

February 24, 1987

DEC 01/6

Dockets Nos. 50-269, 50-270
and 50-287

Distribution: Docket File NRC & L PDRs
Branch File HPastis ACRS TBarnhart 4
LFMB OPA ORAS OGC
EJordan JPartlow BGrimes NThompson
GEdison Ringram FMiraglia HDenton/RVollmer
DCrutchfield

Mr. Hal B. Tucker
Vice President - Nuclear Production
Duke Power Company
P. O. Box 33189
422 South Church Street
Charlotte, North Carolina 28242

Dear Mr. Tucker:

SUBJECT: EXEMPTION FROM THE REQUIREMENTS OF APPENDIX J TO 10 CFR PART 50,
PARAGRAPH III.A.3

The Commission has issued an exemption from certain requirements of Appendix J to 10 CFR Part 50 in response to your letter dated August 13, as superseded on August 20, 1986. The exemption pertains to certain requirements of 10 CFR Part 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors", for all Type A tests to be performed in accordance with the provisions of the American National Standard (ANSI) N45.4-1972, Leakage Rate Testing of Containment Structures for Nuclear Reactors, March 16, 1972. This standard requires that containment leakage calculations be performed using either the point-to-point method or the total time method.

In your letter dated August 13, as superseded on August 20, 1986, you requested an exemption to allow use of the mass-plot method (as provided in ANSI/ANS 56.8-1981). The Commission grants the exemption to use the mass-plot method for calculating containment leakage. The exemption is granted for each of the three units until any final changes in rulemaking of Appendix J become effective. The exemption applies only to the method of calculating leakage by use of the mass-plot and not to any other aspects of the tests. The bases for this action are included in the enclosed Exemption. In the same letter, you proposed an amendment to the Technical Specifications (TSs) to maintain consistency between the TSs and Appendix J. We will respond to the proposed amendment by separate correspondence.

The Exemption is being forwarded to the Office of the Federal Register for publication.

Sincerely,

/s/

Helen N. Pastis, Project Manager
PWR Project Directorate #6
Division of PWR Licensing-B

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PDR ADOCK 05000269
PDR

Enclosure:
Exemption

cc w/enclosure:

See next page

PWR#6*	PWR#6*	PWR#6*	PWR#6*	PBECB*	OGC*	DCR
Ringram <i>2/20/87</i>	HPastis;eh	GEdison	JStolz	TMarsh	CWoodhead	FMiraglia
2/5/87	2/5/87	2/5/87	2/6/87	2/6/87	2/10/87	<i>2/2/87</i>

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2/20/87
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Helen N. Pastis, Project Manager
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Division of PWR Licensing-B

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Exemption

cc w/enclosure:
See next page

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RIngram
2/15/87

PWR#6
HPastis;eh
2/15/87

PWR#6
GEdison
2/15/87

PWR#6
JStolz
1/187

PBECB
TMarsh
2/16/87

OGC
1/187

D:DPLB
FMiraglia
1/187

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Duke Power Company
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In your letter dated August 13, as superseded on August 20, 1986, you requested an exemption to allow use of the mass-plot method (as provided in ANSI/ANS 56.8-1981). The Commission grants the exemption to use the mass-plot method for calculating containment leakage. The exemption is granted for each of the three units until any final changes in rulemaking of Appendix J become effective. If the mass-plot method, described and evaluated, is consistent with the final Appendix J, it remain in effect. The exemption applies only to the method of calculating leakage by use of the mass-plot and not to any other aspects of the tests. The bases for this action are included in the enclosed Exemption. In the same letter, you proposed an amendment to the Technical Specifications (TSs) to maintain consistency between the TSs and Appendix J. We will respond to the proposed amendment by separate correspondence.

