

APPENDIX B

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

(This report contains investigative information in paragraph 9)

Report: 50-458/81-10

Docket: 50-458

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

Facility Name: River Bend, Unit 1

Inspection at: River Bend Site

Inspection Conducted: September 1981

Inspector: A. B. Beach 10/6/81
A. B. Beach, Resident Reactor Inspector
Projects Section 3 Date

Inspector: C. E. Johnson 10/8/81
C. E. Johnson, Reactor Inspector, Engineer-
ing and Material Section (paragraphs 4, 5 & 9) Date

Approved: W. A. Crossman 10/24/81
W. A. Crossman, Chief Projects Section Date

Approved: R. E. Hall 10/8/81
R. E. Hall, Acting Chief, Engineering and
Material Section Date

Inspection Summary:

Inspection During September 1981 (Report No. 50-458/81-10)

Areas Inspected: Routine, announced inspection by the Senior Resident Inspector (SRI) including follow-up to previous inspection findings; follow-up to licensee identified items; concrete placement activities; welding of safety-related piping; safety-related piping support and restraint installation; and Class IE electric equipment qualification. The inspection involved 115 hours by two NRC inspectors. Sixteen inspector hours were involved in the investigation effort as a result of the allegation.

Results: Of the five major areas inspected, no violations were identified in two areas. One deviation was identified involving reportability requirements in accordance with 10 CFR 50.55(e)(2) (Deviation - Failure to Promptly Report A Potential Deficiency in Accordance with Previous Licensee Commitments- paragraph 3), and one deviation was identified involving concreting placement activities (Deviation - Deviation from Cleaning Practices for Placement of Concrete Required By ACI 301 - paragraph 5).

1. Persons Contacted

Principal Licensee Employees

*P. D. Graham, Director, Quality Assurance
 C. L. Ballard, Supervisor, Quality Assurance
 R. B. Stafford, Supervisor, Quality Assurance
 G. V. King, Supervisor, Quality Assurance
 H. G. Domschke, QA Engineer
 K. C. Hodges, QA Engineer
 I. M. Malik, QA Engineer
 R. E. Oprea, QA Engineer
 W. S. Stuart, QA Engineer
 E. A. Troncelleti, QA Engineer
 T. C. Crouse, Superintendent, Site Construction
 M. A. Walton, 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
 R. L. Whitley, Assistant Superintendent, FQC
 W. I. Clifford, Resident Manager
 E. A. Sweeny, Superintendent of Site Engineering
 P. D. Hanks, General Superintendent, Construction
 D. P. Barry, Superintendent, Construction Services

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

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

2. Licensee Action on Previous Inspection Findings

(Open) Unresolved Item (50-458/81-06): Substitution of Grade 60 Reinforcing Steel for Grades 40 and 50. The River Bend Final Safety Analysis Report (FSAR) states that ACI 318-1971, "American Concrete Institute Building Code Requirements for Reinforced Concrete," (including 1974 supplement), is used in the structural design of concrete and steel components of Seismic Category I structures.

On August 27, 1980, an Engineering and Design Coordination Report, P-1283, was written to revise the specification requirements to allow the use of Grade 60 material on a one bar-to-bar basis in place of Grade 40 material or Grade 50 material.

On February 5, 1981, a Stone and Webster Engineering Report was issued directing that for structures designed for applicable loads in accordance with ACI Code 318 using reinforcing steel having a specified yield strength (F_y) of 40,000 psi both ASTM A 615 Grade 40 and Grade 60 satisfy the specified yield strength requirement and may be used interchangeably.

The S&W Engineering Report states, "the ACI Code is written to insure an elastic performance of the structure under design loads. Substitution of Grade 60 reinforcing on a one-to-one basis for Grade 40 does not invalidate the original design. The structure will perform in the same manner with the Grade 60 reinforcing as it would have with Grade 40 reinforcing and the stress levels in all elements are unchanged for the design loads."

