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

August 4, 1980

Docket No. 50-155

Mr. David P. Hoffman
Nuclear Licensing Administrator
Consumers Power Company
212 West Michigan Avenue
Jackson, Michigan 49201

Dear Mr. Hoffman:

We are continuing our review of your submittals regarding Appendix J to 10 CFR 50, Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors. Based on our review and that of our consultant, we have found that the additional information identified in the enclosure is needed to continue our review. To maintain our review schedule, please provide your response within 30 days of receipt of this letter.

for *Walter A. Paulson*
Dennis M. Crutchfield, Chief
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Division of Licensing

Enclosure:
Request for Additional
Information

cc w/enclosure:
See next page

Mr. David P. Hoffman

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cc w/enclosure:

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REQUEST FOR ADDITIONAL INFORMATION
IMPLEMENTATION OF 10CFR50, APPENDIX J,
CONTAINMENT LEAKAGE TESTING
BIG ROCK POINT

1.0 BACKGROUND

In a letter dated September 15, 1975, Consumers Power Company (CPC) requested certain exemptions from the requirements of 10CFR50, Appendix J. In a subsequent letter dated February 13, 1976, CPC requested additional exemptions and also proposed revisions to the technical specifications for Big Rock Point regarding containment leakage testing.

2.0 INFORMATION REQUESTED

2.1 AIRLOCK TEST PRESSURE AND FREQUENCY

Exemption Requests C and E of CPC's letter of September 15, 1975, refer to exemptions from the requirements of Appendix J relative to Type B testing of containment airlocks. CPC's request to conduct airlock tests at a pressure of slightly less than 5 psig and at a frequency of once every six months, regardless of openings in the interim, is unacceptable. In order for an exemption to be found acceptable, the following requirements must be satisfied:

1. A test of the entire airlock assembly once every six months at peak calculated accident pressure (Pa).
2. A reduced-pressure test within 72 hours of every first of a series of openings during the interim between the six-month tests.

In recognition of the difficulty some operating plants have in meeting the requirements of Appendix J regarding the testing of airlocks, the NRC staff has developed positions which enable the licensees to consider alternatives that satisfy the objectives of the airlock-testing requirements. The staff positions on the implementation of airlock-testing requirements are appended to this request for information (see Appendix A).

Submit an airlock-testing program which meets the minimum requirements described in the section above as amplified in Appendix A.

2.2 CLOSED SYSTEMS INSIDE CONTAINMENT

CPC's letter of February 13, 1976 requested exemption from Type C testing for valves associated with systems or lines which

. . . are closed systems inside containment and not liable to

rupture during a LOCA and, therefore, manual or check valves were either not provided during initial plant construction or if manual valves were provided at the containment boundary, they are normally left open.

CPC's conclusion is that it is not the intention of the requirements of Appendix J that these penetrations be tested. These penetrations include:

1. Reference Volume Sensing Line
2. Instrument Air Line
3. Service Air Line
4. Service Water Line
5. Reactor Building Heating Steam System
6. Air Operating Lines to CV-4040 and CV-4114 (Reactor Coolant Blowdown Valves) and CV-4029 (RCW Inlet to Shutdown Cooling Heat Exchangers).
7. Shutdown Flushing Line (subsequent correspondence indicates that this line has been capped since the 2-13-76 submittal).

Generally, in order to meet the intent of Appendix J, closed systems inside containment must be designed to engineered-safety-feature (ESF) system criteria (seismically designed, protected against internal missiles, safety class, etc.).

For systems not designed to ESF system criteria, provide a basis for the statement that the systems are not liable to rupture during LOCA.

