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SUBJECT: Discusses containment integrated leak rate testing & imposition of backfit by virtue of change in staff position. Interpretations of 10CFR50, App J should be subjected to regulatory analysis.

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Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -289
McGuire Nuclear Station
Docket Nos. 50-369, -370
Catawba Nuclear Station
Docket Nos. 50-413, -414
Containment Integrated Leak Rate Testing
Imposition of Backfit by Virtue of
Change in Staff Position

Gentlemen:

SUMMARY

In recent months the NRC Staff has adopted various interpretations of 10CFR50 Appendix J which appear to be contrary to previous Staff Positions and which do not appear to be soundly based upon the text of Appendix J. Two items of particular concern to Duke Power are 1) the Staff's reluctance to allow short-duration tests using the Mass-Plot analysis method, and 2) the Staff's requirement that as-found (Type B and C) leakage be included in Type A test results. The purpose of this letter is to assert Duke's position that these interpretations constitute backfit requirements, as defined by 10CFR50.109, and as such should be subjected to the Regulatory Analysis required by §50.109.

DISCUSSION

In 1973, 10CFR50 Appendix J went into effect, referencing ANSI N45.4-1972 (Leakage-Rate Testing of Containment Structures for Nuclear Reactors) as the operative method for performing Leak-Rate Testing at nuclear stations. Since that time Duke has performed leak-rate testing according to Appendix J, with some exemptions.

As time and technology have progressed, the NRC Staff has supplemented the requirements of Appendix J through Staff Positions, both tacit and explicit, which become backfitted requirements when enforced. For example in 1977 the Staff, absent any revision to Appendix J, began requiring that Integrated Leak Rate Test (ILRT) acceptance criteria include a 95 percent Upper Confidence Limit (UCL), rather than actual measured leakage. Inspection of Appendix J and ANSI N45.4-1972 reveals no mention of UCL. This requirement was presumably based on the then-draft revision to the standard, which was issued in 1981 as ANSI/ANS-56.8. Clearly, had the backfit rule been in effect in 1977 the imposition of the more stringent UCL requirement would have been considered as such.

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Another example of a changed Staff position as it affects Appendix J testing relates to the method used to analyze ILRT data. ANSI N45.4-1972 requires that either the "total time" or the "point-to-point" method be used to analyze ILRT data. However, starting in 1976 the Staff endorsed, again absent any revision to Appendix J, the Mass-Plot (Mass-Point) method. As late as 1986 (reference: Staff Review of Leak-rate Methodology, Deputy Director, NRR to Director, Div. of Inspection Programs, IE, April 1, 1986) the Staff has recognized the acceptability of the Mass-Plot method. On August 1, 1986 Duke was notified by the Staff that Mass-Plot was not an acceptable analysis method because Mass-Plot was not provided for in Appendix J. Duke had already obtained exemptions to allow use of Mass-Plot at the McGuire and Catawba stations, and subsequently obtained an exemption for Oconee.

The preceding two examples illustrate instances in which "Staff Position" has achieved virtually regulatory status without being accorded the due process required for rulemaking. Fortuitously, neither has to date resulted in significant adverse impact. There are, however, two issues related to ILRTs which loom as significant contributors to increased probability of test failure and increased outage time. These issues are short-duration Mass-Plot testing and inclusion of as-found leakage from Type B and C testing in Type A test results.

Appendix J, through ANSI-N45.4, requires that ILRTs be performed for a 24-hour period, except "if it can be demonstrated to the satisfaction of those responsible for the acceptance of the containment structure that the leakage rate can be accurately determined during a shorter test period, the agreed-upon shorter period may be used." (ANSI-N45.4, paragraph 7.6). There are two important points in this exception. First, the exception is made without reference to the method of test analysis contained in the standard. Second, the exception refers to "those responsible for the acceptance of the containment structure." The NRC Staff, in its April 1, 1986 review of leak rate testing methodology stated that the only test of less than 24 hours which is acceptable to the NRC is the method specified in the Bechtel Corporation Topical, BN-TOP-1 (the total time and point-to-point methods). The Staff further contends that "those responsible for acceptance of the containment structure" refers to the NRC. In Inspection Report Number 50-269/86-13 (June 30, 1986) the Staff states "ANSI-N45.4, paragraph 7.6 requires a 24-hour test unless a test of shorter duration has been agreed upon by NRC." The Report also states "The Region believes that the second sentence [of paragraph 7.6] is simply a statement of the obvious; specifically, that with the review and approval of the regulatory body that initially approved the rule, in this case the NRC, an acceptable alternative to the requirements of that rule may be implemented."

It is not obvious at all that "those responsible for the acceptance of the containment structure" and "the regulatory body that approved the rule" are one and the same. The licensee is responsible for the operation, maintenance, and overall quality of the nuclear station. Acceptance of the containment structure is one aspect of the licensee's responsibility to assure that the health and safety of the public is not endangered. The ability to verify this acceptability in less than 24 hours, using Mass-Plot, has been explicitly recognized in the revised standard ANSI/ANS-56.8-1981, "Containment System Leakage Testing Requirements." It is implicit in the current standard, N45.4-1972, that if the acceptance criteria are met, the test duration is irrelevant.

The recent unwillingness of the Staff to accept short duration Mass-Plot testing represents a change in Staff position. The table below lists two Inspection Reports in which the NRC Inspector witnessed and, by signing the report with no related violations or identified items, tacitly approved short-duration tests using Mass-Plot.

