

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF SPECIAL PROJECTS

NRC Inspection Report: 50-445/88-45
50-446/88-41

Permits: CPPR-126
CPPR-127

Dockets: 50-445
50-446

Category: A2

Construction Permit
Expiration Dates:
Unit 1: August 1, 1988
Unit 2: Extension request
submitted.

Applicant: TU Electric
Skyway Tower
400 North Olive Street
Lock Box 81
Dallas, Texas 75201

Facility Name: Comanche Peak Steam Electric Station (CPSES),
Units 1 & 2

Inspection At: Comanche Peak Site, Glen Rose, Texas

Inspection Conducted: June 8 through July 6, 1988

Inspector:

P. C. Wagner
P. C. Wagner, Reactor Inspector

7/13/88
Date

Consultant: J. Taylor, (paragraphs 6 and 7)

Reviewed by:

H. H. Livermore
H. H. Livermore, Lead Senior Inspector

7-14-88
Date

Inspection Summary:

Inspection Conducted: June 8 through July 6 1988 (Report 50-445/88-45; 50-445/88-41)

Areas Inspected: Unannounced, resident safety inspection of applicant's actions on previous inspection findings, follow-up on violations/deviations, follow-up on 50.55(e) reports, follow-up on allegations, the Corrective Action Program (CAP), and general plant (tours).

Results: Within the areas inspected, no significant strengths or weaknesses were noted. During the inspection, no significant safety matters, violations, deviations, or unresolved items were identified.

DETAILS1. Persons Contacted

- *R. P. Baker, Licensing Compliance Manager, TU Electric
- *J. L. Barker, Manager, Engineering Assurance, TU Electric
- *M. R. Blevins, Manager, Technical Support, TU Electric
- *J. T. Conly, APE-Licensing, Stone and Webster Engineering Corporation (SWEC)
- *W. G. Council, Executive Vice President, TU Electric
- *G. G. Davis, Nuclear Operations Inspection Report Item Coordinator, TU Electric
- *D. E. Deviney, Deputy Director, QA, TU Electric
- *W. G. Guldemon, Executive Assistant, TU Electric
- *P. E. Halstead, Manager, Quality Control (QC), TU Electric
- *T. L. Heatherly, Licensing Compliance Engineer, TU Electric
- *R. T. Jenkins, Manager, Mechanical Engineering, TU Electric
- *S. D. Karpyak, CPRT, TU Electric
- *J. J. Kelley, Manager, Plant Operations, TU Electric
- *O. W. Lowe, Director of Engineering, TU Electric
- *J. W. Muffett, Manager of Civil Engineering, TU Electric
- *D. M. Reynerson, Director of Construction, TU Electric
- *M. J. Riggs, Plant Evaluation Manager, Operations, TU Electric
- *C. E. Scott, Manager, Startup, TU Electric
- *J. C. Smith, Plant Operations Staff, TU Electric
- *S. L. Stamm, Project Engineering Manager, SWEC
- *P. B. Stevens, Manager, Electrical Engineering, TU Electric
- *C. L. Terry, Unit 1 Project Manager, TU Electric
- *J. R. Waters, Licensing Compliance Engineer, TU Electric
- *C. E. Watters, QA Program Manager, SWEC

The NRC inspectors also interviewed other applicant employees during this inspection period.

*Denotes personnel present at the July 6, 1988, exit meeting.

2. Applicant's Action on Previous Inspection Findings (92701)

- a. (Closed) Open Item (445/8511-0-25): Incomplete cable routing information. During a NRC witnessed third-party inspection of CPRT Verification Package I-E-CABL045, the ERC inspector noted that a through-wall-conduit-sleeve (TWS) was not listed on the cable routing schedule. Review by the NRC inspector disclosed proper processing of a CPRT deviation report (DR) and project nonconformance report (NCR). NCR CE 87-6885 had been dispositioned to add the TWS to the cable routing schedule. Project effort is underway to properly identify and physically label all of the TWSs.

Since the listing of the TWS on the routing schedule has no impact on the safety function of the cable and since the applicant has implemented a program to correct problems with the conduit sleeves (see NRC Inspection Report 50-445/87-23; 50-446/87-17), the NRC inspector considers this item closed.

- b. (Closed) Open Item (445/8511-0-31): Damaged electrical cable jacket. During a NRC witnessed CPRT inspection of Verification Package I-E-CABL040, the ERC inspector identified a cut in the outer jacket of Cable EO122946. The NRC inspector verified that the DR and NCR were initiated for the problem. NCR E85-101048 has been dispositioned to repair the cable with an approved heat shrinkable insulation sleeve.

