

APPENDIX

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-458/88-12

Docket: 50-458

Licensee: Gulf States Utilities Company (GSU)
P. O. Box 220
St. Francisville, Louisiana 70775

Facility Name: River Bend Station (RBS)

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

Inspection Conducted: April 1-30, 1988

Inspectors: William B. Jones 5-11-88
W. B. Jones, Resident Inspector Date
Project Section C, Division of Reactor Projects

G. L. Madsen 5/24/88
G. L. Madsen, Project Engineer Date
Project Section C, Division of Reactor Projects

Approved: E. J. Holler 5/24/88
E. J. Holler, Chief, Project Section C Date
Division of Reactor Projects

Inspection Summary

Inspection Conducted April 1-30, 1988

Areas Inspected: Routine, unannounced inspection of licensee action on previous inspection findings, licensee event reports, 10 CFR Part 21 Reports, surveillance test observation, maintenance observation, and operational safety verification.

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

DETAILS

1. Persons Contacted

- D. L. Andrews, Director, Nuclear Training
- W. J. Beck, Supervisor, Reactor Engineering
- J. E. Booker, Manager, Oversight
- *J. G. Cadwallader, Supervisor, Emergency Planning
- *E. M. Cargill, Director, Radiation Programs
- *J. W. Cook, Lead Environmental Analyst, Nuclear Licensing
- T. C. Crouse, Manager, Quality Assurance (QA)
- *W. L. Curran, Site Representative, Cajun
- *J. C. Deddens, Senior Vice President, River Bend Nuclear Group
- D. R. Derbonne, Assistant Plant Manager, Maintenance
- R. G. Easlick, Supervisor, Radwaste
- *L. A. England, Director, Nuclear Licensing
- A. O. Fredieu, Supervisor, Operations
- P. D. Graham, Assistant Plant Manager, Operations
- *J. R. Hamilton, Director, Design Engineering
- W. C. Hardy, Supervisor, Radiation Protection
- *G. K. Henry, Director, Quality Operations
- *K. C. Hodges, Supervisor, Chemistry
- *L. G. Johnson, Technical Operations Manager, Cajun
- G. R. Kimmell, Director, Quality Services
- R. J. King, Supervisor, Nuclear Licensing
- A. D. Kowalczyk, Director, Oversight
- *A. J. Kugler, Acting Director, Field Engineering
- I. M. Malik, Supervisor, Quality Systems
- *V. J. Normand, Supervisor, Administrative Services
- *W. H. Odell, Manager, Administration
- *T. F. Plunkett, Plant Manager
- M. F. Sankovich, Manager, Engineering
- *K. E. Suhrke, Manager, Project Management
- R. G. West, Supervisor, General Maintenance

NRC

- *G. L. Madsen, Project Engineer, Project Section C, Division of Reactor Projects

The NRC inspectors also interviewed additional licensee personnel during the inspection period.

*Denotes those persons that attended the exit interview conducted on May 3, 1988.

2. Licensee Action on Previous Inspection Findings

(Closed) Open Item (458/8720-02): Backlog of training management reports (TMR) and training material discrepancy reports (TMCR) for review of events and inclusion in training material, respectively.

The licensee has reviewed all the TMRs up to 1988 and initiated TMCRs for those items which may need to be added to the existing training materials. During the review of TMR 86-0001 on fire protection, it was noted that the subject matter had not been appropriately addressed for applicability to the licensed operator requalification training program. The TMR response indicated that fire protection is addressed in the fire brigade training program, however, the subject of the event concerned the effect the deluge system may have on plant equipment if it actuates. This apparent inappropriate response was discussed with licensee management and a review of the TMR is being performed.

This item is closed.

3. Licensee Event Report Followup

The following licensee event reports (LERs) were closed on the basis of the NRC inspector's review of licensee documentation and discussions with personnel:

