



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 159 TO FACILITY OPERATING LICENSE NO. DPR-63
NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT, UNIT NO. 1
DOCKET NO. 50-220

1.0 INTRODUCTION

On September 12, 1995, the U.S. Nuclear Regulatory Commission (NRC) approved issuance of a revision to 10 CFR Part 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors" which was subsequently published in the Federal Register on September 26, 1995, and became effective on October 26, 1995. The NRC added Option B, "Performance-Based Requirements," to allow licensees to voluntarily replace the prescriptive testing requirements of 10 CFR Part 50, Appendix J, with testing requirements based on both overall performance and the performance of individual components.

By letter dated July 16, 1996, Niagara Mohawk Power Corporation (the licensee) requested changes to the Technical Specifications (TSs) for Nine Mile Point, Unit 1. The proposed changes would permit implementation of 10 CFR Part 50, Appendix J, Option B. The licensee has established a "10 CFR 50 Appendix J Testing Program Plan" and proposed adding this program plan to the TS. The program plan references Regulatory Guide 1.163, "Performance-Based Containment Leak Test Program," dated September 1995, which specifies a method acceptable to the NRC for complying with Option B.

2.0 BACKGROUND

Compliance with 10 CFR Part 50, Appendix J, provides assurance that the primary containment, including those systems and components which penetrate the primary containment, do not exceed the allowable leakage rate specified in the TS and Bases. The allowable leakage rate is determined so that the leakage rate assumed in the safety analyses is not exceeded.

On February 4, 1992, the NRC published a notice in the Federal Register (57 FR 4166) discussing a planned initiative to begin eliminating requirements marginal to safety which impose a significant regulatory burden. 10 CFR Part 50, Appendix J, "Primary Containment Leakage Testing for Water-Cooled Power Reactors," was considered for this initiative and the staff undertook a study of possible changes to this regulation. The study examined the previous performance history of domestic containments and examined the effect on risk of a revision to the requirements of Appendix J. The results of this study are reported in NUREG-1493, "Performance-Based Leak-Test Program."

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Based on the results of this study, the staff developed a performance-based approach to containment leakage rate testing. On September 12, 1995, the NRC approved issuance of this revision to 10 CFR Part 50, Appendix J, which was subsequently published in the Federal Register on September 26, 1995, and became effective on October 26, 1995. The revision added Option B, "Performance-Based Requirements," to Appendix J to allow licensees to voluntarily replace the prescriptive testing requirements of Appendix J with testing requirements based on both overall and individual component leakage rate performance.

Regulatory Guide 1.163, "Performance-Based Containment Leak Test Program," dated September 1995, was developed as a method acceptable to the NRC staff for implementing Option B. This regulatory guide states that the Nuclear Energy Institute (NEI) guidance document NEI 94-01, Rev. 0, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," provides methods acceptable to the NRC staff for complying with Option B with four exceptions which are described therein.

