

UNITED STATES NUCLEAR REGULATORY COMMISSION REGION II 101 MARIETTA ST., N.W. ATLANTA, GEORGIA 30323

Report Nos.: 50-327/89-03 and 50-328/89-03 Licensee: Tennessee Valley Authority 6N38 A Lookout Place 1101 Market Street Chattanooga, TN 37402-2801 License Nos.: DPR-77 and DPR-79 Docket Nos.: 50-327 and 50-328 Facility Name: Sequoyah 1 and 2 Inspection Conducted: January 9-13, 1989 Inspector/ aned owlev NB Elig Approved by Date Signed Blake, Chief Materials and Processes Section Engineering Branch Division of Reactor Safety

SUMMARY

Scope

This routine, announced inspection was conducted in the areas of inservice inspection (ISI) and inservice testing (IST) of pumps and valves.

## Results

In the areas inspected, violations or deviations were not identified. Based on review of program documents and procedures and observation of in-process testing, the licensee's IST program and implementation of the program appeared to be good. Some weaknesses in program documents were identified (see paragraph 2.h. of the report details). Based on a review of records and observation of in-process tests, these program document weaknesses did not appear to affect the overall test performance.

As noted in report 50-327, 328/88-58, the ISI program appeared to be well defined and documented.

## REPORT DETAILS

## 1. Persons Contacted

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Licensee Employees

\*D. A. Barker, Lead Mechanical Engineer - Valves
\*K. E. Casey, Mechanical Engineer, NQAD
M. Cooper, Compliance Licensing Supervisor
\*H. M. Dooley, Mechanical Test Section Supervisor
\*J. McClanahan, Engineering Specialist, Nuclear Maintenance
\*S. J. Smith, Plant Manager
\*G. L. Wade, ISI Coordinator
P. D. Ward, Lead Mechanical Engineer - Pumps
\*C. H. Whittenore, Licensing Engineer

Other licensee employees contacted during this inspection included engineers, operators, mechanics, security force members, technicians, and administrative personnel.

NRC Resident inspectors

K. Jenison, Senior Resident Inspector
P. Harmon, Senior Resident Inspector
D. Loveless, Resident Inspector
P. Humphrey, Resident Inspector

\*Attended exit interview

## 2. Inservice Testing of Pumps and Valves (73756)

The inspector reviewed the licensee's IST Program in the areas indicated below to determine whether regulatory requirements and licensee commitments were being met. In accordance with 10 CFR 50.55a(g), the applicable code is the ASME B&PV Code, Section XI, 1974 Edition, S75 Addenda for Unit 1 and 1977 Edition S78 Addenda for Unit 2. Based on TVA's IST Program submittal, dated March 3, 1982, as revised by TVA submittal, dated November 4, 1982, the NRC issued a Safety Evaluation Report (SER), dated April 5, 1985. Based on issue of the SER and subsequent meetings, TVA submitted a revised IST program on August 16, 1985. On June 6, 1986, TVA issued a revision to the August 16, 1985, submittal. On September 18, 1986, NRC requested additional information on TVA's latest IST program. Additional submittals and relief requests were issued in 1987 and 1988. NRC provided SERs and/or approvals of relief requests in letters dated October 23, 1987; January 19, 1988; March 14, 1988; and September 15, 1988.

See RII report 50-327, 328/86-59 for a previous inspection in this area.

- a. The inspector reviewed the following documents for control of IST activities:
  - FSAR, Section 6.8, Amendment 5, Pump and Valve Inservice Testing Program
  - ASME Section XI Valve Trending Program Users Guide, RO.
  - NQAM, Part I, Section 2.16, R4 Corrective Action
  - NQAM, Part II, Section 4.5, R1, Plant Surveillance Test Program
  - NQAM, Part II, Section 4.9, R3, Handling of CSCC Test Deficiencies
  - NQAM, Part II, Section 5.1, R5, Inservice Inspection Nuclear Power Plant Components
  - ~ N()AM, Part III, Section 1.1, R5, Document Control
  - NOAM, Part III, Section 4.1, R2, Quality Assurance Records
  - NOAM, Part III, Section 6.1, R2, Selection and Training of Personnel for Nuclear Power Plants
  - S1-1, R24, Surveillance Program

