

Mr. M. S. Tuckman
 Senior Vice President
 Nuclear Generation
 Duke Power Company
 P. O. Box 1006
 Charlotte, NC 28201

March 7, 1995

SUBJECT: ISSUANCE OF SCHEDULAR EXEMPTION FROM THE REQUIREMENTS OF 10 CFR PART 50, APPENDIX J, FOR CATAWBA NUCLEAR STATION UNIT NO. 1 REGARDING DELAY OF NEXT REQUIRED TYPE A LEAKAGE RATE TEST (TAC NO. M90625)

Dear Mr. Tuckman:

By letters dated October 18, 1994, and February 7, 1995, Duke Power Company requested a one-time schedular exemption to delay performance of a Type A test, as required by 10 CFR Part 50, Appendix J, for a period of approximately 16 months.

The NRC staff has reviewed the information provided in support of your schedular exemption request. On the basis of the submitted information and as discussed in the enclosed Exemption, the NRC staff has concluded that there is a high degree of confidence that the containment will not degrade to an unacceptable extent while this exemption is in effect. Thus, the NRC staff has concluded that your request is justified and your request for a schedular exemption to delay performance of the Type A test until the 1996 refueling outage is granted.

We find that granting the exemption from the requirements of 10 CFR Part 50, Appendix J, Section III.D.1.(a), is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security, and meets the special circumstances described in 10 CFR 50.12(a)(2)(ii).

A copy of the Exemption is enclosed. The Exemption has been forwarded to the Office of the Federal Register for publication.

Sincerely,

ORIGINAL SIGNED BY:

Herbert N. Berkow, Director
 Project Directorate II-3
 Division of Reactor Projects - I/II
 Office of Nuclear Reactor Regulation

Docket No. 50-413

Enclosure: Exemption

cc w/encl: See next page

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

March 7, 1995

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Nuclear Generation
Duke Power Company
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Sincerely,

A handwritten signature in black ink that reads "Herbert N. Berkow".

Herbert N. Berkow, Director
Project Directorate II-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-413

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cc w/encl: See next page

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Catawba Nuclear Station

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)
DUKE POWER COMPANY, ET AL.) Docket No. 50-413
(Catawba Nuclear Station,)
Unit No. 1))

EXEMPTION

I.

The Duke Power Company, et al. (DPC or the licensee) is the holder of Facility Operating License No. NPF-35, which authorizes operation of the Catawba Nuclear Station, Unit No. 1 (the facility), at a steady-state reactor power level not in excess of 3411 megawatts thermal. The facility is a pressurized water reactor located at the licensee's site in York County, South Carolina. The license provides, among other things, that the Catawba Nuclear Station is subject to all rules, regulations, and Orders of the U.S. Nuclear Regulatory Commission (the Commission or NRC) now or hereafter in effect.

II.

Section III.D.1.(a) of Appendix J to 10 CFR Part 50 requires the performance of three Type A containment integrated leakage rate tests (ILRTs) at approximately equal intervals during each 10-year service period of the primary containment. The third test of each set shall be conducted when the plant is shut down for the 10-year inservice inspection of the primary containment.

III.

By letters dated October 18, 1994, and February 7, 1995, the licensee requested temporary relief from the requirement to perform a set of three Type A tests at approximately equal intervals during each 10-year service period of the primary containment. The requested exemption would permit a one-time interval extension of the third Type A test by approximately 16 months (from the 1995 refueling outage, which began on February 11, 1995, to the end-of-cycle 9 (EOC-9) refueling outage, currently scheduled for June 1996) and would permit the third Type A test of the second 10-year inservice inspection period to not correspond with the end of the current inservice inspection interval.

The licensee's request 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:

The previous testing history at Catawba Unit 1 provides substantial justification for the proposed test interval extension. In each of the two previous periodic ILRTs at Catawba Unit 1, the as-found leakage was less than or equal to 22.5% of the allowable leakage, thereby demonstrating that Catawba Unit 1 is a low-leakage containment. There are no mechanisms which would adversely affect the structural integrity of the containment, or that would be a factor in extending the test interval by 20 months. However, as a preventative maintenance measure, a containment civil inspection, currently required by Appendix J prior to a Type A test, will be performed during EOC-8 to verify that no structural degradation exists. Any additional risk created

by the longer interval between ILRTs is considered to be negligible, primarily because Type B and C testing will continue unchanged.

