June 21, 1985

MEMORANDUM FOR: R. P. Denise, Director
Division of Reactor Safety and Projects, Region IV

FROM: J. G. Partlow, Director
Division of Inspection Programs
Office of Inspection and Enforcement

SUBJECT: ASSESSMENT OF IMPLEMENTATION OF THE NRC INSPECTION PROGRAM BY REGION IV AT RIVER BEND STATION

The Office of Inspection and Enforcement described to the Commission in SECY-82-150A the assessment of the implementation of the NRC inspection program in conjunction with Construction Appraisal Team (CAT) inspections. Accordingly, we have examined Region IV's implementation of the construction inspection program based on the July-August 1984 CAT inspection at River Bend. The results of the inspection were documented in Inspection Report 50-458/84-23, dated October 19, 1984. The enclosure to this memorandum documents the results of our assessment of the construction inspection program implementation.

Original signed by:
James G. Partlow

J. G. Partlow, Director
Division of Inspection Programs
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Enclosure: Assessment

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REGIONAL CONSTRUCTION INSPECTION PROGRAM
ASSESSMENT - RIVER BEND (RIV)

I. SCOPE

The Construction Appraisal Team (CAT) of the Division of Inspection Programs conducted an announced construction inspection at the River Bend Station of the Gulf States Utilities Company during the period of July 30th - August 10th and August 20th - August 31st, 1984. While the predominant effort of the inspection team was devoted to hardware inspection, the team also evaluated the control of design changes and corrective actions. In addition, a detailed examination was made of project construction controls.

The purpose of this assessment is to evaluate the implementation by Region IV of the Construction Inspection Program. A further purpose of the assessment is to make recommendations, if necessary, to improve the inspection program so that a comprehensive review of the licensee's construction activities is covered by the Construction Inspection Program.

II. ASSESSMENT ACTIVITIES

A review was made of RIV's inspection and SALP reports of the River Bend Station to identify those deficiencies that were previously identified by RIV inspectors. The inspection reports of 1979-1984, the 1982 and 1983 SALP reports, open items and violations were reviewed.

The Executive Summary and Potential Enforcement Actions of the River Bend CAT inspection report is provided as Appendix A and Appendix B.

The inspection reports for 1983 and the 766 inspection data were analyzed and it was determined that approximately 1850 man hours of direct inspection effort were performed by Region IV at River Bend in 1983. The analysis of the reports and computer data indicated that the construction inspection program was approximately 85 percent complete at the start of the CAT inspection. The total man hours and percent completion is comparable to other construction sites and Regional totals for the construction status of the River Bend construction effort.

III. INSPECTION FINDINGS

A. Electrical and Instrumentation Construction

1. CAT Findings

- A number of cable and raceway separation deficiencies were identified.
- The CAT inspectors found that a number of cable tray supports did not meet the drawing configurations that were used for determining support loading.

2. Assessment

- The cable raceway separation deficiencies were previously identified by the Regional inspectors in Inspection Report 83-21 and was being carried as an open item. Further, the Region had endeavored to have an electrical construction consultant review the separation problem prior to the CAT inspection.

- Inspection Procedure 37051, As-Built Verification has not as yet been implemented by the Region and it is possible that the cable tray support problem may have been identified.

3. Recommendation

The existing Construction Inspection Procedures if properly implemented are adequate to have identified existing problems.

B. MECHANICAL CONSTRUCTION

1. CAT Findings

- Several instances were identified where engineering dispositions of N & Ds and E&DCRs were not as thorough or extensive as necessary to address generic considerations of identified hardware deficiencies.

- Problems were identified with pipe support/restraint lock mechanisms, improper protection and misuse of pipe supports.

2. Assessment

- The Region in the past has identified an inadequacy of the licensee's handling generic considerations of N & Ds and E&DCRs. The specific problem with the incompatibility of ASME snubbers was the subject of a NRC Information Bulletin but for different manufacturers.

- The problems identified with pipe supports/restraint lock mechanisms, improper protection and misuse of pipe supports is common to most sites in the latter stages of construction and require more frequent surveillance and follow-up by the licensee.

3. Recommendation

The Construction Inspection Procedures for this area are evaluated to be adequate to have identified the existing problems.

C. WELDING - NDE

1. CAT Findings

- Several discrepancies were identified concerning film supplied by a pipe vendor.
- Discrepancies were also identified during the inspection of the vendor equipment and review of vendor film.