- 86-024 ESF Actuation Due to an Electrical Protection Assembly (EPA) Breaker Failure - All EPA logic cards were replaced with cards of the same design but containing hand selected components. Two additional spurious EPA breaker trips were reported for the River Bend Station in LER 87-033 indicating that the previous corrective action was not entirely effective. Therefore, investigations are continuing with General Electric. The results of this investigation will be provided in the followup of LER 87-033.
- 86-047 Trip of EJS*SWG2A Breaker Due to a Faulty Output Transistor - The licensee replaced the output transistors in all the affected ITE 50D relays. During this replacement, it was determined that ITE 50H relays could be susceptible to a similar failure. Therefore, the transistors were replaced in nine ITE 50H relays.
- 86-054 Failure to Declare HPCS Inoperable - Human factor mimics were installed on the nuclear steam supply system panels to provide a visual relationship between the master trip units and their slaves. Licensed operator training on Rosemont trip units and LER 86-054 was complete on April 10, 1987.
- 86-067 RCIC Isolation on Apparent High Steam Flow - This anomaly was first noted in November 1985. At that time, it was determined to be caused by a water column forming inside the

sensing line during operation of the reactor core isolation cooling (RCIC) system. As an interim measure, the instrument setpoints were lowered. An instrument piping modification was performed in October 1986 and the setpoints were returned to their normal values. As an interim action for LER 85-067, the licensee again lowered the instrument setpoints. During the 1987 refueling outage, the sensing line routing was altered to correct the water buildup problem.

- 86-068 RCIC Isolation Due to a Failed Pressure Transmitter - The transmitter was replaced. The failed transmitter was returned to the manufacturer for a failure analysis. The vendor found a broken seal between the sensor and the electronic head. Field engineering and the vendor agreed that moisture in the electronics would cause the reported condition. The licensee reviewed the plant maintenance and surveillance procedures to assure agreement with the vendor recommendations and to assure adequate instructions to prevent seal damage.
- 87-003 Reactor Scram Due to a Feedwater Valve Misoperation - The operator involved was counseled and all shift crews reviewed the details of the event prior to assuming a shift assignment. Additionally, the administrative controls now include the assignment of an extra senior reactor operator (SRO) to the control room during startups. Licensed operators received requalification training on feedwater level control. A design modification was implemented which provides feedwater control valve position indications on the main control panel.
- 87-004 Division I Diesel Generator Output Breaker Failure - The licensee inspected and tightened the bolts on safety-related breakers of the same type. Additionally, thread adhesive was applied to the charging motor bolts. To verify the automatic closing capability of these breakers, the licensee has issued a standing order that includes daily visual inspection of the closing spring mechanical charge indicator on all 20 safety-related 4.16 kv circuit breakers.
- 87-007 Annulus Pressure Outside of The Technical Specification Limits - The setpoints of the controllers were changed to allow operation in the automatic mode of operation and provide an alarm prior to exceeding the technical specification limit.
- 87-012 Reactor Scram on High Level Setpoint Due to Feedwater Regulating Valve Lockup - Station Operating Procedure SOP-0048 and corrective maintenance procedure CMP-1056 were revised to include placing the battery inverter in the manual bypass mode prior to trouble shooting.
- 87-013 Missed Gas Sample Due to Inadequate Communications - The volume

of the gaitronics system in the chemistry laboratory was increased. The licensee reinforced operator training to assure that appropriate sections are notified following plant transients that significantly change plant condition.

- 87-015 Scram Initiation While Transferring RPS Power Due to an IRM Spike - Performance of surveillance on August 18, 1987, revealed no abnormalities. During the startup of August 20, 1987, observation of intermediate range monitor operability revealed no noise problems. There was some indication of welding activities near the preamps that could have caused the IRM instability.
- 87-017 Mispositioned Instrument Valves Rendered Leak Detection System Inoperable - LER 87-017 involved a reactor core isolation cooling (RCIC) transmitter instrument valve and a scram discharge volume (SDV) isolation valve for a float switch being found in the closed position. General maintenance procedure GMP-0042 was revised to clarify the definition of independent verifier. The verification is in addition to and independent of the system restorer. Instrument valve lineups servicing safety-related instruments and all other instruments contained in the technical specifications were verified prior to startup.
- 87-018 Deficient Tracking of Diesel Fuel Oil Surveillance - Fuel oil analysis requirements have been added into the River Bend Station surveillance test procedure tracking program. The licensee initiated a review of chemistry procedures and procedure CSP-0100 was revised. The subject of deficient diesel oil surveillance was addressed as violation 458/8720-05 which was closed in NRC inspection report 88-08.
- 87-021 Fire Seal Not Installed in Spent Pool Cooling Pump Cubicle Wall - These seals were not included on the construction drawings. The associated penetrations were sealed and the licensee added the penetrations to the applicable design drawings.
- 87-022 Residual Heat Removal System Isolation Due to Procedural Error - STP 051-4209, STP 051-4210, and STP 051-4211 were corrected to eliminate the improper sequence steps which caused this event.
- 87-023 Radiation Monitor Heat Exchangers Plugged With Corrosion Due to Service Water Chemistry - Chemical cleaning of the lines was only partially successful. The licensee replaced the carbon steel inlet and outlet piping with stainless steel pipe. To address the impact on other safety-related components associated with the service water system, the licensee has instituted a program to improve the overall control of the service water chemistry.

