Appendix B

NOTICE OF DEVIATION

Union Electric Company Docket No. 50-483

Based on the results of an NRC inspection conducted on January 10-13, 23, February 2-3, and 6, 1978, it appears that two of your activities are not being conducted in conformance with your comments to the Commission in Bechtel Topical Report BC-TOP-5A. The following two items are deviations.

1. Contrary to BC-TOP-5A, Section CC-3534, Concrete Crack Control (which states, "Reinforcing bars considered as face reinforcement shall not be more than 1/5 of the total section thickness from the concrete face.") face reinforcement is being placed at a distance greater than the design maximum distance from the concrete face.

2. Contrary to BC-TOP-5A, Section CC-3533, Reinforceing Steel Cover and Spacing Requirements, Subsection CC-3533-1, Cover (which states in part, "the following minimum concrete cover shall be provided for reinforcing bars. . . . No. 6 through No. 18 bars . . . . exposed to earth or weather. . . .minimum cover two inches.") reinforcement bars are being placed with a concrete cover of less than two inches.

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

REGION III

Report No. 50-483/78-01

Docket No. 50-483 License No. CPPR-139

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

Facility name: Callaway, Unit 1

Inspection at: Callaway site, Callaway County, MO

Inspection conducted: January 10-13, 23, February 2-3 and 6, 1978

Inspectors: E. R. Schweibinz — 3-23-78

E. J. Gallagher — 3/21/78

K. R. Naidu — 3/24/78

C. C. Williams — 3/23/78

Approved by: D. W. Hayes, Chief, Projects Section — 3/24/78

Inspection Summary

Inspection on January 10-13, 23, February 2-3 and 6, 1978 (Report No. 50-483/78-01)

Areas Inspected: QA records for containment exterior wall (first lift); concrete work activities; containment concrete placement (fourth lift); containment concrete quality records (third lift), safety related structural welding records; QA records on embedments; inspection requirements for structural steel welding; component

Dupe of 7804260413 PDR (BA)

and materials storage; drawing control; defective clip angles reported per 10 CFR 50.55(e); missing embedments; concrete expansion anchor bolt specification; and allegations relative to construction work. The inspection involved a total of 152 inspector-hours onsite by four NRC inspectors.

Results: Of the 13 areas inspected, no items of noncompliance or deviations were found in eight areas; five apparent items of noncompliance were identified in five areas (Infraction - failure to have an adequate mechanism for closure of nonconformance reports prior to placement of concrete - Paragraph 1.g; Infraction - failure to identify a nonconforming condition - Paragraph 3.a.(2); Infraction - failure to establish a requirement for weld inspection in the procurement documents - Paragraph 7; Infraction - failure to take prompt corrective action to control a nonconforming situation - Paragraph 8.a; Deficiency - failure to properly review revisions to safety related drawings - Paragraph 9.a); Two apparent deviations were identified in one area (Deviation - placement of containment face reinforcement steel at a distance from the concrete face greater than the design maximum - Paragraph 3.a.(7); Deviation - placement of containment reinforcement steel at a distance from the concrete face less than the design minimum - Paragraph 3.a.(8))

DETAILS

Persons Contacted

Union Electric Company (UE)

J. Baker, Construction Supervisor
*D. W. Capone, Assistant Manager Nuclear Engineering
*M. I. Doyne, General Superintendent Callaway Construction
F. D. Field, Manager Quality Assurance
*R. L. Powers, Site Quality Assurance Group Leader
*D. F. Schnell, Manager Nuclear Engineer
*W. H. Stahl, Quality Assurance Engineer
*W. H. Weber, Manager Nuclear Construction
*W. H. Zvanut, Supervising Engineer Nuclear

Daniel International Company (Daniel)

T. Bordeaux, Lead Area Civil Engineer
W. Faulkner, Civil Engineer
J. Haggie, Lead Welding Inspector
*M. McDaniel, Audit Response Coordinator
*H. J. Starr, Project Manager

Bechtel Power Corporation (Bechtel)

*J. R. Cunningham, Bechtel Site Liaison
*J. L. Turdera, Project Engineering Manager

Standardized Nuclear Unit Power Plant System (SNUPPS)

*J. P. Burn, Lead A/E Director

The inspector also contacted and interviewed other licensee and contractor personnel, including craftsman, QA/QC, technical and engineering staff members.

