



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
611 RYAN PLAZA DRIVE, SUITE 1000  
ARLINGTON, TEXAS 76011

OFFICE OF INVESTIGATIONS

DATE: November 23, 1982

REPORT OF INVESTIGATION

TITLE: Comanche Peak Steam Electric Station  
Alleged Electrical Deficiencies

SUPPLEMENTAL: DN 50-445/50-446

CASE NUMBER: 4-82-012

CONTROL OFFICE: REGION IV STATUS: CLOSED

PERIOD OF INVESTIGATION: August 4 - September 17, 1982

REPORTING INVESTIGATOR: Richard K. Herr  
Richard K. Herr, Acting Director  
OI Field Office, Region IV

PARTICIPATING PERSONNEL: Lawrence E. Martin, Reactor Inspector  
Reactor Project, Section B, Region IV

William D. Kelley,  
Senior Resident Reactor Inspector  
Reactor Project, Section A, Region IV

REVIEWED BY: Roger A. Fortuna  
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## SUMMARY

Investigation of alleged electrical deficiencies that occurred from August, 1979 to January, 1980 in the construction phase of the Comanche Peak Nuclear Power Plant at Glen Rose, Texas, included an interview of the contractor's electrical Superintendent, the review of numerous electrical records, and the inspection by NRC personnel of identified alleged electrical "deficiencies." Investigation disclosed that three of the four basic alleged "deficiencies" were in the areas of non-safety wiring. During August and September, 1982 all alleged deficiencies were examined and no irregularities were found. Review of nonconformance report records did identify similar deficiencies discovered in the December 1979 through January/February 1980 time frame; however, these deficiencies were properly addressed in 1980.

DETAILS

Purpose of Investigation

The purpose of this investigation was to investigate allegations of electrical "deficiencies" during the 1979/1980 construction phase of the Comanche Peak Steam Electric Station, Glen Rose, Texas.

Background

On August 4, 1982, Mrs. Juanita Ellis, President, Citizens Association for Sound Energy (CASE), met with NRC Investigator R. K. Herr at the NRC offices in Arlington, Texas. Mrs. Ellis provided reporting investigator a copy of a statement executed on June 14, 1982 by Michael Chandler. Attachment (1)

Mrs. Ellis explained that Chandler worked at the Comanche Peak construction site in the Electrical Department

Mrs. Ellis remarked that Chandler alleged "electrical faults of construction" at the Comanche Peak site located in Glen Rose, Texas.

Interview of CHARLES BRETT

On August 31, 1982, Charles Brett, Superintendent of the Electrical Department, Brown and Root, contractors for Comanche Peak construction, was interviewed by NRC Investigator R. K. Herr at the construction site located in Glen Rose, Texas. Brett explained that he was present during the 1979 time frame, and in December 1979, the electrical department created a "termination crew." Brett stated that this crew would check out all electrical (safety and non-safety) wiring to ensure that work had been accomplished and that the work was done satisfactorily. Brett remarked that the men assigned to the work crews would submit handwritten reports to show what work was done, where the work was done, and the status of the work. Brett emphasized that this crew checked the electrical wiring before the Quality Control Inspectors were advised that the electrical wiring was ready for inspection. Brett explained that the termination crew conducted a preinspection review of all electrical work. Brett also pointed out that, if a deficiency was noticed and reported, the deficiency would be addressed before the Quality Control Inspector would conduct his inspection. Brett explained that this extra "check out" by the electrical personnel was used as a management tool to show the electrician where problems arose and to point out various potential deficiencies. Brett stated that the Quality Control Inspector could still find various deficiencies, and that the practice of utilizing "termination crews" to check the electrical wiring is no longer being used. Brett remarked that "termination crews" were not a requirement in the Brown and Root procedure or instructions, but were merely an extra check for the electrical department itself, and therefore, none of the handwritten reports or status sheets were kept.

The Review of Michael Chandler's Daily Time Sheet

On August 31, 1982, a review of Michael Chandler's Daily Time Sheet, [REDACTED] by NRC Investigator R. K. Herr at the Comanche Peak construction site, Glen Rose, Texas was accomplished. This review disclosed that Chandler worked for Brown and Root (contractors) from August 21, 1979 to January 11, 1980. The records further disclosed that from August 21, 1979 to January 1, 1980, Chandler worked on non-safety related wiring. According to the records, Chandler worked for the "termination crew" from January 3 to January 11, 1980.



## Interview of MICHAEL CHANDLER

On September 2, 1982, Michael Chandler, a former electrician employed at the Comanche Peak construction project, Glen Rose, Texas, was interviewed by NRC Investigator R. K. Herr and NRC Inspector L. E. Martin [REDACTED]

[REDACTED] Chandler executed a signed sworn statement, Attachment (2), wherein he identified four areas of alleged "deficiencies" and drew a map depicting the exact location of these deficiencies. Chandler further described these deficiencies as follows:

- (1) Motor control center located in the circulation water system: use of 1000 MCM cable, using 750 MCM lug that was drilled to accept larger cable.
- (2) Auxiliary Building, Reactor No. 1: lug designed for an approximate screw size of 3/8 inch was used on a terminal block designed for #10 screws.
- (3) Switch Gear Room, Reactor No. 1, black cable: lug designed for 1/2 inch screws were used on terminal blocks designed for #10 screws.
- (4) Annunciator logic panels, Control Room, Reactor No. 1, black cable: improper cable splicing and wiring to the wrong side of lugs.

