

PRELIMINARY NOTIFICATION  
UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
101 MARIETTA ST., N.W., SUITE 3100  
ATLANTA, GEORGIA 30303

MAR 12 1981

Report Nos. 50-348/81-04 and 50-364/81-05

Licensee: Alabama Power Company  
600 North 18th Street  
Birmingham, AL 35202

Facility Name: Farley Units 1 and 2

Docket Nos. 50-348 and 50-364

License Nos. NPF-2 and NPF-8

Inspection at Farley site near Ashford, AL

Inspector: *J E Conlon for* 3-11-81  
J. J. Lenahan Date Signed

Approved by: *J E Conlon* 3-11-81  
T. E. Conlon, Section Chief, Engineering Date Signed  
Inspection Branch  
Engineering and Technical Inspection Division

SUMMARY

Inspected on February 24-27, 1981

Areas Inspected

This special, announced inspection involved 26 inspector-hours onsite in the areas of followup of IE Bulletin 80-11, licensee action on previous inspection findings, and licensee identified items.

Results

Of the areas inspected, no violations or deviations were identified.

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## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*J. Woodard, Assistant Plant Manager
- \*M. Stinson, Supervisor, Systems Engineering
- \*G. S. Waymire, Nuclear Engineer, Systems Engineering
- C. Buck, Project Engineer
- D. M. Varner, Project Manager
- R. G. Berryhill, Supervisor, Systems Performance
- R. S. Fucish, Project Engineer

#### Other Organizations

- D. Pruitt, Civil Engineer, Daniel Construction
- \*T. Merrill, Civil Engineering Manager, Daniel Construction
- \*R. B. Smith, Electrical Engineer, Davcon Corporation
- A. A. Vizzi, Project Engineer, Bechtel
- K. Gandhi, Assistant Project Engineer, Bechtel
- S. Sen, Structural Engineer, Bechtel
- G. W. Turner, Civil QC Inspector, Daniel Construction
- H. C. Lane, Civil QC Supervisor, Daniel Construction

#### NRC Resident Inspector

- \*W. H. Bradford

#### \*Attended exit interview

### 2. Exit Interview

The inspection scope and findings were summarized by the NRC Resident Inspector on February 27, 1981 with those persons indicated in paragraph 1 above.

### 3. Licensee Action on Previous Inspection Findings

- a. (Open) Unresolved Item (348/80-26-01): Containment Tendon Surveillance Program

The inspector reviewed VSL's calibration procedure for stressing rams. This procedure does not address the acceptance criteria for use in calibration of the stressing rams or the required frequency of calibration. The inspector discussed the apparent ram calibration problem encountered subsequent to the completion of the Unit 1 three year

tendon surveillance with licensee and Bechtel engineers. This discussion disclosed that these requirements may have been covered in the Alabama Power contract documents for the tendon surveillance program. This item remains open pending further review by NRC Region II.

- b. (Closed) Infraction (348/80-26-02) and (364/80-37-01): Inadequate Procedures for Preparation of Units 1 & 2 As Built Masonry Wall Drawings

The inspector examined revised Bechtel "Survey Procedure for Concrete Masonry Walls" dated October 15, 1980. This revised procedure (Revision 1) clearly describes those tasks to be performed by Bechtel and those tasks to be performed by Daniel Construction. The revised procedure also provides controls to ensure that the final drawings have been properly reviewed and verified. The inspector examined completed as built drawings for several masonry walls in Units 1 and 2 and compared them to the as built conditions in the field. Based on this review, the inspector concluded that the revised procedure is being implemented. This item is closed.

- c. (Closed) Unresolved Item (348/80-26-03) and (364/80-37-02): IEB 80-11 Safety Related Area Wall Inspection Documentation

The inspector reviewed drawings showing the layout and numerical identification of masonry walls in Units 1 and 2. Licensee engineers stated that all safety-related areas in the plant have been inspected for the presence of masonry walls and that the layout drawing document all areas inspected. This inspection was conducted by three organizations; once by Bechtel, once by Daniel, and once by licensee engineers from the site systems engineering staff. This item is closed.