*Denotes those attending the exit interview.

License Action on Previously Inspection Findings

(Closed) Unresolved Item (50-483/77-07; 50-483/77-09): Tendon gallery dry-pack repairs of concrete honeycombing. Bechtel Specifications C-101, C-103, and C-.91 were revised to clarify

testing requirements of structural dry-pack. Stop work order No. 14 was changed to a start work order No. 14a, on December 7, 1977. The RIII inspector reviewed the changes to the specifications and considered them to be satisfactory.

(Open) Unresolved Item (50-483/77-10): Acceptability of embedded plates installed prior to June 9, 1977. The licensee has submitted an evaluation of this item to RIII office on March 13, 1978. This evaluation will be reviewed by the NRC Headquarters Staff for a determination of its acceptability.

Functional or Program Areas Inspected

1. Review of Quality Records for Containment Exterior Wall (First Lift)

The RIII inspectors reviewed the QA records for containment exterior wall placement 2C231W01 from elevation 998'-5 3/4" to 2004'-0" which was a 350 cu. yd. placement made on August 31, 1977. It was determined that the records reflect the work accomplished and were consistent with applicable requirements in the following areas:

a. Placement Preparation

Preplacement checklists indicate appropriate verification that the location preparation and preplacement inspection was performed on the following items: construction joint preparation, form alignment, concrete placing equipment, verification of vibrator frequency of 8000 to 9500 cps and protection from weather.

b. Delivery and Placement

(1) Specified concrete mix E1 (PTL171) with a required minimum strength of 6000 psi at 90 days was delivered and placed.

(2) Records of batches delivered were available and indicated the specified mix along with mix proportion was verified by comparison to the mix design records.

(3) Records indicate that the concrete temperature as measured at the point of discharge in the forms to be within the temperature limits as specified in Quality Control Procedure QCP-109, Section 4.6.

(4) Required tests were performed and results determined acceptable with a slump range of 2 to 3 inches and air content of 3 to 6% as required in QCP-109, Appendix I and Section 4.4.

(5) Inspection reports relative to placement indicate that proper consolidation was performed and the maximum placement lift of 24 inches and maximum free fall of the material of 5 feet was not exceeded and met the requirements of concrete work procedure WP-109.

c. Curing

(1) Temperature records were maintained for seven days and indicated that temperature met requirements as specified in Technical Specification No. 10466-C103(Q), Section 12.0.

(2) Curing records indicated that wet burlap was used to moist cure the exposed concrete surfaces which was verified as an acceptable method according to Technical Specification No. 10966-C103, Section 12.0.

d. Concrete Materials

(1) The 90-day concrete compressive strength test result records indicated that the cylinders cast during placement 2C231W01 broke well above the minimum required 6000 psi strength. Strength of the cylinders were in excess of 7500 psi.

(2) Inspection records indicated that established requirements relative to control of materials, handling and storage were acceptable.

e. Batch Plant Operations

(1) The inspector reviewed batch plant production records for the first lift of the containment exterior wall and found the records to indicate that concrete supplied was in accordance with concrete requirements.

(2) The batch plant is currently certified with valid calibration tags on all scales used in the production of concrete.

f. Reinforcing Materials

(1) Mill certifications for reinforcing steel were reviewed and established that the chemical and physical test requirements of ASTM A615 were met.

(2) The minimum yield strength of 60,000 psi and tensile strength of 90,000 psi was exceeded for the records reviewed. Heat Nos. A8105, A8419, and B3499 were reviewed relative to the above requirements.

