in the design basis mode of operation, the containment spray flow path is from the torus through the containment spray pumps to the heat exchangers with discharge to the drywell and wetwell spray headers. In this mode of operation, initiation of the raw water pumps from the control room is the only action that will be required. In the EOP mode of operation, the containment spray pumps are secured after the drywell pressure is reduced to less than 3.5 psig and the containment spray system is then aligned to provide torus cooling through the containment spray test return line by operation of three or five valves depending upon the spray loop from the control room. These actions are all directed by the EOPs, are incorporated into the simulator training, and are easily completed in less than 5 minutes. Torus cooling is then initiated by starting the raw water pumps from the control room. The licensee indicated that no other manual actions are required before providing cooling to the suppression pool after a LOCA.

The NRC staff also asked a question regarding the effects of delayed initiation of suppression pool cooling from 15 minutes to 30 minutes. The licensee indicated that it expects the maximum suppression pool temperature to increase by 3.5 °F. The estimate is based on adding the energy removed in the 15 minute period to the total energy in the pool after 30 minutes in one step and solving for enthalpy and the corresponding temperature. For the design basis spray mode of operation, the maximum pool temperature is expected to increase from 159.5 °F to 162.4 °F at 0 psig containment pressure and remain bounded by the maximum analyzed temperature of 165 °F associated with the core spray NPSH requirement. In the EOP mode of operation, the maximum pool temperature is expected to increase from 163 °F to 166.5 °F. This slight increase in pool temperature will not affect the core spray NPSH requirements due to positive pressure of about 4 psig in the containment expected at the time of maximum pool temperature. It will also not affect any other containment temperature limits or torus attached piping.

Based on the above, the NRC staff considers that the licensee has demonstrated that 15 minutes is adequate time for operator action to initiate the suppression pool cooling from the control room and that even if initiation of cooling is delayed to 30 minutes, this delay will have no significant affect on the core spray NPSH requirements and other temperature limits and is therefore acceptable.

The licensee also stated that all safety-related components cooled by lake water system have been evaluated and were found to be able to perform their intended function under normal operating, shutdown, abnormal and accident

conditions with a lake water temperature of up to 81 °F and that the proposed change does not adversely affect the environmental qualification of any plant equipment.

The NRC staff has reviewed the licensee's submittal as discussed above and considers the proposed changes acceptable as the DBR analysis of suppression chamber heat-up post LOCA indicates that the maximum torus water temperature associated with the revised torus level and temperature limits is less than the current maximum torus water temperature using existing torus level limits and a maximum lake water temperature of 77 °F when calculated on an equivalent basis and as all other safety-related systems and components remain operable within their applicable design limits with 81 °F lake water temperature.

The licensee's proposed change to the Bases for TS 3.3.7/4.3.7 is required by the change in the operation of the containment spray system to provide a water seal for the containment spray system isolation valves to meet Appendix J requirements. Operation of the containment spray system with the primary and secondary loops interconnected through the test line requires that the two containment spray pumps function to provide flow to all of containment spray headers located in the primary and secondary loops. Previously, with the two loops separated, one pump in either loop provided flow to the spray headers in that loop to satisfy system design criteria. The staff considers that the above change to the Bases for TS 3.3.7/4.3.7 is administrative in nature. It is based on a safety evaluation report dated March 13, 1990; therefore, the NRC staff offers no objections.

The licensee also indicated that proposed TS changes to TS 3.3.2/4.3.2 and associated Bases to change maximum downcomer submergence to 4.25 feet from 4.50 feet submergence results from the Nine Mile Point Unit 1, Mark I containment plant unique analysis. This discrepancy was discovered as a result of performing the suppression pool heatup analysis. A review of operating data indicated that 4.25 feet submergence has not been exceeded during normal operation and additionally sufficient margins existed in the torus to allow for operation at 4.50 feet submergence. Based on the above discussion, the NRC staff finds the proposed change to correct the maximum downcomer submergence to 4.25 feet acceptable as it is more conservative and consistent with the Mark I plant unique analysis for Nine Mile Point Unit 1.

Based on the above evaluation, the NRC staff concludes that the proposed changes to TS 3.1.4/4.1.4, TS 3.3.2/4.3.2, TS 3.3.7/4.3.7, and associated Bases for minimum and maximum submergence levels, maximum torus and lake water temperatures, and initiation time for raw water system are 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 (56 FR 55948). 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 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: R. Goel

Date: October 14, 1992