

U. S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
REGION IV

Report: 50-458/81-06

Docket: 50-458

Category A2

Licensee: Gulf States Utilities  
Post Office Box 2951  
Beaumont, Texas 77704

Facility Name: River Bend, Unit No. 1

Inspection at: River Bend Site

Inspection conducted: April and May 1981

Inspector:

*A. B. Beach*  
for A. B. Beach, Resident Reactor Inspector  
Projects Section 3

*6/5/81*  
Date

Approved:

*W. A. Crossman*  
for W. A. Crossman, Chief, Projects Section 3

*6/5/81*  
Date

Inspection Summary:

Inspection During April and May 1981 (Report No. 50-458/81-06)

Areas Inspected: Routine, announced inspection by the Resident Inspector (RRI) including follow up to previous inspection findings; follow up to licensee identified items; licensee's response to Bulletins; activities with regard to the reactor pressure vessel; site development work; and concrete placement activities. The inspection involved 140 hours by one NRC inspector.

Results: Of the six major areas inspected, no violations or deviations were identified in five areas, one violation was identified with regard to site development work (violation - inadequate acceptance criteria for in-place density testing of backfill, paragraph 7).

DETAILS1. Persons ContactedPrincipal Licensee Employees

- \*T. C. Crouse, Director, Quality Assurance
- \*P. D. Graham, Supervisor, Quality Assurance
- \*R. B. Stafford, Supervisor, Quality Assurance
- K. C. Hodges, QA Engineer
- R. R. Daggart, QA Engineer
- C. L. Ballard, QA Engineer
- E. A. Troncelliti, QA Engineer
- \*J. R. Dunkelberg, Superintendent, Site Construction
- J. W. Leavins, Director, Site Engineering

Stone and Webster Personnel

- \*C. D. Lundin, Manager, Project Quality Assurance
- \*R. L. Spence, Superintendent, Field Quality Control (FQC)
- G. M. Byrnes, Assistant Superintendent, FQC
- \*J. D. Davis, Assistant Superintendent, FQC
- \*W. I. Clifford, Resident Manager
- E. A. Sweeny, Superintendent of Engineering
- P. D. Hanks, General Superintendent, Construction

The RRI also interviewed other licensee and other Stone and Webster personnel during this inspection period.

\*Denotes those persons with whom the RRI held on-site management meetings during the inspection period.

2. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item (50-458/78-01): Vendor manuals for maintenance slow in arriving. The current specification for storage and maintenance, 229.170 "Storage and Maintenance for Permanent Plant Equipment" now incorporates the appropriate vendor manual requirements within its text. Thus, conflicts between vendor manual requirements and site specification requirements should be minimized. This item is considered closed.

(Closed) Unresolved Item (50-458/79-05): Review of Subvendors. The licensee in a letter dated April 3, 1981 (RBG-10057) requested that the requirement for increased frequency of the quality assurance review of subvendors by the contractor be relieved based on the low number of deficiencies identified in the subvendor programs. This increased frequency was the result of a commitment made in response to an NRC Immediate Action Letter dated November 6, 1979 and a supplement to this letter dated December 13, 1979.

The licensee, in the request, states that additional requirements which have been incorporated into the subsupplier review program will provide and have provided the necessary quality assurance to evaluate the sub-vendors. The RRI reviewed subvendor evaluations for Graver Energy Systems (Letter RBS-T-5836), Peele Company (Letter RBS-T-5823), Baily Meter (Letter RBS-T-5823), and Posi Seal International (Letter RBS-T-5823). Stone and Webster letter RBS-T-5477, dated August 18, 1980, "S&W Procurement Quality Control (PQC) Audits/Schedules" was also reviewed. The evaluations reviewed supported the licensee's request. This item is considered closed.