ACI Code 318, Section 10.3.2 requires that for flexural members, and for members under combined flexure and axial loads, the reinforcement ratio shall not exceed .75 of the ratio which would produce balanced conditions for the section under flexure without axial load. This is to ensure that the steel will govern so that the concrete will not go into tension prior to the yielding of the steel.

A Stone and Webster letter dated August 24, 1981, states that engineering has performed a review of their calculations for Quality Assurance Category I reinforced concrete structures for compliance with the ACI 318-71 Code requirement to limit the amount of reinforcing in flexural members to 75% of the "balanced" design condition. The results indicate that 10 isolated areas exist that would require further review relative to the ACI code requirement if Grade 60 reinforcing were substituted for the specified grade of material. When this list was reviewed against the rebar fabricator's records, it was found that nine of the areas of concern had been fabricated from the specified grade of material leaving only one area to consider; a pipe tunnel roof slab. Since the pipe tunnel reinforcing had already been fabricated, but not yet constructed, the bar spacing and strength of the concrete were modified to conform to a Grade 60 design.

Future designs will include a check for a "balanced" design condition using the specified strength of reinforcing as well as a Grade 60 substitution. Areas where a Grade 60 substitution is not allowed will be noted on the design drawing.

However, these calculations appear to have been made as a result of the concern identified by the NRC inspector regarding the substitution of the steel. The NRC inspector has been assured that loads at River Bend are such that the steel will never be in the plastic range; however, it appears that reinforcing steel was substituted without adequate consideration for the requirements of ACI 318, Section 10.3.2. Thus, since more information regarding this matter is required, this item remains open.

3. Licensee Identified Construction Deficiency Reports

On September 11, 1981, the licensee reported a "Potential Construction Deficiency" regarding ASTM A 500 Grade B material. (This matter was discussed in paragraph 8 of the IE Inspection Report 50-458/81-09).

10 CFR 50.55(e)(2) requires that the holder of a construction permit shall within 24 hours notify the appropriate Nuclear Regulatory Commission Inspection and Enforcement Regional Office of each reportable deficiency.

In accordance with the response to an infraction identified in IE Inspection Report 50-458/79-05 (Failure to Provide Timely Notification of Construction Deficiencies), the licensee committed "to inform the NRC Regional office by telephone call within 24 hours when a problem or deficiency is discovered that could possibly be a reportable deficiency but adequate information will not be available to determine the reportability within 24 hours of discovery of the problem or deficiency.

Contrary to the above, on June 26, 1981, a potential problem involving possible aging characteristics inherent to ASTM A-500, Grade B steel was identified by the licensee, but was not reported to the Region IV office as a "Potential Construction Deficiency" until September 11, 1981. This is contrary to the prompt reporting requirements established by 10 CFR 50.55(e)(2) and the commitments established in the licensee's response. This appears to deviate from the licensee's commitment to the NRC.

Reportability in accordance with 10 CFR 50.55(e)(2) will continue to be reviewed until the NRC inspector is assured reportability requirements are being satisfied.

4. Site Tour

The NRC inspectors toured the Reactor Building, the Control Building, the Auxiliary Building, and the Concrete Laboratory to observe construction in progress and to inspect housekeeping. General construction practices were observed.

5. Review of Concrete Practices

In the review of concrete practices at the River Bend Nuclear Generating Station during the period September 14-18, 1981, the NRC inspector reviewed Specifications 210.370, "Placing Concrete and Reinforcing Steel," and 210.350, "Mixing and Delivering Concrete." The NRC inspector also reviewed a directive from a licensee representative forwarded to the constructor, directing him to discontinue cleanliness requirements on "Q" decking. This potential practice could also govern Category I structures as well. There is "Q" decking in Category I structures including the Fuel Building, Diesel Generator Building, and the Auxiliary Building.

After reviewing this directive, the NRC inspector witnessed a placement on "Q" decking; however, the only placement during this inspection was in

the Turbine Building. The NRC inspector witnessed the placement only to determine what the cleanliness requirements were. After observing this placement, the NRC inspector had concern for concrete placement on "Q" decking in Category I structures. The placement observed in the Turbine Building would not meet ACI 301-72.

