a. The set points included in the tables are those used in the transient analysis and the accident analysis. The high flow set point for the main steam line is 105 psi differential. This represents a flow of approximately 4.4×10^6 lb/hr. The high flow set point for the emergency cooling system supply line is $\leq$ 11.5 psi differential. This represents a flow of approximately 9.8×10^5 lb/hr at rated conditions.

The automatic initiation signals for the emergency cooling systems have to be sustained for more than 12 seconds to cause opening of the return valves. If the signals last for less than 12 seconds, the emergency cooling system operating will not be automatically initiated.

The high level in the scram discharge volume is provided to assure that there is still sufficient free volume in the discharge system to receive the control rod drives discharge. Following a scram, bypassing is permitted to allow draining of the discharge volume and resetting of the reactor protection system relays. Since all control rods are completely inserted following a scram and since the bypass of this particular scram initiates a control rod block, it is permissible to bypass this scram function. The scram trip associated with the shutdown position of the mode switch can be reset after 10 seconds.

The condenser low vacuum, low-low vacuum and the main steam line isolation valve position signals are bypassed in the startup and refuel positions of the reactor mode switch when the reactor pressure is less than 600 psig. These are bypassed to allow warmup of the main steam lines and a heat sink during startup.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 149 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 January 6, 1994, Niagara Mohawk Power Corporation (the licensee or NMPC) submitted a request for changes to the Nine Mile Point Nuclear Station Unit No. 1 (NMP-1), Technical Specifications (TSs). The requested changes would revise TS Tables 3.2.7, 3.6.2a, 4.6.2a, 3.6.2b, and 4.6.2b to delete the automatic reactor scram and main steam line isolation functions of the Main Steam Line Radiation Monitor (MSLRM). Conforming changes would also be made to the Bases for these TSs and to the Bases for TS 2.1.2. This request was submitted as the plant specific portion which, in conjunction with the General Electric (GE) Licensing Topical Report, NEDO-31400A, and the NRC's May 15, 1991, safety evaluation (SE) on this topical report, formed the basis for the package to be evaluated.

NMPC stated that elimination of this trip function would result in reduced potential for unnecessary reactor shutdowns caused by spurious MSLRM actuation trips and would increase plant operational flexibility without compromising plant safety. The licensee's proposed changes are based on the May 1987 BWR Owners Group Licensing Topical Report, NEDO-31400[1] and NUREG-0800[2].

In NEDO-31400A, a reevaluation of the role of the MSLRM in the control rod drive accident (CRDA) analysis was performed, confirming that removal of the MSLRM scram/isolation features would not compromise CRDA consequences. The topical report also evaluated the potential effect on occupational exposure in the event of a sudden release of radioactive material from the fuel and concluded that the elimination of the scram/isolation features would have no adverse effect. NMPC stated that the analyses in NEDO-31400A are bounding for NMP-1.

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[1] NEDO-31400A, "Safety Evaluation for Eliminating the Boiling Water Reactor Main Steam Line Isolation Valve Closure Function and Scram Function of the Main Steam Radiation Monitor."

[2] NUREG-0800, Standard Review Plan (SRP) 15.4.9, Rev.2, July 1981.

Specifically, the licensee proposed the following changes for NMP-1:

1. All references to the MSLRM automatic shutdown features would be deleted from TS Tables 3.6.2a and 4.6.2a.

2. All references to the MSLRM isolation function of the main steam lines would be deleted from TS Tables 3.2.7, 3.6.2b, and 4.6.2b. However, since TS Table 3.2.7 was deleted by License Amendment No. 145 (issued March 7, 1994, subsequent to submittal of this proposed amendment), no further action is required on this portion of the proposed amendment.

3. The Bases for TS 2.1.2, "Fuel Cladding-Limiting Safety System Setting," would be changed to reflect the deletion of the Main Steam Line Radiation automatic reactor shutdown function and closure of the Main Steam Isolation Valves (MSIVs).

4. The Bases for TSs 3.6.2 and 4.6.2, "Protective Instrumentation," would be changed to reflect the deletion of the Main Steam Line Radiation automatic reactor shutdown and closure of the MSIVs.

2.0 EVALUATION

The MSLRM consists of four redundant radiation detectors located on the outside of the main steam lines and external to the primary containment. The MSLRM was designed to provide an early indication of gross fuel failures. The original intent of this monitor was to mitigate the releases of the detected fuel failure by providing a scram signal to terminate the initiating event and a MSIV closure signal to assure containment of the release. However, as indicated in the NMP-1 Updated Final Safety Analysis Report (UFSAR), no credit is taken for these signals in any design basis event for terminating the initiating event or assuring the radioactive release remains within accepted limits.

The UFSAR assumes that the MSIVs, on the MSLRM trip close only in the CRDA. To be consistent with Section 15.4.9 of the Standard Review Plan, all of the postulated radioactive material is assumed to be released to the condenser and turbine before the isolation occurs. Hence, the automatic isolation resulting from the MSLRM provides no benefits, since the resultant dose consequences from the CRDA will remain unchanged. Furthermore, NMPC stated that all the conditions specified in the NRC SE approving NEDO-31400A are to be carried out by NMP-1. These conditions are that NMPC include sufficient evidence to provide reasonable assurance that increased levels of radioactivity in the steam lines will be controlled expeditiously to limit both occupational and environmental releases. NMPC has provided assurance that any increased levels of activity will be detected by the offgas monitor located between the steam jet air ejector and the offgas treatment system. Abnormal operating procedures also control plant response. The other condition that NMPC committed to involves setting the MSLRM alarm setpoints at less than or equal

to 1.5 times the full power N-16 background dose rate and prompt sampling of the reactor coolant to determine the need for corrective action if the MSLRM or offgas radiation monitors exceed their alarm setpoints. This is acceptable. Additionally, upon a main steam line high radiation signal, the mechanical vacuum pumps will trip and isolate.

