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DUKE POWER

October 18, 1994

U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Document Control Desk

Subject: Catawba Nuclear Station
Docket Numbers 50-413 and -414
Technical Specification Revision and Exemption to 10 CFR 50 Appendix J

Attached is a request for a change to Catawba Nuclear Stations Technical Specifications to defer the next scheduled containment integrated leak test (ILRT) at Catawba Unit 1 for one outage, from the end-of-cycle 8 refueling outage (scheduled for February, 1995) to EOC 9 (scheduled for June, 1996). 10 CFR 50, Appendix J, requires that three integrated leak rate tests (ILRTs) be performed at approximately equal intervals during each 10-year service period at a nuclear station. "Approximately equal intervals" is defined in Catawba Nuclear Station's Technical Specifications as 40 $\pm$ 10 months. The proposed one-time change would allow Catawba to extend that interval to 60 $\pm$ 10 months.

Appendix J also requires that the third ILRT of each 10-year service interval be performed during the 10-year in-service inspection (ISI) outage. While the ISI work has been staggered over several outages, the upcoming outage will occur approximately 10 years after the plant was licensed (in December, 1984). Therefore, an exemption to this requirement is also requested.

It is concluded that the proposed change, a one-time extension of the interval between the second and third ILRTs at Catawba Unit 1, is justified for the following reasons:

Previous testing history

The Catawba Unit 1 test history provides substantial justification for the proposed test interval extension. In each of the 2 previous periodic ILRTs at Catawba Unit 1, the as-found leakage was less than or equal to 22.5% of the allowable leakage, L_a, thereby demonstrating that Catawba Unit 1 is a low-leakage containment.

Structural Capability of Containment

There are no mechanisms which would adversely affect the structural integrity of the containment, or that

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would be a factor in extending the test interval by 20 months. However, as a preventative maintenance measure, a containment civil inspection will be performed during EOC-8 to verify that no structural degradation exists.

Risk Assessment

Any additional risk created by the longer interval between ILRTs is considered to be negligible, in part because Type B and C testing will continue unchanged, and the probability of gross containment failure is very low.

The NRC's own analysis, published in draft NUREG-1493, concluded that increasing the ILRT interval to once every 20 years would "lead to an imperceptible increase in risk." It follows logically that increasing a test interval from 40 $\pm$ 10 months to 60 $\pm$ 10 month would amount to a fraction of that already "imperceptible" increase in risk. As evidence of this minimal risk, it is noted that for the 2 previous periodic ILRTs at Catawba Unit 1, the as-found leakage was equal to or less than 22.5% of the allowable leakage, L_a.

Approval of this one-time exemption and Technical Specification change is expected to save Duke Power approximately $900,000 in avoided replacement power cost, with additional savings associated with labor and employee exposure. This is consistent with the NRC's initiative to reduce sigificant cost associated with unnecessary regulatory requirements.

This proposed change is applicable to Unit 1 of Catawba Nuclear Station only.

If any additional information is required, please call Larry Rudy at (803) 831-3084 or Scott Gewehr at (704) 382-7581.

M. S. Tuckman

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M. S. Tuckman, being duly sworn, states that he is Senior Vice President of Duke Power Company; that he is authorized on the part of said Company to sign and file with the Nuclear Regulatory Commission this revision to the Catawba Nuclear Station, Facility Operating Licenses NPF-35 and NPF-52; and that all the statements and matter set forth herein are true and correct to the best of his knowledge.

M. S. Tuckman, Senior Vice President

Subscribed and sworn to before me this 17th day of October, 1994

Notary Public

My Commission Expires:

JAN 22, 1996

Attachment I

Justification for Exemption, Pursuant to 10 CFR 50.12

and

Justification for Technical Specification Change

10 CFR 50.12 states the NRC may grant exemptions to its regulations in Part 50 if special circumstances exist. Special circumstances are considered to exist if "application of the regulation ...**is not necessary to achieve the underlying purpose of the rule.**" The purpose of 10 CFR 50 Appendix J is to assure that "leakage through the primary reactor containment and systems and components penetrating primary containment shall not exceed allowable leakage rate values as specified in technical specifications..." The requirement that tests be performed during the inservice inspection outage is not necessary to achieve that purpose. In fact, the NRC staff recognized long ago that the requirement to perform the ILRT during ISI outage is of minimal safety significance, and proposed rulemaking (Federal Register, Vol. 51, Page 39538, October 29, 1986) to eliminate the requirement. For the reasons outlined below it may be concluded that decoupling the ILRT from the ISI outage, and deferring the ILRT for one outage, will have no significant effect on achieving the underlying purpose of the rule.

Leakage Rate Testing

Type B and C leak rate testing programs are used to determine leakage rates through systems and components that penetrate containment. These tests are currently performed at least every 2 years. This frequency will not be affected by this proposed change. Therefore, the major safety benefit achieved by performance of the Type A test is the detection of gross containment failure. This is a very low probability event. Past ILRT history shows that Catawba Unit 1 has easily passed each of its previous ILRTs. A table showing Unit 1's ILRT result history is included at the end of this Attachment. The table shows that for each of the 2 previous periodic ILRTs at Catawba Unit 1, the as-found leakage did not exceed 75% of the allowable leakage, L_a.