Since the cable jacket provides cable protection during installation and is not required for insulation purposes and since the damage will be repaired, the NRC inspector considers this item to be closed.

- c. (Open) Open Item (445/8513-0-23): Improper conduit installation. During a NRC witnessed inspection of CPRT Verification Package I-E-CDUT027, the ERC inspector identified four problems associated with Emergency Lighting System Conduit ESB6-5. The NRC inspector verified that a DR and NCR were written for the observed conditions. NRC review of NCR CE87-10192, which was dispositioned on October 10, 1987, disclosed the following:

- (1) The flexible conduit connector does not require a bushing; therefore, this deviation is not a nonconforming condition,
- (2) the loose three-piece union was to be tightened, and
- (3) and (4) no separation was required for lighting system conduits.

The NRC inspector found the disposition of items (1) and (2) to be acceptable but questioned items (3) and (4). The deletion of separation requirements for lighting conduits by Design Change Authorization (DCA) 42335 was reconsidered by the applicant following a meeting with the NRC staff on March 16 and 17, 1988.

The applicant agreed to handle the separation of lighting system conduits as they would other low-voltage power system conduits. Subsequently, the applicant issued Revision 7 to DCA 69730 dated May 19, 1988, which

incorporated this change into the Electrical Erection Specification, ES100.

The NRC inspector reviewed the applicable pages of DCA 69730 (pages 54 and 202 thru 205) to verify that the changes had been incorporated and to evaluate the basis and backfit requirements. The DCA indicated that "PCHV-FVM-088 shall be changed to cover this change."

The NRC inspector questioned the adequacy of relying on a future walkdown to identify separation problems already documented. The inspector was informed, by applicant personnel, that the specific NCR would be revised and that a review would be conducted for similar instances. If other instances are detected, the applicant agreed to check the adequacy of the Post Construction Hardware Validation Program (PCHVP) by verifying that, for those areas already walked-down, that the noted problems were identified.

This issue remains open pending completion of the applicant's checks.

- d. (Closed) Open Item (445/8513-0-38): Flexible hose anti-torque indicators misaligned. During a NRC inspection of CPRT Verification Package I-E-ININ005 for Level Switch 1LS4795, the flexible instrumentation hose was observed to have misaligned anti-torque indicators. (The purpose of the indicators, which consist of an etched line on each end of the flexible hose, is to provide the installer an indication that the hose is not twisted.) The NRC inspector noted that the required CPRT DR and project NCR had been written.

NRC inspector review of the closed NCR (CI87-8072X) disclosed a use-as-is disposition with an engineering justification that the alignment of the anti-torque indicators is no longer an inspection attribute. While the NRC inspector found this engineering justification to lack an acceptable basis, he had earlier reviewed the revision to the flexible hose installation requirements (see NRC Inspection Report 50-445/88-09; 50-446/88-07) and found them acceptable. In addition, the NRC inspector reinspected the installation in question and determined that it meets the revised installation requirements. Therefore, this item is closed.

- e. (Closed) Open Item (445/8514-0-03): Cable routing not per schedule. During a NRC witnessed inspection of CPRT Verification Package I-E-CABL-037, the ERC inspector identified two problems with the routing of Cable EG113538. The NRC inspector verified that the conditions

were documented on both a DR and a NCR. NCR CE87-6884 was dispositioned use-as-is because the routing would not result in a condition adverse to safety. The NRC inspector agreed with the above determination and verified that the cable routing schedule was revised to reflect the actual cable route. Therefore, this item is closed.

- f. (Closed) Open Item (445/8514-0-04): Cable not routed per schedule. During a NRC witnessed inspection of CPRT Verification Package I-E-CABL-084, the ERC inspector identified a deviation in the cable route from that shown on the raceway schedule. The NRC inspector verified that a DR and NCR were initiated and reviewed the NCR disposition. Since NCR CE87-4778 was dispositioned to correct the raceway schedule, the NRC inspector considers this item closed.
- g. (Closed) Open Item (445/8514-0-13): Slope of instrument tubing and location of the instrument not in accordance with drawings. During the inspection of CPRT Verification Package I-E-ININ-072, the NRC inspector identified the above problems. The tubing was found to have a slope of 1/2" over a 9" length (or 2/3" per foot) while the then existing requirement was 1" per foot of run. This requirement was revised in Specification CPES-I-1018, to be 1/2" per foot; therefore, the noted condition meets present requirements. The other problem was the instrument (1PIS4251) was found to be located 5' from the auxiliary building wall versus 6' as shown on the applicable drawing. The NRC inspector observed no problem with the location and noted that if it were located an additional foot from the wall, that it would obstruct the passageway. In addition, there were no other instruments in the vicinity which would cause a usage or identification problem. Therefore, the NRC inspector determined that the original issues are not significant problems and that this open item can be closed.
- h. (Closed) Unresolved Item (445/8604-U-06; 446/8603-U-06): Adequacy of equipment qualification (EQ) reviews related to the Bunker Ramo Corporation (BRC) electrical penetration assemblies (EPAs). The NRC inspector identified inconsistencies in the EQ records for the EPAs and wrote the above unresolved item pending further review. Subsequently, the applicant committed to, and implemented the replacement of the BRC EPAs with a different design. The inspector documented the replacement program in a number of inspection reports; see paragraph 2.p of 50-445/87-16, 50-446/87-13.

