



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SUPPORTING AMENDMENT NO. 78 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 application dated January 23, 1986 as supplemented and clarified by letter dated January 24, 1986, Niagara Mohawk Power Corporation (the licensee) requested an amendment to Operating License No. DPR-63 for Nine Mile Point Nuclear Station, Unit No. 1. The amendment request involves a change to the license to permit operation of the facility for the duration of Cycle 8 or until March 31, 1986, whichever occurs first, with certain hot fluid line penetrations not fully in conformance with original Final Safety Analysis Report (FSAR) design criteria.

The license change requested by the licensee became necessary because a reanalysis of the hot process pipe penetration associated with the steam supply to the Emergency Condenser identified different design loads from those originally postulated and considered as a part of the original design. The circumstances leading to and more details of the need for the licensing action are provided in Section 3.0. The staff's evaluation of the licensee's request for a temporary change to the license is provided below.

2.0 EVALUATION

The purpose of this evaluation is to present licensee discussion and staff analysis to establish that the safe operation of the facility, with certain hot process piping penetrations not fully in conformance with original FSAR design criteria, can continue for the balance of Cycle 8 or until March 31, 1986, whichever occurs first.

This evaluation is based on material provided by the licensee in the above stated submittals and in a meeting held with the staff on January 23, 1986 in Bethesda, Maryland. (Meeting minutes have been developed and issued on January 27, 1986.) This present concern is applicable to two Emergency Condenser Supply penetrations, two Main Steam penetrations, two Feedwater penetrations, one Cleanup System Suction penetration and one Cleanup System Return penetration. According to the Second Supplement to the FSAR the penetrations in question were designed to accommodate a fully ruptured and separated process pipe inside the penetration. The FSAR Supplement presents that axial jet loads as well as full pressurization of the guard pipe were considered in determining the adequacy of the anchors at or near the external isolation valves. The licensee stated that momentum effects due to flow reversal were considered during the recent analysis but not in the original analysis. This additional design consideration results in an increase in loads above those originally considered. The increase in loads results in cases where the support loads are in excess of design for the postulated rupture.

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A large break instantaneous guillotine rupture in process piping is considered a highly unlikely event. A break of this type in the specific penetration location is considered even more unlikely. This conclusion is supported by the information provided by the licensee based on the Limited Scope Probabilistic Safety Assessment for the facility. The rupture is considered even less likely for the interim 2 month period in question.

The design assumptions utilized by the licensee in performing the analysis of this event are conservative. The assumptions require the complete severance of the process pipe as well as axial displacement of the pipe a distance of the pipe diameter divided by four to obtain the loads calculated in the recent analysis. If a ligament of pipe remains to limit axial pipe displacement and the assumed gap in the pipe is of a size that is at all physically realistic, the staff finds that the original analysis results would remain valid.

Further, the licensee has performed fracture mechanics analyses for the systems in question. The analyses assume large through-wall cracks to be present in the piping systems in question. The results of the analyses demonstrate that postulated through-wall axial and circumferential cracks will not show substantial growth under ASME B&PV Code Service Level D loadings and that a postulated 90 degree through-wall flaw would remain stable under the Service D loads. Leakage associated with the postulated 90 degree flaw was calculated at normal operating conditions for the systems in question. The minimum calculated leak rate was 1.7 gallons per minute (gpm) for the Reactor Water Cleanup System. Calculated leak rates for other systems were in excess of 3 gpm. The licensee has committed to issue a Standing Order establishing interim limits on changes in the drywell unidentified leakage to less than 1 gpm in 24 hours. If leakage increases to more than this rate once the plant reaches steady-state conditions the licensee has committed to shut down the facility. These measures ensure that operation of the facility would be under conditions analyzed.

Based on the factors discussed above, the staff concludes that operation of the facility for the interim period would be safe with the stated penetrations not fully in conformance with original FSAR design criteria. The staff has concluded that with the aforementioned compensatory measures the plant will operate such that restrictions apply which ensure that all previously analyzed accidents bound the current issue and that containment integrity remains assured.

3.0 EMERGENCY CIRCUMSTANCES

The licensee, in the course of performing preliminary engineering analysis to support a modification for replacement of the supply piping for the Emergency Condenser System noted that the recalculated loads from the new analysis were greater than those calculated as a part of the original design analysis. The licensee notified the NRC of a potentially reportable discrepancy in accordance with 10 CFR Part 21 on January 16, 1986. On January 17, 1986 the licensee notified the Operations Center of the NRC by telephone of a design condition that could be outside of the original design criteria. Following the consideration of the results from additional analysis the licensee shut down the facility on January 18, 1986 pending resolution of the concern raised by the recent analysis for the postulated accident condition.