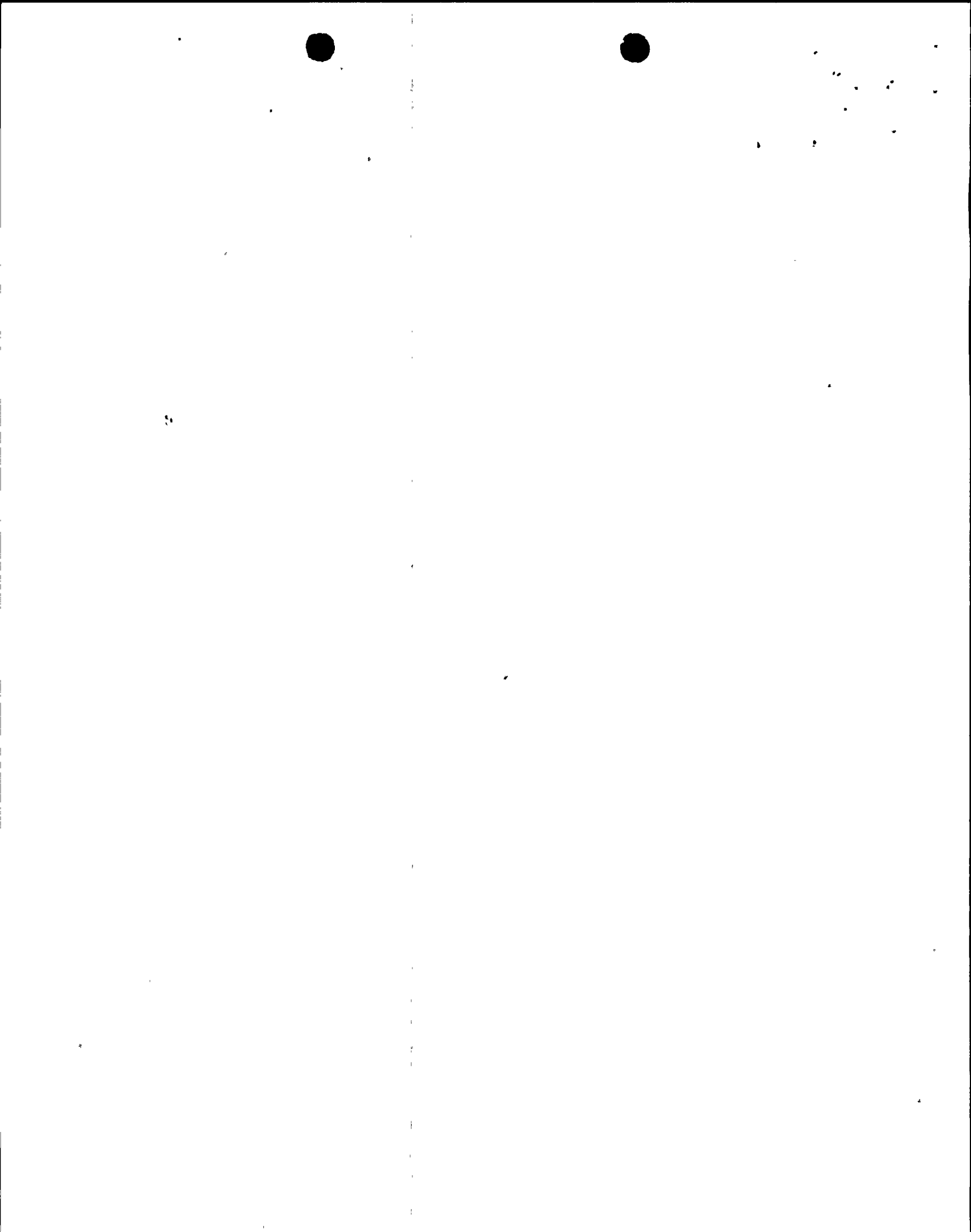
Option B requires that Regulatory Guide 1.163 or another implementation document used by a licensee to develop a performance-based leakage testing program must be included, by general reference, in the plant TS. The licensee has referenced Regulatory Guide 1.163 in the proposed Nine Mile Point, Unit 1 TS.

Regulatory Guide 1.163 specifies an extension in Type A test frequency to at least one test in 10 years based upon two consecutive successful tests. Type B tests may be extended up to a maximum interval of 10 years based upon completion of two consecutive successful tests and Type C tests may be extended up to 5 years based on two consecutive successful tests.

By letter dated October 20, 1995, NEI proposed TS to implement Option B. After some discussion, the staff and NEI agreed on final TS which were transmitted to NEI in a letter dated November 2, 1995. These TS are to serve as a model for licensees to develop plant-specific TS in preparing amendment requests to implement Option B.

In order for a licensee to determine the performance of each component, factors that are indicative of or affect performance, such as an administrative leakage limit, must be established. The administrative limit is selected to be indicative of the potential onset of component degradation. Although these limits are subject to NRC inspection to assure that they are selected in a reasonable manner, they are not TS requirements. Failure to meet an administrative limit requires the licensee to return to the minimum value of the test interval.

Option B requires that the licensee maintain records to show that the criteria for Type A, B, and C tests have been met. In addition, the licensee must maintain comparisons of the performance of the overall containment system and the individual components to show that the test intervals are adequate. These records are subject to NRC inspection.



3.0 EVALUATION

The licensee's July 16, 1996, letter to the NRC proposes to establish a "10 CFR 50 Appendix J Testing Program Plan" and proposes to add this program plan to the TS. The program plan references Regulatory Guide 1.163, "Performance-Based Containment Leak Test Program," dated September 1995, which specifies methods acceptable to the NRC for complying with Option B. This requires changes to existing TS 3.3.3 and 4.3.3, and the addition of the "10 CFR 50 Appendix J Testing Program Plan" as Section 6.16. Corresponding bases were also modified.

Option B permits a licensee to choose Type A; or Type B and C; or Type A, B and C; testing to be done on a performance basis. The licensee has elected to perform Type A, B, and C testing on a performance basis.

