CENTRAL FILES

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

FEB 16 1977

Union Electric Company
ATTN: Mr. John K. Bryan
Vice President - Nuclear
P. O. Box 149
St. Louis, Missouri 63166

Docket No. 50-483
Docket No. 50-486

Gentlemen:

This refers to the inspection on January 12-14, 1977, conducted by Mr. T. E. Vandel of this office and Messrs. A. A. Varela and R. C. Haynes of the Inspection and Enforcement, Region I Office, relative to the activities at the Callaway site authorized by NRC Construction Permits No. CPPR-139 and No. CPPR-140 and to the discussion of our findings with Messrs. Weber and Harmon of your staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

Within the scope of this inspection, no items of noncompliance were observed.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room, except as follows. If this report contains information that you or your contractors believe to be proprietary, you must apply in writing to this office, within twenty days of your receipt of this letter, to withhold such information from public disclosure. The application must include a full statement of the reasons for which the information is considered proprietary, and should be prepared so that proprietary information identified in the application is contained in an enclosure to the application.

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We will gladly discuss any questions you have concerning this inspection.

Sincerely yours,

R. F. Heishman, Chief
Reactor Construction and
Engineering Support Branch

Enclosure:
IE Inspection Reports
No. 050-483/77-01
and No. 050-486/77-01

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Central Files
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UNITED STATES NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Construction Inspection

IE Inspection Report No. 050-483/77-01
IE Inspection Report No. 050-486/77-01

Licensee: Union Electric Company
P. O. Box 149
St. Louis, Missouri 63166

Callaway Site
Units 1 and 2
Callaway County, Missouri

License No. CPPR-139
License No. CPPR-140
Category: A

Type of Licensee: PWR (W) - 1150 MWe

Type of Inspection: Routine, Unannounced

Dates of Inspection: January 12-14, 1977

Principal Inspector: T. E. Vandel — 2-15-77 (Date)

Accompanying Inspectors: A. A. Varela (Region I) — 2-15-77 (Date)

R. C. Haynes (Region I) — 2/16/77 (Date)

Other Accompanying Personnel: None

Reviewed By: D. W. Hayes, Chief
Projects Section — 2/16/77 (Date)

SUMMARY OF FINDINGS

Inspection Summary

Inspection of January 12-14, 1977, (Unit 1, 77-01) (Unit 2, 77-01): Review of containment base mat rebar and cadwelding procedures, activities and records; review of containment prestressing procedures and activities; review of concrete test laboratory facilities and equipment and results of CCRL's December, 1976 inspection of the laboratory and; review of qualifications of site civil-structural quality control inspection personnel. No items of noncompliance were identified.

Enforcement Items

None.

Licensee Action on Previously Identified Enforcement Items

Not inspected.

Other Significant Items

A. System and Components

1. Backfill and concrete construction below the bottom of the containment base mat has been completed.

2. Placement and cadwelding of the rebar for the containment base mat was in progress.

3. Concrete construction on the turbine building was complete up to the turbine pedestals.

B. Facility Items (Plans and Procedures)

1. A Cement and Concrete Reference Laboratory (CCRL) evaluation was performed for the completed site concrete test laboratory including the analytical chemical laboratory section used for the ASTM C 150-74 cement tests.

2. The containment base mat is currently planned as a monolithic placement which will be accomplished in early March, 1977.

3. Unresolved item - the rebar specification and cadwelding inspection and work procedures do not require inspection of rebar deformations on No. 14 and No. 18 rebar, nor require permanent marking of rebar to facilitate inspection of rebar centering in splice sleeve and do not require documented QC inspections of a representative sample of cadwelds during the preparation stage.

4. Containment prestressing inspection and work procedures were provided for the work in progress. Remaining procedures for prestressing activities are scheduled to be completed commensurate with the status of construction.

C. Managerial Items

Mr. Lewis Shaw joined the Union Electric Site QA organization as a QA Engineer. This completes UE's immediate staffing plans for this organization. Mr. W. F. Reilly, the SNUPPS site representative is now located at the Callaway site to facilitate and expedite communications with the SNUPPS Gaithersburg, Maryland office.

D. Deviation

None.

E. Status of Previously Unresolved Items

Not inspected.

Management Interview

A. A management interview was held at the conclusion of the inspection at the site. The following Union Electric (UE) and Daniel International personnel were in attendance.