2. Assessment

- The piping vendor film discrepancies were reported to the NRC and the Region is carrying the deficiency as an open item and is currently reviewing the licensee's corrective action.
- The deficiencies identified concerning vendor film and equipment has been a recurring problem at many of the nuclear construction sites and the current reorganization and redirection of the Vendor Inspection Program should result in addressing these vendor deficiencies.

3. Recommendation

The Construction Inspection Procedures for this area are determined to be adequate if the program is properly implemented.

The identified problems with vendor film and equipment will be brought to the attention of the Vendor Inspection Program Branch for their evaluation.

D. CIVIL AND STRUCTURAL CONSTRUCTION

1. CAT Findings

- Identification of two cracks in concrete, and Roto Foam, debris and concrete in plant isolation joints.
- A significant number of high strength bolts in the Reactor Building structural steel connections were found to be below minimum torque values.

2. Assessment

- The current IE Inspection Procedures do not specifically call for the inspection of foreign material in isolation joints. However good inspection practice and a review of the licensee's construction and inspection procedures should have indicated the need for this inspection to be performed by the Regional Inspectors.

- The current Inspection Procedure for Structural Steel and Supports does not specifically require a recheck of structural steel bolt torquing after initial inspection. The relaxation of bolt torquing has been identified at previous sites and the Reactor Construction Programs Branch will evaluate including this recheck in existing procedures.

3. Recommendations

Other than the evaluation for retorquing of high strength bolts the Inspection Program Procedures are evaluated to be adequate for this area.

E. MATERIAL TRACEABILITY

1. CAT Findings

- The temperature control of weld filler material storage ovens was deficient.

- Work or rework of some flange joints was being accomplished without QC or engineering concurrence.

2. Assessment

- The regional inspectors have made frequent inspections of the licensee's control of weld filler metal and have not found temperature control deficiencies. These inspections are outlined in Regional Inspection Reports 81-8, 82-5, 83-2, and others. The identified deficiency is apparently a result of a change in the licensee's monitoring procedures and is being reviewed for possible corrective action by the licensee.

- The identification of undocumented rework performed on a pipe flange is apparently an isolated case and was not identified in other discipline areas.

3. Recommendations

The Construction Inspection Procedures for this area are evaluated to be adequate for the area of material traceability.

F. DESIGN CHANGE CONTROLS AND CORRECTIVE ACTION SYSTEMS

1. CAT Findings

- Incorrect mounting of diesel generator silencers.

- Installation of ASME Class 3 orifice plates in ASME Class 2 lines.

- Inadequate corrective action being taken to preclude repetition of non-conformances or to properly disposition existing nonconformances.

2. Assessment

- The mounting of the diesel generator silencers was in accordance with the manufacturer's installation direction. However, the design was found to be deficient. This problem has been identified by the CAT at other facilities.

- The improper installation of Class 3 orifices in a Class 2 line was a result of an engineering specification error and it is possible the licensee would have identified the error during its ASME document review.

- The necessity to continuously review the licensee's adequacy for corrective action is common to many construction sites.

3. Recommendation

— The regional inspectors should review previous CAT construction appraisal reports to better assist them in identifying deficiencies.

G. PROJECT CONSTRUCTION CONTROLS

1. CAT Findings

- The GSU quality assurance audit section needs to periodically review its audit program.

- GSU needs to develop and implement a quality concern program.

2. Assessment

- The overall audit program for River Bend was adequate and failure to detect some missing audit criteria is not unexpected. The failure of GSU to audit the engineering activities at Stone and Webster - Toronto will be addressed by the Vendor Program Branch.

- The lack of a GSU quality concern program at River Bend has been the subject of prior conversations between GSU and the Region IV Regional Administrator.

3. Recommendation

The Construction Inspection Procedures for these areas are evaluated to be adequate for their intended scope.

IV. OVERALL ASSESSMENT CONCLUSIONS

The implementation of the Construction Program Inspection Procedures at the River Bend Station was satisfactory. The majority of the CAT findings or related findings were identified by the Region. Those CAT findings not specifically identified by the Region will be the subject of evaluation by the Reactor Construction Programs Branch for possible specific inclusion in the current inspection procedures.

Those CAT findings that relate to the Vendor Program Branch will be transmitted for their evaluation and possible inclusion in their activities.

