

APPENDIX B

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-458/86-04

License: NPF-47

Docket: 50-458

Licensee: Gulf States Utilities Company (GSU)
P. O. Box 2951
Beaumont, Texas 77704

Facility Name: River Bend Station (RBS)

Inspection At: River Bend Station, St. Francisville, Louisiana

Inspection Conducted: January 1 through 31, 1986

Inspectors: *Dwight D. Chamberlain* 2-6-86
D. D. Chamberlain, Senior Resident Inspector
(pars. 1, 3, 5, 6, 7, 8, 9, 10) Date

William B. Jones 2-6-86
W. B. Jones, Resident Inspector
(pars. 1, 2, 4, 7, 9, 10) Date

[Signature] 2/20/86
J. E. Jaudon, Chief, Project Section A
Reactor Projects Branch
(par. 8) Date

W. R. Bennett 2/19/86
W. R. Bennett, Project Engineer
(par. 8) Date

Inspectors:

J. P. Jaudon

B. L. Kelley, Senior Resident Inspector
Comanche Peak Steam Electric Station
(par. 3)

2/20/86
Date

Approved:

J. P. Jaudon

J. P. Jaudon, Chief, Project Section A
Reactor Projects Branch

2/20/86
Date

Inspection Summary

Inspection Conducted January 1 through 31, 1986 (Report 50-458/86-04)

Areas Inspected: Routine, unannounced inspection of licensee action on previous inspection findings, operational safety verification, startup test program QA review, startup test observation, IE Bulletin review, safety system walkdown, in-office review of written reports of nonroutine events at power reactor facilities, and site tours. The inspection involved 381 inspection-hours onsite by five NRC inspectors.

Results: Within the areas inspected, two violations were issued in the area of operational safety verification and startup test program QA review (failure to administratively control temporary circuit alterations and failure to schedule a supplemental audit/surveillance, paragraphs 3 and 4, respectively).

DETAILS

1. Persons Contacted

Principal Licensee Employees

R. E. Bailey, Supervisor, Quality Concern
C. L. Ballard, Projects Supervisor
*J. E. Booker, Manager, Engineering, Fuels and Licensing
*W. H. Cahill, Jr., Senior Vice President, River Bend Nuclear Group
*J. V. Conner, Supervisor, Environmental Services
T. C. Crouse, Manager, Quality Assurance (QA)
*J. C. Deddens, Vice President River Bend Nuclear Group
*Jan Evans, Stenographer
*P. E. Freehill, Superintendent, Startup and Test
A. D. Fredieu, Assistant Operations Supervisor
*P. F. Gillespie, Senior Compliance Analyst
*D. R. Gipson, Assistant Plant Manager, Operations
P. D. Graham, Assistant Plant Manager, Services
*E. R. Grant, Supervisor, Nuclear Licensing
*R. W. Helmick, Director, Projects
B. D. Hey, Licensing Engineer
K. C. Hodges, Supervisor, Quality Systems
R. Jackson, Shift Supervisor, Operations
G. R. Kimmell, Supervisor, Operations QA
R. King, Engineer, Licensing
A. D. Kowalczyk, Assistant Plant Manager, Maintenance
T. Lacy, Shift Supervisor, Operations
*D. N. Lorring, Sr. Nuclear Engineer
W. H. Odell, Manager, Administrative
*T. L. Plunkett, Plant Manager
W. J. Reed, Director Nuclear Licensing
D. Reynerson, Director, Nuclear Plant Engineering
F. L. Richter, Operations, QA
*C. G. Sprangers, Engineer, QA
*R. B. Stafford, Director, Quality Services
*K. E. Suhrke, Manager, Projects
*B. K. Thibodeaux, Acting Asst. Plant Manager-TS
*P. F. Tomlinson, Director, Operations QA
*C. W. Walling, QA Engineer
D. Williamson, Operations Supervisor

Stone and Webster

B. R. Hall, Assistant Superintendent, Field Quality Control
R. L. Spence, Superintendent, Field Quality Control

The NRC senior resident inspector (SRI) and resident inspector (RI) also interviewed additional licensee, Stone and Webster (S&W), and other contractor personnel during the inspection period.

*Denotes those persons that attended the exit interview conducted on February 5, 1986. NRC resident inspector, W. B. Jones, also attended the exit interview.