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- S1-129.4, RO, Emergency Core Cooling Safety Injection Pump 2A-A Quarterly Operability Test
- SI-166, R19, Summary of Valve Tests for ASME Section XI
- SI-166.1, R41, Full Stroking of Category "A" and "B" Valves During Operation
- SI-166.6, R24, Testing of Category "A" and "B" Valves after Maintenance or Upon Release from a Hold Order
- SI-166.8, R7, Increased Frequency Testing of Category "A" and "B" Valves
- SI-166.10, R23, Accumulator Inspection Primary Check Valve Integrity
- SI-166-12, R16, SIS/RHR/UHI Check Valve Opening Test
- SI-166.18, R15, RHR Return Valve Leak Rate Test
- CI-166.39, R2, Disassembly and Inspection of SIS/RHR/CS/UHI Check Valves During Refueling Outages

- SI-260, R13, SIS/BIT/RHR Injection Flow Balance, Pump Performance and Check Valve Test
- SI-260.1, RHR Injection Flow Measurement, Pump Performance and Check Valve Test
- SI-260.2, R5, BIT Cold Leg Flow Balance, Pump Performance and Check Valve Test
- TI-54, R14, Compliance Instruments
- TI-54.2, R9, Compliance Instruments
- TI-69, R15, PMT Summary for ASME Section XI and 10 CFR 50 Appendix J Valves
- TI-89, R5, Inservice Testing Required by ASME Section XI
- TI-94, RO, Reactor Coolant Pump Vibration Measuring System
- TI-96.1, R1, Vibration Observations Pumps and Motors
- TI-103, RO, Establishment and PMT Update of ASME Pump Reference Valves
- AI-4, R72, Plant Instructions Document Control
- AI-12, R1, (Part I) Corrective Actions
- AI-31, RIO, Control of Measuring and Test Equipment
- SQA-134, R20, Critical Structures, Systems and Components (CSSC) List
- SOA-193, R1, Quality Assurance for Computer Software Systems

The documents were reviewed for general content to support the reviews/observations detailed in paragraph b. through h. below and to verify that the licensee had assigned responsibilities for:

- preparation, review, and approval of inservice testing (IST) procedures
- scheduling of IST for normal and increased frequency testing
- performance of testing per approved procedures
- performance of post-maintenance and post-modification IST proper certification and calibration of IST instruments

- b. For the tests identified in paragraph f. below, the inspector verified that the test procedures were the latest approved procedures and the test criteria were valid for the component being tested.
- c. The inspector verified, based on the procedures identified in paragraph a. above and the observations and reviews identified in paragraphs d. and f. below, that the licensee performs IST to an approved schedule within the limitations described in the IST program.
- d. In order to verify that test results are recorded per approved procedures and that data are evaluated and appropriate corrective action performed in accordance with code requirements, the inspector reviewed the following completed test procedures:

'alve No.	Test Date	SI No.
1-FCV-90-107	01/26/88 04/16/88 07/8/88 09/02/88 10/17/88	166.1.1 166.1.1 166.1.1 166.1.1, 166.4 166.1.1
2-FCV-1-148	08/03/88	166.1
1-FCV-63-175	04/06/88 09/05/88	166.6 166.6, 166.1, 166.4
1-63-563	12/15/88	166.10
1-FCV-70-66	01/26/88 04/29/88 07/9/88 08/22/88 10/17/88	166.1.1 166.1.1 166.1.1 166.1.1, 166.4 166.1.1
1-87-558	10/03/88	166.11
2-FCV-68-332	01/21/88 01/28/88 04/20/88 04/30/88 07/11/88 10/03/88 01/03/89	166.1.1 166.40 166.1.1 166.40 166.1.1 166.1.1 166.1.1

- Valves

2-FCV-67-66	01/13/88 01/21/88 01/26/88 04/20/88 07/11/88 10/03/88 12/27/88	166.1.1, 166.6 166.1.1 166.6 166.1.1 166.1.1 166.1.1 166.1.1
Pumps		
Pump	Date	SI No.
CS 1B-B SI 2A-A AFW 1A-A CC 2B-B	12/15/88 10/21/88 01/03/89 12/15/88	37.2 129 130.2.1 40

In addition the following MIT-14 test records were reviewed to determine if pumps were being tested on required schedules and that data met requirements:

Pump	Test Date
CS 1B-B	12/15/88
SI 2A-A	11/05/87 02/15/88 02/18/88 05/18/88 01/19/88 10/22/88
AFW 1A-A	08/28/86 08/20/88
CC 2B-B	10/15/86 01/05/87 04/23/87 07/15/87 09/25/87 01/10/88 04/06/88 06/27/88 09/17/88