(3) Caldweld splice tests records between December 31, 1976 to December 19, 1977 were reviewed and the test results indicated that the minimum tensile requirements of 75,000 psi were exceeded.

g. Deviation Reports

The inspector requested to review all nonconformance reports identified as pertinent information relative to this placement. Document and Control was able to supply NCR Nos. 2-1012, 2-1042, 2-1243, and 2-1314 which were reviewed and found to have proper engineering disposition and approvals. NCR No. 2-1033, dated August 8, 1977, was not available and determined to be still open as of this inspection. It was determined that QCP-1.9 did not have an adequate mechanism for closure of nonconformance reports prior to placement of concrete, and this was an instance where a NCR was not closed prior to placement. This item is considered an item of noncompliance with 10 CFR 50, Appendix B, Criteria XV. (483/78-01-01)

2. Observation of Concrete Work Activities

The inspectors reviewed concrete work being performed on placement No. 2C232W24 (interior containment wall) on January 10, 1977.

a. Placement Inspection

(1) Forms were verified to be adequately secured and clean.

(2) Reinforcing steel and embedded plates were adequately placed and secured with tie wire and free of any excess rust.

(3) Reinforcing was of the size and grade as specified on design drawings.

(4) Reinforcing had proper concrete cover as specified on General Notes Drawing C-0003R10, note 11.

b. Delivery and Placement

(1) Specified concrete mix C1 (PTL138) was delivered and placed.

(2) Concrete was pumped via a 6" diameter steel pipe from the truck to the point of discharge in the forms.

(3) Adequate crew was available for concrete consolidation with adequate vibrators available.

(4) Concrete was delivered within the slump range of 2 to 3 inches as specified in QCP-109, Appendix I.

(5) Concrete temperature was verified to be within the allowable temperature range of 50°F to 70°F.

(6) The air content of the mix was tested and observed to be 4.4% which is within the specified range of 3 to 6%.

c. Curing

The inspector verified on January 11 and 12, 19[illegible], that the above placement was being properly moist cured with wet burlap and the ambient temperature to be within the required temperature range.

d. Batch Plant Operation

The inspector witnessed concrete production activities and verified that adequate material storage and control was being performed relative to the concrete materials, the aggregate storage pile, aggregate washing facility, cement storage, and admixture storage tanks.

3. Inspection of Containment Concrete Placement 2C231W04 (Fourth Lift)

The inspector observed partially completed work and completed work by Daniel International Constructors (DIC) on containment

concrete exterior wall (4th lift) placement 2C231W04 between elevations 2023'-11 1/2" to 2033'11 1/2".

a. Placement Preparation (January 10-13, 1978)

(1) Reinforcing steel was observed to be heavily congested under the penetrations at elevation 2023'-11 1/2" due to interaction of hooked reinforcing terminating under the penetrations. Based on discussions with licensee personnel it is the inspectors' understanding that special care will be given to these areas to assure proper consolidation around the penetrations. The inspector was also told that a maximum 3/4" aggregate concrete mix which was flowable would be utilized in these areas.

(2) Reinforcing projecting from the 3rd lift into the 4th lift appeared to not have the required minimum clear distance between bars as indicated on drawing C-0003 Revision 10, note 12. This item was identified on NCR No. 2-1907-C, illustrating the two areas where less than 1 inch clear distance had been provided. These areas were not identified as nonconforming conditions during the inspection of the 3rd lift. This is considered an item of noncompliance with 10 CFR 50, Appendix B, Criteria XV. (413/78-01-02)

(3) The inspector observed that contrary to drawing C-0R 2901(Q), note 12, reinforcing had been placed closer than 2 inches from the edge of pipe sleeve penetrations. The inspector was advised that final QC inspection had not been completed and that any deviations from this requirement would be identified and corrected prior to releasing the placement.

(4) The inspector observed ten No. 9 reinforcing steel cut and tied under penetrations. Upon inquiring the inspector verified that NCR No. 2-1724-C-D identified this condition and corrective action was to lower the No. 9 bars to avoid interference with the horizontal sheathing and to cadweld splice the No. 9 bars together. This work was later inspected and verified as being acceptable.

(5) The inspector observed the bundling of shear ties in lift 4, between elevations 2023'-11 1/2" to 2033'-11 1/2" in conjunction with lap contact splices with horizontal No. 14 hoop bars. The inspector expressed concern that the bundling of 4 or 5 bars would hinder the proper consolidation of concrete materials around the reinforcement and would not provide the required concrete to reinforcing bond. Bechtel stated that the bundling of shear ties with the main reinforcing as per drawing was permissible in that the shear ties are not considered to be main reinforcing. This explanation was determined to be acceptable.