In the May 15, 1991, SE on NEDO-31400, the NRC staff concluded that removal of the MSLRM trips that automatically shutdown the reactor and close the MSIVs was acceptable and that Topical Report, NEDO-31400A, may be referenced in support of an amendment request as long as the following three conditions were met:

1. the applicant demonstrates that the assumptions with regard to input values (including power per assembly, X/Q, and decay times) that are made in generic analysis bound those for the plant,

NMPC, in response to condition 1, has provided two tables showing: a comparison of key input parameters, and a comparison of the dose assessment between NMP-1 design basis and NEDO-31400A analysis assumptions. The specific power level is used to determine the source term. This factor is offset by the lower calculated power for the failed fuel rods. The licensee also considered the 2 hour Exclusion Area Boundary dose, i.e., atmospheric dispersion factor X/Q, which was approximately a factor of 10 less than the NEDO-31400A values. The other parameters are the same or more conservative than the NEDO-31400A values. Based on the above, the NRC staff agrees that the generic analysis of the NEDO-31400A is bounding for NMP-1. The NRC staff finds that the NMPC's analysis has met the applicable requirements of Condition 1, and is therefore acceptable.

2. the applicant includes evidence (implemented or proposed operating procedures, or equivalent commitments) to provide reasonable assurance that increased significant levels of radioactive material in the main steam lines will be controlled expeditiously to limit both occupational doses and effluent releases, and

In the response to Condition 2, NMPC has in place the Offsite Dose Calculation Manual (ODCM), a Radiation Protection Program, including an ALARA program, and a Radiological Environmental Monitoring Program. NMP-1's radiation protection, chemistry, operating, emergency operating procedures, and the ODCM will be revised as necessary to incorporate specific considerations to change isolation of the main steam lines from an automatic to a manual function. Thus, any significant increase in the levels of radioactivity in the main steam lines will continue to be promptly controlled to limit effluent releases and onsite occupational exposure.

The MSLRM alarm setpoint of 1.5 times the normal full power background will be used to initiate sampling and surveillance actions. Confirmation of elevated activity will cause administrative controls to be implemented that ensure

offsite and onsite doses are maintained ALARA. Manual action to close the main steam lines and shutdown the reactor will occur when all the evidence has indicated the need for isolation and shutdown. Also, procedures will require immediate notification of Radiation Protection and Chemistry personnel upon annunciation in the control room of the high radiation alarm of the MSLRM or Offgas Radiation Monitor. The NRC staff concludes that NMPC's commitment is acceptable and responsive to Condition 2 which was addressed in Topical Report NEDO-31400A.

3. The applicant standardizes the MSLRM and offgas radiation monitor alarm setpoint at 1.5 times the nominal nitrogen-16 background dose rate at the monitor locations, and commits to promptly sample the reactor coolant to determine possible contamination levels in the plant reactor coolant and the need for additional corrective actions, if either the MSLRM or offgas radiation monitors or both exceed their alarm setpoint.

In response to Condition 3, the NMP-1 MSLRM alarm setpoint will be 1.5 times the normal full power N-16 background dose rate. This alarm will trigger entry into a procedure which will require a reactor coolant sample to be obtained and analyzed. The alarm setpoint accounts for the normal full power N-16 carryover, due to hydrogen water chemistry, at the monitor location. The offgas radiation monitor is a more sensitive monitor than the MSLRM because the nitrogen-16, dominating the radiation signal to the MSLRM, has decayed by the time the offgas radiation monitor can be affected by any increase levels of activity. Therefore, setting the offgas radiation monitor at 1.5 times the nitrogen-16 background dose rate can lead to spurious activations of the alarm. The offgas radiation monitor alarm is set to satisfy NMP-1 TS 3.6.15.c, which is based on the ODCM. The offgas monitor setpoint provides assurance that the total body exposure to an individual at the exclusion area boundary will not exceed the dose guidelines of 10 CFR Part 100. The licensee has proposed to set the offgas radiation monitor alarm at five (5) times the normal full power background. If the monitor alarms at this setpoint, the offgas will be immediately sampled and analyzed, followed by an analysis of reactor coolant sample. Based on a review of the licensee's commitment, the NRC staff has determined that Condition 3 has been satisfied.

3.0 SUMMARY

Based on a review of the NMPC's submittal and safety analysis, the NRC staff concludes that there are no adverse safety implications associated with removal of the MSLRM scram and MSIV closure function since the licensee has provided reasonable assurance that the offsite radiation exposure levels are within the guidelines of 10 CFR Part 100 and SRP 15.4.9. The NRC staff concludes that the proposed changes to eliminate the reactor scram and MSIV closure requirements associated with the MSLRMs are acceptable.

4.0 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.

5.0 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 and changes surveillance requirements. 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 (59 FR 7692). 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.

6.0 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.

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Date: September 9, 1994