#### 4. Unresolved Items

Unresolved items were not identified during this inspection.

#### 5. Licensee Identified Items (LER)

- a. (Open) LER (80-058/036-0) Containment Tendon Surveillance

In a corporate management meeting on October 7, 1980, the licensee stated that an LER would be submitted concerning tendon surveillance. The inspector reviewed the LER (number 80-058/036-0) submitted to NRC Region II on November 4, 1980 and Revision 1 which was submitted to Region II on January 23, 1981. This LER is a commitment from the licensee to do the following:

- (1) Perform the five year tendon surveillance inspection in the Spring of 1981;

- (2) Recheck the lift-off forces for all tendons inspected during the three year surveillance (performed in Spring 1980);
- (3) Compare the results of the five year surveillance with the original construction QC records;
- (4) Promptly resolve problems disclosed during the surveillance;
- (5) Keep Region II informed of the results of the surveillance inspection as the inspection is in progress.

The inspector discussed the schedule and proposed tendon surveillance inspection program with licensee and Bechtel engineers. This discussion disclosed that the licensee plans to purchase the necessary equipment to perform the surveillance in lieu of hiring a contractor to perform the work. The licensee is in the process of purchasing equipment and plans to start the Unit 1 tendon surveillance inspection in June 1981. The licensee will submit an information copy of the tendon surveillance procedure to NRC Region II when it is available.

- b. (Open) LER (80-076/01-T (Unit 1) and 80-003/01-T (Unit 2)): Masonry Walls Not Constructed in Accordance with Design Drawings

During preparation of its response to IE Bulletin 80-11 for Unit 1 and in response to an NRR information request concerning Unit 2 masonry walls, the licensee performed inspections to determine if reinforcing steel had been installed in masonry walls as required by the design drawings. These inspections, which consisted of drilling holes in the masonry walls to verify that the reinforcing steel and grout were in place as required, disclosed that a substantial portion of the vertical reinforcing steel was omitted during construction. The licensee reported this to NRC Region II as an LER for Unit 2 on December 9, 1980, and as an LER for Unit 1 on December 18, 1980. The licensee's actions to correct this problem are discussed in paragraph 6 of this report.

No deviations or violations were identified.

- 6. (Open) IE Bulletin 80-11, Masonry Wall Design, Unit 1 and Design Re-Evaluation of Concrete Masonry Walls on Unit 2 Structures

- a. Summary of Licensee's Responses to IE Bulletin 80-11

The licensee submitted its 60-day response to IE Bulletin 80-11 for Farley Unit 1 to NRC Region II on July 7, 1980. On October 22, 1980, the licensee submitted a letter to NRC Region II which contained a revised schedule for completion of the design re-analysis of the Unit 1 walls and stated that the IEB 80-11 work for Unit 1 would be completed and submitted to NRC on or about January 30, 1981. IE Bulletin 80-11 did not apply to Unit 2 which was still under construction when the bulletin was issued. However, in response to an NRR letter dated April 21, 1980, requesting information on Category I masonry walls in



Unit 2, the licensee stated that all masonry walls in Unit 2 would be re-evaluated as per IE Bulletin 80-11 requirements. As stated in paragraph 5, during preparation of the response to Bulletin 80-11 and the NRC information request, the licensee discovered that vertical reinforcing steel was omitted during construction of several masonry walls in both Units 1 and 2, and that the walls did not meet design requirements. On January 15, 1980, the licensee submitted a supplemental report to NRC for IE Bulletin 80-11 which discussed the deficiencies concerning the omitted reinforcing steel. In this letter, the licensee committed to complete all repairs and design re-evaluation for Unit 1 walls prior to return to criticality, and for Unit 2 walls prior to initial criticality. The licensee enclosed a copy of Bechtel Specification 7597-C, "Criteria for the "Re-Evaluation of Concrete Masonry Walls" as an attachment to the January 15, 1981 letter.