(6) The inspectors observed that the shear ties in the 4th lift were not installed as per the PACAL detail drawings or the design basis document BC-TOP-5A, Section CC-3532.1.2 (Anchorage of Radial Shear Reinforcing) which requires that "between anchored ends, each bend in the continuous portion of a transverse simple U . . . shall enclose a longitudinal bar." The applicability of the above requirement could not be resolved at the site. A meeting was held in Bethesda, Maryland, on January 23, 1978, which resolved the above issue. A copy of the minutes of that meeting is attached to this report.

(7) The inspectors noted that in several areas the concrete cover was on the order of 12 to 13 inches which appeared to be more than permitted. The design basis as indicated in Bechtel Topical Report BC-TOP-5A, Section CC-3534 (concrete crack control) states "reinforcing bars considered as face reinforcement shall not be more than one-fifth of the total section thickness from the concrete face." The total section thickness of the containment wall is 48" which limits the maximum concrete cover to 9 3/5 inches. Therefore, the areas noted as being in excess of 9 3/5 inches are in deviation with the original design basis. (483/78-01-03)

The above item was also discussed in the meeting on January 23, 1978, and is addressed in the meeting minutes attached.

(8) The inspectors observed that in several areas the concrete cover was less than two inches as specified on the placement drawings. The licensee pointed out

that the Specification No. C-112 allowed them to reduce the concrete cover by no more than one third of the specified cover. This would allow a concrete cover of one and third inch where it was specified to be two inch cover. Subsequent to this portion of this inspection it was determined that Bechtel Topical Report BC-TOP-5-A, Section CC-3533-1 on concrete cover, states that the minimum concrete cover for No. 6 through No. 18 bars where the concrete is exposed to earth or weather shall be two inches. The question of whether or not this could be further reduced by one third could not be resolved at the site. This item was discussed in a meeting between the licensee and NRC in Bethesda, Maryland on January 23, 1978, and is addressed in the meeting minutes attached. Since there were areas were the concrete cover was less than the two inches specified in the original design basis this item is considered a deviation from that design basis. (483/78-01-04)

b. Preplacement Preparation (February 2-3, 1978)

Prior to the placement of the fourth lift of the exterior wall of the Containment Building, RIII inspectors observed the preplacement preparation. The following items were unacceptable at the time of the inspection:

(1) At azimuth 250° the concrete cover was ten and one half inches, eleven and one eight inch, and eleven and three sixteenths inch to the outer face of the number eleven horizontal bars. Bechtel Topical Report BC-TOP-5A limits the design cover to a maximum of 9.6 inches at this location.

(2) At azimuth 300° two shear ties were not adequately tied in place.

(3) At azimuth 305° a No. 11 bar was against the side of the penetration sleeve. The requirement is to have a minimum of two inches between reinforcing bar and the edge of a penetration.

(4) At azimuth 305° the concrete cover was one and one fourth inch, 1 and 3/8 inch, and 1 and 1/2 inch to the outer face of the horizontial bars. This is less than the design minimum cover of two inches.

(5) At azimuth 345° debris was found on the top of lift No. 3.

(6) At azimuth 235° the concrete cover was 3/4 of an inch over a No. 14 horizontal bar. This is less than the minimum cover two inches.

(7) At azimuth 210° the concrete cover was 11 inches, which is more than the maximum cover permitted of 9.6 inches for this area.

(8) At azimuth 210° the concrete cover over a No. 7 shear tie was 5/8 of inch which is less that the minimum required.

(9) At azimuth 150° loose shear ties were observed. All reinforcing is to be adequately restrained from moving during the placement.

(10) At azimuth 120° the concrete cover was 1 and 3/8 inches to the outer face of No. 14 bars. This is less than the minimum design cover of two inches.

(11) At azimuth 110° a patch of ice was observed. The area lacked heat to raise the ambient temperature to the required temperature.

(12) At azimuth 200° the concrete cover was twelve inches to the No. 11 bar at elevation 2023'-11 1/2" inches. This exceeds the maximum design cover of 9.6 inches for the wall thickness in that area.

(13) At azimuth 68° the forms were observed to be coated with debris and excess mortar from the previous lift. The forms are to be cleaned prior to placing concrete.