The TS changes proposed by the licensee are in compliance with the requirements of Option B and consistent with the guidance of Regulatory Guide 1.163, with two exceptions noted by the licensee; these are discussed in sections 3.1 and 3.2, below. Further, despite the different format of the licensee's current TS, all of the important elements of the model TS guidance provided in the NRC letter to NEI dated November 2, 1995, are included in the proposed TS, with a few exceptions as discussed in section 3.3, below.

3.1 Extension Of Current Type A Test Interval

The licensee's proposed TS changes include a one-time exception to Regulatory Guide 1.163 in that the next Type A test will be performed at an interval of approximately 70 months, rather than 48 months, since the last Type A test. Regulatory Guide 1.163 endorses NEI 94-01 which states that periodic Type A tests shall be performed at intervals of 48 months until acceptable performance is established to extend the test intervals. Acceptable performance history is defined as completion of two consecutive periodic Type A tests where the calculated performance leakage rate was less than $1.0 L_a$. At least one of these tests must be performed at peak accident pressure (P_a). Since the periodic Type A tests at Nine Mile Point, Unit 1, have been conducted at reduced pressure, the licensee must perform a full pressure test in order to implement the extended Type A test interval provisions of Option B. Absent the proposed exception to Regulatory Guide 1.163, the next Type A test for Nine Mile Point, Unit 1, would have to be performed during the spring 1997 refueling outage (Refueling Outage 14). The licensee's proposal would delay the next Type A test until Refueling Outage 15, early in 1999. That test will be conducted at full pressure, P_a , and if it is successful, the next test may be done at the extended interval of 10 years.

Industry experience indicates that the largest contribution to containment leakage comes from the containment penetrations and not from the containment walls or liner plate. Penetration and valve leakage rates are measured by Type B and C tests, and the schedule for these tests will be consistent with NEI 94-01. Further, results from the two most recent Type A tests show that the calculated performance leakage rates were less than the performance leakage rate acceptance criterion for a reduced pressure test, $1.0 L_r$, where L_r is the maximum allowable leakage rate at reduced pressure.



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In addition, the licensee notes that there have been no permanent or temporary modifications to the containment structure, liner, or penetrations since the last Type A test that could adversely affect the Type A test results. No modifications that require a Type A test are planned before Refueling Outage 15. Also, there have been no pressure or temperature excursions in the containment that could have adversely affected containment integrity.

Based on the plant's Type A test performance history, as discussed above, the staff finds the licensee's proposal to delay the next Type A test until Refueling Outage 15 to be acceptable.

3.2 Use Of Bechtel Topical Report BN-TOP-1

NEI 94-01, Section 8.0, "Testing Methodologies for Type A, B, and C Tests," states that these tests should be performed using the technical methods and techniques specified in ANSI/ANS 56.8-1994, "or other alternative testing methods that have been approved by the NRC." Some licensees wish to use the alternative testing methodology contained in Bechtel Topical Report BN-TOP-1, Revision 1, "Testing Criteria For Integrated Leakage Rate Testing of Primary Containment Structures For Nuclear Power Plants," dated November 1, 1972. The staff approved use of BN-TOP-1 in 1972 and it has been used ever since, primarily because it allows Type A tests to be completed in as little as 6 hours instead of the typical 24 hours. Although Option B and ANSI/ANS 56.8-1994 allow tests as short as 8 hours and may be preferable to the dated methodology of BN-TOP-1, the licensee proposes to retain BN-TOP-1 as an option for performing Type A tests. BN-TOP-1 still provides acceptable results and, therefore, continues to be acceptable for plants under either Option A or Option B of Appendix J.

The proposed TS describe the use of BN-TOP-1 as an exception to Regulatory Guide 1.163. As an alternative testing method approved by the NRC, the use of BN-TOP-1 does not constitute an exception to Regulatory Guide 1.163. Nevertheless, the staff has no objection to specifically citing BN-TOP-1 in the TS so as to avoid any confusion as to its acceptability. Therefore, the staff finds the proposed TS concerning BN-TOP-1 to be acceptable.