W. H. Weber, Manager, Nuclear Construction (UE)
W. F. Reilly, SNUPPS Site Representative
L. G. Harmon, Site QA Supervising Engineer (UE)
M. R. Hamby, Jr., Project Manager (Daniel)
C. B. Bliesener, Project QC Manager (Daniel)
W. Van der Zalm, Project QA Manager (Daniel)

B. The inspector stated that no items of noncompliance were identified during this inspection. The inspector discussed the scope of the inspection and his findings as stated in the Details section of this report. The inspector's understanding of comments by the management personnel with respect to an unresolved item identified during this inspection is as stated in Details paragraph 8.

REPORT DETAILS

1. Persons Contacted

Persons contacted during this inspection are as follows:

Union Electric Company (UEC)

W. H. Weber, Manager, Nuclear Construction
L. G. Harmon, Site QA Supervising Engineer
G. S. Tomei, QA Assistant Engineer
H. Wilson, Construction Supervisor

Daniel International Corporation (Daniels)

Mr. Hamby, Project Manager
W. Van der Zalm, Project QA Manager
C. B. Bliesener, Project QC Manager
D. D. White, Civil Quality Control Supervisor
J. Sexton, Quality Control Inspector, Cadwelding
J. Greer, Quality Control Inspector, Civil
M. Keathley, Quality Control Inspector, Batch Plant
J. V. Cuccinello, Material Processing Facilities Superintendent

2. Scope of Inspection

The scope of the inspection included the following:

a. Review of specifications, work procedures and quality control procedures for rebar and cadweld splicing; observation of rebar cadwelding for bottom layer of rebar in the containment base mat.

b. Observation of concrete test laboratory facilities and test equipment and review of a memorandum from the Daniel's Civil QC Engineer concerning CCRL's inspection of December 22, 1976, of the site concrete test laboratory for its conformance to ASTM A 329.

c. Review of specifications, work procedures, and quality control procedures for containment prestressing activities; observations of prestress anchorage components and trumpets installed in preparation for U tendons.

d. Review of qualifications of civil-structural quality control inspection personnel.

3. Status of Construction

The inspector observed that fill and concrete construction below the bottom of the containment base mat had been completed including the tendon access gallery mat and walls, the reactor vessel pit and incore instrumentation tunnel base mat and walls. Additionally, concrete construction on the turbine building was complete up to the turbine pedestals. Installation of the bottom layer of rebar for the containment base mat and the vertical prestressing tendon anchorages and trumpets were in progress. The contractor and licensee stated that the containment base mat was presently planned as a monolithic placement in early March, 1977, and the NRC would be notified of the exact placement date when established.

4. Observation of Rebar Installation and Cadweld Splicing for Containment Base Mat

The inspector determined by direct observation of partially completed work on the containment base mat bottom steel that the required work and inspection activities were being accomplished according to applicable specifications, codes, standards, and procedures in the following areas:

a. Rebar and prestressing anchor plates and trumpets were properly placed, secured, cleaned and were at specified distance from forms.

b. Construction joint preparation was completed with coarse aggregate exposed.

c. Rebar cadwelding activities were accomplished, sampled and inspected in accordance with work procedure and quality control procedure No. 118.

d. Cadwelding process and crew were qualified and inspections of cadwelds were performed by qualified QC personnel.

e. Completed splices Nos. AC-H-8 through 14 and AI-H-8 through 12 were inspected; in both sets the No. 9 splice was cut-out for testing as one of the first ten production splices produced by qualified operators -- D. Jeff (AC) and T. Rash (AI) -- on No. 18 horizontal rebar.

In addition, the qualifications of QC inspection personnel for above activities were reviewed. Certificates of qualification were reviewed

for the following personnel and these certificates and qualification levels were in accordance with ANSI N45.2.6 requirements:

D. White, Civil QC Supervisor, Level III
J. Sexton, QC Inspector Cadwelding, Level II
J. Greer, Civil QC Inspector, Level II

The inspector observed no discrepancies in these activities.

