



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

January 8, 1991

Docket No. 50-327

Mr. Oliver D. Kingsley, Jr.
Senior Vice President, Nuclear Power
Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dear Mr. Kingsley:

SUBJECT: THIMBLE TUBE THINNING IN WESTINGHOUSE REACTOR (BULLETIN 88-09,
MPA X8-09) (TAC 72681) - SEQUOYAH NUCLEAR PLANT, UNIT 1

By letter dated July 26, 1988, the staff issued NRC Bulletin 88-09, "Thimble Tube Thinning in Westinghouse Reactors." In the Bulletin, the staff requested each licensee for Westinghouse-designed nuclear power reactors that utilize bottom mounted instrumentation, to establish an inspection program to monitor thimble tube performance. Sequoyah is such a reactor.

In its letter dated May 3, 1990, the Tennessee Valley Authority (TVA) submitted its thimble tube inspection program for Unit 1 and the results of its first inspection on Unit 1. This inspection was conducted during the Unit 1 Cycle 4 refueling outage which ended in June 1990. The Unit 2 thimble tubes were first inspected in the Unit 2 Cycle 3 refueling outage in 1989 and TVA submitted this inspection program for Unit 2 and the results of the first inspection on Unit 2 in its letter dated February 28, 1990.

TVA stated that the wear acceptance criteria for the Unit 1 thimble tubes are as follows: (1) wear equal to or greater than 60-percent through-wall loss requires thimble tube plugging, (2) wear equal to or greater than 30 percent and less than 60 percent through-wall loss requires repositioning the thimble tube by a minimum of two inches, and (3) less than 30 percent through-wall loss requires no corrective action for the next fuel cycle. The inspection frequency has been established for Unit 1 by TVA as each refueling outage until a data base is established and the inspections will be accomplished by eddy current testing. In the letter dated February 28, 1990, TVA stated for Unit 2, that worn thimble tubes that meet Criterion 2 above would be repositioned a minimum of one and one-half inches instead of the minimum of two inches given above for Unit 1. In discussions by phone with the TVA Sequoyah licensing staff on December 12, 1990 and January 2, 1991, TVA explained that the first repositioning of thimble tubes at either unit after eddy current testing would be the one and one-half inches and any later repositioning at either unit would

Doc

*DF01
1/0*

be the two inches. Therefore, even though all the thimble tubes at Unit 1 had been repositioned at the end of Unit 1 Cycle 3 operation, the repositioning at Unit 1 in the Unit 1 Cycle 4 refueling outage was the minimum of one and one-half inches because it was the first repositioning after eddy current testing. Any additional repositioning of these tubes would be at the minimum of two inches. The inspection frequency and testing method for Unit 1 are the same stated by TVA for Unit 2.

TVA stated in the May 3, 1990 letter that eddy-current testing and analysis were completed for Unit 1 in the Unit 1 Cycle 4 refueling outage with none of the tubes examined found to have equal to or greater than 60 percent through-wall loss. Nine tubes were found to have equal to or greater than 30 percent and less than 60 percent through-wall loss, which according to Criterion 2 above requires repositioning of the tubes. However, as a preventative measure, all Unit 1 thimble tubes had been repositioned at the end of Unit 1 Cycle 3 operation and the wear identified in seven of the nine tubes is indicative of wall loss before the tubes were repositioned. Therefore, TVA concluded that only two of the nine tubes, Tubes 12 and 46, required additional repositioning. Forty-two tubes have less than 30 percent and greater than 0 percent through-wall loss and six tubes have no identifiable loss. In the discussions with TVA on December 12, 1990, TVA explained that it was the eddy current testing of the nine thimble tubes discussed above which showed that (1) the wear on the seven tubes had occurred at the position previous to the Unit 1 Cycle 3 repositioning and, therefore, these tubes do not need to be repositioned again and (2) the wear on the two tubes had occurred at the new position resulting from the Unit 1 Cycle 3 repositioning and, therefore, these tubes needed to be repositioned again. The end of Unit 1 Cycle 3 operation is the Unit 1 Cycle 3 refueling outage.

TVA explained that one tube, Tube 29, was inaccessible for full-length eddy-current testing because the eddy-current probe would not pass through the tube although the incore detection instrumentation will. As a precaution, TVA had the tube repositioned the minimum of one and one-half inches because this was the first repositioning of this tube since eddy current testing was attempted. TVA considered this acceptable because (1) examination results for the balance of the thimble tubes indicate that the maximum through-wall loss at Unit 1 is 46 percent and (2) Unit 1 has adequate makeup capability for a postulated thimble tube leak and has the capability to isolate leaking thimble tubes at the seal table.

