APPENDIX B

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

This Report Contains Results of an Investigation

Report: STN 50-482/82-04

Docket: STN 50-482 Category A2

Licensee: Kansas Gas and Electric Company
P. O. Box 208
Wichita, Kansas 67201

Facility Name: Wolf Creek Generating Station

Inspection At: Wolf Creek Site

Inspection Conducted: March 1-31, 1982

Inspector: T. E. Vandel 4-19-82
T. E. Vandel, Senior Resident Reactor Inspector, Reactor Project Section C (Paragraphs 1, 3, 4, 5, 6, 7, and 8) Date

Inspector: T. E. Vandel for 4-19-82
F. C. Hawkins, Reactor Inspector, DETP Region III (Paragraph 2) Date

Approved: R. E. Hall 4/23/82
R. E. Hall, Chief, Reactor Project Section C Date

Inspection Summary

Inspection During March 1-31, 1982 (Report STN 50-482/82-04)
Areas Inspected: Routine, announced inspection by the Senior Resident Reactor Inspector and by a Region III Reactor Inspector covering follow up to previous inspection findings; review of licensee Reactor Containment Building adequacy assessment; program review and observation of work activities for post-tensioning system installation; and review and inspection of piping system hangers and supports. The inspection activity involved 111 inspector-hours by the Senior Resident Reactor Inspector and by a Region III Reactor Inspector.

Results: Of the five areas inspected, one violation was identified regarding lack of prompt correction of a deficient condition committed to by the licensee. (Violation: Failure to Perform Timely Corrective Action, see paragraph number 4)

DETAILS

1. Persons Contacted

Principal Licensee Personnel

D. W. Prigel, QA Manager, Wolf Creek Generating Station (WCGS)
J. L. Stokes, Project Support Supervisor, Construction WCGS
G. W. Reeves, Assistant Manager QA, WCGS
C. E. Parry, QA Systems Supervisor, WCGS
O. L. Thero, QA Surveillance Supervisor, WCGS
R. W. Holloway, Assistant Project Construction Supervisor, WCGS
E. Anderson, Contracts Supervisor, Construction WCGS
J. L. Nix, Contracts Coordinator, Construction WCGS
H. J. Moody, QA Engineer, WCGS
W. M. Lindsay, QA Engineer, WCGS
P. M. Burck, QA Engineer, WCGS
D. A. Colwell, QA Technologist, WCGS

Other Personnel

J. Herbst, Project Field Engineer, Inryco Company
W. Schneider, Lead QC Inspector, Inryco Company
G. Jewell, Project Manager, Inryco Company

The above listed personnel attended one or more of the entrance and exit meetings held on March 15, 18, 29, and April 2, 1982.

Other licensee and contractor personnel were contacted during the course of inspection activity.

2. Post-Tensioning System

Inryco Company (Inryco) of Melrose Park, Illinois, is the Wolf Creek Generating Station contractor responsible for installation, stressing, and first line QC inspection of the post-tensioning system. Inryco commenced site construction activities in November 1981.

The Wolf Creek (SNUPPS) Reactor Building design utilizes the BBRV (patented trademark) wire-tendon post-tensioning system. This system uses unbonded tendons, each consisting of 170 high strength steel wires with cold formed buttonheaded ends.

The Wolf Creek Reactor Building is a cylindrical shell with a hemispherical dome. The conventional vertical and dome tendons have been combined in the SNUPPS design into 86 inverted U-shaped tendons. These tendons run vertically from the tendon gallery over the top of the dome and down the opposite wall to the tendon gallery below. There are 135 circumferential tendons which are anchored at three buttresses equally spaced around the outside of the Reactor Building.

This inspection consisted of a review of the Inryco Field Installation Manual, quality records, and the governing Bechtel specifications. Observation of inprocess QC inspection activities was also conducted.

a. Review of Inryco Procedures and Bechtel Specifications

Bechtel Specifications C-155, C-156, and C-157 were examined to assure that they included appropriate criteria for the procurement, storage/handling, placement, buttonheading, stressing, and greasing of the post-tensioning system components. The Inryco Field Installation Manual was reviewed to verify its compatibility with the Bechtel specifications and to confirm that it provided appropriate inspection requirements so as to assure quality.

Chapter 9 of the Field Installation Manual outlines the quality control functions necessary to assure that post-tensioning activities are performed in accordance with applicable procedures, specifications, and industry standards. The QC inspection requirements, specified by Chapter 9, for post-tensioning material receipt, tendon placement, buttonheading, stressing, and greasing activities were reviewed in detail.