5. Review of Requirements and Control Procedures for Prestressing

The inspector reviewed the contract specifications C-155, C-154, C-154A and work and quality control procedures No. 106 to determine whether appropriate procedures are provided in the QA program to assure that specific prestressing activities and materials are controlled and performed according to NRC requirements and SAR commitments. Procedures were provided for the work completed or in progress. The remaining prestressing procedures for subsequent activities are to be provided at a later date. The inspector also reviewed QC documents concerning the chemical and mechanical properties of tendons, anchorage components and associated hardware. In addition, the inspector reviewed the procedures for the installation of trumpets, tendon sheaths and anchorages - especially the spacing of tendon sheaths and bearing plates.

The inspector observed no discrepancies in these documents.

6. Concrete Batch Plant Observations

The site batch plant was observed by the inspector and the NRMCA certification was reviewed for check-off of the prescribed mechanical features of the central mixer and the truck mixer/agitators. The inspector interviewed the contractor's equipment superintendent, QC Civil Supervisor and the QC inspector. The central mixer was observed to be a Koehring-Johnson unit, 10 cubic yard capacity, Model JE-213, with an ALKON No. 1150 computerized automatic panel unit. During this inspection only grout was being produced at the batch plant. The inspector ascertained the following:

a. Batch plant equipment is calibrated on a routine basis as to weights, measures and timing and supporting instrumentation is routinely calibrated.

b. Accuracy of material and temperature control is acceptable.

c. Generation and control of required batch records is provided for.

d. Inspection frequency and scope is accomplished using qualified inspection (QC) personnel.

The inspector observed no discrepancies in these activities.

7. Concrete Test Laboratory

The inspector was informed by the licensee's representative that the newly completed site concrete and steel test laboratory was inspected by a National Bureau of Standards CCRL representative in December, 1976. This was the second inspection by CCRL and was required because the site laboratory facilities were expanded after their previous inspection in April, 1976. The laboratory can now provide testing of cement for the chemical and physical requirements delineated in ASTM C150-74.

A formal report of the CCRL's second inspection has not been received at the site. However, an Inter-Office Memorandum (IOC) dated January 3, 1977, from the Daniel Civil QC Engineer was reviewed by the inspector. This IOC documented that the CCRL inspector found four deficiencies in physical testing and/or equipment for testing of cement. Other deficiencies noted were found in the material for concrete cylinder molds, compressive test equipment accuracy and rate of loading, moist cure room and aggregate test equipment. The IOC documented that Daniel QC personnel had initiated corrective actions for the deficiencies.

The inspector observed that compressive strength cylinders in the moist curing room had water dripping on the ends of the specimens and that one batch lot of the rejected paraffin coated paper concrete cylinder molds had not been removed from the laboratory. The inspector discussed these items with the laboratory supervisor and found that steps were being taken to correct the curing room problem and the rejected cylinder molds were not being used and were to be replaced. The inspector found that the licensee's planned corrective actions were acceptable and were in progress. The inspector had no further questions on this matter at this time.

8. Rebar Specifications and Cadwelding Procedures

Three items were identified in rebar specifications work procedures and QC procedures which are unresolved.

a. Rebar deformations are not required by purchasing specification C-111 to be verified by the Bechtel vendor inspector for height and spacing of deformations on No. 14 and No. 18 rebar which are to be cadwelded.

b. QC procedure No. 118 permits optional rebar marking (for inspection of rebar centering in splice sleeve) using non-permanent marks such as paint or keel. The inspector stated that non-permanent marks do not assure that splices can be inspected after firing for centering as required by Regulatory Guide 1.10. The inspector observed that the current site practice is to use permanent marking on the rebar by means of a round file mark which is also permitted by the procedure.

c. QC procedure No. 118 permits QC inspection of cadweld pre-preparation by spot-checking each operator once per shift without formal documentation or check-off of this inspection activity. The inspector stated that the once-per-shift inspection schedule was too infrequent since this could represent a sample size of less than 5 percent instead of the normal 10-20 percent sample size. Also, he stated that such inspections were to be documented. The inspector observed that current site practices are that cadweld QC inspectors are present throughout each cadweld preparation and they maintain a field log of their observations.

The above three items were discussed with licensee and contractor personnel. The licensee stated that he would forward these items to the engineering and QA personnel responsible for reviewing these documents. He stated that clarification of specification requirements for rebar deformation inspection, elimination of the non-permanent marking option for rebar centering during cadwelding and strenghtening of the QC procedure on inspection of cadwelding activities would be evaluated.

This matter is unresolved pending review by an NRC inspector of the licensee's evaluation of these items and subsequent actions.