This directive specifies no category levels, so this potential practice could also govern Category I structures as well. This deviates from the licensee's commitments and ACI 301 cleaning practices for concrete placements.

6. Welding of Safety-Related Piping

As addressed in IE Inspection Report 81-09 (paragraph 7), the NRC inspector is reviewing licensee actions taken relative to the welding program to ensure proper action is being taken to minimize weld repairs. On September 4, 1981, the licensee issued a letter (RBG 11,132) directing, effective immediately, Stone and Webster to implement the following actions:

- a. All manual production welding of joints which are to be radiographically examined are to be suspended until items (2) and (3) are satisfied. Increased use of automatic welding machines is encouraged.
- b. Develop a training program for welders to prepare them for River Bend RT pipe welding. Included in this program shall be the practice of screening welders who will fabricate radiographic quality welds by the radiographic method.

This program is to be reviewed and approved by GSU prior to implementation, and should be in effect by September 12. The method of final qualification of welders shall be at S&W's discretion.

- c. Using the last 10 welds per welder, select those manual welders who meet the criteria for 30% weld-to-weld and/or 4% linear inches rejection rate. These welders may continue welding. All other welders and new hires will be trained in accordance with item (2). If at any time a welder does not meet the above criteria, he will be retrained. S&W should establish, based on performance, when a welder is to be terminated. A system to track individual welder performance must be developed, in order to satisfy the above criteria. This system should use existing documentation.

The licensee stated further that these actions may not necessarily resolve the welding reject rate, but a noticeable improvement should result.

No violations or deviations were identified.

7. Safety-Related Piping Support and Restraint Installation

10 CFR 50, Appendix B, Criterion VIII states, "Measures shall be established for the identification and control of materials, parts, and components,

including partially fabricated assemblies. These materials shall assure that identification of the item is maintained by heat number, part number, serial number or other appropriate means, either on the item or on records traceable to the item, as required throughout fabrication, erection, installation, and use of the item. The identification and control measures shall be designed to prevent the use of incorrect or defective material, parts, and components."

River Bend Management interprets this to mean that only those projects which purchase Category I, II, and III visually similar materials are required by 10 CFR 50, Appendix B, Criterion VIII to assure that the identification of Category I items is maintained by heat number, part number, serial number, or other appropriate means, to point of use within the plant.

The River Bend Project is currently purchasing only Category I material. A limited amount of non-category material has been purchased in the past, but a program is established to control this material. It is the licensee's interpretation that traceability of Category I Non-ASME material is required only through receipt at the site, since the Category QA Program requirements applied throughout the design and procurement process assure the adequacy of this material, and no Category II, III, or QA/NA material may be substituted.

In the future, the following policy is proposed to be established and implemented with respect to Non-ASME Category I material.

- a. Procurement of Category I material only - Procurement documents will be initialed and reviewed to assure that only Category I material is specified and the vendor is an approved S&W QA vendor. Noncategory material presently on site will be salvaged. Additionally, any data sheets that would allow purchase of non-Category I material will be revised or removed from the specification.
- b. PQA activity will be in accordance with the S&W QA Program to assure material acceptability and vendor compliance with specification requirements.
- c. Engineering will require Certified Mill Test Reports (CMTR's) and Certificates of Compliance to be sent with the shipment, and FQC will verify CMTR adequacy.
- d. Once the material has been accepted, traceability will no longer be required. If for some reason, FQC cannot accept the material (material deficiency and/or inadequate documentation) the material will be rejected and handled in accordance with the existing S&W QA Program.

The NRC inspector reviewed Stone and Webster Specification 210.371, "Installation of Drilled-In Expansion Type Concrete Anchors," which establishes anchor

bolt installation requirements at the River Bend site. Inspection requirements as well as training requirements were discussed with Field Quality Control representatives.

