Enclosure

EG&G Idaho, Inc.

FORM EG&G-460

(Rev. 05-84)

N O T E G R A M

Date December 28, 1987

To Horace Shaw

Org. NRC/EMEB

Address Bethesda, MD

From T. L. Cook

Org. Mechanical Systems Evals.

Address INEL-Idaho Falls, ID

TRIP REPORT FOR THE PUMP AND VALVE
INSERVICE TESTING PROGRAM
WORKING MEETING FOR RIVER BEND STATION

On December 15 and 16, 1987, a working meeting was held at the River Bend Station site near St. Francisville, Louisiana with Gulf States Utilities Company, NRC, and EG&G Idaho, Inc., representatives to discuss the questions and comments resulting from the review of the River Bend Station pump and valve inservice testing (IST) program.

Attached is a list of meeting attendees, the questions that served as an agenda for the meeting, and the responses to those questions as taken from the meeting minutes. The utility representatives were given a brief introduction outlining the agenda and the methods used for the documentation of questions and responses. This was followed by detailed discussions concerning specific pumps and valves in the River Bend Station IST program.

These discussions resulted in nine (9) open items for the licensee which are specifically identified in the body of this report.

Attachment:
As Stated

cc: R. F. Bonney
C. F. Obenchain
[redacted]
H. C. Rockhold
E. J. Sullivan NRC/NRR/EMEB

ATTENDANCE

River Bend Station Working Meeting

December 15 and 16, 1987

C. W. Walling	Gulf States Utilities
G. W. Siry	Gulf States Utilities
J. W. Lorino	Gulf States Utilities
J. B. Blakley	Gulf States Utilities
D. A. Shelton	Gulf States Utilities
A. J. Kugler	Gulf States Utilities
J. E. Teer	Gulf States Utilities
T. L. Cook	EG&G Idaho/INEL
R. Bonney	EG&G Idaho/INEL
H. K. Shaw	NRC/NRR/EMEB
W. A. Paulson	NRC/NRR/PD4

RIVER BEND STATION

PUMP AND VALVE INSERVICE TESTING PROGRAM

QUESTIONS AND COMMENTS

1. VALVE TESTING PROGRAM

A. General Questions and Comments

1 Provide a list of all valves that are Appendix J, Type C, leak rate tested but not included in the IST program and categorized A or A/C.

Response:

All valves that are Appendix J, type C leak rate tested are included in the IST program and categorized A or A/C.

2. The Code permits valves to be exercised during cold shutdowns where it is not practical to exercise them during plant operation and these valves are specifically identified by the licensee and are full-stroke exercised during cold shutdowns. The staff requires that the licensee provide a technical justification for each valve that cannot be exercised quarterly during power operation that clearly explains the difficulties or hazards encountered during that testing. The staff will then verify that it is not practical to exercise those valves and that the testing should be performed during cold shutdowns. Cold shutdown testing of valves identified by the licensee is acceptable when the following conditions are met:

a. The licensee is to commence testing as soon as the cold shutdown condition is achieved, but not later than 48 hours after shutdown, and continue until complete or the plant is ready to return to power.

b. Completion of all valve testing is not a prerequisite to return to power.

c. Any testing not completed during one cold shutdown should be performed during any subsequent cold shutdowns starting from the last test performed at the previous cold shutdown.

d. For planned cold shutdowns, where ample time is available and testing all the valves identified for the cold shutdown test frequency in the IST program will be accomplished, exceptions to the 48 hours may be taken.

The information concerning cold shutdown testing in paragraphs 2.2.5 on page 2-2 and 3.3.5 on page 3-3 does not conform with this position.

Response:

The licensee will revise the IST program to state that cold shutdown valve testing will commence within 48 hours of reaching the cold shutdown condition.

3. The NRC has concluded that the applicable leak test procedures and requirements for containment isolation valves are determined by 10 CFR 50, Appendix J, however, the licensee must comply with the Analysis of Leakage Rates and Corrective Action Requirements paragraphs of Section XI, IWV-3426 and 3427. Valve Relief Request No. 31 is not in compliance with this position.

Response:

The licensee will comply with IWV-3426 and 3427 concerning Valve Relief Request No. 31.