### 3. Licensee Identified Construction Deficiency Reports

(Closed) Byron Jackson Pump Seal Leakage. A deficiency involving a portion of the pump seal cooling water piping not tested to the pressure required by the ASME Specifications for five ECCS pumps as manufactured by Byron Jackson for River Bend was reported to the NRC by GSU in a letter dated December 2, 1977 (RBG-4757). A December 30, 1977 letter (RBG-4813) from GSU to the NRC concluded that, as a result of their evaluation, this deficiency was not reportable under the requirements of 10 CFR 50.55(e). Furthermore, a March 13, 1978 letter from Byron Jackson to the NRC stated that the evaluation revealed that the deficiency was not reportable under the requirements of 10 CFR 21 as it does not meet the criteria for "Determination of Creation of a Substantial Safety Hazard." This letter further stated that all subject piping will be hydrostatically tested to the pressure required by the appropriate ASME specification. This item is considered closed.

(Closed) Second Pop Phenomenon. In a November 4, 1977 letter (RBG-4688), GSU notified the NRC Region IV Office of a 10 CFR 50.55(e) reportable deficiency regarding the safety relief valve second pop phenomenon. It was determined that more than one valve will reactuate after the initial pressure transient from a reactor isolation instead of a single valve predicted for Mark III containment design. General Electric has likewise reported this design deficiency in accordance with the requirements of 10 CFR 21. A letter explaining that the final analysis of this reportable deficiency will be included in the River Bend safety analysis report has been sent to the Region IV office (RBG-10.269). GE's generic resolution will incorporate a modification to the SRV control system logic as well.

(Open) Miscellaneous Steel Provided by CIVES Steel. The NRC Region IV Office was notified on December 6, 1979 of a potentially reportable deficiency with regard to miscellaneous steel provided by CIVES Steel Company. The problem involved CIVES procurement of steel from suppliers who did not meet applicable quality assurance requirements. In addition, a small amount of the questionable material was inadvertently installed.

A review of Stone and Webster Specification 210.320, Revision 1, "Miscellaneous Steel and Embedments, Category I," indicated four nonconformance and disposition (N&D) reports were initiated indicating low yield strength readings or questionable material for plates from one of the suppliers for CIVES steel.

N&D 9209 documents that a test specimen obtained from the same heat as that used on the mat anchor ring exhibited a yield strength of 48.3 ksi versus the specified 50 ksi of ASTM 588-74. These were confirmatory tests. The manufacturer's test indicated 52 ksi and 52.5 ksi. N&D 9220 documents a 47.3 ksi for this same test performed by the independent testing agency. In addition, the element nickel composition test performed by the agency conflicted with the manufacturer's test results.

N&D 9225 and N&D V009 document other suspect material from this same manufacturer and supplier to CIVES steel.

These conditions were evaluated by the licensee and found not to constitute a reportable deficiency under the requirements of 10 CFR 50.55(e).

The RRI, however, requires assurance that the design calculations for the mat anchor ring reflect that the actual stresses are less than the maximum allowed and that the appropriate design criteria as defined in the safety analysis report has not been violated by the low yield strength readings obtained during tensile testing. Additionally, the RRI requires assurance that none of the suspect material performs an actual structural function and has little or no structural significance.

This item will remain open.

(Closed) Incorrect input to the finite element model used to calculate the amplified floor response spectra of the Reactor Building structures due to the hydrodynamic forces in the suppression pool. This subject was reported to the Region IV Office as a potentially reportable construction deficiency (10 CFR 50.55(e)) on August 14, 1980. A Stone and Webster letter dated March 17, 1980 (RBS-4794) to the licensee revealed that the input used to generate the amplified response spectra for the safety relief valve loading resulted from misalignment of data on one computer card causing incorrect material properties to be used in the computer analysis. Stone and Webster concluded that by correcting the discrepancy of the input in the calculations, there was no adverse impact on the design of the structures and had this problem remained uncorrected, it would not have affected the safety of the plant. A letter from the licensee to the Region IV Office dated April 1, 1981 (RBG-10.034) concluded that this item is not a reportable deficiency under 10 CFR 50.55(e). This item is considered closed.