b. Field Walkdown in Safety Related Areas to Verify Accuracy of Masonry Wall As-Built Drawings

The inspector, accompanied by Daniel engineers, examined the following walls to verify the accuracy of the as-built drawings which had been prepared for each of them:

(1) Unit 1 Auxiliary Building Walls (ID Numbers)

- 1 CBW 8
- 1 CBW 9
- 1 CBW 12
- 1 CBW 19
- 1 CBW 24
- 1 CBW 25
- 1 CBW 30

(2) Unit 2 Auxiliary Building Walls (ID Numbers)

- 2 CBW 2-A (west elevation)
- 2 CBW 2-B (west elevation)
- 2 CBW 2-C (west elevation)
- 2 CBW 4 (east elevation)
- 2 CBW 21 (south and east elevation)
- 2 CBW 37 (north elevation)

In review of the as-built drawings, the inspector noted that wall dimensions, location and size of wall openings and penetrations, and location and identification of attachments, including the manner of attachment, had been accurately recorded.

c. Review of Masonry Wall Repair Program

The inspector examined procedures, quality records, and the completed work associated with the repair of the masonry walls where the vertical reinforcing steel was omitted during construction, and for other

masonry walls which required modification to meet IE Bulletin 80-11 requirements. A summary of the inspection of the masonry walls for the presence or absence of vertical reinforcing steel, details of the program and methods to repair the walls, and the details of the inspection of the repair program are stated in the following paragraphs:

(1) Masonry Wall Inspection Program

Three types of masonry walls were specified on the Farley design drawings. These were as follows: Type 1 - hollow block walls with vertical reinforcement grouted in place in the vertical cells on 16 inch centers, Type 2 - hollow block wall with no vertical reinforcing, and Type 3 - solid block walls with no vertical reinforcing. In the original design, none of the concrete masonry walls were designed for seismic conditions. During construction of Farley Units 1 and 2, masonry walls were considered to be non-Category I (i.e., non-safety related) items and consequently received minimal or no QC inspection. In order to verify that the vertical reinforcing steel had been installed in the Type 1 masonry walls as required by the design drawings, Daniel Construction initiated an inspection program on selected Type 1 walls in Unit 2. This program involved drilling holes in the masonry walls at various heights on the wall to confirm the presence or absence of the vertical reinforcing steel and grout. The results of the inspection effort for these selected unit 2 walls were documented on Field Change Requests which proposed a repair method and were forwarded for approval to Bechtel. When it became apparent that this was a widespread problem involving the majority of the Unit 1 Type 1 masonry walls, the licensee identified the problem as a Unit 2 LER (see paragraph 5.b of this report) and expanded the inspection program to include all Unit 2 Type 1 masonry walls. The licensee also initiated an inspection program on selected Unit 1 Type 1 masonry walls to determine if a similar problem existed in Unit 1. The preliminary investigation of the Unit 1 Type 1 walls disclosed that a substantial portion of the vertical reinforcing steel had been omitted from the Unit 1 walls which had been checked. This was reported to NRC Region II as a Unit 1 LER (See paragraph 5.b). The licensee then conducted an extensive inspection of all Unit 1 Type 1 walls. The inspector examined Engineering Technical Procedure FNP-1-ETP-202 "Masonry (Concrete Block) Wall Reinforcement Determination" which controlled the inspection of Unit 1 Type 1 masonry walls. The inspector reviewed data sheets entitled "Block Wall Reinforcing Verification" for Unit 1 wall numbers 1 CBW 8, 1 CBW 9, 1 CBW 12, 1 CBW 19, 1 CBW 30, 1 CBW 44 and 1 CBW 69. These data sheets document the results of engineering investigations performed in

accordance with procedure FNP-1-ETP-202. The licensee's investigation disclosed that the majority of the Type 1 walls in Units 1 and 2 did not contain the vertical reinforcing required by the design drawings.