4. Identify the Code requirement from which relief is being sought in Valve Relief Request No. 10.

Response:

Relief is sought for IWV-3417(a). Hardening of grease will give less friction to valve stem as it wears smooth; therefore, the valves are tested for plus and minus tolerance. The minus tolerance should alert valves which stroke faster due to grease hardening. IWV-3417 indicates that the acceptance criteria for stroke time is based on the last test results. The relief request changes this. It indicates that the acceptance criteria is based on the first test of the valve when it is known to be operating acceptably (in the same manner as for amps). In addition, it provides for a minimum stroke time limit equal in percentage to the maximum limit as compared to the reference value. The above has since been endorsed in the last draft of OM-10, Section 5218. The change is not necessarily more conservative in all situations; hence, the reason a relief request is required. For example: first (1st) test (reference) 50 seconds, second (2nd) test 45 seconds, third (3rd) test 58 seconds. In IWV-3417, the test frequency would be increased, but per RR#10, it would be fully acceptable.

Clarification will be added to Valve Relief Request No. 10 to reflect acceptance criteria of a reference stroke time vice acceptance criteria of "from the previous test".

5. The NRC staff has concluded that a valve sampling disassembly/inspection utilizing a manual full-stroke of the disk is an acceptable method to verify a check valve's full-stroke capability. The sampling technique requires that each valve in the group must be of the same design (manufacturer, size, model number and materials of construction) and must have the same service conditions. Additionally, at each disassembly it must be verified that the disassembled valve is capable of full-stroking and that its internals are structurally sound (no loose or corroded parts).

   A different valve of each group is required to be disassembled, inspected and manually full-stroked at each refueling, until the entire group has been tested. If it is found that the disassembled valve's full-stroke capability is in question, the remainder of the valves in that group must also be disassembled, inspected, and manually full-stroked at the same outage.

   Valve Relief Request No. 24 will be affected by this position.

   Response:

   The staff position was explained to the licensee. Valve Relief Request No. 24 will be revised to reflect the staff position.

6. Valve Relief Request No. 50 is not necessary because Section XI does not identify any leak rate testing for category B valves.

   Response:

   Valve Relief Request No. 50 will be deleted. Concerned valves are category B passive and may be deleted from the IST program.

7. Valves that have been identified as Passive in the IST program do not require a request for relief from exercising according to IWV-3700, therefore, passive valves should be identified in the IST program and testing conducted in accordance with Table IWV-3700-1. Various relief requests will be affected by this requirement.

Response:

Valve Relief Request No. 48 will be deleted. Concerned valves are category B passive and may be deleted from the IST program.

8. Valves and pumps needed to support the operation of the HPCS diesel generator should be included in the IST program and tested in accordance with Section XI.

Response:

The applicable valves and pumps in the fuel transfer and air start systems for the HPCS diesel generator will be added to the IST program and tested to the Code requirements or relief requested as necessary.

9. Air operated dampers in the ventilation systems do not come under the definition of valves as addressed by Section XI and need not be included in the IST program.

Response:

The dampers are required to be tested in accordance with ASME XI per Technical Specification 4.6.5.3 (which invokes 4.0.5).

B. Control Rod Drive Hydraulic System

1. Provide the current revision of P&ID 36-1C for our review.

   Response:

   The P&ID has been provided.

2. Provide the CRD scram test schedule that is required by Technical Specifications (refer to Valve Relief Request No. 33).

   Response:

   Licensee has provided technical specification required testing schedule (10% on a rotating basis per 120 days, Technical Specification 4.1.3.2).

3. How are valves V115 and V138 individually verified to close during CRD scram testing?

   Response:

   Valve V115 is verified closed by a pressure drop test. Valve V138 is verified to close via normal rod movement. Valve Relief Request No. 33 will be modified to delete the V138 valves and to specify the frequency of testing for the other concerned valves.

C. Reactor Recirculation System

1. Provide a more specific technical justification for not full-stroke exercising valves VF013A, 13B, 17A, and 17B quarterly.

Response:

The recirculation pump seals could be damaged if these valves were exercised quarterly and/or when recirculation pumps are operating. Open Item for licensee to determine frequency for exercising of these valves.

D. Condensate Makeup, Storage and Transfer System

1. What is the safety related function of valves VF044A and 44B?

Response:

These valves will be categorized A passive as their safety position is closed and they are normally closed.

