



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

Report Nos.: 50-327/92-12 and 50-328/92-12

Licensee: Tennessee Valley Authority
3B Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

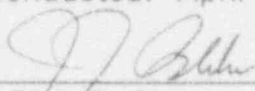
Docket Nos.: 50-327 and 50-328

License Nos.: DPR-77 and DPR-79

Facility Name: Sequoyah 1 and 2

Inspection Conducted: April 13-17, 1992

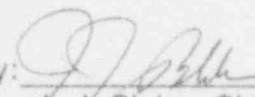
Inspector:


for Rich C. Chou

5/16/92

Date Signed

Approved by:


J. J. Blake, Chief
Materials and Processes Section
Engineering Branch
Division of Reactor Safety

5/15/92

Date Signed

SUMMARY

Scope:

This routine, unannounced inspection was conducted in the area of Inservice Inspection (ISI) of pipe supports and snubbers.

Results:

In the area inspected, violations or deviations were not identified.

One unresolved item was identified involving the discrepancies found during walkdown reinspection inadequacy in procedures for pipe supports and snubbers. The licensee has a weakness on retrieving the drawing for reinspection. Currently, the licensee will not revise or incorporate the changes into the original drawings until the five revisions have been accumulated. Therefore, it took time to collect all the outstanding revisions plus the latest original drawings.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *J. Bajraszewski, Licensing Engineer
- *R. Beecken, Plant Manager
- *L. Bryant, Maintenance Manager
- *M. Cooper, Site Licensing Manager
- *D. Love, Maintenance Planning and Technical Support Manager
- *M. Maxwell, Lead Civil Engineer
- B. McDonald, Quality Control (QC) Inspector
- *J. Naik, Maintenance Engineer
- *S. Patel, Civil Engineer Section Supervisor
- R. Proffitt, Licensing Engineer
- *W. Pruett, Jr., Quality Assurance (QA) Supervisor
- *F. Scalise, Inservice inspection (ISI) Supervisor
- *R. Thompson, Compliance and Licensing Manager
- G. Wade, ISI Supervisor
- *J. Wilson, Site Vice President

Other licensee employees contacted during this inspection included craftsmen, engineers, mechanics, technicians, and administrative personnel.

NRC Resident Inspector(s)

- *W. Holland, Senior Resident Inspector
- S. Shaeffer, Resident Inspector
- R. McWhorter, Resident Inspector

*Attended exit interview

2. Inservice Inspection - Unit 2

a. Status

The commercial operation date for Sequoyah Nuclear Power Plant (SQN) Unit 2 was June 1, 1982. The four year second period of the first interval should be from June 1, 1985 to May 31, 1989 per the original schedule. On August 21, 1985, SQN Unit 2 went off line and remained off line until May 13, 1988. In accordance with ASME B&PV Code, Section XI, IWA-2400(C) TVA will extend the first interval by 996 days. As a result of this extension, the first interval will end on February 21, 1995.

During the restart from long shutdown and the last refueling outage, the licensee completed most of the ISI pipe support inspections which would have been inspected during this refueling outage. Therefore, the pipe supports reinspected by the inspector were the supports inspected by the licensee's examiners during the last refueling outage.

b. Program Review

The inspector reviewed Surveillance Instruction, SI-114.2, American Society of Mechanical Engineer (ASME) Section XI Inservice Inspection Program, Unit 2, Revision 16. The purpose of review was to determine whether the program had been approved by the licensee and to assure that procedures had been established to control and accomplish the inspection and provide acceptance criteria for records and defect evaluation.

c. Procedure Review

The inspector reviewed the procedure listed below to determine whether it was consistent with regulatory requirements and licensee commitments. The procedure was also reviewed in the areas of procedure approval, requirements for qualification of examiners, and compilation of required records.

<u>Procedure No.</u>	<u>Rev. No.</u>	<u>Title</u>
N-VT-1	16	Preservice and Inservice Visual Examination Procedure

d. Visual Examination of Pipe Supports

The licensee completed ISI inspection on 643 pipe supports for class 3 during the 1990 fall refueling outage (Unit 2 Cycle 4) and two pipe supports for class 3 during this refueling outage. The Inservice Inspection Final Report for Unit 2 Cycle 4, reported that nineteen supports were found to have discrepancies and to be unacceptable due to minor problems. These problems included loose bolts, loose jam nuts, sheared cotter pin, damaged support rod, loose nuts on base plates, and settings out of range.