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Helen N. Pastis, Project Manager
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Division of PWR Licensing-B

Enclosure:
Exemption

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AEE
PWR#6* PBECB*
JStolz TMarsh
2/6/87 2/6/87

*w/ noted changes
* on condition EA
is published in Fed Reg
CWoodhead prior to issuance*
OGC
2/10/87

D:DPLB
FMiraglia
1/87

Mr. H. B. Tucker
Duke Power Company

Oconee Nuclear Station
Units Nos. 1, 2 and 3

cc:

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Honorable James M. Phinney
County Supervisor of Oconee County
Walhalla, South Carolina 29621

UNITED STATES NUCLEAR REGULATORY COMMISSION

In the Matter of)	
)	
DUKE POWER COMPANY)	Dockets Nos. 50-269
)	50-270
(Oconee Nuclear Station,)	and 50-287
Units 1, 2 and 3))	

EXEMPTION

I.

Duke Power Company (DPC or the licensee) holds Facility Operating Licenses Nos. DPR-38, DPP-47 and DPR-55 which authorize the operation of the Oconee Nuclear Station, Units Nos. 1, 2 and 3 (Oconee or the facilities) at steady-state power levels not in excess of 2568 megawatts thermal for each unit. These licenses provide, among other things, that the facilities are subject to all rules, regulations and Orders of the U.S. Nuclear Regulatory Commission (the Commission) now or hereafter in effect.

The facilities are pressurized water reactors located at the licensee's site in Oconee County, South Carolina.

II.

The Code of Federal Regulations, 10 CFR 50.54(o), specifies that primary reactor containments for water-cooled power reactors shall comply with Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors." Paragraph III.A.3 of Appendix J incorporates by reference the American National Standard (ANSI) N45.4-1972, "Leakage Rate Testing of Containment Structures for Nuclear Reactors." This standard requires that containment leakage calculation be performed using either the point-to-point method or the total time method. This standard indicates that the point-to-point method applies more to uninsulated containments where atmospheric stability

is affected by outside diurnal changes, while the total time method applies more to insulated (for example, concrete) containments, that are relatively unaffected by diurnal changes.

In 1976, a comparison was made of the results of test analyses that were performed using point-to-point, total time, and mass-plot (or mass-point) techniques. ("Containment Leak Rate Testing: Why the Mass-Plot Analysis Method is Preferred," Power Engineering, February 1976). A revision to ANSI/ANS Standard 56.8-1981, "Containment System Leakage Testing" specifies the use of mass-plot, to the exclusion of the two older methods. A proposed revision to Appendix J, which has been published for public comment (Proposed Rules, FEDERAL REGISTER Volume 51, No. 209, October 29, 1986), incorporates the new standard.

On August 1, 1986, the licensee was notified via telephone that mass-plot method was not in conformance with the current Appendix J and was therefore not permitted without exemption. Pending the revision of Appendix J which incorporates the mass-plot analysis, licensees who wish to use the mass-plot techniques must submit an application for exemption from the Appendix J requirement that Containment Integrated Leak Rate Tests (CILRTs) will conform with ANSI-N45.4-1972.

III.

By letter of August 13, as superseded on August 20, 1986, the licensee requested an exemption from 10 CFR Part 50, Appendix J, Paragraph III.A.3. which requires that all Type A CILRTs be performed in accordance with ANSI N45.4-1972, "Leakage Rate Testing of Containment Structures for Nuclear Reactors." ANSI N45.4-1972 requires that leakage calculations be performed using either the total time method or the point-to-point method.

In the same letter, the licensee proposed an amendment to the Technical Specifications (TSs) to maintain consistency between the TSs and Appendix J. The Commission will respond to the proposed amendment by separate correspondence.

The licensee indicated that in 1976 the Commission's staff recognized the merits of the mass-plot technique and that this method became the staff recommended method to use. On that basis, the licensee has been performing calculations using the mass-plot method. While in the process of performing the leak-rate tests, the licensee was informed by the Commission that the 1976 staff position with regard to the mass-plot method has not been incorporated into the current provisions of 10 CFR Part 50, Appendix J, and is therefore not permitted without an exemption. The licensee has stated that, in support of the application for exemption from Appendix J, the mass-plot method is a more accurate method of calculating containment leakage.