E. Feedwater System

1. Provide a more specific technical justification for not full-stroke exercising valves VF010A, VF010B, AOVF032A, and AOVF032B during cold shutdown.

Response:

Valve Relief Request No. 28 basis for relief will be augmented with further technical information concerning exercising consequences quarterly and during cold shutdown.

Exercising any one of these valves quarterly could result in a plant trip because that feedwater header must be isolated and drained. During cold shutdown, large amounts of radiological waste water is generated from draining the headers which must then be processed. Shutdown cooling and reactor water cleanup must be removed from operation which results in loss of chemistry control and the ability to maintain the plant in the cold shutdown condition.

2. Concerning Valve Relief Requests No.3 and No. 28, what are the consequences of interruption of feedwater flow to the reactor during power operation?

Response:

An isolation of both feedwater lines during power operation will scram the reactor on low water level. Isolation of a single line above 5% power is not recommended by GE due to thermal stress to the reactor vessel. This information will be added to Valve Relief Request No.'s 3 and 28.

F. Main Steam System

1. Provide a more specific technical justification for not full-stroke exercising, fail-safe testing, and stroke timing valves AOV022A, 22B, 22C, 22D, 28A, 28B, 28C, and 28D quarterly.

Response:

Open Item for licensee to provide more technical justification for not exercising these valves during cold shutdown.

2. Provide a more specific technical justification for not full-stroke exercising valves VF036A, 36F, 36G, 36J, 36L, 36M, 36N, 36P, 36R, 39B, 39C, 39D, 39E, 39H, 39K, 39S, V31, and V9 during cold shutdown.

Response:

ALARA concerns for drywell entry and possible injection of lower quality water to the reactor from the suppression pool preclude exercising of these valves during cold shutdown. In order to test these valves, instrument air must be isolated which results in the automatic transfer of HPCS

suction to the suppression pool. This introduces lower quality suppression pool water into the HPCS system which could migrate into the reactor. This could result in reactor shutdown due to inability to maintain reactor chemistry specifications. This condition could delay reactor startup due to system clean up requirements.

3. Provide a more specific technical justification for not full-stroke exercising and stroke timing valves RVF041A, 41B, 41C, 41D, 41F, 41G, 41L, 47A, 47B, 47C, 47D, 47F, 47G, 47L, 51B, 51C, 51D, and 51G quarterly.

Response:

Exercising of these valves would add heat to the suppression pool thereby approaching technical specification temperature limits that would require plant shutdown. These valves cannot be stroke timed when exercised because they are extremely fast acting and accurate measurements require the installation of special timing equipment.

4. Review the safety-related function of valves VF024A, 24B, 24C, 24D (P&ID 3-1A, locations F-14, L-7, K-14, and G-7), VF029A, 29B, 29C, and 29D (P&ID 3-1C, locations K-18, N-18, H-18, and L-18) to determine if they should be included in the IST program.

Response:

Open Item for licensee to determine safety function of these valves.

G. Reactor Plant Closed Cooling Water System

1. Provide a more specific technical justification for not full-stroke exercising valve V119 quarterly.

Response:

Testing this valve could result in thermal damage to the recirculation pumps which would cause a forced plant shutdown.

2. How are valves V133 and V160 verified to full-stroke open?

Response:

The licensee's surveillance testing provides for flow testing these valves.

3. Provide a more specific technical justification for not full-stroke exercising valves V72 and V73 quarterly. Also, the functional description for these valves in Valve Relief Request No. 15 appears to be in error. What is the safety-related position(s) for these valves.

Response:

Valve Relief Request No. 15 will be modified and augmented with further technical information, i.e., RHR and CRD pump coolers must be isolated resulting in loss of the pumps and service water would contaminate the clean closed cooling water system.

4. Provide a more specific technical justification for not full-stroke exercising valves MOV16A, 16B, 129, 130, 335, and 336 quarterly.

Response:

Valve Relief Request No. 15 will be modified and augmented with further technical information concerning loss of RHR and CRD pump coolers which would result in loss of the pumps.

5. If valves MOV163 and MOV169 have a safety-related function in the open position, then valves V75 and V80 (P&ID 9-1B, locations N-2 and M-2) should be included in the IST program and tested to the Code requirements.