To verify the licensee examination results, the inspector randomly selected 23 pipe supports, some containing snubbers, for walkdown reinspection. The 23 pipe supports in various systems were located in the reactor building and other areas. The inspection results were

compared with the applicable procedure, N-VT-1, Revision 16. The visual inspection included a check for defects including: distortion, cracks, bent members, and weld failures induced by plant operations; condition of connections to supporting structures; and component settings. The inspector's observations generally agreed with the information reported by the licensee's ISI examiners, with the exception of the discrepancies noted below:

Table 1

Pipe Support Walkdown Reinspection

<u>Support No.</u>	<u>Rev. 0</u>	<u>Discrepancies/Remedies</u>
1-ERCW-235	2D	Weld symbols were wrong for the connections between tube steel to tube steel and tube steel to wide flange beam. No welds existed inside the connections between tube steel to tube steel at southeast and southwest. The licensee will issue Deviation Report to revise the drawings.
47A450-28-7	0	No weld existed on two top locations at the connections between the top beam and two posts. The licensee issued Deviation Report to revise the drawings.
47A450-28-8	1	
47A450-28-9	0	
47A450-28-10	0	
47A464-26-1	1	
47A464-26-2	0	

	4	
47A464-26-3	0	
47A464-26-4	1	
47A464-26-5	1	
47A464-26-6	0	
47A464-26-8	1	
1CCN-577	2A	
2-SIH-2	2B	Pipe legs protrude out and past pipe sleeve by 1½" in cold condition. The provided contact length is about twice the required contact length shown in the design calculation. The licensee will walk down the line downstream and upstream of this support to see any damage or distortion of the line and supports and take appropriate action.
2-SIH-3	2A	
2-SIH-4	2A	
2-SIH-5	4A	Note 1
2-SIH-6	908B	- A ¼" gap was found between the spacer (also called washer) and clevis at pipe clamp load pin.
		- No spacers were found between the spherical bearing and clevis at the rear bracket.
		- Note 1
2-SIH-21	2A	

2-SIH-22	5A	-	No spacers were found between the spherical bearing and clevis at the rear bracket and pipe clamps.
		-	A 1 1/4" gap was found between the spherical bearing and clevis at the pipe clamps.
2-SIH-23	C	-	3/8" gaps were found between the spacer and clevis at the rear bracket and pipe clamps.
		-	Note 1
2-SIH-71	1A		
2-SIH-107	10B		A nut on the rod turnbuckle was loose. Work Request (WR) C054942 was issued to fix it.

Note 1: Two bolts were covered by insulation and were not inspected by the inspector.

For the discussion about the discrepancies found, see the section of results and conclusion.

e. Visual Examination and Functional Test of Snubbers

In accordance with Section 3/4.7.9 of the Technical Specification, all safety-related snubbers shall be operable and each safety-related snubber shall be demonstrated operable by performance of augmented inservice inspection program and the requirements of Specification 4.0.5. The surveillance requirements include visual inspection and functional test. All safety-related snubbers shall be visually examined to verify snubber operability. During each refueling outage, a representative sample of 10 percent of the safety-related snubbers in use in the plant shall be functionally tested either in place or in a bench test. The total snubber population in Unit 2 was 561 during the cycle 4 refueling outage. There are 40 snubbers to be deleted or replaced per approved modification during this refueling outage. 54 snubbers were functionally tested for

10 percent of the snubber population during this refueling outage. There were two large bore mechanical snubbers, two small bore hydraulic snubbers and 50 mechanical snubbers in various sizes. Three additional snubbers (mechanical) were tested to reverify operability as they were suspected to be inoperable. Three mechanical snubbers were retested due to previous cycle failure. Three mechanical snubbers were retested due to service life monitoring requirements.

The functional test includes the drag force and actuation tests. The procedures used for functional test are listed below:

<u>Procedure No.</u>	<u>Rev. No.</u>	<u>Title</u>
0-SI-MFT-000-001.0	2	Snubber Functional Testing (Mechanical Snubbers)
0-SI-MFT-000-002.0	2	Snubber Functional Testing (Basic Engineers Hydraulic Snubbers)
0-SI-MFT-001-003.0	2	Snubber Functional Testing (Paul Monroe Snubbers)

Per licensee test results, only one snubber was found inoperable. This snubber was in subgroup 4, PSA, small size snubbers of PSA $\frac{1}{2}$ and PSA $\frac{1}{4}$. The total population for this subgroup was 239. Therefore, no additional snubbers were required to be tested since one failure is allowed for a population size greater than 225 within the subgroup. The inspector observed the manual functional testing on a sample of mechanical snubbers. The on-site hydraulic snubber test bench is used for small and medium sizes only. The large hydraulic snubbers and Paul Monroe snubbers are tested by Wiley Laboratory who will bring equipment on site for testing.