Discussion with licensee and contractor representatives indicated an Engineering and Design Coordination Report (E&DCR) was being processed to clarify and quantify certain procedural requirements that may lead to confusion as the installation progresses. After approval of this E&DCR, the NRC inspector will review the requirements of NRC Bulletin 79-02, Revision 2, "Base Plate Flexability Analysis" against Specification 210.371 to ensure the licensee's commitments are satisfied by the specification requirements. Until these requirements can be reviewed, this matter is considered to be unresolved.

No violations or deviations were identified.

8. Electrical Equipment Qualification

The licensee remains actively involved in IEEE 323-1974 qualification requirements. Reviews of the program, as well as reviews of the vendor's program are continuing. Regular interface meetings are being held between the licensee and his Architect-Engineer to ensure that a viable program is established.

No violations or deviations were identified.

9. Allegations

On September 3, 1981, the NRC Headquarters Duty Officer notified the NRC Region IV office of an alleged at the River Bend site. The RRI and a region based inspector interviewed the alleged at his home September 15, 1981. In general, the individual was concerned about poor practices utilized by craft supervision involving the installation of concrete expansion anchors.

a. Allegation No. 1

The alleged's first concern identified three base plates on Elevation 115 of the south wall of the Control Building where supervision had instructed workers to fill "unused" holes prior to inspection by Field Quality Control (FQC).

A review of E&DCR P-1842 by the RRI showed that these three base plates were added to accomodate additional supplemental steel. Nonconformance and Disposition Report (N&D) 1675 was written to document poor installation practices (hammer blows to anchors to fit plate) for the middle plate. The west plate had to be relocated in accordance with Unsatisfactory Inspection Report IRS 120-1629. The east plate was installed satisfactorily.

An inspection performed by FQC and documented by FQC indicated that all grouted holes were reviewed to ensure minimum edge distances were not violated. Subsequently, these grouted holes (unused) were drilled out for inspection purposes and it was found that six of the twenty were not to the full depth of the hole. The NRC inspector observed what was in general "poor workmanship", and thusly, this portion of the allegation has merit, but all nonconformances relative to procedural violations were documented.

b. Allegation No. 2

He (the alleged) was instructed to unplug his "black box," which should automatically shut off the drill when the drill hits reinforcing steel, and just have it on the scaffold to look as if it is being used.

The "black box" is included in the drilling operation to preclude possible damage to reinforcing steel. A test block was made, and four drilling operations were performed, with one man drilling into reinforcing steel contained within the block for two minutes. No damage outside of allowable specification requirements could be ascertained; thus, this indicates it to be impractical to continue drilling after hitting reinforcing steel. In addition, FQC is required to inspect all anchor holes for damage to reinforcing steel. Thus, this portion of the allegation may have merit, but it has no safety significance.

c. Allegation No. 3

Another concern identified two base plates on Elevation 115 of the north wall of the Control Building where the anchor bolt locations may violate spacing requirements. A review of Inspection Reports IRS 120-1641 and IRS 120-1642 demonstrates that bolt locations were in accordance with specification requirements. This concern cannot be substantiated.

d. Allegation No. 4

The fourth concern addressed installation of drilled-in concrete anchors at Elevation 154 south wall where concrete was chipped out to insert a base plate into the wall. The individual was concerned this plate may have been installed without FQC involvement.

A review of N&D 1450 shows FQC involvement; again, the NRC inspector observed "poor workmanship," but installation was approved by FQC and no procedural violations in accordance with the program could be ascertained that were not documented. Thus, the allegation has merit, but documentation in accordance with the program requirements appears adequate.

Although some of the above concerns have merit, the procedural violations had been previously identified by the licensee and documented in accordance with procedural requirements. The installation procedure must be reviewed (reference paragraph 7) to ensure controls are adequate to preclude general practices of poor workmanship.

10. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. One such item has been discussed within this report. It will be entitled as follows in future discussions.

Paragraph 7, "Specification Requirements Regarding Installation of Drilled-In Expansion Anchors"

11. 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 September 30, 1981, with Mr. Phillip Graham to discuss various findings and observations made during this inspection period.