UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION REPORT BY THE OFFICE OF NUCLEAR REACTOR REGULATION

APPENDIX J REVIEW

COOPER NUCLEAR STATION

DOCKET NO. 50-298

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1.0 Introduction

On August 5, 1975 (Reference 1), the NRC requested Nebraska Public Power District (licensee) to review its containment leakage testing program for Cooper Nuclear Station and the associated Technical Specifications for compliance with the requirements of Appendix J to 10 CFR Part 50.

Appendix J to 10 CFR Part 50 was published on February 14, 1973. Since by this date there were already many operating nuclear plants and a number more in advanced stages of design or construction, the NRC decided to have these plants reevaluated against the requirements of this new regulation. Therefore, beginning in August 1975, requests for review of the extent of compliance with the requirements of Appendix J were made of each licensee. Following the initial responses to these requests, NRC staff positions were developed which would assure that the objectives of the testing requirements of the above cited regulation were satisfied. Subsequently, Section III.D.2 of Appendix J was revised, effective October 22, 1980 and conformance is considered in our evaluation. These staff positions have since been applied in our review of the submittals filed by the licensee for Cooper Nuclear Station. The results of our evaluation are provided below.

2.0 Evaluation

Our consultant, the Franklin Research Center (FRC), has reviewed the licensee's submittals (References 2 and 3) and prepared the enclosed Technical Evaluation Report (TER-C5257-13), Containment Leakage Rate Testing for Cooper Nuclear Station. We have reviewed FRC's evaluation and concur in its bases and findings, with the exception of its assessment of the licensee's re st for exemption pertaining to the frequency of Type B tests for the containment airlock, which is further evaluated below.

Section III.D.2 of Appendix J, effective October 22, 1980, requires testing of the airlock as follows:

1. Every six months at a pressure of not less than accident pressure (Pa) and after periods when the airlock is opened and containment integrity is not required.

2. Within three days of opening (or every three days during periods of frequent opening) when containment integrity is required, at a pressure of Pa or at a reduced pressure as stated in the Technical Specifications.

By letter dated September 10, 1975, the licensee requested an exemption from the frequency requirements of Section III.D.2 in order to permit testing on a frequency consistent with the plant operating cycle (i.e., each refueling outage). FRC's evaluation of the licensee's submittals in support of the exemption request which is contained in the enclosed TER concluded that the licensee's program related to the test frequency and pressure should conform to the requirements of Section III.D.2 of Appendix J.

However, subsequent discussions with the licensee regarding test methodology and additional evaluation by the staff of airlock degradation causal factors and operating history have resulted in a reevaluation of our position. Test performance requires shutting down the reactor and opening the equipment hatch in order to install a strongback on the inner airlock door to prevent unseating the airlock door, and subsequent door and hatch openings to remove the strongback. This would result in an outage of several days for the licensee, the cost of replacement power to the public, and could subject operating personnel to additional radiation exposure. In addition, the additional openings of the equipment hatch and airlock provide additional opportunities for inadvertent seal degradation.

Based on these considerations, we have developed the following modified position which we believe meets the objectives of Appendix J requirements for Type B tests of containment airlocks.

We will still require containment airlocks to be tested every six months at a pressure of not less than Pa in accordance with Appendix J, except that the test interval may be extended to the next refueling outage (up to a maximum interval between Pa tests of 24 months) provided that there have been no airlock openings since the last successful test at Pa and a Pa test is performed following the next airlock opening. The intent of the Appendix J requirement is to assure that the airlock door seal integrity is maintained and no degradation has occurred as a result of opening of the airlock doors between testing intervals at Pa. Since there is an inadequate basis to conclude that no airlock seal degradation occurs if the airlock doors have not been opened between extended testing intervals at Pa, we believe that a reduced pressure testing or testing between seals every six months should be performed to assure that the airlock door seal integrity is maintained between the extended testing intervals at Pa. We believe this position satisfies the objectives of the requirements. The licensee will be requested to propose appropriate modifications to his Technical Specifications.

Therefore, the exemption from the airlock testing frequency requirements of Appendix J requested by the licensee should be granted provided the licensee complies with the staff's revised position on airlock testing.

3.0 Summary

Based on our review of the Technical Evaluation Report as prepared by the FRC and our evaluation of the containment airlock door testing requirements, the following conclusions are made regarding the Appendix J review for Cooper Nuclear Station:

1. The NPPD proposal to test containment airlocks annually at a pressure of Pa and every 6 months at a pressure of 3 psig is not totally acceptable. However, we have developed a position which we believe meets the objectives of the Appendix J requirements for these type tests and grants the licensee relief from the airlock testing interval requirements. This position is as follows:

   > Containment airlocks must be tested at six-month intervals at a pressure of Pa in accordance with Appendix J, except that this testing interval may be extended to the next refueling outage (up to a maximum interval between Pa tests of 24 months) provided that there have been no airlock openings since the last successful test at Pa.

   The NPPD proposal to test the containment airlock doors every 6 months at a reduced pressure of 3 psig during the interval when the doors have not been open is acceptable.

2. The NPPD proposed method for correlating reduced pressure leakage rates to full pressure leakage rates is not sufficiently conservative. The measured result of a reduced pressure test should be extrapolated to Pa using the formula recommended in the Technical Evaluation Report or some other equivalent method to determine the test's acceptability.

3. The NPPD proposal to test feedwater check valves with water in lieu of air or nitrogen as a test medium is not acceptable because these valves may be exposed to the containment atmosphere during the post-accident period. Valves must be pneumatically tested in accordance with Appendix J unless system conditions and valve liquid leakage limits assure a water seal for 30 days following onset of the postulated accident.

4.0 References

1. K. R. Goller (NRC) letter to J. M. Pilant (NPPD) dated August 5, 1975.

2. J. M. Pilant (NPPD) letter to K. R. Goller (NRC) dated September 10, 1975.

3. J. M. Pilant (NPPD) letter to T. A. Ippolito (NRC) dated October 30, 1978.

Dated: SEP 3 - 1982

Enclosure:
Technical Evaluation
Report