The licensee performed snubber visual inspection during the last refueling outage, cycle 4. There is no need to perform the snubber visual inspection during this refueling outage if the inoperable snubbers were found during the last refueling outage to be less than the guidance established by NRC and the licensee Technical Specification Table 4.7.9-1, Snubber visual Inspection Interval. Total of 561 snubbers (393 in inaccessible area in Reactor Building and 168 in accessible area in Auxiliary Building, Annulus, and Upper Containment) were visually inspected during the last refueling outage and no snubbers were found visually inoperable. The guidelines allows 12 inoperable snubbers for a

population of 500 snubbers. However, 79 minor deficiencies were found in the snubber visual inspection which included 11 in hydraulic fluid leaks; 20 in binding, misalignment, and loose bolts; 48 in damaged locking device, rust on nuts or bolts, snubber end covered by insulation, and paint on snubbers.

The inspector conducted independent visual examination verification on 37 snubbers at random. These snubbers included hydraulic and mechanical snubbers in various sizes. Ten snubbers were located in inaccessible areas. These examinations were conducted in order to evaluate the adequacy of the examination procedures being used by the licensee and to assess the validity of the information reported by the examiners. The procedures used for inspection were 2-SI-MIN-000-001.0, Snubber Visual Inspection, Hydraulic and Mechanical, Rev. 2 and 2-SI-MIN-000-002.0, Snubber Visual Inspection, Hydraulic and Mechanical - Inaccessible Snubbers, Rev. 1. These verification examinations generally agreed with the findings of the visual examiners except as noted in Table 2. The snubbers inspected with deficiencies were listed below. Snubbers with no deficiencies were not listed.

Table 2

Snubbers Inspected with Deficiencies

<u>Support No.</u>	<u>Accessible Area Classification</u>	<u>Discrepancies Deficiencies/Remedies</u>
2-CSH-75	Yes	The spherical bearing at the indicator tube end was dislodged. Work Request C080683 was issued to fix it.
2-CSH-99	Yes	Bottom cotter pin was missing and spacers at indicator tube end was missing too. Work Request C080682 was issued to fix them.
2-CSH-77	Yes	The spherical bearing at the indicator tube end was dislodged. Work Request C080684 was issued to fix it.

2-RCH-106U	No	Both pipe clamp bolts were loose but snubber load pin was tight. Work Request C080681 was issued to fix them.
2-RCH-106L	No	The locking wire at the indicator tube was broken. Work Request C080681 was issued to fix it.

f. Discussion and Conclusion

During the review of procedures and support and snubber walkdown reinspection, the inspector had the following concerns:

(1) Discrepancies

Some discrepancies found in Table 1 during the walkdown reinspection were not resolved before the end of inspection.

(2) Insulation Removal

The inspector noticed during ISI pipe support walkdown reinspection that some of the pipe clamp bolts were covered by insulation. The inspection results recorded by the licensee examiners did not indicate that the insulation was removed during the ISI inspection. The licensee ISI examiner indicated that the insulation is required to be removed during ISI inspection and was recorded in Work Order Form per the Work Request. The inspector requested the Maintenance Work Request B-258787 and tried to verify that the insulation was removed during ISI inspection for the supports shown on Note 1 of Table 1. The actual work performed stated in B-258787 did not specify the exact locations for the insulation removal such as support numbers, snubber numbers, or equipment names. It only indicated the line numbers. In addition, the Note 2, Item 1, Part B - VT-3 Visual Examination of Procedure No. N-VT-1 partially states that component support insulation removal is not required, provided bolted connections and other devices that may vibrate loose during operation are visibly accessible. "Component Support" in this procedure means all the pipe supports. Therefore, there is a confusing note in the procedure N-VT-1 and an unclear location indication of actual work done in the work order form to pinpoint the exact location for the insulation removal during the ISI inspection.

(3) Broken Grout or Concrete

The Note in Section B.2.2.B of Part B of Procedure No. N-VT-1 states that conditions such as broken grout or concrete around the area of the base plate are beyond the recording and reporting requirements of this procedure. The inspector asked the licensee engineer to explain the meaning of this note. He stated that there are several other procedures to record or repair the broken grout or concrete. Therefore, the ISI examiners are not required to record and report the broken grout or concrete in the ISI inspection sheets and report them through the other channels. The inspector considered this note or the statement for not recording or reporting the broken grout or concrete in the inspection sheet is inadequate since the broken grout or concrete may reduce the baseplate or anchor bolt capacity which affects the operability of the pipe supports.