Additionally, the KG&E Memo Work Order No. 01 for Contract/P.O. No. 10466-C-1560-1-C was reviewed. The Work Order increases the number of Inryco QC inspectors assigned to Wolf Creek and clearly defines the scope of required inspection. It is the NRC inspector's conclusion, based on this review, that the Inryco quality program, in its present configuration, can support post-tensioning construction activities and assure a quality product.

b. Review of Quality Records

(1) Installation, Buttonheading, Stressing, and Greasing Cards

Tendon work activity cards for Phase I over-the-dome tendons were reviewed. The review confirmed that the stressing sequence specified on Bechtel Drawing No. C-0107 (Q), Revision 2, had been followed. It also verified that the allowable time limits between installation/stressing and stressing/greasing as specified by Bechtel Specification 10466-C156 had been met, with the following exceptions:

- NCR F12WC identified two tendons (V7 and V11) which were installed and not stressed within 60 days as required by Bechtel Specification 10466-C156.

- NCR F13WC identified three tendons (V1, V43, and V44) which were not greased within 15 calendar days after stressing as required by Bechtel Specification 10466-C156.

- NCR F14WC identified one tendon (V86) which was not greased within the specified 15 days after stressing.

- NCR F15WC identified six tendons (V5, V9, V35, V39, V48, and V82) which were not greased within the specified 15 days.

- NCR F16WC identified two tendons (V31 and V78) which were not greased within the specified 15 days.

- NCR F17WC identified three tendons (V3, V41, and V46) which were not greased within the specified 15 days.

- NCR F18WC identified nine tendons (V58, V60, V62, V64, V66, V68, V70, V72, and V76) which were not greased within the specified 15 days.

The disposition of each NCR was verified to be in accordance with Inryco procedures and was consistent with good construction practice.

(2) Control of Measuring and Test Equipment

The calibration/verification records of the following equipment were reviewed:

- Stressing Rams: 8805 and 8813

- Stressing Gauges: N154 and N240

- Heise Digital Indicator (Serial No. 57-7233)

- Micrometers: QC17, QC30, QC31, and QC53

- Go, No-Go Gauges: BH39, BH43, BH45, and BH55

- Dial Gauges: ECC8 and ECC19

- Feeler Gauges: F17 and F18

- Thermometers: PK22, PK23, and CAP 12

Each item was properly calibrated at the frequency specified in Field Installation Manual, Chapter 9, Section 19, and was properly tagged to indicate calibration status.

(3) Certification of Personnel

The training records for nine Inryco production personnel were reviewed. The personnel met the requirements set forth in the Field Installation Manual, Chapter 9, Section 4.

The qualification and training records for one Level II and two Level I QC inspectors were reviewed. The inspector's certification records met the requirements of ANSI N45.2.6 as referenced by the Inryco QA Manual, Section II.10.7.

(4) Receipt of Purchased Material

Receiving records and manufacturers' material certifications for the following were reviewed:

. Visconorust 1702 Amber Grease - Batch No. 01151

. Visconorust 2090P-4 Casing Filler - Lot No. 79, 275, 315, and 2819

Additionally, the inprocess testing of 2090P-4 casing filler material samples was verified to be in accordance with the requirements of Bechtel Specification 10466-C157.

(5) Surveillance/Audit Reports

Three KG&E surveillance reports of Inryco work activities were reviewed. The audits were well planned and executed in a timely manner with relation to ongoing work.

The results of an Inryco internal audit of field operations was also reviewed. The audit was conducted in accordance with the Inryco QA Manual, Section XVIII.

c. Observations of Work/Inspection Activities

(1) Storage

The NRC inspector confirmed that the tendon laydown area met the requirements for Level D storage, as described in ANSI N45.2.2. The tendons were in their shipping racks, surrounded by a waterproof enclosure, and stored on dunnage so as to provide proper moisture protection and ventilation.

(2) Hold and Reject Tags

The implementation of the Inryco hold and reject tag system specified in the Field Installation Manual, Chapter 9, Section 16 was verified. Reject Tag No. 207 and Hold Tags 2225 and 2226 were observed to be placed on Tendon V-84 as referenced in the Inryco Hold and Reject Tag Log.

No violations or deviations were identified.

3. Reactor Building Containment

Reactor Containment Building was completed on October 29, 1980, when the upper buttresses and dome crest concrete were placed. The containment slab concrete placement was critically reviewed by licensee personnel for soundness and acceptability and the whole containment reviewed for completeness and adequacy. A document package was generated as a result of this review which will not become part of the permanent plant records. This package was reviewed by the NRC Senior Resident Reactor Inspector (SRI).

The document package contained copies of information and/or records that attested to the surveillance and audits performed, the training and special instructions provided to craft and inspection personnel, and the completed dome inspections for soundness of concrete. Included were copies of 12 nonconformance reports that were generated, dispositioned, and completed relative to containment problems requiring nine of which required repair to correct.