2. Licensee Action on Previous Inspection Findings

(Closed) Open Item (458/8563-01): Inadequate Instructions for Emergency Containment Venting.

The RI reviewed Section 3.4 of Emergency Operating Procedure EOP-002, Revision 3, "Primary Containment Control," and verified the licensee has provided the necessary instructions for the operators to reduce and control primary containment pressure under abnormal conditions. In addition, Section 3.4 of EOP-002 delineates the primary containment, drywell and reactor pressure vessel (RPV) pressure setpoints which will require either emergency RPV depressurization or flooding, depending on which setpoints are reached.

3. Operational Safety Verification

The SRI and RI observed operational activities throughout the inspection period and closely monitored operational events. In addition to the daily followup of operational events, the SRI conducted further in-depth review of selected operational events. The preliminary results of these reviews by event is as follows:

a. Feedwater Heater Isolation:

On January 1, 1986, with reactor power at approximately 19% power, the reactor scrammed because of low water level. This low level occurred when both trains of 5th point feedwater heaters isolated and the feedwater heater bypass valve failed to open, resulting in a complete isolation of condensate flow to the main feedwater pumps and a loss of feedwater flow to the reactor vessel. The licensee investigation of this event determined that the probable cause of the feedwater heater isolation to be flashing in the level instrumentation causing high level spikes and that the bypass valve may have bound during system heatup. Licensee action in response to this event included resetting the bypass valve motor overload to its upper current limit, leaving the heater bypass valve open until 15% power to ensure system heatup does not cause binding, instrumenting heater level transmitters with strip recorders to monitor for similar occurrences and initiation of potential human factor design changes to highlight feedwater heater operational status.

The SRI considered that the licensee's response to this event was prompt and thorough. The effectiveness of the corrective action will

be monitored and final closure of this event will be documented in a future NRC inspection during licensee event report reviews.

b. Loss of Offsite Power:

On January 1, 1986, with the reactor shutdown, a loss of offsite power occurred. The licensee declared an "Unusual Event" and the SRI was notified via the site paging system at about 11:00 a.m. The SRI and RI responded to the event and, upon arrival in the control room at about 11:40 a.m., offsite power was still not restored. The standby diesels were running and carrying required electrical loads. Both sources of offsite power were restored at about 11:50 a.m. and the "Notification of Unusual Event" was terminated at about noon. The actions of the plant operational staff during this event were observed to be well coordinated and efficient, and the reactor remained in a safe and shutdown condition throughout the event. Subsequent review of this event by the SRI revealed that at 09:41 a.m. the switchyard breakers to the A&C preferred station service transformers (PFSS) had tripped and, approximately 1 hour later at 10:44 a.m., the B&D PFSS transformer switchyard breakers had tripped, isolating the plant from offsite power. No actual electrical faults were detected to cause these breaker trips. During the attempts to reset the lock-out relays ("86" relays) and reclose the tripped breakers, it was discovered that the "86" relays could not be reset because they had sealed in trip signal through a fiber optics "tone" generator trip system. In order to finally reset the "86" relays, the signals to the "tone" system were switched off and reset was accomplished. The fault protection system for the PFSS transformer switchyard breakers and the main generator breaker includes two pilot wire systems and a backup fiber optic tone generator system for transfer of trip signals between the switchyard and plant.

While maintaining the plant in a shutdown status, licensee management assembled a task force with directions to diagnose the cause of the trips, recommend corrective actions for return to power operation and to develop a plan to prevent future occurrences. NRC Region IV responded to this event by dispatching an inspector experienced in switchyard design and operation to the site to assist the SRI with evaluation of the event and with evaluation of licensee actions prior to plant restart. A discussion of the task force actions is as follows:

(1) Cause of the Trip:

Since no fault condition was found to exist at the times of the trips, several alternative explanations were put forth such as: operator error, malfunction due to component failure, radio or electronic emission interference, miscalibration, etc. All alternative explanations were eliminated except radio frequency interference (RFI). This area was further investigated and

testing was performed. The result was records showing that at the approximate time of the two trips, members of the security force were making rounds at the switchyard. The security force use hand held radios for communication. Tests were conducted using the 4 and 5 watt radio transmitters as used by operations and security personnel and a 100 watt mobile radio to determine the tone equipment susceptibility to RFI. Although keying of the 100 watt mobile unit outside the Fancy Point substation control building had no effect on the equipment, keying of the 4 and 5 watt radios inside the control building repeatedly produced trip signals. Due to the proven susceptibility of the tone transfer trip equipment to RFI, the task force concluded with high probability that the trip was initiated by RFI, which had caused the backup tone relaying equipment to be erroneously keyed and causing the loss of offsite power.