Response:

The safety position for valves MOV163 and MOV169 is closed.

H. Service Water System

1. Describe how the proposed refueling outage exercise testing of valves V135, 136, 143, 144, 326, and 327 meets the requirements of IE Bulletin No. 83-03.

Response:

Valve Relief Request No. 25 will be augmented with further technical information. The proposed testing does exercise the check valves as provided for in IE Bulletin No. 83-03.

2. Provide a more specific technical justification for not full-stroke exercising valves MOV57A and 57B quarterly.

Response:

Further technical justification will be added to the relief request concerning these valves. Loss of cooling capability to diesel generators, drywell coolers, and RHR heat exchangers precludes exercising of these valves.

3. What is the P&ID locations of valves 1SWP*V1102, 1SWP*SOV523A, and 1SWP*SOV523C? Also, the P&ID coordinates for valves RV49A, AOV51A, MOV73A, and MOV74A are incorrect.

Response:

The revised P&ID has been provided that shows these valves.

4. Provide a more specific technical justification for not full-stroke exercising valves V172 and V173 during cold shutdown.

Response:

Valve Relief Request No. 27 will be augmented with information concerning liability of draining the standby service water header. In addition to the loss of an entire system, drywell coolers will be lost and drywell temperature could exceed technical specification limits.

5. Provide a more specific technical justification for not verifying the open position of valves V174 and V175 quarterly.

Response:

Valve Relief Request No. 42 will be augmented with information concerning liability of loss of drywell cooling. Drywell temperatures could exceed technical specification limits.

6. Provide a more specific technical justification for not full-stroke exercising valves V650 and V651 quarterly.

Response:

<u>Open Item for licensee</u> to determine safety function of these valves.

7. What are the consequences of valve failure during quarterly full-stroke exercising of valves MOV507A and MOV507B (downstream valves MOV4A and MOV4B are exercised during cold shutdown as per Valve Relief Request No. 52)?

Response:

Valve failure while exercising would result in reduced cooling flow to the drywell and could force a plant shutdown due to excessive drywell temperatures. These valves will be added to Valve Relief Request No. 52.

8. What are the consequences of valve failure during quarterly full-stroke exercising of valves MOV81A and MOV81B (downstream valves MOV5A and MOV5B are exercised during cold shutdown as per Valve Relief Request No. 52)?

Response:

Valve failure while exercising would result in reduced cooling flow to the drywell and could force a plant shutdown due to excessive drywell temperatures. These valves will be added to Valve Relief Request No. 52.

9. Provide the P&ID(s) that show valves 1SWP*V1086, V1087, V1091, V1092, V1095, V1098, V1103, SOV522A, SOV522B, SOV522C, SOV522D, SOV523B, SOV523D, SOV552A, and SOV552B.

Response:

The P&ID has been provided.

I. Service and Breathing Air System

1. Provide a more specific technical justification for not full-stroke exercising and leak rate testing valve V487 in accordance with the requirements of Section XI.

Response:

This category B passive valve will be deleted from the IST program. Valve Relief Request No. 35 will be deleted.

2. Provide a more specific technical justification for not full-stroke exercising valves V514, V515, V562, V563, V608, and V609 quarterly. What are the consequences of testing these valves quarterly?

Response:

Further technical justification will be added to Valve Relief Request No. 29 concerning these valves which explains that various safety-related ventilation dampers will shift position and how that affects system operation.

3. Is valve V79 correctly identified as to type on page 38 of Appendix C?

Response:

This valve was incorrectly identified. The valve is a category B passive and may be deleted from the IST program.

J. Standby Liquid Control System

1. Provide a more specific technical justification for not full-stroke exercising valves VF006 and VF007 quarterly.

Response:

Valve Relief Request No. 13 will be augmented with further technical information for not exercising these valves quarterly and during cold shutdown. Exercising these valves quarterly could result in reactor vessel thermal shock. Procedures required for exercising these valves with standby liquid control pump flow during cold shutdown could delay plant startup due to the time required to flush the boron solution from the system before performing the test.

2. Provide a more specific technical justification for not full-stroke exercising valves MOVF001A, MOVF001B, VF033A, and VF033B quarterly.