(14) At azimuth 345° a No. 7 reinforcement bar was against the side of a penetration sleeve. The requirement is to have a minimum of two inches between reinforcing bar and the edge of a penetration.

Items (2), (3), (5), (8), (9), (11), (13), and (14) were promptly corrected by the licensee and reinspected by the RIII inspectors. Items (6), - the cover was increased to 1 and 1/2 inches which placed it in the same category as Items (4) and (10), which were determined to be acceptable for this lift during the January 23, 1978 meeting. Items (1), (7), and (12) fell into a category in which the licensee felt that they could allow the 1 and 1/2 inch placement tolerance on the 9.6 inch maximum cover for a fourty-eight inch thick section, which would allow a maximum cover 11.1 inches. Based on this position a noncomformance report (NCR-2-2055-C-A) was written to indicate the installed condition. This NCR was dispositioned "use as is" by Bechtel prior to concrete placement.

c. Placement of the Fourth Lift (February 6, 1978)

A final preplacement inspection was made by a RIII inspector just prior to the placement of the fourth lift on the containment exterior wall. All nonconformance reports involving this lift were found to have been properly closed prior to the placement of concrete. The beginning of concrete placement was observed and include the following:

(1) Grout and then, concrete was pumped up to the fourth lift via steel pipe.

(2) Concrete is tested by removing samples from the pipe at its discharge point into the forms.

(3) Tests for slump, concrete temperature, and air content were observed to be performed properly and the results were within the acceptance criteria.

(4) An adequate crew and use of vibrators for proper consolidation was observed.

(5) Chutes were provided to prevent excessive free fall of the concrete.

4. Review of Containment Concrete Quality Records (Third Lift)

The inspectors reviewed the quality records relative to placement 2C231W03 containment wall between elevations 2013' - 11 1/2" to 2023' - 11 1/2" and determined that the records indicate the following:

a. Prepour checklist indicated no adverse findings relative to the following:

(1) Rebar/welded wire fabric

(2) Embedded metal

(3) Waterstop

(4) Formwork; cleaned and coated, blockout placement and anchorage, shore and bracing, alignment, forms adequately secured.

(5) Tendon sheathing and trumpets correctly located.

b. Concrete placement preparation checklist indicates no adverse findings relative to the following:

(1) Construction joint preparation

(2) Forms

(3) Concrete placing equipment

(4) Vibrator equipment

(5) Protection

(6) Adequate personnel were available to monitor the pour

c. Summary of concrete batched indicated the following:

(1) Mix design E-1(PTL-171) was specified, and 633 cubic yards of concrete were delivered.

(2) Concrete test cylinder specimens were collected at the required frequency.

d. Summary of concrete placed indicated the following:

(1) Minimum/maximum values of concrete temperatures measured were 52°F and 60°F, respectively; acceptable values are between 50°F and 70°F, respectively.

(2) Minimum and maximum values of slumps measures were 1 1/2" and 3"; acceptable values are between 1" and 5".

(3) Air content measured was between 3.5 and 4.7% (acceptable 3-6%)

(4) Unit weights of concrete weighed were between 144.40 and 147.75.

e. Concrete Placing Report indicated the following:

(1) 633 cubic yards of concrete were placed.

(2) 6 vibrators were used; 3 spare vibrators were available as standby.

(3) Moisture cure and protection against cold weather was specified.

f. Post-placement Inspection Report indicates the following:

(1) 7 days of moisture curing.

(2) Surveillance on curing every four hours; temperature did not fall below 41°F (Procedure QCP-109, Revision 9, stipulates minimum temperature of 35°F).

g. The RIII inspector reviewed 22 NCR's which concerned nonconforming situtations identified prior to the commencement of the pour and concluded that they were appropriately closed; two NCR's which were written after the pour relative to rebar spacing (i.e., bar moved during concrete placement) and Cadweld splice tests were not closed.

h. Compression tests on concrete cylinder specimens indicate that, after 7-day and 28-day curing, the compressive strengths met the specification requirements.

No items of noncompliances or deviations were identified in the above area.