It has been recognized by the professional community that the mass-plot method is superior to the two other methods, point-to-point and total time, which are referenced in ANSI N45.4-1972 and endorsed by the present regulations. The mass-plot method calculates the mass at each point in time, and plots it against time. A linear regression line is plotted through the mass time points using a least square fit. The slope of this line is the leak rate. The Commission's staff believes that the mass-plot method was not specified in ANSI N45.4-1972 because the other more conservative methods (point-to-point and total time) were adequate and suitable for the sensitivity levels of the instrumentation in use at that time. However, with the present developments in technology, the mass-plot method has gained recognition as the proper one to use. The superiority of the mass-plot method

becomes apparent when it is compared with the two other methods. In the total time method, a series of leakage rates are calculated on the basis of air mass differences between an initial data point and each individual data point thereafter. If for any reason (such as instrument error, lack of temperature equilibrium, ingassing or outgassing) the initial data point is not accurate, the results of the test will be affected. In the point-to-point method, the leak rates are based on the mass difference between each pair of consecutive points which are then averaged to yield a single leakage rate estimate. Mathematically, this can be shown to be the difference between the air mass at the beginning of the test and the air mass at the end of the test expressed as a percentage of the containment air mass. It follows from the above that the point-to-point method ignores any mass readings during the test and thus the leakage rate is calculated on the basis of the difference in mass between two measurements taken at the beginning and at the end of the test, which are 24 hours apart.

The present position of the Commission's staff is formulated in the "Draft Regulatory Guide and Value/Impact Statement," published for comment, dated October 1986, which, with exceptions, endorses the ANSI/ANS Standard 56.8-1981.

Furthermore, it recommends the extended ANSI method which is basically the mass-plot method with two additional conditions pertaining to the quality of the regression fit obtained using the mass-plot method. Condition 1 represents a limit on the deviations of the data points from a straight line. Condition 2 provides a limit on the scatter of the data points about the regression line.

The licensee's letter submitted information to identify the special circumstances for granting this exemption for Oconee pursuant to the Final Rule amending 10 CFR 50.12 (50 FR 50764) published on December 12, 1985. The purpose of Appendix J to 10 CFR Part 50 is to assure that containment leak-tight integrity can be verified periodically throughout the service lifetime so as to maintain containment leakage. The licensee proposes as an alternative method to use the mass-plot method to calculate containment leakage. The licensee has described a special circumstance which was not considered when the regulation was adopted in that the mass-plot analysis has been approved in its proposed rule by the Commission and because this type of analysis was initiated and conducted at Oconee with the knowledge and the recommendation of the Commission's staff.

Based on the above discussion, the licensee's proposed exemption from Paragraph III.A.3. of Appendix J, for using the mass-plot method as requested in the submittal dated August 13, as superseded on August 20, 1986, is acceptable for each of the three units until the presently proposed changes to Appendix J (51 FR 39538) become effective. Thereafter, the licensee shall comply with the provisions of such rule (or may renew its request for exemption). The exemption applies only to the method of calculating leakage by use of the mass-plot and not to any other aspects of the tests.

IV.

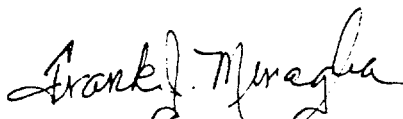
Accordingly, the Commission has determined that, pursuant to 10 CFR Part 50.12, this exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and

security. The Commission further determines that special circumstances, as set forth 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 rule specifying particular methods for calculating leakage rates is to assure that accurate and conservative methods are used to assess the results of containment leak rate tests. As set forth above, over recent years, the mass-plot method has become a widely used method providing accurate results. Accordingly, the Commission hereby grants an exemption as described in Section III above from Paragraph III.A.3 of Appendix J to the extent that the mass-plot method may be used for containment leakage calculations. The exemption is granted for each of the three units until the presently proposed changes to Appendix J become effective. Thereafter, the licensee shall comply with the provisions of such rule. The exemption applies only to the method of calculating leakage by use of the mass-plot and not to any other aspects of the tests.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will have no significant impact on the environment (52 FR 5510).

This exemption is effective upon issuance.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION



Frank J. Miraglia, Director
Division of PWR Licensing-B

Dated at Bethesda, Maryland, this 24th day of February, 1987