4. Licensee Actions In Response to IE Bulletins

The RRI reviewed the licensee's April 22, 1981 letter (RBG-10.167) in response to IE Bulletin 80-21, "Valve Yokes Supplied by Malcolm Foundry Company, Inc." which stated their investigation was not complete. This Bulletin was discussed in NRC Inspection Report 50-458/81-04.

Responses to Bulletins from the year 1977 to September 1980 were reviewed. Timeliness of the licensee's response was in accordance with established NRC requirements.

5. Site Tour

The RRI toured the safety-related plant areas several times weekly during this inspection period to observe the progress of construction and the general practices involved. One specific area reviewed by the RRI during these tours involved in-place storage of piping.

The RRI noted several unsatisfactory conditions in the Diesel Generator Building, Control Building, and the Auxiliary Building relative to in-place storage of safety-related piping. Most of these conditions were documented on Inspection Reports IR1000167 and IR10000154. However, corrective action had not yet been completed. The RRI discussed these conditions with licensee and contractor personnel and explained the importance of timely corrective action. These conditions were first documented at the end of March 1981 by S&W FQC and additional documentation was provided on a copy of an interoffice memorandum indicating similar conditions around the end of April 1981.

No violations or deviations were identified.

6. Reactor Pressure Vessel

The Reactor Pressure Vessel arrived by a barge shipment to River Bend during this reporting period. Activities with regard to RPV head removal and storage were observed. The RPV was safely unloaded May 13, 1981.

No violations or deviations were identified.

7. Site Development Work

The RRI initiated this portion of the inspection with the review of the Stone and Webster Specification 210.100, Revision 2, "Site Development Work." The applicable portions of the Safety Analysis Report (SAR) were also reviewed to ensure that the appropriate Category I activities were being performed in accordance with the licensee's commitments.

Specification 210.100 requires that tests for in-place density and moisture content for Class I granular fill materials be performed in accordance with ASTM D2167-66 (Washington Densometer). The test for moisture content, however, usually is determined in accordance with the "Quick Dry Method" as outlined under "Modifications to Test Procedure" within the referenced specification.

The RRI reviewed approximately ten in-place density tests performed for Category I fill in various areas for the year 1979. Ten more in-place densities were reviewed for the year 1980. Approximately thirty tests for in-place density were reviewed for the first quarter of 1981. All test reports reviewed were found to be in accordance with the applicable specification requirements. The RRI noted that the testing frequency usually exceeded the established minimum frequency requirement of the specification.

A sieve analysis in accordance with ASTM C136-71 (except for Section 5.3 as modified in the specification) is required to be performed both at the stockpile source and in-place at the fill. Maximum/minimum density tests are to be performed in accordance with ASTM D2049-69 using an electromagnetic vibratory table with material obtained from the vicinity of every fifth in-place density test made on Class I fill.

The RRI reviewed ten sieve analyses and ten maximum/minimum density tests performed during the first quarter of 1981 and found them to be in accordance with the soils testing requirements of Specification 210.100, Revision 2. Testing frequencies met the specified requirements.

Specification 210.100 requires that a reference curve correlating relative density to in-place density be established. The curve is to be updated on the basis of current maximum/minimum density test results. The acceptable criteria will be a minimum acceptable in-place unit weight derived for compaction control from the maximum/minimum density tests.

In addition, work shall be performed such that a high percentage of the fill is placed in excess of seventy percent relative density. Occasional test results between sixty and seventy percent may be accepted on a case-by-case basis.

A review of the minimum acceptable unit weights as established on the test reports reviewed indicated that the highest value of density corresponding to sixty percent relative density was chosen as the minimum acceptable in-place density. This is contrary to the sixty percent minimum acceptable unit weight procedure as defined in the specification and the SAR. This is considered to be a violation to



Criterion XI of Appendix B to 10 CFR 50, i.e., specifically, inappropriate qualitative acceptance limits for the minimum unit weight for compaction control contrary to specification requirements. The RRI additionally requested that the licensee, in response to this violation, address the affects of this calculation on the average relative density as defined in the SAR.