5. Review of Safety-Related Structural Welding Records

a. Magnetic Particle Test (MT) Report

The inspector reviewed the MT report performed on welds - regarding two clips and an embedded plate and two clips on

the beam identified as 245-b. Daniel International Corporation (DIC) Technical Service Laboratory Report MT-00531, dated January 5, 1978, indicates that weld Nos. 25, 26, 27, 28, 65, 66, and 67, as referenced in drawing C-05'411(Q) were examined utilizing Magnetic Particle Test Procedure NDE 73W. "Magna Magic" apparatus identification No. WQ-052 was used; 300 amps DC was used for 3" spacing and 600 amps was used for 6" spacing; 8A-Red particles, supplied by Magnaflux, were used.

b. Weld on Column C13KA

The inspector observed the weld between clip angle and column C13KA at elevation EL 1988 and, subsequently, verified that the size and length of the shop weld 5/16" along the length of the weld, with 5/8" return at the top - was in accordance with American Bridge (Vendor) drawing K6720, sheet 206.

c. Review of Inspection Records and Field Welds

The RIII inspector reviewed the inspection records on the following field welds:

(1) Nos. 29, 30, 31, and 32 relative to beam 616B3 and Column No. 129C3FA on one end, and an embedment on the other end as referenced on Bechtel drawing C-051241(Q)

(2) Nos. 25, 26, 27, and 28, on beam 132B5, referenced on drawing 6720-E201

The inspection records indicated that the welds were acceptable.

6. Review of QA Records on Embedments

The RIII inspector observed Reactor Vessel Support (RVS) No. 22000, and Reactor Vessel Support Wing (RVSW) No. 21000, placed in position; rebar was being installed around the embeds. These embeds were manufactured and supplied by teledyne Brown Engineering Company (TBE) Alabama, and were identified in Reactor Vessel Support Embed Erection and Assembly - Reactor Building, TBE Drawing E-21325. The material was procured to Bechtel Specification 10466-C202(Q) titled Technical

Specification for Purchase of Pipe Whip Restraint Embeds and Nuclear Steam Supply Embeds for SNUPPS. The records consisted of the following:

a. MCR No. 8-00860, dated April 4, 1977, which indicated that the Reactor Vessel Support embeds were received onsite without shipping damage.

b. Bechtel Shop Release Form G-321-D signed by the Bechtel shop inspector.

c. Fabrication routing reports.

d. Certificate of compliance from Ameron Protective Coating Division for the painting materials.

e. Magnetic Particle Examination reports which indicated that Procedures PS-102-3-4A and PS-102-3-2A, Parker probe (Contour Probe) 4"-6" spacing (6"-8" spacing) with 8 amps and red powder (Particles) were used. No unacceptable indications were identified.

f. Welding procedure qualification. Also material certifications for the Nelson studs which indicated that the material was ASTM-A 108, Grade 1015, with heat number 658W150.

g. Material test report from the manufacturer that material met ASTM-A-36 requirements; Certificates of Analysis from Chemtron, Airco, Teledyne McKay, for the weld rod supplied, met the applicable requirements.

h. Ultrasonic Test reports from Lukens Steel Company which indicated no adverse indications.

i. Weld repair records for Item No. 22000, dated March 10, 1977, which indicated that two weld defects were identified; welds with dimensions 1" x 2" and 1/2" x 2 1/2" were removed; however, the column joint shape restoration was not signed off, indicating that the weld was filled after the removal of the defect. The report appears to indicate that only one weld was reexamined and accepted. The inspector requested the licensee to obtain further information. This is an unresolved item. (483/78-01-05)

7. Inspection Requirements for Structural Steel Welding

During review and examination of the structural steel welding and inspection activity associated with the cracked structural beam clips and the associated concrete embedment that appears to be pulling out of its concrete anchorage (reported under the requirements of 10 CFR 50.55(e)), the inspectors made the following significant finding:

The Technical Specification (contract) No. 10466-C122, Revision 7, does not require weld inspection in accordance with the referenced AWS code. Section 4.1 of the subject specification (No. C122, Revision 7), states in part that "Erection of structural steel shall be in accordance with the following codes and standard specifications to the extent indicated by reference herein . . .". However, although AWS D-1.1 is referenced by this specification, the extent of the reference does not include the inspection requirements of AWS D-1.1, and no other contractural measure for inspection is established.