- 87-024 Reactor Protection System Initiation Due to Personnel Communications - Immediate action was taken to revise open job orders that pertained to work involving more than one logic channel by adding a step requiring the performer to date and initial after ensuring applicable work was completed on one channel and the logic reset prior to starting work on another channel. The assistant plant manager for maintenance issued memorandum APM-M-88-28 which issued directions for all the plant staff regarding utilization of and modifications to the scram prevention sheet.
- 87-025 Valid Failure of Diesel Generator Due to Output Breaker Failure - The site procedures for racking circuit breakers was compared with the vendor instructions. As a result, operating procedure SOP-0046 was revised by TCN 87-1256 by adding a caution statement to emphasize the importance of proper circuit breaker racking and to provide additional clarification to the procedure.
- 87-026 Missed Fire Door Surveillance Due to Error in Test Procedure - Surveillance procedure STP-0000-3001 was revised to add the subject fire doors. Additionally, a review of all other fire door STPs against design documents was performed. This revealed that STP-0000-3401, "Semi Annual Fire Door Operability Check," also omitted the same fire doors. Procedure STP-0000-3401 was revised.
- 87-028 Residual Heat Removal System Isolation Due to High Differential Temperature - The initial corrective action included returning the RHR A pump room cooler to service, resetting the isolation signal, and returning RHR A system to service. SOP-0031, "Residual Heat Removal System," was revised to state that the respective unit cooler(s) should be in service prior to starting a RHR pump for shutdown cooling.
- 87-029 Residual Heat Removal System Isolation Due to Inadvertent Jumper Grounding - The blown fuse was replaced and RHR A was returned to service. The licensee instituted shop training on the use of proper tools and equipment (especially jumpers) when performing testing and maintenance for instrumentation and control technicians.
- 87-032 Manual Reactor Scram Due to Control Rod Drive Trip - Deficient Procedure - SOP-0002 was revised to clarify the step which was improperly performed. Other procedures used during the current startup were reviewed for similar deficiencies. The licensee responded to Violation 458/8729-01, "Failure to Follow Procedures for Control of Locked Valves," which was closed in NRC Inspection Report 458/88-08. Operations personnel were also reminded, by memorandum, of their responsibility to control evolutions and follow procedures.

4. Followup on Part 21 Reports

Part 21 reports are received by the licensee from a variety of sources, most often from the vendors and the resident inspectors. The following Part 21 reports are considered closed on the basis of the NRC inspector's review of licensee records and discussion with personnel:

- o B&B Promatec - Fire Protection Penetration Seals - dated February 17, 1986. Licensee tracking number PRC 86-003. The licensee determined that the seal configurations described in the Part 21 report are not utilized at the River Bend Station.
- o 87-001 - Brown Boveri - Battery Ground Detector Relays - dated November 7, 1986. The licensee identified ten 125V DC ground detectors with ITE 27B relays and that the recommended interim actions had been previously implemented. MR 87-0294 was initiated for implementation of permanent corrective action which consists of the recommended replacement of two resistors of each circuit board. (Licensing track No. PRC 86-28)
- o 87-012 - Atwood Morrill Company - Main Steam Isolation Valve Return Springs - dated June 13, 1986. The licensee inspected the MSIV return springs and no cracking was identified. Testing of the MSIV revealed no abnormal conditions. (PRC 86-13)
- o 87-014 - Transamerica Delaval - Lube Oil Sump Tank Foot Valve Liner - dated March 10, 1986. Subsequent evaluations by Transamerica Delaval revealed that the River Bend Station was not subject to the potential problem. River Bend has relief valves in the piping to protect the system from overpressurization. (PRC 86-06)
- o 88-003 - Limitorque Corporation - Defective Wire Lugs on Valve Motor Operators - All Limitorque SMB 4 Valves were inspected. Five of ten had oversized wire lugs. GSU reported this Part 21 reporting matter to the NRC. The licensee replaced the defective wire lugs and revised their receipt inspections for limitorque operators. (PRC 87-66)

No violations or deviations were identified on this area of the inspection.