Therefore, the adequacy of the EQ records for the original EPAs is a moot point.

In addition, the applicant has implemented a program to ensure that proper EQ records exist for all applicable equipment. The details of this program are presented in the EQ Project Status Report (PSR) which was submitted to the NRC by letter dated January 8, 1988. NRC evaluation of the applicant's program is continuing and will be documented separately.

On the basis of the replacement of the equipment in question and a program to address the generic concern, the inspector considers this item resolved.

- i. (Closed) Open Item (445/8730-0-04; 446/8722-0-04): Revised electrical separation requirements. The NRC inspector questioned the acceptability of revisions to the electrical separation criteria implemented by the applicant in Revision 3 to the Electrical Erection Specification ES-100. The revisions deleted the requirements for lighting system conduits and allowed the use of protective wrap (silicon dioxide) as being equivalent to the protection of a conduit.

Recent NRC inspector review determined that the use of the protective wrap has been proposed as a part of Amendment 65 to the FSAR; as such, the technical staff will evaluate the acceptability of this change as part of the FSAR review. The inspector also determined that DCA 69730, Revision 7 dated May 19, 1988, to Revision 7 of ES-100 revised the separation requirements for the lighting system conduits and cables to be the same as those for any other non-Class 1E, low-power system (see paragraph 2.c, above). Therefore, the inspector's questions are resolved and this item is closed.

3. Follow-up on Violations/Deviations (92702)

- a. (Closed) Violation (445/8604-V-04; 446/8603-V-04): Equipment qualification adequacy of specified field rework of cable splices. The applicant was unable to demonstrate that the rework which the vendor (BRC) stipulated would have produced a qualified splice. However, rework of the vendor installed splice was never implemented.

As discussed in paragraph 2. above, the EPAs on which these splices were installed have been replaced. The replacement EPAs are of a different design and do not incorporate the pigtail extension splices which were determined to be not qualified on the BRC EPAs.

Since the EPAs were replaced and a program is being implemented to ensure all applicable equipment is properly qualified, the inspector determined that this violation can be closed.

In addition, this violation was also designated as Item I.B.6 in NRC Report EA 86-09. This item is also closed.

- b. (Closed) Violation (445/8604-V-07; 446/8603-V-07): Adequacy of the receiving inspection reports (RIRs) for various BRC EPAs. The NRC inspector identified a number of problems with the RIRs for some BRC EPAs. As stated above, however, the BRC EPAs have been replaced with a different vendor's EPAs.

In addition, the applicant implemented improvements to the receiving inspection process and evaluated additional components as part of the third-party review. The results of the third-party program were presented in the Issue-Specific Action Plan (ISAP) VII.a.9, "Adequacy of Purchased and Safety-Related Material and Equipment" Results Report. This report was submitted to the NRC by letter dated February 29, 1988. The NRC evaluation of the report will be documented in separate correspondence.

Based on the replacement of the EPAs in question and the applicant's program, the inspector considers this violation to be closed.

In addition, this violation was also designated as Item I.B.3 in NRC Report EA 86-09. This item is closed.

- c. (Closed) Deviation (445/8604-D10; 446/8603-D10): Failure to submit analysis. The applicant had not submitted an analysis of the acceptability of electrical cable splices in raceways as required by their commitment to Regulatory Guide (RG) 1.75, Revision 1. Subsequent to the NRC inspection which pointed out this deviation of their commitment, the applicant submitted an analysis as part of the FSAR (new Appendix 8A). The submission of the analysis fulfills the RG commitment. This deviation is closed.

The NRC technical staff's review of the FSAR change (Amendment 60, dated November 3, 1986) will be documented in separate correspondence.

In addition, this deviation was designated as Item I.B.1.d in NRC Report EA 86-09. This item is closed.