REPORT NO.	REPORT DATE	TEST DURATION	MINIMUM TEST DURATION PER PROCEDURE
50-270/83-35	Dec. 15, 1983	8 hours 25 min.	6 hours
50-287/81-04	April 6, 1981	10 hours 45 min.	Not in procedure

Note that the inspector(s) reviewed at least one procedure which specified a minimum 6-hour test.

As noted, the provision in the standard to allow short duration testing did not make reference to any of the analysis methods included in the standard. In addition to the total time and point-to-point methods (two options in the broader category of the absolute method) the Standard describes testing by the Reference-Vessel Method. The Reference-Vessel Method is distinctly different from the absolute method; nevertheless, the Standard, in paragraph 7.10, reaffirms that "If it can be demonstrated to the satisfaction of those responsible for the acceptance of the containment that the leakage rate can be accurately determined during a shorter test period, the agreed upon shorter period may be used". It follows that if two diverse methods have the capability to satisfactorily determine leakage rates in less than 24 hours, then the duration of the test is not as critical a parameter as the April, 1986 Staff position seems to indicate.

In accordance with the backfit policy guidance presented in Chapter 0514 of the NRC Manual, the elements of imposition of a backfit are satisfied. The Staff's original position of acceptance of short duration testing is documented in the above inspection reports. The Staff's new position is documented in the April, 1986 Staff review of leakrate methodology. Actual imposition of the backfit has been accomplished by the need to perform 24-hour tests or risk ILRT failure. The previous Staff position had been in effect since the inception of Appendix J.

The issue of as-found leakage has already proven significant at McGuire Nuclear Station, where one unit was ruled to have failed an ILRT by virtue of having not included as-found leakage in Type A test results. The Staff's position, established in Information Notice 85-71, was identified too close in time to a scheduled ILRT to allow resolution in a timely manner. Information Notice 85-71 was dated August 22, 1985; before the effective date of 10 CFR 50.109 (October 21, 1985). However, the backfit policy identified in Generic Letter 84-08, which is similar to §50.109, is applicable to this issue.

Appendix J appears to have been predicated upon the intent of assuring containment integrity for the period of operation following the test. The acceptance criteria for the test require that the measured leakage (LTM) rate be 75% of the allowable leakage (LT) rate. Thus, assuming a nominal degradation (25%) of containment integrity over the subsequent period, the leakage will still be within the allowable limits at the conclusion of the period.

The inclusion of as-found leakage in Type A test results thus causes a double-counting of normal (anticipated) containment integrity degradation. The .75 La acceptance criterion of Appendix J concedes an acceptable amount of expected degradation. To further require that the actual degradation of the containment (i.e., the as-found leakage) result in a total leakage of less than .75 La, rather than La, is beyond the intent of the rule. Any other interpretation must refute the definition of La as an acceptable leakage and .75 La as an acceptance criterion.

The periodic testing and maintenance which is performed only serves to reinforce the probability of sound containment integrity. The Staff apparently accepted this philosophy for many years; as indicated by the fact the NRC inspectors have reviewed test procedures and witnessed ILRTs, and have not (until recently) identified any deviations or violations. There appears to be a shift in the philosophy of the intent of Appendix J from ensuring future operability to verification of past operability. It may be valid that future operability may best be expected based upon past history of containment leakage. It may also be that this new philosophy of verifying past operability results in penalization for utilities' valve maintenance programs by increasing the time required to perform Type B and C testing, increasing the possibility of Type A test failure, and thus increasing the Type A test frequency. In fact, the valve and penetration maintenance program will accomplish the same goal as the ILRT program, without subjecting the utility to the economic risks (i.e., increased outage time) associated with ILRT failure.

An example of the Staff's previous position that Type C as-found leakages need not be included in ILRT test results can be found in Information Report 50-269/80-06, transmitted to Duke by letter, R.C. Lewis to W.O. Parker, dated March 20, 1980. The inspector noted that 14 of 60 penetrations were not aligned as required for ILRT. As a result, the inspector required that the as-found leakage from those 14 valves be included in the ILRT results. As-found leakage from the 46 valves which were properly aligned were not required to be included. This specific exclusion of valves from the as-found testing requirement serves as documentation of a previous Staff position that as found valve leakage need not be included in ILRT results. Again, the Staff position presented in Information Notice 85-71 represents a departure from that position and should receive the appropriate analysis to determine that there is a substantial increase in the overall protection of the public health and safety from the imposition of this backfit.

CONCLUSION

The Staff's original positions on short duration Mass-Plot Testing and as-found leakage are documented in the various inspection reports referenced elsewhere in this letter. By approving the inspection reports with no applicable violations ro deviations identified, the Staff has tacitly approved short-duration Mass-Plot Testing and ILRTs without as-found leakage. More recent Staff documents, notably the April 1, 1986 Staff review of leakage methodology and Inspection Notice 85-71, change Staff position in such a way as to place additional burden on Licensees without demonstrating that a significant increase in overall protection of public health and safety will be achieved. Duke considers that these issues are backfits and should receive the appropriate regulatory analysis. This analysis should compare the cost of the increased outage time associated with extended leak rate

testing to the significance of the overall increase in protection of the health and safety of the public. The analysis should also state the Staff's interpretation of the intent of Appendix J relative to verification of past or insuring future integrity of the containment structure.

Very truly yours,

Hal B. Tucker

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SAG/84/jgc

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