5. Surveillance Test Observation

During this inspection period, the resident inspector observed the performance of Surveillance Test Procedure STP-05-4247, "ECCS Reactor Vessel Pressure Low/SRV Actuation Instrumentation Monthly CHFUNCT, 18 Month CHCAL, 18 Month LSFT (B21-N068A, B21-N668A, B21-N669A, B21-N670A, B21-N617A, B21-N618A, B21-N697A, B21-N699A)," and STP-051-4505, "RPS/RHR Reactor Vessel Level-Low, Level 3, High, Level 8, Monthly CHFUNCT, (B21-N080A, B21-N680A, B21-N683A)."

- o STP-051-4247: This surveillance test procedure was performed on April 19, 1988, to verify operability of the reactor vessel low pressure - low pressure core spray (LPCS)/low pressure coolant inspections (LPCI) injection valve permission and the relief valve/low-low set function pressure actuation instrumentation. These monthly channel functional test requirements are established in the River Bend Station Technical Specification Section 4.3.3.1, Table 4.3.3.1.A.1.d and in Sections 4.4.2.1.2.a and 4.4.2.2.. Prior to beginning this STP, the instrumentation and control (I&C) technicians obtain permission from the control operating foreman (COF) to perform the surveillance. The maintenance and test equipment was verified to have been calibrated within the required time period. The required jumpers to prevent inadvertent safety relief actuation were installed and controlled in accordance with General Maintenance Procedure GMP-G42, "Circuit Testing and Lifted Leads and Jumpers." All as-left values were within the specified setpoint range.

- o STP-051-4505: This surveillance test procedure was performed on April 30, 1988, to verify operability of the reactor protection system (RPS)/residual heat removal (RHR), reactor vessel level 3 and level 8 instrumentation. This monthly channel functional test requirement is specified in the River Bend Station Technical Specifications Sections 4.3.1.1, 4.3.2.1, Tables 4.3.1.1-1.4.5 and 4.3.2.1-1.6.c. The I&C technicians received permission from the COF prior to beginning the STP. The at-the-controls (ATC) was notified prior to the I&C technicians inserting the RPS half-scam as required by the procedure. The ATC operator was immediately notified when the half-scam could be reset. The licensee determined that all the acceptance criteria had been met and the test results were properly reviewed by the COF.

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

6. Maintenance Observation

During this inspection period, the resident inspector observed corrective maintenance activities for the repair of narrow range level instrument 1B21*N680D which failed the channel check on April 19, 1988, and again on April 27, 1988. Prompt maintenance work orders (PMWOs) R056151 and R056173 were initiated, respectively, to evaluate and correct the indicated level deviation on the "D" channel.

- o PMWO-R056151: The narrow range level instrument 1B21-N680D was noted to have deviated from the other three channels by nine inches during the performance of Surveillance Test Procedure STP-000-0001, "Daily Operating Log." The channel was placed in the trip condition within one hour as required by the River Bend Station Technical Specifications. Calibration of the level transmitter 1B21-LTN080D was checked and found to be acceptable. The "D" channel reference leg was then backfilled in accordance with Maintenance Corrective

Procedure MCP-4191, "Reactor Vessel Reference, Log 1B21-TKD004D Isolation, Filling, and Purge." This restored the level indication to within the acceptance band for the narrow range level instrument. The instrument was declared operable following successful completion of STP-051-4208, "RPS/RHR Reactor Vessel Level-Low Level 3; High Level 8, Monthly CHFUNCT, 18 Month LSFT (B21-N080D, B21-N680D, B21-N683D)."

- o PMWO-R056173: The narrow range level instrument 1B21-N680D again was noted to have deviated from the other three channels by approximately nine inches during the performance of STP-000-0001. The licensee conducted a complete walkdown of the "D" level reference leg and identified a root valve with a small packing leak. The licensee was able to stop the leak by tightening the packing. The reference leg was backfilled in accordance with MCP-4191 and the channel returned to operable status following successful completion of STP-000-0001. All required Technical Specification actions were initiated during the performance of this PMWO within the required time periods.

No violations or deviations were identified in this inspection area.