In addition, the statement that a "High Percentage" of the fill is to be placed in excess of seventy percent relative density, represents a qualitative rather than quantitative value and as such does not satisfy the requirement that test procedures incorporate acceptance limits.

The RRI also reviewed several inspection reports and the associated attributes relative to soils testing. Qualifications of soils testing inspection personnel were found to be in accordance with the May 1981 FQC Matrix, which defines those tasks which an inspector is qualified or may perform.

Technical manuals for compaction equipment were reviewed. The on-going program for settlement monitoring as well as the location of extensometers and settlement markers were discussed with the geotechnical engineers. These manuals and programs were found to be in accordance with the specification requirements.

## 8. Concrete Placement Activities

### A. Reinforcing Steel

The requirements for the reinforcing steel used in Category I concrete placements at River Bend are established in Stone and Webster Specification 210.341, Revision 2, "Specification for Reinforcing Steel." Eight receipt inspection packages and their associated documentation for certification were reviewed as follows:

<u>Material Receiving Report</u>	<u>Inspection Report</u>	<u>Heat Numbers</u>
79-1237	S9100016	29-1562
		29-1563
		29-1588
		29-1589
		29-1590
		29-1591

<u>Material Receiving Report</u>	<u>Inspection Report</u>	<u>Heat Numbers</u>
79-1237	S9100019	29-1554 29-1555 29-1563 29-1564 29-1565 29-1573 29-1574 29-1575 29-1576 29-1577
79-1561	S9100049	29-1581 29-1577 29-1583
79-5894	S9100515	29-1712 29-1714
80-2330	S0100271	T0-2151 T0-2152 T0-2153 T0-2154
80-11328	S0101359	A219K262
80-11431	S0101359	B217K189
80-11329	S0101359	C218K258

These packages included documentation for reinforcing steel used in the reactor base mat, the Control Building, and the shield wall. All documentation reviewed met the requirements of ASTM A615 and Specification 210.341, Revision 2. Chemical requirements



and testing requirements were within the applicable specification limits as well as NRC Regulatory Guide 1.15, Revision 1, "Testing of Reinforcing Bars for Category I Concrete Structures."

The RRI reviewed Engineering and Design Coordination Report P-1283, which requests that the specification be revised to allow the use of Grade 60 material on a one bar-to-one bar basis in place of Grade 40 material or Grade 50 material. The RRI, however, needs additional information to ensure that the concrete will not crush prior to the yielding of the steel in a seismic event. Until this information is obtained this item is considered to be unresolved.

#### B. Concrete Placement Activities

The following concrete placements were reviewed by the RRI in this inspection period:

<u>PLACEMENT</u>	<u>POUR CARD</u>
PT-5-W92D4	5825
PT-5-W91E3	5557
PT-5-W91D3	5829
AB-7-M95B5	5642
CB-16-W131A2	5682
CB-17-S135A3	5749
CB-17-S13501	5752
CB-16-W131	5766

Work was found to be performed in accordance with Specification 210.370, Revision 6, "Placing Concrete and Reinforcing Steel." However, the RRI needs additional information indicating that concrete was placed and consolidated before initial set.

Specification 210.370, Revision 6, requires that concrete shall be placed and consolidated before initial set has occurred and before

it has contained its water content for more than 90 minutes. Agitation of the concrete mix in the truck mixer shall not exceed 300 revolutions.

However, these limitations may be waived in accordance with ASTM C94 provided the concrete can be placed without the addition of water to the batch. Based on observation of the times at which cylinders were made and time of placement versus times batched, the RRI could not determine if adequate controls were being maintained. Thus, this item is considered to be unresolved.

9. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations or deviations. Two such items are discussed in paragraph 8 and will be entitled "Substitution of Grade 60 Reinforcing Steel for Grades 40 and 50" and "Time Limits for Category I Concrete Placements," respectively, in future discussions.

10. Management Interviews

The RRI met with one or more of the persons identified in paragraph 1 at various times during the inspection period. An exit meeting was held on May 13, 1981 to discuss various findings.