Additionally, the licensee stated that its exemption request meets the requirements of 10 CFR 50.12, paragraphs (a)(1) and (a)(2)(ii), for the following reasons:

In order to justify the granting of an exemption to the requirements of 10 CFR Part 50, paragraph 50.12(a)(1) requires that the licensee show that the proposed exemption will not pose an undue risk to the public. That this proposed change will not pose an undue risk is demonstrated by the analysis presented in draft NUREG-1493, which concludes that an increase in the test interval to once every 20 years would "lead to an imperceptible increase in risk." The analyses in draft NUREG-1493 are considered to be specifically applicable to Catawba because: 1) the requested exemption would result in a one-time increase in the test interval to 5 years, not 20; 2) the population density around Catawba is less than that used in the study (329 people per square mile, vs. 340 used in the study); 3) no ILRT at Catawba has failed; 4) the core inventory used in the study was represented by a 3412 Mwt PWR [pressurized water reactor]. Catawba is a 3411 Mwt PWR. Other factors which lead to the conclusion that the proposed change will not pose an undue risk include the fact that local leak rate testing, which identifies 97% of leakage in excess of prescribed limits, will remain in place at its current test frequency; the detailed, proceduralized containment civil inspection which is normally performed in conjunction with an ILRT will be performed in place of the scheduled ILRT, to identify potential structural deteriorations; and the historical leak-tightness of the containment structure, as evidenced by two successive ILRTs in which the as-found leakage did not exceed 22.5% of the allowable leakage rate.

A comparison was made between the risk analysis presented in draft NUREG-1493 and a probabilistic risk assessment performed for Catawba Nuclear Station. While the quantitative results of the NUREG are not directly applicable to plants not used in the study, similar conclusions can be made concerning Catawba. NUREG-1493 indicates that reactor accident risks are dominated by accident sequences that result in failure or bypass of the containment. This conclusion is also valid for Catawba. Considering only the Catawba accident sequences that do not result in containment failure, containment leakage contributes approximately 0.08 to 0.09 percent to off-site risk (whole-body person-rem, thyroid nodules, and latent fatalities). NUREG-1493 indicated that containment leakage contributed from 0.02 to 0.10 percent to latent cancer risk. The comparison between the analysis of NUREG-1493 and the Catawba PRA concludes that increases in containment leakage at Catawba are expected to produce increases in accident risk similar to the results in NUREG-1493.

Special circumstances, as defined in 10 CFR [50].12(a)(2)(ii), are present in that the requirement to perform the third ILRT during the ISI outage is not necessary to achieve the underlying purpose of the rule. The purposes of the rule, as stated in Section I of Appendix J, are to ensure that: a) leakage through the primary reactor containment and systems and components penetrating containment shall not exceed allowable values, and b) periodic surveillance of reactor containment penetrations and isolation valves is performed so that proper maintenance and repairs are made. One of the significant factors in assuring that the proposed exemption will not pose an undue risk to the public, as noted above, is the local leak rate testing (LLRT) which is performed. That the LLRT program at Catawba provides an effective mechanism for maintaining containment integrity is perhaps best demonstrated by the fact that the most recent ILRT at Catawba Unit 1 was performed at the front end of the refueling outage; before any repairs or adjustments were made to valves or penetrations. Nevertheless, the as-found leakage did not exceed 22.5% of the allowable leakage rate. The fact that no leakage paths were identified by an ILRT, and that the ILRT met the acceptance criteria with significant margin confirms the results of the Type B and C testing.

The frequency and scope of the Type B and C LLRT program are not being changed by this exemption request. The LLRT program will continue to effectively detect containment leakage resulting from the degradation of active containment isolation components, as well as containment penetrations. Administrative limits have been established for each Type B or C component at a fraction of the allowable leak rate, such that any leakage detected in excess of the administrative limit will indicate a potential valve or penetration degradation. In instances in which a component's leakage exceeds its administrative limit, proceduralized controls in the test program require that a work order be written to repair the component.