7. Operational Safety Verification

The resident inspector observed operational activities throughout the inspection period and closely monitored operational events. Control room activities and conduct were generally observed to be well controlled. Proper control room staffing was maintained and access to the control room operational areas was controlled. Select shift turnover meetings were observed and it was found that information concerning plant status was being covered in each of these meetings. System walkdowns of the "A" and "C" low pressure coolant injection and the standby liquid control systems were conducted to verify major flow path alignments, proper breaker alignment and control board status for operability. Plant tours were conducted and overall plant cleanliness was good.

General radiation protection practices were observed and no problems were noted. Personnel exiting the radiation control area were observed and radiation monitors were being properly utilized to check for contamination. Contaminated areas are being well controlled and the total area that is considered contaminated is being reduced.

Security activities at the primary access point were observed on several occasions. In each case, security officers verified that each individual entering the protected area (PA) had adequately cleared the security detection aides and had access to the protected area. Packages to be brought into the PA were also cleared prior to being released.

The resident inspector also reviewed licensee actions on operational events and potential problems. The results of reviews of selected items are described below:

- a. Inadvertent Activation of Emergency Sirens: At 11:15 am CDT on April 6, 1988, the emergency sirens activated in West Feliciana Parish. The siren activation was caused by a personnel error during electro-magnetic interference (EMI) testing of the system at the West Feliciana Parish Emergency Operations Center (WFEOC). A siren "All Call" was initiated when a radio frequency (RF) choke came loose and grounded control leads on an adjacent terminal board. The Louisiana Office of Emergency Preparedness was notified within one minute of the event and a message was broadcast over the emergency broadcast system at 11:18 am CDT stating that the siren activation had been inadvertent.

On April 21, 1988, the resident inspector met with licensee emergency preparedness personnel to review corrective actions that have been and that are to be taken to prevent future inadvertent activation of the emergency sirens.

(1) The following corrective actions have been completed:

- o formalize Emergency Preparedness Procedures EPP-2-701, "Prompt Notification System Parish EOC Control Disable Procedure," and EPP-2-702, "Prompt Notification System Individual Siren Disable Procedure," to require sign offs as each step is performed;
- o require arming the sirens at the River Bend Station Emergency Operating Facility (EOF) before they can be actuated at the different parishes' EOCs;
- o physically separated the base station and microprocessor at WFEOC to reduce the effects of EMI; and
- o improved grounding and RF chokes at the WFEOC.

(2) The following corrective actions are expected to be completed by August 1988:

- o improve shielding and grounding at the remaining parishes' EOCs; and
- o modify the 92 sirens to reduce their susceptibility to individual activations because of lightning strikes nearby.

(3) The following corrective actions are expected to be completed by October 1988:

- o install an upgraded computer with the hardware capability to provide a fully redundant siren control and monitoring system; and
- o complete testing of the associated software which will provide for "safe" failure modes to prevent inadvertent siren activation.

It should be noted that the monthly siren test will still be conducted on the first Wednesday of each month at 10 am central time. The licensee's actions to prevent future inadvertent siren activations will be an open item pending review of the completed corrective actions by the NRC inspector. (458/8812-01)

- b. Pressure Regulator Induced Transient: On April 29, 1988, at approximately 1:30 pm (CDT), with the plant at 100 percent power, the Pressure Regulating System (PR) automatically switched from process circuitry Channel A to Channel B. The switch was initiated by a momentary decrease of the steam pressure reference signal. This resulted in a decreased error signal when compared to the pressure set point, causing the main turbine throttle valves to begin closing. The steam reference signal was completely restored within one second, however, the processing circuitry sensed the decrease in the steam flow signal from Channel A and initiated the automatic switch to Channel B. The steam pressure reference signal is common to both channels. The reactor responded as expected with a maximum neutron flux reaching 116 percent caused by the increase in moderator inventory in the reactor core as voids collapsed with the increase in reactor vessel pressure. Calculated maximum core thermal power was 104 percent for less than one second. The licensee reviewed the reactor protection system (RPS) response to the transient and concluded that no RPS activation should have occurred. The plant response was also determined to be within the boundaries identified in Chapter 15 of the Updated Safety Analysis Report for a pressure regulator failure. The licensee is examining the potential causes for the sudden loss, then restoration of the steam pressure reference signal. General Electric electro-hydraulic control specialist personnel have been contacted to help in the licensee's review of this event.

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

8. Exit Interview

An exit interview was conducted with licensee representatives (identified in paragraph 1). During this interview, the resident inspector reviewed the scope and findings of the inspection.