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50-413 Catawba Nuclear Station, Unit 1, Duke Power Co. 05000413
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RECIP.NAME RECIPIENT AFFILIATION
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SUBJECT: Requests use of alternative to ASME Boiler & Pressure Vessel Code,Section XI,to allow use of sampling plan for augmented exam of surface areas of metal containments & liners of concrete containment.

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October 19, 1998

U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

ATTENTION: Document Control Desk

SUBJECT: Duke Energy Corporation

Oconee Nuclear Station - Units 1, 2, & 3
Docket Nos. 50-269, 50-270, and 50-287

McGuire Nuclear Station - Units 1 & 2
Docket Nos. 50-369 and 50-370

Catawba Nuclear Station - Units 1 & 2
Docket Nos. 50-413 and 50-414

Request to use an Alternative to the ASME Boiler and Pressure Vessel Code, Section XI in accordance with 10 CFR 50.55a (a) (3) (i).
Duke Energy Corporation Serial Number 98-GO-007

Pursuant to 10 CFR 50.55a (a) (3) (i), Duke Energy Corporation requests the use of an alternative to the requirements of the ASME Boiler and Pressure Vessel Code, Section XI, Subsection IWE, 1992 Edition with the 1992 Addenda for Oconee Units 1, 2 and 3, McGuire Units 1 and 2, and Catawba Units 1 and 2.

This purpose of this request is to allow the use of a sampling plan for augmented examination of surface areas of metal containments and liners of concrete containment (Class MC components), as specified in The ASME Boiler and Pressure Vessel Code, Section XI, 1992 Edition with the 1992 Addenda, IWE-2500(c) and Table IWE-2500-1, Examination Category E-C, Containment Surfaces Requiring Augmented Examination, Item E4.12.

A047

Duke Energy Corporation believes that compliance with the specified requirements of IWE-2500(c)(4) and Table IWE-2500-1, Examination Category E-C, Item E4.12 would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety for certain cases. The proposed alternative will provide an equivalent level of quality and safety for all containment surfaces subject to ultrasonic thickness measurement in accordance with the augmented examination requirements of IWE-2500(c).

A detailed description of this proposed alternative, including a background discussion and justification is included as an enclosure to this letter. Duke Energy requests timely NRC review and approval of this request by January 19, 1999 to allow implementation during the next scheduled refueling outage at McGuire Nuclear Station. Questions regarding this request may be directed to J. S. Warren at (704) 382-4986.

Very truly yours,

M. S. Tuckman

MST/JSW

Attachment:
Duke Energy Corporation
Request to use an Alternative
Serial Number 98-GO-007, Pages 1 through 7.

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DUKE ENERGY CORPORATION

Oconee Nuclear Station Units 1, 2 and 3
McGuire Nuclear Station Units 1 and 2
Catawba Nuclear Station Units 1 and 2

Request for Alternative to the Requirements of the ASME Boiler and Pressure Vessel Code, Section XI

Background:

Pursuant to 10 CFR 50.55a (a) (3) (i), Duke Energy Corporation requests the use of an alternative to the requirements of the ASME Boiler and Pressure Vessel Code, Section XI, Subsection IWE, 1992 Edition with the 1992 Addenda for Oconee Units 1, 2 and 3, McGuire Units 1 and 2, and Catawba Units 1 and 2.

Duke Energy has concluded that some containment surface areas identified in accordance with IWE-1241 will require ultrasonic thickness measurement in accordance with IWE-2500(c). The following information describes the difficulties expected when complying with these augmented examination requirements.

IWE-2500(c)(4) requires that the minimum wall thickness be marked within each grid, as required by Table IWE-2500-1, Examination Category E-C, Item E4.12. Because Duke Energy interprets the Code to require 100% examination of each grid square during each Inspection Period, in accordance with footnote (2) of this Table, the requirement of IWE-2500(c)(4) is excessive for potentially large surface areas subject to ultrasonic thickness measurement. Our preliminary assessment has revealed several areas in at least 2 containments where ultrasonic thickness measurements will be required on areas which may exceed 300 square feet.

In lieu of the requirements of IWE-2500(c)(4) and Table IWE-2500-1, Examination Category E-C, Item E4.12, the alternative proposed in this request will provide an equivalent level of quality and safety.