It is recommended that the previous CAT reports be made available to the Resident Inspectors for their review for possible applicability of the findings to their specific construction site.

APPENDIX A

EXECUTIVE SUMMARY

An announced Construction Appraisal Team (CAT) inspection was conducted at the River Bend Station during the period July 30-August 10 and August 20-31, 1984.

Overall Conclusions

It is the conclusion of the Construction Appraisal Team that the hardware, documentation for construction activities, and project construction controls were generally in accordance with requirements, commitments and principles of prudent management. However, the team did identify a number of construction program weaknesses that require management attention. These are:

1. The inspection program, in the area of cable and raceway separation deficiency identification, requires improvement. A number of cable and raceway separation deficiencies were identified by the NRC CAT in raceway and cable which had been previously inspected by site Field Quality Control.

2. Numerous cable tray supports did not meet the drawing configurations that were utilized for determining support loading.

3. The applicant failed to consider the generic implications of identified deficiencies. An identified problem with incompatability of non-ASME snubber assemblies was not investigated to determine application to ASME snubbers, and a specification change requiring the installation of a fire barrier seal for fire dampers was not specified as applicable to previously installed and accepted hardware.

4. Implementation of FSAR and procedural engineering requirements were not consistently met in the areas of cable tray fill, cable spacing and control of hydrogen producing materials.

In summary, the identified weaknesses require increased attention by management to assure that completed installations meet design requirements.

AREAS INSPECTED AND RESULTS

Electrical and Instrumentation Construction

The majority of the electrical and instrumentation samples were found to meet the appropriate design and construction requirements. However, deficiencies were identified in several areas including items which will require additional NRC review and analysis.

Although not extensive, a number of cable and raceway separation deficiencies were identified, and it was determined that the applicant's inspection program in this area was not fully effective. Additional information is also required

regarding qualification and NRC approval of fire barrier materials used in cable wrap applications.

Implementation of FSAR and procedural engineering requirements were not consistently performed in the electrical area. Examples include failure to implement requirements limiting the use of hydrogen generating materials inside the containment drywell and failure to properly incorporate FSAR requirements for items such as tray fill and cable spacing into quality control procedures.

A number of cable tray supports did not meet the drawing configurations that were used for determining support loading.

Several discrepancies were found in equipment environmental qualification reports indicating that review of reports of this type requires improvement.

The Class 1E 125 volt batteries had been charged and turned over to the startup organization even though the battery room ventilation systems were still under construction and not in operation. This indicates that additional management attention is required for the control and maintenance of completed equipment turned over to startup.

Mechanical Construction

The mechanical equipment and HVAC supports/restraints were found to be constructed in accordance with applicable requirements. Although discrepancies were noted on piping, pipe supports and restraints, concrete expansion anchors and HVAC ducting and accessories, no serious technical deficiencies were observed.

Several instances were observed where engineering dispositions on Nonconformance and Disposition Reports and Engineering and Design Coordination Reports were not as thorough or extensive as necessary to address generic considerations of identified hardware deficiencies. Lack of thoroughness by engineers and QA reviewers in this area could allow potentially significant safety issues to be overlooked or inadequately resolved. Lack of attention to detail and poor construction practices with regard to installed and accepted hardware was evident. Problems were identified by the NRC CAT with pipe support/restraint fastener locking mechanisms, improper protection and misuse of pipe supports and the number of interdisciplinary clearance problems that had not been pre-authorized by engineering.

Welding and Nondestructive Examination

Welding and nondestructive examination activities were generally found to be in accordance with applicable codes and specifications. However, several discrepancies were identified concerning film supplied by a piping vendor. The applicant had previously reported similar problems to the NRC and the NRC CAT believes that the applicant should review additional radiographic packages in order to assure that discrepancies identified by both the applicant and the NRC constitute isolated cases.

In addition, some discrepancies were also identified during the inspection of vendor equipment and review of vendor film. The applicant has committed to reviewing these discrepancies and the NRC will assess the results of this review.

Civil and Structural Construction

Concrete quality, Cadwelding and Concrete Material Certification were, in general, found to be acceptable. Rebar appeared to be placed in accordance with the design drawings. However, deficiencies identified by NRC CAT inspectors, namely two cracks in the concrete, and Roto Foam, debris and concrete in the plant isolation joints (rattle spaces) are indicative of a need for improvement in the inspection activities.