Containment Structural Capability

The Containment System consists of a free-standing cylindrical steel shell surrounded by a separate reinforced concrete reactor building. A six foot annular space is provided between the exterior surface of the steel containment vessel and the inner wall of the reactor building. The Annulus Ventilation system maintains this space at a negative pressure relative to the outside atmosphere during accident conditions. Although the Containment System incorporates the Annulus Ventilation, assurance of leak-tightness does not depend on this system at any time. This leak rate is a property of the containment vessel alone and the effect of the Annulus Ventilation System may be considered a margin of conservatism as the system collects, delays and filters gases leaking from the containment vessel.

Two mechanisms could adversely affect the passive structural capability of containment. The first is deterioration of the structure itself, due to pressure, temperature, radiation, chemical, or other such effects. Secondly, modifications can be made to the structure which, if not carefully controlled, could leave the structure with reduced capability.

Prior to the performance of the Type A test, a general visual inspection of all accessible interior and exterior surfaces of both the steel containment vessel and the reactor building shield wall is conducted. This inspection is performed in accordance with procedure. The purpose of the inspection is to detect any

evidence of structural deterioration which may affect either the containment structural integrity or its leak-tightness. At the same time, the adjoining areas are inspected to ensure that there are no significant interferences with other structures which would restrict the differential movement of the steel vessel. The civil inspections conducted in support of each of the two periodic Type A tests have identified no evidence of structural deterioration that would impact structural integrity or leak tightness of containment.

Absent actual accident conditions, structural deterioration is a gradual phenomenon requiring periods of time well in excess of the proposed interval extension. However, as a preventive maintenance measure, the containment civil inspection will be performed in lieu of the scheduled Type A test in February, and again during the end of the following cycle refueling outage (currently scheduled for June, 1996) as part of the deferred Type A test.

Modifications that would alter the passive containment structure are infrequent and would receive extensive review to ensure containment capabilities are not diminished. The Catawba modification process and 10 CFR 50.59 programs have been demonstrated to be effective in providing a high quality oversight of such safety significant modifications. In addition, 10 CFR 50, Appendix J, Section IV.A, requires Type A testing to be performed following any major modification to primary containment boundary. This requirement will be maintained.

Risk Assessment

Draft NUREG-1493 includes the results of a sensitivity study performed to explore the risk impact of several alternate leak rate testing schedules. Alternative 4 from this study examines relaxing the ILRT frequency from 3 tests in 10 years to 1 test in 10 years. Using best estimate data, the draft NUREG concludes that the increase in population exposure risk to those in the vicinity of the five representative plants ranged from .02% to .14%. This very low impact on risk is attributable to: 1) the effectiveness of Type B and C tests in identifying potential leak paths (only about 3% of leakages that exceed current requirements are detectable only by Type A tests, and those few failures were only marginally above prescribed limits), 2) a low likelihood of ILRT-identified leakages in excess of 2 times allowable, and 3) the insensitivity of risk to containment leak rate (e.g., no discernable increase in population dose risk with containment leak rates 100 times greater than currently allowed). This led the authors of draft NUREG-1493 to conclude that even increasing the ILRT frequency to once in 20 years would "lead to an imperceptible increase in risk."

The analyses presented in draft NUREG-1493 are considered to be bounding for Catawba because: 1) the requested exemption would result in a one-time test interval of about 5 years, not the 20 or even 10 years mentioned in the study; 2) the population density around Catawba is less than that used in the study (approximately 329 people per square mile, versus the 340/mi^2 used in the study; 3) no ILRT at Catawba has failed; and 4) the core inventory used in the study was represented by a 3412 MWt PWR. Catawba is a 3411 MWt PWR.

Summary

This proposed exemption to the requirements of 10 CFR Appendix J, and the concurrent Technical Specification change, are considered to be justified based upon the minimal safety significance.

Catawba Nuclear Station
Unit 1
ILRT Test Results

Test Type	*Test Date*	*Test Method*	*Test Duration*	*Test Results (%/day)*	
			hours	*As-Found*	*As-Left*
Pre-operational	1/13/84	Mass Point	24	N/A	0.1108
1st Periodic	11/25/87	Mass Point	24	0.0614	0.0522
2nd Periodic	3/29/91	Mass Point	24	0.0675	0.0675

Acceptance Criteria (0.75 La): < 0.225 %/day
Allowable Leakage (1.0 La): < 0.300 %/day

Notes:

(1) All test results reported at the 95 % Upper Confidence Limit and include the leakage penalty total for all Type B or C penetrations not challenged during performance of the ILRT.

(2) The As-Found test results also include the leakages savings total for all penetrations repaired or adjusted prior to the start of the ILRT in accordance with IE Notice No. 85-71.

(3) The 2nd Periodic test was performed at the front of the outage prior to any repairs or adjustments; therefore, the As-Found test result is equal to the As-Left test result.