(2) Summary of Masonry Wall Repair Methods

An extensive masonry wall repair program was undertaken by the licensee to repair the walls which required modification to meet IE Bulletin 80-11 requirements. This included not only the Type 1 walls which were constructed without the vertical reinforcement, but also the Type 2 and 3 walls in the proximity of safety related equipment which did not meet seismic design requirements. As stated above, the results of the investigation of the Unit 2 Type 1 walls were transmitted to Bechtel on Field Change Requests (FCR) in which Daniel proposed a method of repair to the walls. These FCRs generally specified installation of the reinforcing steel and grout as called for on the original design drawings. Since the walls had not been originally designed for seismic conditions, Bechtel performed the design re-analysis required by Bulletin 80-11 to verify the proposed repairs on the FCRs would meet seismic design requirements, or if they did not, specified modifications which would. The methods to repair the wall were submitted to Daniel as Change Notices which called for either an internal fix, an external fix, or a combination of internal-external fix. The internal fix involved chipping holes in the walls and installation of reinforcing steel and grout in the cells of the masonry units. The external fix involved bracing of the walls by attachment of various types of structural steel supports on the walls. Modifications to Types 2 and 3 walls in Unit 2 required by the Bulletin 80-11 design re-analysis were also transmitted to Daniel as Change Notices and involved repairs similar to those specified for the Type 1 walls. The methods for accomplishing the modifications to the Unit 1 walls to meet Bulletin 80-11 requirements were similar to those followed for the Unit 2 walls, with the exception that the licensee furnished the results of the rebar investigation performed in accordance with procedure FNP-1-ETP-202 to Bechtel, and Bechtel issued Production Change Notices (PCNs) to the site which contained the walls modification details. The PCNs covered all Types 1, 2 and 3 walls which required modifications to meet IE Bulletin 80-11 requirements. The reason for the difference in the administrative controls used to transmit the results of the rebar investigation data to Bechtel, and the difference in the documents by which Bechtel transmitted design information relative to the wall modification requirements to Units 1 and 2 is due to the fact that Unit 1, which is an operating plant, operates under different administrative controls than Unit 2, where construction and preoperational testing is not yet completed.

(3) Review of Procedures for Accomplishment of Masonry Wall Repairs

The inspector examined the following documents which control the masonry wall modification activities:

- (a) Daniel Field Quality Control Procedure No. 6.20, "Procedure for Reinforcement of Concrete Block Walls"
- (b) Bechtel Specification No. SS-1102-19 "Structural Steel"
- (c) Change Notice (CN) numbers 2BC-4015, 2BC-4016, 2BC-4024, 2BC-4030 and 2BC-4037. These change notices specified modifications for Unit 2 wall numbers 2CBW-15, 2CBW-16, 2CBW-24, 2CBW-30 and 2CBW-37, respectively.
- (d) Production Change Notice (PCN) numbers PCN B81-904-8, 9, 12, 19, 24, 25 and 30. These PCNs specify wall modification details for Unit 1 wall numbers 1 CBW 8, 9, 12, 19, 24, 25 and 30, respectively.

(4) Inspection of Completed Wall Modifications

The inspector examined the Unit 1 walls listed below and compared the modifications which had been made to the walls with the details shown in the PCNs. Walls examined were as follows: 1 CBW 8, 9, 12, 19, 24, 25 and 30. The inspector noted that when changes were required to the wall modification details shown in the original PCNs, the changes were approved by the Bechtel site representative and the PCNs were revised to reflect the changes as required by Daniel FQC procedure 6.20.

(5) Review of Quality Records Relating to Masonry Wall Modifications

The inspector reviewed the following records relating to the masonry wall modification (repair) program for Unit 1 wall numbers 1 CBW-12, 19, 24, and 24 and Unit 2 wall numbers 1 CBW-15, 16, 24 and 30.

- (a) Internal reinforcement placement as-built details
- (b) External reinforcement (structural steel) checklist
- (c) Grouting inspection report
- (d) Compressive test reports for 7 and 14 day grout cubes
- (e) Concrete (grout) batch records.

No deviations or violations were identified.