Examination and review of QC documents, showed that some of the weld inspections are being conducted. However, the technical specification (contract) does not establish a requirement.

This is an item of noncompliance with 10 CFR 50, Appendix B, Criteria IV. (483/78-01-06)

The weld inspections, which are being done, are conducted to the requirements of procedure Nos. QCP-507, QCP-508, and QCP-133 as applicable.

8. Component and Materials Storage

a. During the observation and examination of the status and condition of stored materials and components the inspectors noted some discrepancies as listed in paragraph C below. The licensee took immediate corrective action relative to each of these issues. However, the following significant item is considered an item of noncompliance.

Relative to the nonconforming status of the Component Cooling Water Heat Exchanger, No. EEG01B (inadequate nitrogen blanket), this discrepancy was noted by the licensee's inspectors on December 27, 1977 and again on January, 9, 1978. However, corrective action was not initiated until after NRC identification and notification of these discrepancies.

This is item of noncompliance with 10 CFR 50, Appendix B, Criteria XVI. (483/78-01-07)

b. It appears that the QA/QC system implemented by the licensee does not require that nonconforming storage items be tagged or otherwise identified relative to their status. This matter is unresolved. (483/78-01-08)

c. Items identified by NRC inspectors for which immediate corrective action was initiated and completed during the inspection:

(1) CCW Heat Exchanger No. EEG01A; missing tag

(2) CCW Heat Exchanger No. EEG01B; contained moisture, inadequate purge

(3) Stainless steel pipe not on dunnage

(4) SIS Accumulator Tank SIATAT-3, lost purge

9. Paper Calmenson Drawing Approval

During the review of reinforcing steel placement drawings for the reactor containment the RIII inspectors observed that there were missing checker and appover signoffs on a number of drawings. These drawings were made by Paper Calmenson and Company (PACAL) as a subcontractor of Bechtel Power Corporation. As a result of the questions raised by the RIII inspectors PACAL was requested to make a total review of their drawings with specific emphasis on the examples provided by the NRC. The results of their (PACAL) review indicated that prior to January 19, 1978, at least 106 revisions to safety related drawings were issued for approval without being checked by PACAL. Followup of this item will be conducted in two parts as follows:

a. Failure to check the revisions of drawings prior to issue to Bechtel is an item of noncompliance with 10 CFR 50, Appendix B, Criteria VI. (483/78-01-09)

b. The questions regarding the missing appr[illegible]er signoff by Paper Calmenson of their drawing has not been addressed by the licensee, Bechtel, or PACAL. This item remains unresolved. (483/78-01-10)

10. 50.55(e) on Cracked Clip Angles and Embedment Pullout

During the inspection on January 11, 1978, the Union Electric Company reported cracks in the clip angles used to connect structural steel in the Auxiliary Building and that an associated concrete embedment appears to be pulling out of its concrete anchorage. Both of these matters are being investigated by the licensee. RIII inspectors did observe the cracked clip angles and the concrete embedment. This item was reported per the requirements of 10 CFR 50.55(e).

11. Missing Embedments

During a review of NCR 2-0831-C-B performed by the licensee they identified that 16 embedments which were rejected had no record that they were later reworked and it appears that they are missing. The licensee identified this to a RIII inspector during the inspection effort that occurred between January 10 and 13. Fifteen of these plates are safety related and one is non safety related. The following is a list of the plate numbers and the date they were rejected:

SIXTEEN MISSING PLATES IDENTIFIED ON NCR 2-0831-C-B

	Plate Number		Date Rejected
1.	EP-611-A6-17		6-27-77
2.	EP-411-A10-55		6-27-77
3.	EP-311-A18-12		7-05-77
4.	EP-311-A9-47		8-31-77
5.	EP-311-A9-3		8-29-77
6.	EP-311-A9-1		6-28-77
7.	EP-611-A6-59		6-27-77
8.	EP-711-36	(QC Assigned No.)	6-24-77
9.	EP-711-20	(QC Assigned No.)	6-24-77
10.	EP-611-8	(QC Assigned No.)	6-22-77
11.	EP-611-1001	(QC Assigned No.)	6-22-77
12.	EP-511-6	(QC Assigned No.)	6-22-77
13.	EP-411-39	(QC Assigned No.)	6-24-77
14.	EP-411-9	(QC Assigned No.)	6-22-77
15.	EP-211-37	(QC Assigned No.)	6-24-77
16.	EP-1-1000	(QC Assigned No. Non-Q)	6-27-77

