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

March 1, 1994

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

Mr. J. W. Hampton
Vice President, Oconee Site
Duke Power Company
P. O. Box 1439
Seneca, South Carolina 29679

Dear Mr. Hampton:

SUBJECT: DEMONSTRATION OF ULTRASONIC TECHNIQUES CONDUCTED FROM THE INSIDE DIAMETER TO DETECT SURFACE FLAWS ON THE OUTSIDE DIAMETER OF SELECTED WELDS - OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3 (TAC NOS. M88241, M88242, AND M88243)

REFERENCES:
1. NRC, "Trip Report on the Demonstration of Ultrasonic Techniques Conducted from the Inside Diameter to Detect Surface Flaws on the Outside Diameter of Selected Welds," September 29, 1993.
2. "NRC Inspection Report No. 50-302/89-21," to Florida Power Corporation, August 30, 1989.
3. B&W Owners Group to NRC, "B&W Request to NRC for Witnessing of UT Demonstration to Meet NRC Requirement for Acceptance of Relief Request," April 15, 1993.

Duke Power Company submitted a letter dated November 18, 1993, requesting that the NRC reconsider its position regarding a demonstration using ultrasonic examination techniques to detect surface flaws on the outside diameter of selected welds, documented in a trip report (Reference 1). The NRC position was that "the demonstration did not show that the equipment was capable of detecting flaws in stainless steel, Inconel, and carbon steel at or near the (ASME) Code maximum lengths (using) the surface examination method." The demonstration was performed to show the acceptability of a proposed alternative to ASME Section XI requirements for surface examinations of the core flood nozzle-to-safe end, safe end-to-pipe, and reactor coolant nozzle-to-pipe welds by applying ultrasonic techniques on the inside diameter to detect surface flaws on the outside diameter of selected welds.

After reviewing References 1, 2, and 3, and the November 18, 1993, submittal, the NRC's staff finds insufficient justification to change its present position on the 1993 demonstration. The NRC concerns with the 1993 demonstration are reflected in the attached questions. Your response to these

questions is required for us to complete our review of this issue. In addition, a meeting with the NRR technical staff may be useful in resolving this issue. Please contact me at (301) 504-1495 to arrange such a meeting.

This requirement affects fewer than ten respondents, and therefore, it is not subject to Office of Management and Budget review under P. L. 96-511.

Sincerely,

Original signed by:

L. A. Wiens, Project Manager
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Division of Reactor Projects-I/II
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc w/enclosure:
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QUESTIONS ON B&WOG'S 1993 DEMONSTRATION TO USE ULTRASONIC TECHNIQUES TO DETECT SURFACE FLAWS ON THE OUTSIDE DIAMETER OF SELECTED WELDS

A. There was a fundamental change in objectives between the 1989 and the 1993 demonstrations. The 1989 demonstration attempted to show equipment capability by selecting electrical discharge machined (EDM) notches with a depth slightly above, slightly below, and well below the Code maximum through-wall depth. The applicable Code was ASME, Section XI, 1974 Edition through the Summer 1975 Addenda, which limited the maximum allowable flaw depth to 5-percent through-wall (independent of the examination method). The 1993 demonstration attempted to show flaw detection capabilities for fatigue-induced flaws according to ASME, Section XI, Appendix VIII, which does not relate to opposite surface flaw depth.

1. What was the basis for this change?

2. How does the basis relate to the surface examination method requirements contained in the ASME Code?

B. There was a change in showing equipment capability between the 1989 and the 1993 demonstrations. Specifically, one mockup in the 1989 demonstration contained ten EDM flaws measuring 0.455- to 1.00-inch long by 2.3- to 5.6-percent through-wall. The ten flaws were located as follows: two in the steel pipe, two in the Inconel butter, two in the stainless steel pipe, and four in the Inconel weld. Two mockups in the 1993 demonstration contained a total of four fatigue flaws that ranged from 7.0- to 12.6-percent through-wall. These four flaws are approximately the maximum through-wall depth allowed by ASME Section XI, 1980 Edition through the Winter 1980 Addenda without further evaluation for flaws initially detected by the surface examination method and subsequently sized by the volumetric examination methods. Three flaws were in steel and one flaw was in stainless steel.

1. What was the bases for this change?

2. How would the flaws in the 1993 demonstration show equipment capability in all three alloys?

3. How would the use of the 1993 mockups demonstrate the detectability of random flaws in an actual welded assembly?

C. For the implants used in the 1993 mockups,

1. Were the implants made of the same material as the base metal receiving the implants?

2. How were the implants fused to the carbon steel, stainless steel, Inconel butter, and Inconel base metals?

3. How were the implant-to-base metal joints examined?

4. Were there volumetric examinations conducted with implants and blind implants (without cracks)?

D. The 1989 demonstration was to the Section XI, 1974 Edition through the Summer 1975 Addenda and the 1993 demonstration was to Section XI, 1980 Edition through the Winter 1980 Addenda.

1. How will the changes in Code requirements be reconciled with the prior examinations conducted in anticipation of an acceptable demonstration?