(4) Gap and Spacer Inspection for sway struts and snubbers

During the ISI pipe support walkdown inspection, a sway strut had a gap $1\frac{1}{4}$ " existing between the spherical bearing and clevis and no spacers at the pipe clamps. The similar gaps $1/4$ " to $3/8$ " were found at both ends of snubbers. Table 1 indicated several examples. The current inspection procedures for ISI, Snubber Visual Inspection, Snubber Functional Test, Snubber Removal and Reinstallation do not have requirements to inspect the gap and spacers between the spherical bearing and clevis/or spacers at the rod and near the rear bracket or the piston rod eye near the pipe clamps. Conceivably, with an excessive gap, the snubber movement or impact due to pipe movement could cause damage to the rods or pins. The licensee should revise procedures and establish a tolerance for a guideline to inspect the gaps and spacers for ISI, Snubber Visual Inspection, or any assembly after removal or disassembly in field.

(5) Overall Support Inspection

The current snubber visual inspection procedure does not require the overall inspection for the supporting structures or foundation to support the snubber function. The supporting structures should include the gang supports. The procedures only requires visual examiners to inspect the snubber pin to pin. The licensee snubber examiner stated that he did inspect the overall structure condition. But, there is no requirement in the procedure.

(3) Broken Grout or Concrete

The Note in Section B.2.2.B of Part B of Procedure No. N-VT-1 states that conditions such as broken grout or concrete around the area of the base plate are beyond the recording and reporting requirements of this procedure. The inspector asked the licensee engineer to explain the meaning of this note. He stated that there are several other procedures to record or repair the broken grout or concrete. Therefore, the ISI examiners are not required to record and report the broken grout or concrete in the ISI inspection sheets and report them through the other channels. The inspector considered this note or the statement for not recording or reporting the broken grout or concrete in the inspection sheet is inadequate since the broken grout or concrete may reduce the baseplate or anchor bolt capacity which affects the operability of the pipe supports.

(4) Gap and Spacer Inspection for sway struts and snubbers

During the ISI pipe support walkdown inspection, a sway strut had a gap 1 1/4" existing between the spherical bearing and clevis and no spacers at the pipe clamps. The similar gaps 1/4" to 3/8" were found at both ends of struts. Table 1 indicated several examples. The current inspection procedures for ISI, Snubber Visual Inspection, Snubber Functional Test, Snubber Removal and Reinstallation do not have requirements to inspect the gap and spacers between the spherical bearing and clevis/or spacers at the rod and near the rear bracket or the piston rod eye near the pipe clamps. Conceivably, with an excessive gap, the snubber movement or impact due to pipe movement could cause damage to the rods or pins. The licensee should revise procedures and establish a tolerance for a guideline to inspect the gaps and spacers for ISI, Snubber Visual Inspection, or any assembly after removal or disassembly in field.

(5) Overall Support Inspection

The current snubber visual inspection procedure does not require the overall inspection for the supporting structures or foundation to support the snubber function. The supporting structures should include the gang supports. The procedures only requires visual examiners to inspect the snubber pin to pin. The licensee snubber examiner stated that he did inspect the overall structure condition. But, there is no requirement in the procedure.

(6) Snubber Setting Verification

The current requirement and practice in the snubber visual inspection for Technical Specification is to check or record the snubber settings if the snubber settings are very close to each end. Normally, the licensee examiners do not inspect and verify the actual snubber settings in the field and compare them to the settings stated in the design drawings.

(7) Drawing Retrieval

The licensee's engineers could not assemble all the outstanding drawings for the inspection due to the short notice. The licensee stated that they can assemble all the outstanding drawings completely if they have enough time. The licensee's current practice on the original drawing revision is to accumulated six outstanding revisions such as Field Change Request (FCR), Deviation Report (DR), or other revision and then make the revision on the original drawings. Therefore, a complete set of drawings for a pipe support should include the latest original drawing plus all the outstanding drawings. There should be at least one controlled set of drawings which has all outstanding FCR's and DR's attached to each drawing.

All the concerns stated above are identified as Unresolved item 50-327, 328/92-12-01, Field Discrepancies and Inadequate Procedure in Inservice Inspection for Pipe Supports and Snubbers. No violations or deviations were identified in the areas inspected.

3. Exit Interview

The inspection scope and results were summarized on April 17, 1992, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results listed below. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

(Open) UNR 50-327, 328/92-12-01, Field Discrepancies and Inadequate Procedures in Inservice Inspection for Pipe Supports and Snubbers.