Chandler's other general allegations of deficiencies identified in his previous statement of June 14, 1982, were addressed in the following manner. Chandler expressed concern with the improper installation and check-out of Cannon type plugs. Chandler was provided NRC Inspection Report 50-445/80-13, dated May 21, 1980. Chandler stated that after reading the NRC Inspection Report, the report answered all his concerns in this area. Mr. Chandler had also expressed concern regarding the patching/repairing of damaged cable, faulty grounding, and wiring not protected from abrasions. Chandler was provided eight nonconformance reports covering the above general allegations that were issued from December 20, 1979 to March 18, 1980 and subsequently corrected. Chandler, after reviewing the nonconformance reports, stated that the deficiencies identified in the nonconformance reports and subsequent corrections appeared to address the concerns that he identified in his previous statement of June 14, 1982.

Chandler explained [REDACTED] he was not in a position to determine if his concerns were addressed properly, pointing out that he did not have access to the nonconformance reports or NRC inspection reports. Further, Chandler remarked that most of his work was with non-safety cable. However, he stated that between January 2 and January 11, 1980 he was assigned to the Electrical Department "termination check-out crew" that went around to ensure that all work was done properly, and that some of the items he checked could have been safety related.



Chandler stated that he was unaware of QA/QC activities or procedures that took place subsequent to the check-out crew activities on all safety-related activities. Chandler also expressed concern that when cad-welding was done, welders only protected an area of about 3 feet; however, Chandler had not inspected any of these to determine if any cables had been damaged and could not identify any specific areas for follow-up by NRC.

### Inspection of Alleged Deficiencies

On August 31, 1982, Dennis L. Kelley, NRC Senior Resident Reactor Inspector (SRI), assigned to Comanche Peak, Glen Rose, Texas, met with NRC Investigator R. K. Herr to review the allegations set forth by Michael Chandler.

Allegation Number 1: Kelley was able to physically locate the motor control center (MCC) located in the circulating water system, as described in the allegation concerning the use of 1000 MCM cable with a 750 MCM lug. Kelley stated that he inspected the area in question and found no 1000 MCM cable in the motor control center. Kelley reported that he did find one 750 MCM cable in MCC XB3-2 that is matched up to the proper lugs. He also found that the MCC 1B3-2 contained paired 350 MCM cables properly terminated. Kelley remarked that as of August 31, 1982, no improper wiring was evident in the MCC's of the circulating water system.

On September 17, 1982, Kelley advised that the areas of the alleged deficiencies that were identified by Michael Chandler in his statement of September 2, 1982 (see below), were located with the assistance of the maps drawn by Chandler.

Allegation Number 2, Auxiliary Building, Reactor No. 1, improper screw size for lugs: Kelley stated that he physically located this area utilizing Map No. 1, and found that there were no washer/screws in panel 5 or 6. However, he did discover a number of screws with attached washers. Kelley explained that upon close examination he found that the washer attached to the screws is an intricate part of the screw (manufactured together) and it not an add-on as it may appear at first glance. Kelley stated that some screws contained brass plate and some contained chrome plate. Kelley remarked that the chrome plate gives the appearance of a steel washer and could easily be mistaken for steel. Kelley concluded that as of September 1982, there was no improper wiring in this area.

Allegation Number 3, Switch Gear Room, Reactor No. 1, improper screw size for lugs: Kelley stated he physically located this area utilizing Map No. 2 and found that the same conditions existed as per Allegation No. 2, above. Kelley added that as of September 1982, when he inspected Switch Gear Room, Reactor No. 1, no improper wiring was observed.

Allegation Number 4, Control Room, Reactor No. 1, splicing and cable termination to wrong side of fuse block with some shaving of the lugs: Kelley stated he physically located this area, using Map No. 3, and found no evidence of shaving or erroneous termination of cable. Kelley further stated that he checked the section in question as well two other sections in the control panel and found that there was no evidence of lugs being shaved and added that blocks were of such a nature that it makes no difference which side accepts power leads. Kelley remarked that there were three blocks located in this area at the time of his examination. He did not find any improper wiring. Kelley confirmed Chandler's statement that the wiring in this area is black cable wiring, and is non-safety.

Kelley stated that during his inspection effort, he also examined safety and non-safety cable in the location of Chandler's concern, utilizing Map No. 4, to determine if any cables were pulled too tight. Kelley explained that the cables are tied off with tie wraps and anchored with adhesive clips to hold wires down and stated he found adequate slack in these cables. Kelley pointed out that these conditions are in existence at the present time. However, he could not comment on the conditions as they existed in January 1980.

Status of Investigation

The status of this investigation is CLOSED.

Attachments .....

Attachment 1 - Chandler's signed statement

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Attachment 2 - Chandler's signed sworn statement

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