One final inspection was performed on January 27, 1982, which established that all repairs had been completed and that no further reportable concerns remained.

The SRI had no further questions regarding the containment dome concrete.

4. Licensee Action on Previous Inspection Findings

(Closed) Noncompliance Item (Report STN 50-482/81-06-02): Fabrication of an unauthorized piping hanger from nonconforming materials. Deficiency Report (DR) No. 1SD6526M was issued April 6, 1981, to control and remove an unauthorized hanger fabricated to replace the destroyed Hanger No. 1-BN-01 C011 123. The SRI became aware of the unauthorized hanger on April 10, 1981, through an allegation source and observed the hanger and remnants of the original hanger on April 13, 1981, then located in the Piping Superintendent's office. During the course of an investigation conducted by a Region IV Investigator, it was established that the corrective

action by the licensee included the discharge of the piping hanger crew foreman who directed the fabrication.1/ Final disposition of the hanger has been completed and the DR signed off as complete on April 6, 1982, and the SRI confirmed that the hanger is in the custody of the KG&E QA Manager.

This item is closed.

(Closed) Noncompliance Item (Report STN 50-482/81-01-02): A superseded drawing was not accounted for and returned to Document Control Section as required. The March 19, 1981, licensee letter of response committed to corrective action which modified Daniel Procedure AP-IX-03 for: (1) an improved document suspense file follow-up system, and (2) a Document Control Technician assigned full time to monitoring duty. The SRI confirmed that the implementation of this corrective action had been completed as committed; however, it was also learned that the committed revision of the procedure to provide the upgraded requirements had not been done. Licensee representatives stated that an Interim Change to Procedure (ICP) Number ICP-485 will be issued April 8, 1982, and incorporated into the procedure in the next revision. This failure to promptly correct a deficient condition (for more than a year after committing to the change) constitutes a violation of 10 CFR Part 50, Criterion XVI. (482/82-04-01)

5. Post-Tensioning Installation Observations

The installation of the replacement tendon for the broken and removed Vertical Dome Tendon V-84 was observed by the SRI. A 526-foot long tendon marked #EV-1, available on site, was utilized for the replacement tendon. This tendon had been tagged "Acceptable" on December 18, 1981, by the Tampa, Florida, facility when it was shipped. The following installation activities were observed with no concerns being identified.

- The uncoiling and pulling installation activities were observed. The SRI witnessed one wire of the tendon, which had caught on a feed roller bracket and had been bent, being critically inspected by the QC inspector and passed as continuing to meet the acceptance criteria.

- Cutting operations of the installed tendon were observed.

- The shop end buttonheading operation was observed.

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- The QC acceptance inspection of 100 per cent of the buttonheads with the go, no-go gauge and with visual examination was observed. No failures were detected.

- The head machine qualification test sheet and the tendon pull card prepared by the QC inspector were reviewed.

- The final tendon cut and buttonheading operations of the field end of the tendon were observed.

In response to questioning, regarding the completion of the A-E disposition for NCR 1SN3941C dated December 10, 1981, the SRI was informed that the constructor is currently searching for the unlocated tendon sheath vents and drains (all for horizontal tendons). Of the 17 identified tendon sheaths with either vents or drains or both that are required to be located, eleven have been located and cleared, and two more are expected to be cleared before April 10, 1982. The last four sheaths will be located and cleared before they impact the schedule for tendon installation. This item is considered to be an unresolved item which will be followed up during a future inspection. (482/82-04-02)

6. Hanger and Supports

The SRI selected six hangers and supports of the Chemical and Volume Control System Piping, elevation 1974' 6" of the Auxiliary Building for review. Detail drawings were obtained for reference regarding requirements of location, configuration, and construction as well as material. The hangers and supports selected were as follows:

- BG01-H003
- BG01-H004
- BG01-H005
- BG01-R012
- BG01-R007
- BG01-R008

All of the above hangers and supports are located on Hanger Location Drawing M-05 BG01 (Q), Revision 8.

It was soon learned that two of the hangers (R007 and R008) were under QC hold tag for unacceptable welds that had not yet been repaired (DRs 1SD8484 M/W and 1SD8485 M/W) and that weld craft personnel began performing additional welding on some of these as well as other hangers and supports. Only hanger location and configuration were completed by the end of the inspection period (no problems identified). Further inspection will be completed in the future.

No violations or deviations were identified.

7. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. One unresolved item disclosed during this inspection is discussed in paragraph 5.

8. Exit Meetings

The SRI met licensee representatives identified in paragraph 1 to discuss the various findings, in conjunction with NRC inspector, F. Hawkins, on March 15 and 18, 1982, and with NRC inspector, L. Gilbert, on March 29 and April 2, 1982.