IV.

Section III.D.1.(a) of Appendix J to 10 CFR Part 50 states that a set of three Type A leakage rate tests shall be performed at approximately equal intervals during each 10-year service period.

The licensee proposes an exemption to this section which would provide a one-time interval extension for the Type A test by approximately 16 months. The Commission has determined that, pursuant to 10 CFR 50.12(a)(1), this exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. The Commission further determined, for the reasons discussed below, that

special circumstances, as provided in 10 CFR 50.12(a)(2)(ii), are present justifying the exemption; namely, that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. The underlying purpose of the requirement to perform Type A containment leak rate tests at intervals during the 10-year service period, is to ensure that any potential leakage pathways through the containment boundary are identified within a time span that prevents significant degradation from continuing or becoming unknown. The NRC staff has reviewed the basis and supporting information provided by the licensee in the exemption request. The NRC staff has noted that the licensee has a good record of ensuring a leak-tight containment. All Type A tests have passed with significant margin, and the licensee has noted that the results of the Type A testing have been confirmatory of the Type B and C tests which will continue to be performed. The licensee has stated that it will continue to perform the general containment civil inspection although it is only required by Appendix J (Section V.A.) to be performed in conjunction with Type A tests. The NRC staff considers that these inspections, though limited in scope, provide an important added level of confidence in the continued integrity of the containment boundary.

The NRC staff has also made use of a draft staff report, NUREG-1493, which provides the technical justification for the present Appendix J rulemaking effort which also includes a 10-year test interval for Type A tests. The integrated leakage rate test, or Type A test, measures overall containment leakage. However, operating experience with all types of containments used in this country demonstrates that essentially all containment leakage can be detected by local leakage rate tests (Type B

and C). According to results given in NUREG-1493, out of 180 ILRT reports covering 110 individual reactors and approximately 770 years of operating history, only 5 ILRT failures were found which local leakage rate testing could not detect. This is 3% of all failures. This study agrees with previous NRC staff studies which show that Type B and C testing can detect a very large percentage of containment leaks. The Catawba Unit 1 experience has also been consistent with this.

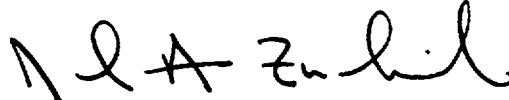
The Nuclear Management and Resources Council (NUMARC), now the Nuclear Energy Institute (NEI), collected and provided the NRC staff with summaries of data to assist in the Appendix J rulemaking effort. NUMARC collected results of 144 ILRTs from 33 units; 23 ILRTs exceeded $1.0L_a$. Of these, only nine were not due to Type B or C leakage penalties. The NEI data also added another perspective. The NEI data show that in about one-third of the cases exceeding allowable leakage, the as-found leakage was less than $2L_a$; in one case the leakage was found to be approximately $2L_a$; in one case the as-found leakage was less than $3L_a$; one case approached $10L_a$; and in one case the leakage was found to be approximately $21L_a$. For about half of the failed ILRTs, the as-found leakage was not quantified. These data show that, for those ILRTs for which the leakage was quantified, the leakage values are small in comparison to the leakage value at which the risk to the public starts to increase over the value of risk corresponding to L_a (approximately $200L_a$, as discussed in NUREG-1493).

Based on generic and plant-specific data, the NRC staff finds the licensee's proposed one-time exemption to permit a schedular extension of one cycle for the performance of the Appendix Type A test to be acceptable.

Pursuant to 10 CFR 51.32, the Commission has determined that granting this exemption will not have a significant impact on the human environment (60 CFR 11125).

This exemption is effective upon issuance and shall expire at the completion of the 1996 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, appearing to read "John A. Zwolinski". The signature is written in a cursive style with a large initial "J" and "Z".

John A. Zwolinski, Acting Director
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,
this 7th day of March 1995