GULF STATES UTILITIES COMPANY
POST OFFICE BOX 2951 • BEAUMONT, TEXAS 77704
AREA CODE 409 838 6631

April 6, 1984
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File Code G9.5, G9.8.6.2

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

River Bend Station Unit 1
Docket No. 50-458

Enclosed for your review are Gulf States Utilities Company's (GSU) supplemented responses to additional information requests and Draft Safety Evaluation Report (DSER) open items identified by the Nuclear Regulatory Commissions's (NRC) Mechanical Engineering Branch (MEB) and addressed in GSU's December 29, 1983 and February 21, 1984 letters from J. E. Booker to H. R. Denton. Attachment 1 is a summary listing of the supplemented items. Attachment 2 provides the response and reference material for each supplemented item. Where indicated, these responses will be provided in a future amendment to the FSAR.

Sincerely,

William J. Lee Jr.
for J. E. Booker
Manager-Engineering
Nuclear Fuels & Licensing
River Bend Nuclear Group

JEB/WJR/RJK/je

Attachments

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Attachment 1

Supplemental Information to December 29, 1983 and February 21, 1984 Letters

Item #	DSER Section	Related Question	Subject	FSAR Changes
12.	3.9.2 pg. 3-50	Q#210.62	Preoperational Vibration Testing	Amendments 7,11 and Enclosure 1
24.		Q#210.71	Pressure Isolation Valves	Amendment 9

Additional Information

37.		NRC Ltr. 4/14/82	Preoperational Testing of Snubbers

Attachment 2

Supplemented Response to GSU's December 29, 1983 and February 21, 1984 Letters

12. DSER, page 3-50-Preoperational Vibration Testing

Response

The response to FSAR Question 210.62, Chapter 3, for the BOP preoperational vibration testing program is revised in Enclosure 1. This information will be provided in a future FSAR amendment.

24. A response to FSAR Question 210.71 was submitted in Amendment 9. As discussed in FSAR Section 3.9.6A, the reactor coolant pressure boundary pressure isolation valves are considered as a part of, and will be included in the inservice testing (IST) program for River Bend Station. The IST program will be provided within six months of the anticipated date of commercial operation.

Additional Information

37. The RBS preservice inspection and preoperational testing programs for snubbers will be performed in accordance with the guidelines provided in the NRC's April 14, 1982 letter from A. Schwencer to W. J. Cahill. These guidelines are reiterated in Enclosure 2. I & E Bulletin 81-01, Revision 1, "Surveillance of Mechanical Snubbers," dated March 4, 1981 was forwarded to GSU for information only since GSU does not employ any International Nuclear Safeguards Corporation snubbers. A description of the RBS snubber examination program which reflects these guidelines will be provided in a future amendment to Section 14 of the FSAR.

QUESTION 210.62 (3.9.2)

The discussion of the preoperational testing program does not discuss the acceptance limits for steady state and transient vibrations. What criteria will be used in developing these limits. If a stress limit will be used, what basis will be used to determine the actual stress from the measured values? Please provide a list of flow transients and a list of selected locations for visual inspections and measuring devices.

It is the staff's position that all essential safety-related instrumentation lines should be included in the vibration monitoring program during pre-operational or start-up testing. We require that either a visual or instrumented inspection (as appropriate) be conducted to identify any excessive vibration that will result in fatigue failure.

Provide a list of all safety-related small bore piping and instrumentation lines that will be included in the initial test vibration monitoring program.

The essential instrumentation lines to be inspected should include (but are not limited to) the following:

1. Reactor pressure vessel level indicator instrumentation lines (used for monitoring both steam and water levels).

2. Main steam instrumentation lines for monitoring main steam flow (used to actuate main steam isolation valves during high steam flow).

3. Reactor core isolation cooling (RCIC) instrumentation lines on the RCIC steam line outside containment (used to monitor high steam flow and actuate isolation).

4. Control rod drive lines inside containment (not normally pressurized but required for scram).

RESPONSE

The response to this request for the NSSS scope is provided in revised Sections 3.9.2.1.4.3B and 3.9.2.1.6B, and in Section 3.9.2.2.1.3B.

The response to this request for the BOP scope is provided in Section 3.9.2.1.2A. | 11

3.9.2.1.1A Flow Modes

Tabulated flow modes for various systems are provided as part of the above test program.

3.9.2.1.2A Preoperational Vibration Testing

Safety-related piping systems designated as Class 1, 2, or 3 are designed in accordance with ASME Section III. Each system is designed to withstand dynamic loadings from operational transient conditions that are encountered during expected service as required by NB-3622, NC-3622, and ND-3622 of the code.

During the preoperational test program, vibration testing is performed using a portable vibration meter on the following high energy systems located in Seismic Category I structures:

1. Reactor recirculation system
2. Residual heat removal system
3. High pressure core spray system
4. Low pressure core spray system
5. Reactor core isolation cooling system
6. Feedwater system
7. Condensate system
8. Other piping systems which have exhibited significant vibration response based upon past operating experiences with similar systems or similar system operating conditions.