3.3 Exceptions To The Model TS Guidance

3.3.1 Containment Purge/Vent Valves

It should be noted that the proposed TS set the Type C test interval for containment purge/vent valves to no more than 30 months. Although the model TS guidance provided in the NRC letter to NEI dated November 2, 1995, contains a requirement to perform leakage rate testing of containment purge valves every 6 months, the TS is in brackets, which means that it may or may not be applicable to a specific plant. The licensee's current TS do not contain a requirement for this more frequent leakage rate testing of containment purge/vent valves, which may be compared to the Appendix J, Option A frequency of once per refueling outage. Further, Option B of Appendix J, Regulatory Guide 1.163, and the subordinate guidance documents do not require the testing



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of these valves more often than once per 30 months. Therefore, the proposed TS sets the test interval for containment purge/vent valves to no more than 30 months, through adherence to section C.2. of Regulatory Guide 1.163. The staff finds this to be acceptable.

3.3.2 As-Left and As-Found Leakage Rates

The model TS, in the Bases for TS 3.6.1.1.1, state:

Reviewer's Note: Regulatory Guide 1.163 and NEI 94-01 include acceptance criteria for as-left and as-found Type A leakage rates and combined Type B and C leakage rates, which may be reflected in the Bases.

As an extension of this concept, the licensee is proposing additional words, beyond the model TS, for TS 3.3.3, "Leakage Rate," and TS 6.16, "10 CFR 50 Appendix J Testing Program Plan," to reflect these acceptance criteria and proper means for determining as-left and as-found leakage rates. The staff has reviewed these additional words and finds that they are consistent with Regulatory Guide 1.163 and NEI 94-01, and are therefore acceptable.

3.3.3 Allowance For Exemptions

The program section of the model TS state that the program shall be in accordance with Appendix J, Option B, "as modified by approved exemptions." The licensee has proposed to leave out the phrase quoted above. Since the proposed TS is more conservative than the model TS, requiring compliance with Option B regardless of approved exemptions, the staff finds it to be acceptable.

3.3.4 Air Lock Leakage Rate Acceptance Criteria

The proposed TS 6.16, "10 CFR 50 Appendix J Testing Program Plan," deviates from the model TS in that it does not state separate, individual air lock leakage rate testing acceptance criteria. It also differs from current TS 4.3.3.d.(3)(d), which states: "Leakage rate for airlocks shall not exceed $0.05L_a$ at 35 psig." (Note: $P_a = 35$ psig.) Proposed TS 6.16 instead adds the measured air lock leakage rate to all of the other Type B and C leakage rates and requires that the sum be less than $0.6 L_a$.

The purpose for having separate, individual air lock leakage rate testing acceptance criteria is two-fold: to account for differing test pressures, and to provide better indications and corrections of degradation of air lock leak-tightness. At many plants, some air lock tests are performed at full pressure (P_a) and some at a lower pressure, usually 10 psig. It is difficult to compare leakage rates measured at different test pressures, so separate acceptance criteria for the two test pressures are preferable. Furthermore, separate, individual acceptance criteria provide better indication of degradation and require finer control of corrective action, compared to an overall, summary acceptance criterion for many components, which can mask individual problems.



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At Nine Mile Point, Unit 1, all air lock tests are performed at one pressure, P_a . Also, individual administrative leakage rate limits in the licensee's program are required by the licensee's TS. These two circumstances ensure the fulfillment of the purpose of separate, individual acceptance criteria in the TS, and make them unnecessary.

Finally, the provisions of Option B of Appendix J and Regulatory Guide 1.163 do not require separate, individual air lock leakage rate testing acceptance criteria to be placed in the TS. Based on the foregoing, the staff finds the subject TS to be acceptable.

3.3.5 Continuous Integrated Leakage Rate Monitoring

The licensee proposes to delete current TS 4.3.3.f., "Continuous Leak Rate Monitoring," which contains requirements for a continuous integrated leakage rate monitoring, or on-line monitoring, system. The provisions of Option B of Appendix J, Regulatory Guide 1.163, and the model TS do not require the existence or operation of such a system. In fact, the staff considered at length the need for such systems during the rulemaking proceedings that produced Option B (e.g., see 60 FR 49497; NUREG-1493), and decided that on-line monitoring systems would not be required. Therefore, the staff finds the deletion of the on-line monitoring requirement to be acceptable.

3.4 Summary

In summary, the staff has reviewed the changes to the TS and associated Bases proposed by the licensee and finds that they are in compliance with the requirements of Appendix J, Option B, and are consistent with the guidance of Regulatory Guide 1.163, with the two exceptions reviewed above, and conform with the model TS except as noted above, and are, therefore, 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 a surveillance requirement. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluent 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 (61 FR 52965). 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.



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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.

Principal Contributor: J. Pulsipher

Date: February 10, 1997