Structural steel member size, configuration and connections were generally found to be acceptable. Two steel connections were found not to be in accordance with the design drawings and are being evaluated by S&W. These are also indications of a need for improvement in the construction inspection program.

A significant number of high strength bolts in the Reactor Building structural steel connections were found to be below minimum torque values. This indicates that these bolts do not have the bolt preload required by AISC specifications.

Material Traceability and Controls

In general, the project traceability and controls program was found to be acceptable. A few deficiencies were found by the NRC CAT in the material traceability and control of some safety-related fasteners, piping flange components and environmental control of weld filler material storage ovens. Work or rework of some flange joints was being accomplished without QC or engineering concurrence or knowledge which also resulted in a loss of material control.

Design Change Control

Design change control, including control of changes to design documents, was determined to be generally in conformance with applicable requirements. A number of isolated (non-generic) discrepancies were identified, of which the most significant were incorrect mounting of diesel generator silencers and installation of ASME Class 3 orifice plates in an ASME Class 2 line. Three deficiencies were identified which could be generic; two of these deficiencies concerned failure to check and independently review design calculations prior to release of design information to Construction. The third was the use of E&DCRs to identify nonconformances.

Corrective Action Systems

In general, the corrective action program utilizing Nonconformance and Disposition Reports to identify, evaluate and correct nonconforming conditions was found to be acceptable except that in certain instances inadequate corrective action was being taken to preclude repetition of nonconformances or to properly dispose of existing nonconformances.

Project Construction Controls

The overall project construction controls were found to be adequate to assure that construction and test activities will meet quality requirements. Specific

areas were identified that require additional management attention. Project management review of important quality control reports needs to be improved. The GSU quality assurance audit section needs to periodically review its audit program to make sure that all scheduled audit areas have actually been addressed. An improved and more comprehensive quality concern program needs to be developed, proceduralized, and implemented.

APPENDIX B

POTENTIAL ENFORCEMENT ACTIONS

As a result of the NRC CAT inspection of July 30 to August 10 and August 20 to August 31, 1984, the following items have been referred to Region IV as Potential Enforcement Actions (section references are to the detailed portion of the inspection report):

1. Contrary to 10 CFR 50, Appendix B, Criterion II, and GSU Nuclear Quality Assurance Manual (NQAM) Quality Assurance Procedure QAP-2, the applicant failed to regularly review the status and adequacy of the Quality Assurance Program in that certain quality trending documents did not receive adequate management review. (Section IX.B.2)

2. Contrary to 10 CFR 50, Appendix B, Criterion III, and GSU NQAM QAP-3, design control has not been maintained as the applicant has:

   a. Failed to verify adequacy of design. Load calculations for Reactor Building cable tray supports were based on design information which does not represent as-built configurations. (Section II.B.1)

   b. Failed to properly translate FSAR requirements for items such as cable tray fill, cable spacing and control of aluminum permanent plant materials inside of the containment drywell, into specifications, drawings, procedures and instructions. (Sections II.B.1 and II.B.2)

3. Contrary to 10 CFR 50, Appendix B, Criterion VI, and GSU NQAM QAP-6, measures failed to assure that procedures and drawings, including changes, were used at the location where the prescribed activity is performed in that nine of the 37 inspection reports on anchor and high strength bolting had the incorrect revision of either the drawing or the procedure identified on them. (Sections III.B.3 and V.B.2)

4. Contrary to 10 CFR 50, Appendix B, Criterion X, and GSU NQAM QAP-10, applicant failed to provide an adequate inspection program in that:

   a. Inspection of some raceways for physical separation had not been accomplished in accordance with the criteria established in the applicable procedures. (Section II.B.1)

   b. Safety-related ASME class pipe support/restraints have not been constructed and inspected in accordance with design requirements. (Section III.B.2)

5. Contrary to 10 CFR 50, Appendix B, Criterion XVI, and GSU NQAM QAP-16, the applicant's program has failed to assure that conditions adverse to quality have been promptly identified and corrected in that:

a. An identified problem with non-ASME snubber assemblies was not investigated sufficiently to reveal the same problem on ASME snubber assemblies supplied by the same vendors. (Section III.B.2)

b. A new specification requirement for the use of fire barrier sealant around fire damper to wall joints was not clearly identified to be backfitted to previously installed and accepted hardware. (Section III.B.5)

c. Inadequate corrective action is being taken to preclude repetition of nonconformances. (Section VIII.B.1)