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The operation of the facility with the hot process pipe penetrations not fully in conformance with the FSAR design criteria as described in Paragraph 2.A of the license is considered by the NRC as a facility operating with a design different from that which was licensed. The facility is currently shut down and requires a change to the license granting a temporary waiver from the FSAR design criteria for the affected hot process piping penetrations for the balance of Cycle 8 or March 31, 1986, whichever occurs first. Design of structural modifications for the penetrations, purchase of materials and implementation of the modifications cannot be accomplished without extensive prior planning, analysis and possible retrofit. The staff has determined that this constitutes an emergency situation since resumption of power would be precluded if the action were not taken.

3.1 No Significant Hazards Consideration Determination

The Commission's regulations in 10 CFR 50.92 present that the Commission may make a final determination that a license amendment involves no significant hazards considerations if operation of the facility in accordance with the amendment would not:

- (1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or
- (2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or
- (3) Involve a significant reduction in a margin of safety.

The information in Section 2.0 above provides the basis for evaluating this license amendment against these criteria. Since the requested operational mode is acceptable and the plant operating conditions, the physical status of the plant, and dose consequences of potential accidents are the same as without the requested change, the staff concludes that:

- (1) The proposed amendment of the license authorizing operation of Nine Mile Point, Unit No. 1 for the interim period will not involve a significant increase in the probability or consequences of an accident previously evaluated since compensatory measures have been provided for early warning of any potential piping degradation. The detection of a change in leakage rate of 1 gallon per minute in 24 hours is less than the leakage that would be expected from a 90 degree circumferential flaw in the affected piping system at normal operating conditions. Analyses have shown that a flaw of the size described above would remain stable under ASME BP&V Code Service Level D conditions and a rupture would not occur. The conditions postulated in the recent analysis are precluded by the above measures and, therefore, the consequences of the previously analyzed accident do not change since failure of the penetrations are precluded. The staff has concluded that with the aforementioned compensatory measures the plant will operate such that restrictions apply which ensure that all previously analyzed accidents bound the current issue and that containment integrity remains assured. Nothing has physically changed in the systems to increase the probability of a pipe break. Further, the piping system stress levels in the hot fluid systems are low. In current design plants, pipe breaks need not be postulated inside penetrations if the stress levels are sufficiently low.

- (2) The proposed amendment of the license authorizing operation of Nine Mile Point, Unit No. 1 for the interim period will not create the possibility of a new or different accident from any accident previously analyzed since the compensatory measures limit the accidents to those previously analyzed for the reasons given in (1) above.
- (3) The proposed amendment of the license authorizing operation of Nine Mile Point, Unit No. 1 for the interim period will not involve a significant reduction in a margin of safety for the following reasons. No changes have been made to the facility nor have any changes been made to accident analysis methods. The conditions assumed in the reanalysis of the affected hot process pipe penetrations have been mitigated by the compensatory measures and other factors presented in (1) above. Therefore, the staff finds that continued operation of the facility for the interim period does not represent a significant reduction in the margin of safety.

Based on the above analysis, the proposed amendment involves no significant hazards considerations.

3.2 State Consultation

Consultation was held with the State of New York by telephone. The State expressed no concern either from the standpoint of safety or of no significant hazards consideration determination, in view of the interim nature of the amendment and the compensatory measures.

4.0 ENVIRONMENTAL CONSIDERATION

This amendment involves changes to a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and in surveillance requirements. The 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 reached a finding that this amendment involves no significant hazards consideration. Accordingly, this 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 nor environmental assessment need be prepared in connection with the issuance of this amendment.

5.0 CONCLUSION

The staff has concluded, based on the considerations discussed above that: (1) the amendment does not (a) significantly increase the probability or consequences of an accident previously evaluated, (b) increase the possibility of a new or different kind of accident from any previously evaluated or (c) significantly reduce a safety margin and, therefore, the amendment does not involve significant hazards consideration; (2) there is reasonable assurance that the health and safety of the public will not



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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 the amendment will not be inimical to the common defense and the security or to the health and safety of the public.

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Dated: January 28, 1986