(2) Corrective Actions for Return to Power:

Corrective actions completed prior to return to power included restriction of radio use inside the Fancy Point substation building (signs were posted on all doors to the building and at the substation entrance gate and operations and security personnel were notified), an operator aid was posted to provide instructions on how to reset the relay equipment and the tone system was returned to service.

(3) Subsequent Actions/Plans to Prevent Future Occurrences:

- . The training department added Fancy Point protective relaying to license requalification training.
- . RF shielding will be installed around the tone relay equipment in the substation.
- . A modification request was initiated to require that two tone trip signals be present for a transfer trip to be initiated.
- . A modification request was initiated to place the power and keying for the same tone channel on one battery voltage source.
- . The lock-up features of the tone relaying equipment was reviewed by engineering. It was determined that the lock-out relays could be reset if the proper sequence was followed. The operator aid was revised to delineate the proper reset sequence.
- . Sequence of events recorders are being installed at both the plant and substation to monitor both pilot wire and tone equipment trip systems.

- . The GSU transmission and distribution (T&D) personnel have been instructed not to take radios into the Fancy Point substation building and to keep the building and substation gate locked.
- . Operations was instructed and signs were posted at the tone equipment location in the plant to not use RF equipment and to keep the doors locked.
- . Alarms will be added in the control room for tone equipment trouble.
- . Instructions for maintaining the sequence of events recorders will be added to procedures.
- . A preventive maintenance procedure has been issued for testing the tone systems on a monthly basis instead of the semiannual cycle that was being used.

The SRI concluded that the licensee's response to this event had been prompt and thorough. Final closure of this event will be documented in a future NRC inspection during licensee event report reviews.

c. Feedwater Motor Operated Valve Failure:

On January 5, 1986, during plant startup with reactor power below 5%, the plant operator inadvertently closed feedwater valve FWS*07B, which is one of two flow paths for normal feedwater to the reactor vessel. The operator then immediately attempted to reopen the valve at which time the breaker for the motor operated valve (MOV) tripped. The breaker was reset and valve operation was attempted several times subsequently. Further investigation of the valve revealed that the motor operator was laying on the floor no longer attached to the valve. The licensee immediately initiated an investigation of the problem and a NRC regional inspector was dispatched to the site to review the licensee actions. The results of this review are documented in NRC Inspection Report 50-458/86-02.

d. Feedwater Regulating Valve Failure:

On January 15, 1986, with reactor power at approximately 17%, a reactor scram and turbine trip occurred due to high reactor vessel water level. The reactor feedwater system was in a normal lineup with reactor feedwater pump (RFP) "B" maintaining reactor water level using the startup feedwater regulating valve in automatic. All three main feedwater regulating valves (air operated) were in manual and indicated closed on their controllers in the control room. The three feedwater regulating valve inlet isolation valves (motor operated) also indicated closed. While preparing to line up one of the main feedwater regulating valves, the operator placed the control switch for the "B" inlet isolation valve to the open position per the

applicable operating procedure. When the motor operated valve started to come open, reactor vessel level increased rapidly (in approximately 6 seconds) to the reactor scram and turbine trip setpoint. The "B" RFP tripped and the reactor scrambled on high level. Upon investigation, the licensee found that the "B" feedwater regulating valve was actually stuck approximately 70% open and not closed as indicated in the control room. The control room indication represents the demand signal to the valve and does not indicate actual valve position.

The licensee's immediate actions were to initiate repair work to the "B" feedwater regulating valve and to instruct the operators to locally verify valve position in the future. The licensee is continuing to investigate the cause of the valve sticking and to review the design of the control room indication. The SRI will monitor licensee action on this problem as an open item (458/8604-03).

e. Discovery of Unauthorized Electrical Jumper:

The licensee notified the SRI that an unauthorized electrical jumper had been found in a control room panel on January 1, 1986. The licensee immediately initiated an investigation of the jumper and corrective action to determine if other unauthorized circuit alterations existed. The jumper found would have inhibited a Division I reactor water clean-up (RWCU) system leak detection isolation. The Division II RWCU leak detection circuit was not affected by the jumper nor was the low reactor water level isolation function inhibited. The licensee's investigation of the jumper revealed that a surveillance test procedure had been completed on December 27, 1985, which required the jumper to be installed, but the completed procedure showed that this jumper had been removed during restoration. The signatures associated with the restoration indicated that the jumper was removed by one technician and removal was verified by a second technician. Subsequent reviews revealed no activity that would have required this jumper to be installed. As a result of finding this unauthorized jumper, the licensee conducted a 100% inspection of panels in the control room and a sample inspection of panels outside the control room. One lifted lead was identified in the control room with a similar system affect as the jumper. The lifted lead would have inhibited a single division isolation to a ventilation system. Neither the jumper nor the lifted lead was identified in accordance with administrative procedures as a temporary alteration. This failure to follow administrative procedure requirements for temporary alterations was identified by the SRI as an apparent violation (458/8604-01).

As a result of the licensee investigation, several additional controls were implemented to prevent unauthorized circuit alterations. The additional controls included procedure controls to

require serialized tagging of all circuit alterations, improvement of access control to control room cabinets, additional QA/QC monitoring of temporary circuit alterations and restorations.

4. Startup Test Quality Assurance Program

During this inspection period, the RI reviewed the licensee's QA audit and surveillance program for operational activities conducted under the startup and power program. This review included the QA audit report for startup testing, QA surveillance reports, and discussion with QA personnel on the responsibilities of the QA organization for the startup test program.

The scope of the QA audit report 85-02, conducted from February 9 through 18, 1985, on the startup test program was to provide an evaluation of GSU's compliance program procedures using; (1) Appendix B of 10 CFR Part 50, (2) Final Safety Analysis Report (FSAR) Chapter 14, "Initial Text Program," (3) Administrative Procedure ADM-002, "Charter of the Facility Review Committee," and (4) Startup Manual Test Instructions.

Four deficiencies were identified as a result of the above licensee audit:

- . (P-85-03-25D) - The FSAR, Procedure ADM-002 and Startup Manual were not in agreement on whether the Joint Test Group and the Facility Review Committee must both review and approve preoperational test phase data.
- . (P-85-03-26D) - The FSAR and the Startup Manual have not been updated to reflect current organization and review responsibilities.
- . (P-85-03-27D) - The System turnover Quality Assurance Category 1 punchlist outdated.
- . (P-85-03-24D) - The Startup Manual not controlled with latest revisions.

The deficiencies were properly closed out with the exception of (P-85-03-25D), which is being held open until commercial operation. The RI determined that the licensee performed the audit in accordance with the audit schedule, using qualified personnel and an approved audit checklist.

The licensee's next annual audit of the startup program has been scheduled for February 1986. The RI will review the scope and findings of the audit during a subsequent inspection and document the results of the review in a future NRC report.

Secondly, the RI reviewed the QA surveillance reports concerning the startup program which are performed to supplement the annual QA audit. Surveillance reports reviewed included those for control and measuring and test equipment, startup testing, and temporary alterations program. The RI noted that the surveillances were performed using qualified personnel

and approved checklists. The licensee is presently developing standardized checklists for each of the the inspection areas to ensure uniform inspection of each of the areas. During the review of the surveillance reports for the temporary alterations program, the RI noted that a followup surveillance or audit had not been scheduled for deficiencies identified in temporary alteration surveillance audit OSDA-85-06-14 performed June 14, 1985. The deficiencies identified were as follows:

- . (O-85-06-45-D) - Safety evaluation checklists were not utilized by technical staff and attached to the temporary alteration forms.
- . (O-85-06-44-D) - Inadequate and incorrect request forms being utilized.
- . (O-85-06-43-D) - Temporary alteration forms stand in temporary storage for greater than 1 month.
- . (O-85-06-42-D) - Inadequate reviews of temporary alteration forms.