Response:

Open Item for licensee to determine if valves MOVF001A and B can be exercised quarterly. Valves VF033A and B are full-stroke exercised during standby liquid control pump testing. Valve Relief Request No. 18 will be modified accordingly.

3. Why are valves VEXF004A and VEXF004B categorized as A?

Response:

Zero leakage is specified by system design, however, since these valves are not leak tested, they will be categorized D.

K. Residual Heat Removal System

1. How are valves VF046A, 46B, and 46C verified to full-stroke open quarterly?

Response:

The residual heat removal pumps are operated and as the mini-flow isolation valves are stroked open valves VF046A, 46B, and 46C are verified to open by observing residual heat removal pump discharge pressure and flow rate changes.

2. Provide a more specific technical justification for not full-stroke exercising closed valves VF050A and VF050B during cold shutdown.

Response:

Valve Relief Request No. 20 will be augmented with further technical information for not exercising these valves during cold shutdown. A modified leak test is used to verify closure and this could delay plant startup.

3. Is credit taken for the steam condensing mode of the RHR system at River Bend? If not, should valves VF054A and VF054B be included in the IST program?

Response:

Steam condensing mode operation is not permitted at River Bend. These valves may be deleted from the IST program.

4. Can valves VF085A, 85B, and 85C be verified to full-stroke exercise closed using the valve handwheel?

Response:

These valves need not be verified closed using the valve handwheel. They will be tested in series with valves VF084A, 84B, and 84C (keep-full system).

5. Why is valve VF099C listed in valve Relief Request No. 31 and not listed in Appendix C?

Response:

This was a typographical error. The IST program will be corrected.

6. Valve VF041C is not listed on Relief Request No. 31, but is listed in Appendix C as being listed on Relief Request No. 31.

Response:

This valve will be added to Valve Relief Request No. 31.

L. Low Pressure Core Spray

1. How is valve V10 verified to full-stroke exercise open quarterly?

Response:

The low pressure core spray pumps are operated and as the mini-flow isolation valve is stroked open, valve V10 is verified to open by observing pump flow and discharge pressure changes.

2. How is valve VF033 verified closed quarterly?

Response:

A pressure differential is measured to verify closure.

M. MSIV Positive Leakage Control System

1. What is the difference between valves E33-RV-F002 and E33-PV-F022? Should these two valves be included in the IST program?

Response:

These valves are pressure control valves and do not have a required fail-safe position. They need not be included in the IST program.

N. Reactor Core Isolation Cooling System

1. What alternate methods have been investigated to verify closure of valves VF011 and VF061 quarterly?

Response:

Open Item for licensee to determine method for verifying closure of valve VF061 quarterly. Valve VF011 will have closure verified quarterly.

2. Describe the flow path utilized to full-stroke exercise valve VF030 open quarterly. Does this valve perform a safety function in the closed position?

Response:

Open Item for licensee to determine method for full-stroke exercising open and closed valve VF030.

3. Does valve VF040 perform a safety function in the closed position? If so, should it be considered as a containment isolation valve and tested accordingly?

Response:

This valve is not a containment isolation valve.

4. Provide a more detailed technical justification for not full-stroke exercising valve VF013 quarterly?

Response:

Open Item for licensee to investigate interlocks associated with valve VF013, i.e., opening this valve during power operation may trip the main turbine.

5. Would failure of valve VF063 in the closed position during quarterly exercising render an entire safety system inoperable? Should this valve be exercised during cold shutdowns?

Response:

Valves VF063, 64, and 76 will be exercised during cold shutdown because failure while exercising during power operation would render the reactor core isolation cooling system inoperable.

6. How is valve 1ICS-V21 verified to full-stroke exercise quarterly?

Response:

The reactor core isolation cooling pump is operated and as the mini-flow isolation valve is stroked open, valve V21 is verified to open by observing pump flow and discharge pressure changes.

O. MSIV & Penetration Valve Leakage Control System

1. In reference to Relief Request No. 4, identify the systems that would be affected while exercising the check valves listed in this relief request. Also explain the consequences of removing those systems from service for the purpose of check valve exercising.