The enclosure to TVA's letter provided a list of the three tubes that have been repositioned as a result of the Unit 1 thimble tube inspection program.

The staff has reviewed the thimble tube wear acceptance criteria, inspection frequency, and inspection methodology provided in TVA's letter dated May 3, 1990 for Unit 1 and concluded that they are acceptable and adequately address the actions requested in the bulletin. The actions taken by TVA on the seven tubes with wear indicated at their previous position and the one tube that was inaccessible for

Mr. Oliver D. Kingsley, Jr.

-3-

full-length eddy-current testing are acceptable. Records generated during the development of the thimble tube inspection program and of the results of the inspections at Unit 1 shall be documented and maintained in accordance with plant procedures. These records may be the subject of a future inspection. This closes out the staff's review on Bulletin 88-09 for Unit 1. The staff's evaluation of the bulletin for Unit 2 was issued in the letter dated June 15, 1989.

Sincerely,

Original signed by
Frederick J. Hebdon, Director
Project Directorate II-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

cc: See next page

Distribution
Docket File

NRC PDR
Local PDR
S. Varga 14-E-4
G. Lainas 14-H-3
F. Hebdon
S. Black
L. Marsh 7-E-23
E. Jordan MNBB-3701
W. Little R-II
B. Wilson R-II
GPA/CA 17-A-3
GPA/PA 2-G-5
ACRS(10)
OGC
J. Donohew
M. Krebs
B. Buckley 14-H-22
SQN Reading File

OFC	: PDII-4/LA	: PDII-4/PM	: EMB/BC	: PDII-2	: PDII-4/DD
NAME	: MKrebs <i>MK</i>	: JDonohew <i>dw</i>	: <i>L. Marsh</i>	: BBuckley	: SBlack
DATE	: 12/17/90	: 12/19/90	: 1/3/90	: 1/8/90	: 1/8/90

OFC	: PDII-4/D	:	:	:
NAME	: FHebdon	:	:	:
DATE	: 12/19/90 <i>1/2/91</i>	:	:	:

OFFICIAL RECORD COPY
Document Name: SQN TAC 72682

Mr. Oliver D. Kingsley, Jr.

cc:

Mr. Marvin Runyon, Chairman
Tennessee Valley Authority
ET 12A 7A
400 West Summit Hill Drive
Knoxville, Tennessee 37902

Mr. Edward G. Wallace
Manager, Nuclear Licensing
and Regulatory Affairs
Tennessee Valley Authority
5N 157B Lookout Place
Chattanooga, Tennessee 37402-2801

Mr. John B. Waters, Director
Tennessee Valley Authority
ET 12A 9A
400 West Summit Hill Drive
Knoxville, Tennessee 37902

Mr. W. F. Willis
Chief Operating Officer
ET 12B 16B
400 West Summit Hill Drive
Knoxville, Tennessee 37902

General Counsel
Tennessee Valley Authority
400 West Summit Hill Drive
ET 11B 33H
Knoxville, Tennessee 37902

Mr. Dwight Nunn
Vice President, Nuclear Projects
Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dr. Mark O. Medford
Vice President, Nuclear Assurance,
Licensing and Fuels
Tennessee Valley Authority
6N 38A Lookout Place
Chattanooga, Tennessee 37402-2801

Mr. Joseph Bynum, Acting Site Director
Sequoyah Nuclear Plant
Tennessee Valley Authority
P. O. Box 2000
Soddy Daisy, Tennessee 37379

Ms. Marci Cooper
Site Licensing Manager
Sequoyah Nuclear Plant
P. O. Box 2000
Soddy Daisy, Tennessee 37379

County Judge
Hamilton County Courthouse
Chattanooga, Tennessee 37402

Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta Street, N.W.
Atlanta, Georgia 30323

Mr. Paul E. Harmon
Senior Resident Inspector
Sequoyah Nuclear Plant
U.S. Nuclear Regulatory Commission
2600 Igou Ferry Road
Soddy Daisy, Tennessee 37379

Mr. Michael H. Mobley, Director
Division of Radiological Health
T.E.R.R.A. Building, 6th Floor
150 9th Avenue North
Nashville, Tennessee 37219-5404

Tennessee Valley Authority
Rockville Office
11921 Rockville Pike
Suite 402
Rockville, Maryland 20852