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- e. In conjunction with the <u>second</u> lews/observation identified in paragraphs a. thru d. above and f. below, the inspector verified that IST procedures and data reflected the requirements of the applicable edition of the ASME B&PV Code, Section XI in the areas of:
  - evaluations of imposing and removing increased frequency testing requirements
  - pump vibration test data analysis and acceptance criteria justification, including location of vibration measurement
  - requirements that pump tests be conducted at reference conditions, including reference speed
  - compliance of test instruments to 10 CFR 50 and ASME Code requirements
  - requirements that testing of Category A through D valves include:
    - operformance of positive testing of Category C check valve whose safety function is to open and close (i.e., full stroke verification in both directions and individual quantitative leak rate testing where applicable)
    - evaluation of Category A valve leak test data conducted in accordance with ASME IWV-3426 and -3427 guidelines and including containment isolation and pressure isolation valves
    - observation of remote position indicators, including those on the remote shutdown panels, at least once every two years to verify that valve operation is accurately indicated
    - o indication that valve stroke times are commensurate with the capabilities of the valve tested
- f. The inspector observed the in-process testing detailed below to verify that test procedures were adequate, test quantities were obtained consistently and that applicable test conditions were met.

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Stroke time testing in accordance with SI-166.1 was observed and in-process records reviewed for the following valves:

1-FCV-61-191 -193 -194 -192 -96 -110 -97 -122 1-FCV-63-4 -7 -38 -25 -26 -42 -41

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- Operability testing in accordance with SI-129.4 was observed and in-process records reviewed for Safety Injection pump 2A-A.
- g. Calibration records for the below listed instruments, used in the testing listed in paragraphs d. and f. above, were reviewed.

-	Serial	No.	549654
-	Serial	No.	41:194
**	Serial	No.	522396
-	Serial	No.	900187
-	Serial	No.	900741
-	Serial	No.	549546
-	Serial	No.	E084025
-	Serial	No.	571191
-	Serial	No.	561718
-	Serial	No.	555665
-	Serial	No	526752
-	Serial	Ν.	526758
		<ul> <li>Serial</li> </ul>	<ul> <li>Serial No.</li> </ul>

- h. In the above reviews/observations, the following problems or weaknesses were identified:
  - There is no stand alone "IST Program" document. Section 6.8 of the FSAR contains the IST program. Therefore, the IST program is being administratively controlled through the FSAR. When changes are required to the program based on approved relief request or for any other reason, significant or insignificant, the FSAR must be changed. Normally the FSAR is only revised once per year. This method of controlling the IST program is very cumbersome and difficult to administer. Also, the NQAM,

Part II, Section 5.1, indicates that a stand alone IST Program is required and that the program is to be prepared by DNE. Based on recent TVA reorganizations, nuclear Maintenance, rather than DNE, now has this responsibility. Therefore, the NQAM is out of date based on the current organization.

The Nuclear Maintenance organization has recognized the discrepancy in the NQAM and the need to enhance the IST program by issuing a stand alone program document. Such a document is planned.

Based on this inspection, the fact that the NQAM is out of date and the need for a stand alone IST program does not appear to have adversely affected the overall performance of IST of pumps and valves.

- There is not a procedure to cover the general code requirements for IST of pumps. For valves, the general code requirements are covered in SI-166. For pumps specific SI's for each pump test cover the general as well as specific code requirements. The licensee agreed that the program for pump testing could be enhanced by specifying general requirements for pump testing in a general procedure, and that TI-89 would be evaluated for this purpose.
- Paragraph IWP-6210 of ASME B&PV Code Section XI requires that a Summary Listing of pumps be maintained to record the current status of the test program. Until very recently, MTI-14 data has served this purpose. A new computer program is now being used that stores the information needed for a Summary List. The computer program is an improvement over MTI-14. However, the program has not been through the approval cycle in accordance with procedure SQA-193. Although, the program does need to be processed in accordance with procedure SQA-193, the fact that it has not, is not that significant since all data in the list is backed up by QA records and other computer programs that have been QA processed.
- Near the close of the inspection, during reviews of M&TE records as detailed in paragraph g. above, the inspector noted the following discrepancies:
  - For vibration meter, Serial No. 549654, the M&TE usage log indicated that the meter was checked out for use on TI-96.1. The inspector had observed the equipment being used on SI-129.4. For UT flow meter, serial No. 561718, the M&TE usage log indicated that the meter was checked out for use on SI-129.4. Records reviewed by the inspector had shown the equipment being used on SI-130.2.1. The purpose of the M&TE usage log is to allow identification of equipment tested using a particular instrument should the

instrument be found out of calibration. For the two instruments in question, the test engineer was able to show the inspector a computer backup (part of the program identified above that has not been through the approval cycle) to the manual M&TE log that provided complete usage history.