Response:

Valve Relief Request No. 4 will be augmented with further technical information concerning the basis for relief. For example, removal of the main steam system from service for testing during power operation is not possible. During cold shutdown, removal of the main feedwater system from service for testing is not desirable as this would require removal from service of the RHR shutdown cooling system and the plant could not be maintained in the cold shutdown condition.

2. Why are manual valves LSV-V64 and V65 listed as Category C valves?

Response:

This is a typographical error. These valves are instrument isolations and may be deleted from the IST program.

P. HVAC Chilled Water System

1. How is the closed position of valve V421 verified quarterly? Does this valve perform a safety function in both the open and closed positions?

Response:

Valve V421 is not a safety related valve and need not be included in the IST program.

2. Review the safety-related function of valve V420 to determine if it should be included in the IST program.

Valve V420 is not a safety related valve and need not be included in the IST program.

Q. Containment Atmosphere and Leakage Monitoring System

1. What is the correct direction of flow through valve V41? Should both the open and closed positions be verified during testing?

Response:

Flow direction on the P&ID is incorrect. This valve is closure verified during refueling outages. Open Item for licensee to determine open verification frequency.

2. How are solenoid valves SOV31A, SOV31B, SOV31C, SOV31D, SOV32A, SOV32G, SOV35A, SOV35B, SOV35C, and SOV35D fail safe tested "as-is"? The P&ID indicates that these valves fail closed.

Response:

These valves fail-as-is and fail safe testing is not required.

R. Fuel Pool Cooling System

1. How are valves V350 and V351 full-stroke exercised quarterly?

Response:

These valves are closure verified during Appendix J leak testing. These valves are open verified via flow noise.

S. Drains-Floor and Equipment System

1. What is the P&ID location of valve DER-V4?

Response:

The proper P&ID's have been provided. No further questions are needed.

2. Provide the P&ID that shows the location of the valves listed on page 104 of 105, Appendix C.

Response:

The proper P&ID's have been provided. No further questions are needed.

T. Sampling- Reactor Plant System

1. Provide a more detailed technical justification for not full-stroke exercising valves SSR-V705 and V706 quarterly. In reference to Relief Request No. 43, inconvenience is not adequate justification for not performing the required testing.

Response:

STP-610-3301 shall be revised to incorporate testing these valves quarterly. Valve Relief Request No. 43 shall be cancelled.

2. PUMP TESTING PROGRAM

1. Provide pump Relief Request No. 10 for our review.

Response:

Pump Relief Request No. 10 has been provided. The alternate testing will identify vibration velocity measurements.

2. Why is lubricant level listed as "N/A" for the HPCS, RHR, LPCS, standby service water, and diesel generator fuel oil pumps?

Response:

For HPCS, RHR, LPCS, and SSW pumps there is no lubricant level because the bearings are lubricated by the pumped medimum - water. These are deepwell pumps as stated. For the D/G Fuel Oil pump, they are submerged in the pumped fluid and are lubricated by the pumped fluid. The fact that they are submerged is stated in RR #9. There are no oil cases visible. A note will be added to the pump table explaining the "not applicable" notation.

3. In reference to pump Relief Request No. 6, the NRC staff position is that instrumentation that meets the accuracy requirements of the ASME Code, Section XI, is readily available on the commercial market and should be procured, installed, and utilized in order to permit pump testing in accordance with Section XI.

Response:

This relief is for scale range (three times reference values) requirements as the licensee is utilizing Heise gauges which are more accurate than the Code requirements.

4. Provide a more detailed technical justification for not measuring the inlet pressure of the standby liquid control pumps during pump tests.

Response:

Pump Relief Request No. 7 concerning the measurement of the inlet pressure of the standby liquid control pumps will be revised to state that inlet pressure has no effect on pump discharge pressure as these pumps are positive displacement type.

5. In reference to pump Relief Request No. 2, provide a detailed technical justification for not establishing Required Action ranges for pump flow and differential pressure in accordance with Section XI.

Response:

Pump Relief Request No. 2 will be revised to reflect guidance provided by OM-6. This will also affect Pump Relief Reque.. No. 5.

6. How is flow measured during tests of the standby liquid control pumps?

Response:

Flow is measured by marking with a piece of masking tape on the sightglass the initial level of the Standby Liquid Control Test Tan and then measuring the amount of time needed for the level to drop 5 inches. A calculation is then performed to determine the flow rate.