Summary No.	Plates
	EP-211-1
	EP-611-4
	EP-411-3
	EP-311-4
	EP-711-2
	EP-511-1
	EP- 1-1
	16

Subsequent to this notification the licensee informed a RIII inspector on Feburary 23, 1978, that one of these embedments had been found installed as a support to structural steel member in the Auxiliary Building at elevation 2026'. This item was reported under the requirements of 10 CFR 50.55(e).

12. Review of the Concrete Expansion Anchor Bolt Speficiation

The inspector reviewed construction Specification No. 10466-C-103A, Installation of Concrete Expansion Anchor Bolts for the CNUPPS Plants. The following items were presented to the licensee for clarification:

a. The specification does not state the material requirements. Material requirement for safety related items are to be identified.

b. The inspector questioned what documentation from the supplier is required i.e., mill test reports on chemical, physical, and mechanical properties.

c. The inspector questioned the method by which the torque values were determined for setting the anchors.

d. No embedment depths were specified for each size bolt. Since the tensile capacity of the bolt is proportional to the embedment depth the requirements are to be stated.

e. The inspector questioned if any onsite testing would be performed to confirm the torque vs. tensile capacity requirements of each size bolt.

f. Torque values were specified, however, the tensile values which correlate to the torque requirements were not stated in the specification.

g. The inspector questioned whether any inplace testing would be performed to monitor the torque and tensile valves of the installed bolts in order to preclude relaxation of the both after installation.

The licensee stated that the above items would be addressed and that RIII would be notified of the response. This item is unresolved. (483/78-01-11)

13. Items Inspected as a Result of Allegations and Not Addressed Elsewhere in This Report

a. Allegation

On January 11, 1978, the south west wall of the Control Building was poured, at elevation 2059'-6", inspite of the fact that the wall below it had a crack that was 12 feet long and at least 8 inches deep and probably extends all the way from the inside to the outside of the wall. The crack is still visible.

Finding

Region III inspectors were able to locate a crack that was approximately twelve feet long in the "plant" north wall of the Control Building which extended from elevation 2047 feet to elevation 2059 feet. The licensee was informed of the location of this crack. The crack did extend from the inside to the outside of the wall. Subsequent to this inspection and at the request of the RIII Inspectors a nonconformance report was written to document this crack and other cracks in the control building walls, NCR 2-2081-C-A. The NCR states that the above mentioned cracks were documented in the NCR for information and to indicate a recurring problem.

This item is considered to be unresolved pending review of the disposition of NCR 2-2081-C-A. (483/78-01-12)

b. Allegation

In at least ten cases No. 14 bars were lap-spliced together, particularly around the 340° azimuth. A bar that large should have been mechanically spliced instead - that is, the No. 14 bars should have been cadwelded.

Finding

The above condition was reviewed by the RIII inspectors and found to be properly documented on NCR 2-1906-C-D. Resolution could not be obtained initially at the site but necessitated a conference call with Bechtel Power Corporation. These bars were not being lap-spliced for mechanical strength but they were over lapping grids of reinforcing in the transition zone between the auxiliary reinforcing the penetration area and the general shell wall area. The mechanical strength was provided in each case by the bar having a standard hook plus an effective embedment length. Upon review of the situation the above item was considered acceptable.

Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations. Unresolved items disclosed during the inspection are discussed in paragraphs 6, 8, 9, 12, and 13 of the Details section of this report.

Exit Interview

The inspectors met with site staff representatives (denoted in the Persons Contacted paragraph) at the conclusion of the inspection on January 13 and February 6, 1978. The inspectors summarized the scope and findings of the inspection, including the five apparent items of noncompliance identified in paragraphs 1, 3, 7, 8, and 9 of the Details section of this report. The deviations discussed in paragraph 3 were identified as deviations subsequent to the inspection. The licensee acknowledged the findings.