<sup>o</sup> For vibration meter, serial No. 571191, the M&TE lab could not provide a usage log. The test engineer had possession of the meter and again, his computer records showed complete usage history.

As noted abore, the M&TE log discrepancies were identified at the close of the inspection. The licensee requested time to investigate the problems and determine their significance. Further evaluation of these problems and the M&TE records system will be required by the NRC. Pending further evaluation during a future inspection, this matter is identified as Unresolved Item 327, 328/89-03-01, Evaluation of M&TE Record Discrepancies.

No violations or deviations were identified.

3. Inservice inspection - Review of Program (73051) (Units 1 and 2)

The inspector reviewed the licensee's ISI program in the areas indicated below. In accordance with 10 CFR 50.55a(g), the applicable code for both units is the ASME Boiler and Pressure Vessel (B&PV) Code, Section XI, 1974 Edition with Addenda through S75. However, as indicated in TVA's submittal to the NRC, dated September 13, 1984, TVA has updated their ISI programs to the 1977 Edition, S78 Addenda of the ASME B&PV code except that the extent of examination for category B-J and C-F pipe welds is in accordance with the 1974 Edition, S75 Addenda. Steam Generator Tubing is to be inspected in accordance with Regulatory Guide 1.83.

In response to TVA's submittal, dated September 13, 1984, the NRC requested additional information by letter (Adensam to Parris), dated November 18, 1985. TVA provided additional information by letters (Gridley to Youngblood), dated March 12, May 6, and July 30, 1986. As followup to the March 12, 1986 response, on December 10, 1986, TVA submitted revision 7 to Surveillance Instructions 114.1 and 114.2 (Units 1 and 2 ISI Programs). On July 30, 1987, Revision 10 to SI 114.2 was submitted to the NRC for Unit 2. In response to "NRC Safety Evaluation Report on Tennessee Valley Authority: Sequoyah Nuclear Performance Plan, dated May 1988", revision 13 to SI 114.2 for Unit 2 was submitted November 9, 1988. Revision 13 augments and accelerates the ISI of welds for Unit 2. The SER for the ISI programs has not yet been issued.

See RII Report No. 50-327, 328/88-58 for a previous inspection of the ISI program. As followup to the 88-58 inspection, the following program and QA documents were reviewed:

- SI-114.1, Revision 12, ASME Section XI Inservice Inspection Program -Unit 1
- SI-114.2, Revision 13, ASME Section XI Inservice Inspection Program
   Unit 2
- NQAM, Part I, Section 2.5, R2, Instructions, Procedures and Drawings
- NQAM, Part I, Section 2.16, RA Corrective Action
- NQAM, Part II, Section 2.3, R2, Repair and Replacements of ASME Section XI Components
- NOAM, Part III, Section 1.1, R5, Document Control
- AI-12 (Part III), R1, Corrective Action

The documents were reviewed in the areas of:

- Plan and procedure review, approval and issue
- Corrective action of conditions adverse to quality detected during examination

Within the areas inspected, no violations or deviations were identified.

4. Fxit Interview

The inspection scope and results were summarized on January 13, 1989, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results listed above. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

(Open) Unresolved Item 327,328/89-03-01, Evaluation of M&TE Record Discrepancies - Paragraph 2.h.

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Acror	yms	and Initialisms
AFW	-	Auxiliary Feedwater
AI	-	Administrative Instruction
ASME	-	American Society of Mechanical Engineers
B&PV	-	Boiler and Pressure Vessel
CC	-	Centrifugal Charging
CS	-	Containment Spray
DNE	-	Design Engineering
NOA:1	-	Nuclear Quality Assurance Manual
ISI	-	Inservice Inspection
IST	-	Inservice Testing
M&TE	-	Measuring and Test Equipment
MTI	-	Mechanical Test Instruction
R	-	Revision
RII		Region II
SI	-	Surveillance Instruction or Safety Inject

- njection
- TI Technical Instruction

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