2.3 CORE SPRAY RECIRCULATION SYSTEM VALVES

CPC's letter of February 13, 1976, requested exemption from Type C testing for valves in the core spray recirculation lines (3 penetrations) and in two additional penetrations associated with the core spray system and the back-up core spray system. CPC's basis for this position is that the systems are in use for long-term cooling following a postulated accident at a pressure far in excess of containment pressure and that the lines are not provided with automatic isolation valves. In order to justify your position, provide an evaluation that the systems will remain operating during the post-accident period considering the possibility of a single active failure since such failure may cause a valve to perform a containment isolation function. If such an evaluation cannot be provided, submit a plan of action to conform with the requirements of Appendix J including a schedule for accomplishing the plan.

2.4 WATER SUPPLY LINE TO THE CONTROL ROD DRIVE PUMPS AND FEEDWATER CHECK VALVES

CPC's letter of February 13, 1976 requested hydraulic testing, in lieu of pneumatic testing, for the isolation valves in the water supply to the control rod drive pumps because the line is configured such that it cannot be completely drained of water. CPC also stated that it appears likely that following a LOCA, sufficient water will remain in this line to form an effective hydraulic seal.

CPC's letter of February 13, 1976 also requested hydraulic testing of the feedwater check valves because these valves cannot be tested pneumatically.

Hydraulic testing of the above valves is acceptable provided the testing is used to verify that the leakage rate is such that there is sufficient water inventory to provide an effective water seal during and following a postulated LOCA.

Provide the following information which is needed to complete our evaluation of these requests.

1. Total water inventory available to each valve.
2. The water-leakage-rate limits or pressure-decay-rate limits allowed during the hydraulic tests.

APPENDIX A CONTAINMENT AIRLOCKS

Appendix J to 10CFR50 requires that reactor containment airlocks be leak-tested at the peak calculated accident pressure (Pa) at six-month intervals. Further, should the airlocks be opened during such intervals, the airlocks will be leak-tested after each opening. Appendix J calls out these specific requirements for airlocks because they present potentially large leakage paths which are subject to human error to a larger degree than other potential leakage paths.

The staff's interpretation of the objectives of the airlock-leak-testing requirements are:

1. That the six-month test will provide an integrated leakage rate for the entire airlock assembly including electrical and mechanical penetrations, the airlocks cylinder, hinge assemblies, welded connections, and other potential leakage paths.
2. That the "after-each-opening" test would provide a means of ensuring that the door seals had not been damaged or seated improperly during airlock use.

For those operating facilities that were designed and constructed prior to the issuance of Appendix J, consideration has been given to the alternatives to the specific testing requirements which will meet the provisions of Appendix J. Listed below are a number of guidelines which may be useful when considering or revising current airlock-leak-testing programs.

1. At six-month intervals the entire airlock assembly shall be leak-tested at the peak pressure, Pa. If the test pressure will lift the inner airlock door off its seat, a strongback or other mechanical device should be used so that meaningful test results can be obtained at Pa.
2. Should the airlock be opened during the interval between the six-month tests, the airlock door seals shall be tested within 72 hours of every first of a series of openings. This relaxation in the "after-each-opening" test requirement of Appendix J recognizes that a significant amount of time is required to conduct these intermediate tests in relation to the frequency of use of the airlock. These tests would be conducted whenever containment integrity is required.
3. For those plants which require the use of a strongback or clamps to leak-test the door seals at a pressure, Pa, a lower pressure (e.g., manufacturer's recommended pressure, which would not require the use of such clamping devices) should be used to conduct the intermediate tests. The results of leakage tests at the

reduced pressure must be conservatively extrapolated to the leakage at the accident pressure, Pa, to determine acceptability. (The extrapolation to be utilized must be submitted to the NRC.)

In lieu of the intermediate tests, an acceptable alternative would be the use of a continuous monitoring system to achieve the objective of the "after-each-opening" test requirement. As in the case of the reduced-pressure intermediate test, it must be demonstrated that the continuous monitoring system is sufficiently sensitive to detect unacceptable leakage rates and that the acceptable leakage-rate limits will be based upon a conservative extrapolation to the limiting leakage rate experienced under accident conditions (e.g., at a pressure of Pa).