Vibration measurements are conducted for steady-state and transient conditions such as pump starts and valve operation. Also, visual inspections are performed on these systems with emphasis placed on vents, drains, and branch piping. Determining vibration response is the objective of these visual inspections.

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3.9.2.1.3A Preoperational Thermal Expansion Testing

Preoperational tests for BWRs are conducted near ambient conditions; therefore, thermal expansion testing during the preoperational test phase is very limited.

BOP steady-state vibration testing consists of two separate testing phases. Phase I testing consists of visual screening of ASME Class 1, 2, and 3, and selected high and moderate energy piping systems at preselected locations. A specific list of monitored systems and locations at which visual observations will be made will be contained in start-up test and preoperational test procedures. These vibration visual observations are performed by engineers trained for excessive vibration screening. Any piping system viewed from the recommended observation distance which does not exhibit excessive vibration, is considered acceptable.

Calculations for observation distance (eg, displacement) are based upon deflection equations given in the ANSI/ASME OM-3 Requirements for Preoperational and Initial Start-Up Vibration Testing of Nuclear Power Plant Piping Systems with an allowable stress of $(0.8/1.3)\ S_{el}$ for carbon steel piping and an allowable stress of S_a at 10^{11} cycles for stainless steel piping.

Phase II testing is performed on piping systems which exhibit excessive vibration during the visual screening. Phase II testing consists of taking a velocity and/or displacement reading using handheld vibration monitors. Criteria for displacement measurements are based on the ANSI/ASME OM-3 with assumptions as stated above.

BOP transient vibration testing is performed at preselected data points. Two levels of acceptance criteria, Level I and Level II are imposed. Level I and II criteria are defined per RBS FSAR Sections 3.9.2.1.4.1B and 3.9.2.1.4.2B. Acceptance limits for Level I are based upon the ASME Boiler and Pressure Vessel Code Section III Equation 9 for Class 1, 2 and 3 systems or the ANSI B31.1 Equation 12 for Class 4 (NNS) systems. Acceptance limits restrict the bending stress due to deflection plus stresses due to deadweight and pressure to a value less than the normal/upset allowable stress for occassional loads. Level II criteria are based on pipe stress and support loads not to exceed design basis predictions. Flow transients monitored are pump starts, pump stops, changes to system flows due to rapid valve position changes, and FSAR designated system trips. A specific list of flow transients is contained in start-up test and preoperational test procedures.

Small Bore Pipe Testing Small bore piping branch connections on systems monitored for steady-state vibration is included as part of the visual observations. Control rod drive lines are instrumented for transient vibration with level 1 and level 2 acceptance limits as defined above.

Essential instrument lines chosen for additional monitoring points are instrumented or visually examined for vibration. Acceptance criteria limits for these test points are based upon deflection equations given in ANSI/ASME OM-3 with stresses as defined above. The reactor pressure vessel level indicator instrumentation lines for monitoring both steam and water levels, main steam instrumentation lines for monitoring main steam flow, reactor core isolation cooling (RCIC) instrumentation lines on the RCIC steam line outside containment and instrumentation lines and systems identified in the INPO SER 64-83, "Fatigue Cracks and Leaks in Small Diameter Piping", dated September 12, 1983, are possible additional monitoring points for excessive vibration.

Enclosure 2

Maintenance records for snubbers should be documented as follows:

Preservice Examination:

A pres-service examination should be made on all snubbers listed in Tables 3.7-4a and 3.7-4b of Standard Technical Specifications 3/4.7.9. This examination should be made after snubber installation but not more than six months prior to initial system pre-operational testing, and should as a minimum verify the following:

1. There are no visible signs of damage or impaired operability as a result of storage, handling, or installation.

2. The snubber location, orientation, position setting, and configuration (attachments, extensions, etc.) are according to design drawings and specifications.

3. Snubbers are not seized, frozen or jammed.

4. Adequate swing clearance is provided to allow snubber movement.

5. If applicable, fluid is to be recommended level and is not leaking from the snubber system.

6. Structural connections such as pins, fasteners and other connecting hardware such as lock nuts, tabs, wire, cotter pins are installed correctly.

If the period between the initial pre-service examination and initial system pre-operational test exceeds six months due to unexpected situations, re-examination of items 1, 4, and 5 shall be performed. Snubbers which are installed incorrectly or otherwise fail to meet the above requirements must be repaired or replaced and re-examined in accordance with the above criteria.

Pre-Operational Testing

During pre-operational testing, snubber thermal movements for systems whose operating temperature exceeds 250 F should be verified as follows:

a. During initial system heatup and cooldown, at specified temperature intervals for any system which attains operating temperature, verify the snubber expected thermal movement.

b. For those systems which do not attain operating temperature, verify via observation and/or calculation that the snubber will accommodate the projected thermal movement.