Please note the following:

(1) Duke Energy Corporation previously submitted a request for alternative on this topic, as documented in Serial Number 98-GO-003, submittal dated April 6, 1998. In a letter dated October 1, 1998, the NRC issued a Safety

Evaluation Report approving proposed alternatives to IWE-2500(c)(1), IWE-2500(c)(2), and IWE-2500(c)(3) documented in that request. This request (Serial Number 98-GO-007) provides an alternative to IWE-2500(c)(4) only.

(2) If approved, Duke Energy Corporation intends to use this request in conjunction with the alternative approved by the NRC (Serial Number 98-GO-003). As such, the NRC is requested to approve Table 1 in this request (Serial Number 98-GO-007) for use in performing all augmented examinations required by IWE-2500(c).

I. Systems/Components for Which Alternative is Requested:

Class MC pressure retaining components and metallic shell and penetration liners of Class CC pressure retaining components.

II. Code Requirement(s):

The requirement of The ASME Boiler and Pressure Vessel Code, Section XI, Division 1, 1992 Edition with the 1992 Addenda, Paragraph IWE-2500(c)(4) is provided below:

> *(4)* Ultrasonic measurements shall be used to determine the minimum wall thickness within each grid. The location of the minimum wall thickness shall be marked such that periodic reexamination of that location can be performed in accordance with the requirements of Table IWE-2500- 1, Examination Category E-C.

Table IWE-2500-1, Examination Category E-C, Item E4.12 requires ultrasonic thickness measurement of 100% of minimum wall thickness locations during each Inspection Period, established in accordance with IWE-2500(c)(3) and IWE-2500(c)(4). The extent of examination shall be 100% for each inspection period until the areas remain essentially unchanged for three consecutive inspection periods. Such areas no longer require augmented examination in accordance with IWE-2420(c).

III. Requirement from Which Alternative is Requested:

An alternative is requested to the ultrasonic thickness measurement requirements of IWE-2500(c)(4) and Table

IWE-2500-1, Examination Category E-C, Containment Surfaces Requiring Augmented Examination.

IV. Basis for Requesting Alternative:

Duke Energy has interpreted the Code to require that 100% of areas subject to ultrasonic thickness measurement be examined in accordance with Table IWE-2500-1, Category E-C, Item E4.12. Because IWE-1241 is applicable to areas that not only have experienced accelerated degradation and aging, but also to areas that could experience such degradation and aging, potentially large areas of containment surfaces may require ultrasonic thickness measurement. The requirement to perform examinations on 100% of these areas is excessive and may expose personnel to increased radiological exposure, with no compensating increase in quality or safety. 100% Examination is unwarranted if an appropriate sampling plan is established for these examinations that provides an equivalent level of assurance that potential degradation can be detected.

An alternative sampling plan for selecting areas to be examined using an ultrasonic thickness measurement method is provided in Table 1 of this request.

Table 1 permits the use of a sampling plan using sample sizes found in U.S. Nuclear Regulatory Commission Draft Regulatory Guide DG-1070, September 1997, "Sampling Plans Used for Dedicating Simple Metallic Commercial Grade Items for use in Nuclear Power Plants". The sampling plan documented in this Regulatory Guide provides a 95% confidence level that at least 95% of the items in the lot from which the sample is drawn are acceptable. Although intended for use with dedicating commercial grade items, the sampling plans provided in this Regulatory Guide are valid for sampling other items with similar characteristics. In this case, the critical characteristic (remaining vessel or liner plate thickness) may be dependent on service conditions. Please note that the proposed alternative includes provisions to consider service conditions when establishing lot sizes to ensure a high confidence level that any defects will be detected.

The proposed alternative will provide an equivalent level of quality and safety in lieu of the augmented examination requirements of IWE-2500(c)(4) and Table IWE-2500-1, Examination Category E-C, Item E4.12 for all

containment surfaces subject to ultrasonic thickness measurement and will minimize personnel radiological exposure associated with performing these examinations.

V. Alternative Examination(s):

In lieu of the requirements of IWE-2500(c)(4), the following alternative is proposed:

> (4) Ultrasonic thickness measurements shall be used to determine the minimum wall thickness within each grid selected for examination. The location of the minimum wall thickness shall be recorded or marked so that periodic reexamination of that location can be performed in accordance with Table 1, Examination Category E-C, Containment Surfaces Requiring Augmented Examination.