These QAFRs were closed out on July 29, 1985, August 2, 1985, August 1, 1985, and July 29, 1985, respectively. GSU QA Directive QAD-18, requires supplemental audits be performed when it is suspected that the quality of an item is in jeopardy due to deficiencies in the QA program and when necessary to verify implementation of required corrective action. Specifically, GSU QA Instruction QAI-2.3, requires that surveillances be scheduled and performed for areas of increased activity, concerns noted in documents reviewed, and previous surveillances requiring followup action on identified adverse trends. The significance of failing to schedule a supplemental audit or surveillance to ensure corrective actions were adequately implemented is illustrated by the NRC violation on administrative controls with temporary alterations which was identified in NRC Inspection Report 50-458/86-02. Subsequent to the identification of this violation, the licensee conducted a complete review of the temporary alterations program. The results revealed that there were similar administrative problems with the temporary alterations program as identified in the June 1985 surveillance. This failure to schedule a followup surveillance/audit as required by procedures to ensure adequate corrective actions were implemented was identified by the RI as an apparent violation. (458/8604-02)

The RI also discussed the QA program with onsite QA personnel to determine what was their understanding of their basic responsibilities as applied to the startup test program. All personnel interviewed were cognizant of their responsibilities as defined by GSU's QADs, QAIs, and the Startup Manual.

5. Startup Test Observation

The SRI observed collection of data for performance of Startup Test 1-ST-19, "Core Performance," during this inspection period. The

purpose of 1-ST-19 is to evaluate the core thermal power and flow and to evaluate whether the following core performance parameters are within technical specification limits:

- . Maximum linear heat generation rate (MLHGR)
- . Minimum critical power ratio (MCPR)
- . Maximum average planar linear heat generation rate (MAPLHGR)

This test is repeated at each test condition during the startup test program.

Data was collected and entered in the process computer on January 24, 1986, at a reactor power of 18-20% (core thermal power). The process computer verification was completed and a "P1" process computer printout was obtained for data input to procedure 1-ST-19 for Test Condition TC-1. A preliminary review by the SRI of 1-ST-19 Test Condition TC-1 data revealed that core thermal power and core performance parameters were will within established limits.

Observation of subsequent test condition performance of 1-ST-19 and final review of test data will be completed during future NRC inspections.

No violations or deviations were identified in this area of inspection.

This item is closed.

6. IE Bulletin Review

This area of inspection was conducted to review licensee action with regards to information contained in IE Bulletin 78-14. The subject of IE Bulletin 78-14 is "Deterioration of Buna-N Components in Asco Solenoids." Action required by this bulletin included to review Buna-N material applications in control rod scram systems and to establish an initial schedule and a periodic maintenance schedule for replacement. GSU has completed the review of Buna-N material applications in the control rod drive system. The initial required material replacements have been accomplished. The periodic maintenance schedule for replacement has been established at 5-year intervals, based on environmental qualification report data.

IE Bulletin 78-14 is closed.

7. Safety System Walkdown

During this inspection period, the SRI and RI performed a walkdown of the high pressure core spray (HPCS) system to verify operability as required by the Technical Specifications for operational conditions 1, 2, and 3. The NRC inspectors verified HPCS operability by observing that

- (a) accessible valves were properly aligned and locked as appropriate;
- (b) no abnormal control room instrumentation readings or alarms were

present; (c) no leakage from major components was present; (d) the HPCS pump upper and lower bearing seal oil reservoirs were properly filled; and (e) accessible hangers and supports were intact.

No violations or deviations were identified in this area of inspection.

8. In-Office Review of Written Reports of Nonroutine Events at Power Reactor Facilities

The purpose of this portion of the inspection was to ascertain whether corrective actions discussed in the licensee's event reports appeared to be appropriate, and whether information reported satisfied reporting requirements.

The NRC inspector reviewed Licensee Event Reports 85-032 through 85-058. All reporting requirements were found to have been met, and all reports were adequate to assess the events reported. Corrective actions specified in the reports appeared to be adequate to identify the root causes and to correct these causes.

The NRC inspector noted a trend concerning failure of Riley temperature switches on the reactor water cleanup system. It was determined that the licensee had prepared maintenance work requests to correct the problem with these switches.

In addition to the in-office review, the NRC inspectors participated in an onsite review of reportable events with personnel from the Offices of Nuclear Reactor Regulation and Inspection and Enforcement. Results of this review included the determination to pursue issuance of a Information Notice concerning the torquing of limitorque operators to valves.

No violations or deviations were identified in this area of inspection.

9. Site Tours

The SRI and RI toured areas of the site during the inspection period to observe general work practices and gain knowledge of the facility.

No violations or deviations were identified in this area.

10. Exit and Inspection Interview

An exit interview was conducted on February 5, 1986, with licensee representatives (identified in paragraph 1). During this interview, the SRI reviewed the scope and findings of the inspection.