In lieu of the requirements of Table IWE-2500-1, Examination Category E-C, Containment Surfaces Requiring Augmented Examination, the following table (Table 1) is proposed.

TABLE 1

EXAMINATION CATEGORY E-C, CONTAINMENT SURFACES REQUIRING AUGMENTED EXAMINATION							
Item No.	**Parts Examined**	**Examination Requirements/ Fig. No.**	**Examination Method**	**Acceptance Standard**	**Extent and Frequency of Examination (See Notes 1, 2)**		**Deferral of Inspection to End of Interval**
					1st Inspection Interval	**Successive Inspection Intervals**	
E4.10	Containment Surface Areas						
E4.11	Visible Surfaces	IWE-2500(c)	Visual, VT-1	IWE-3512.1 IWE-3512.2	100% of Surface Areas Identified by IWE-1242	100% of Surface Areas Identified by IWE-1242	Not Permissible
E4.12	Surface Area Grid, Minimum Wall Thickness Locations	IWE-2500(c)	Ultrasonic Thickness Measurement	IWE-3512.3	100% of Minimum Wall Thickness Locations during each Inspection Period (See Notes 3, 4, 5)	100% of Minimum Wall Thickness Locations during each Inspection Period (See Notes 3, 4, 5)	Not Permissible

NOTES:

(1) Containment surface areas requiring augmented examination are those identified in IWE-1240.

(2) Except as permitted in Note 4, the extent of examination shall be 100% for each inspection period until the areas remain essentially unchanged for three inspection periods. Such areas no longer require augmented examination in accordance with IWE-2420(c).

(3) Examinations need not be performed on portions of grids obstructed by structures, components, or permanent plant equipment. If more than 75% of any selected grid is obstructed, an alternate grid shall be selected at random for examination.

TABLE 1

EXAMINATION CATEGORY E-C, CONTAINMENT SURFACES REQUIRING AUGMENTED EXAMINATION
(4) The following sampling plan may be used for surface areas requiring ultrasonic thickness measurement: (a) Surface areas shall be divided into lots. Each lot shall consist of areas subject to similar service conditions which have caused, or could cause, accelerated degradation and aging. Grids of uniform size not exceeding one foot square shall be selected at random from within each lot. The lot size shall be equal to the total number of grids within 100% of the lot area. (b) The sample size shall be defined as the number of grids within each lot to be selected for examination. The sample size shall comply with Table 1 of U. S. NRC Draft Regulatory Guide DG-1070 (September 1997) using a maximum number of defectives in sample equal to zero. (c) If the minimum wall thickness within each selected grid remains essentially unchanged for three consecutive inspection periods, the lot from which the sample was drawn no longer requires augmented examination in accordance with IWE-2420(c). (5) If an ultrasonic thickness measurement of a selected grid within a lot reveals wall thickness loss exceeding the acceptance standard of IWE-3512.3, the entire lot shall be unacceptable, unless the remaining grids within the lot are examined and the entire lot accepted in accordance with IWE-3120.

VI. Justification for Granting Alternative:

The purpose of IWE-2500(c) is to require ultrasonic thickness measurement on areas likely to experience accelerated aging and degradation to ensure containment leak-tight or structural integrity. Ultrasonic thickness measurements are required for these areas when accessible only from the opposite side [to that requiring augmented examination], as permitted by Duke Energy Corporation's Relief Request, Serial Number 98-GO-003.

The sampling plan proposed in this alternative does not require examination on 100% of these areas, but does satisfy the 95/95 criterion (95% confidence level that at least 95% of the items in the lot are acceptable). Sampling plans satisfying this statistical criterion provide a high confidence that defective items will be detected by examination. As such, Duke Energy Corporation believes that the proposed alternative can detect conditions for which the augmented examinations are performed, and provides an equivalent level of quality and safety.

Augmented examinations performed in accordance with this alternative will also minimize unnecessary radiological exposure to examination personnel.

VII. Implementation Schedule

First Inspection Interval for IWE.

Evaluated By: _____
Date: 10-15-98

Reviewed By: D.E. Deyo
Date: 10-15-98