4. Action on 10 CFR Part 50.55(e) Deficiencies Identified by the Applicant (92700)

- a. (Open) SDAR CP85-39: Equipment/conduit interface. The applicant reported deficiencies involving conduits not installed in accordance with design documents on September 18, 1985. By Letter TXX-38035 dated January 11, 1988, the applicant provided additional information on the deficiency. Based on a self-initiated evaluation, the applicant determined that the conduit interface concerns encompassed three issues:

- (1) Cable slack adequacy
- (2) Conduit-to-equipment interfaces
- (3) Conduit orientation

The applicant stated in TXX-88035 that issue (3) was not reportable as discussed in TXX-6521 dated June 19, 1987.

A review of TXX-6521, however, provided no basis for that determination. Therefore, issue (3) remains open pending further NRC evaluation.

Issue (1) was the subject of a meeting between the involved NRC and applicant personnel on June 21, 1988, and will be discussed in separate correspondence.

Issue (2) was discussed in TXX-88035 in detail. The applicant's evaluation consisted of configuration walkdowns involving 516 pieces of equipment. A total of 112 components did not conform to design documents and 11 were found to be unacceptable. Of these 11, 2 were 480V power centers requiring further seismic analyses, 4 were motor control centers (MCCs) with damage to structural members and 5 were lighting system panels. Therefore, issue (2) also remains open pending NRC evaluation of the repair to the MCC structural members and the completion of the seismic analyses. (The lighting panels have been downgraded to nonsafety related status.)

- b. (Closed) SDAR CP87-06: Seismic qualification of as-built 480 volt power centers. The applicant informed the NRC of a potentially reportable deficiency concerning the routing of power cables to power center transformers. The vendor (Westinghouse) seismic qualification was performed assuming bottom entry of the power cables whereas some installations have top enclosure entry. The applicant, therefore, had a new seismic analysis performed utilizing the as-built configuration. The results of this (finite element) analysis showed that the stresses, locally and globally, comply with the AISC manuals of steel construction limits.

The above analysis results were in agreement with preliminary vendor evaluation discussed in their letters dated July 17 and August 17, 1987.

On the basis of the results of the reanalyses performed using as-built configurations, the NRC inspector considers this SDAR to be closed.

5. Allegation Follow-up (99014)

In order to ensure that some older allegations had been fully considered and completely addressed, the staff requested that TU Electric provide an assessment of some open items from previously discussed allegations. The response to NRC's January 21, 1988, request was provided by TU Electric Letter TXX-88-294 dated March 25, 1988. The following two allegations and the TU Electric assessments of them were evaluated by the NRC inspector:

- a. (Closed) Allegation (OSP 84-A-0016): Electrical cable terminations. The staff identified two open issues in the January 21, 1988, letter for the applicant to assess:
- "(1) Reconcile differences between Specification 2323-ES-17B and the vendor's information.
 - "(2) Assure that the concerns raised by Allegation AE-57 are addressed by actions taken in response to the concerns stated in Item 5 (first bullet) on page J30 of SSER-7."

The applicant assessed these open issues and determined that the differences had been reconciled and that the present requirements were in agreement with vendor information. Therefore, no corrective actions were required. The applicant's assessment of the second issue which deals with the acceptability of electrical butt splices also concluded that no further corrective actions were required, but referenced the NRC approval of the use of the splices and the CPRT program related to the further qualification of these splices.

The NRC acceptance of the butt splices was documented in NRC letter dated September 14, 1984. The NRC inspection of the CPRT program implementation was documented in NRC Inspection Report 50-445/86-07; 50-446/86-05. The Unresolved Item from that report was closed in NRC Inspection Report 50-445/88-38; 50-446/88-32.

Based on the above, the NRC inspector agrees that no further corrective actions are needed and that this allegation can be closed.

- b. (Partial Closure) Allegation (OSP 84-A-0022): The portion of this allegation related to the Emergency Diesel Generator (EDG) wattmeters and varimeters. In addition to some other pending issues, there were two open issues identified in the staff's letter related to the above meters; these were:

"(1) Provide adequate design controls to properly certify the EDG wattmeters and varimeters.

"(2) Establish the equipment qualification status of the wattmeters for Unit 1."

The applicant's assessment of these open issues determined that: (1) adequate requirements have been established to ensure that design controls are in place to utilize commercial grade items as allowed by regulatory requirements, and (2) that procurement requirements will ensure that any future procurements of Class 1E electrical meters will be in accordance with a quality Code A for the nuclear grade assigned. In addition, the applicant committed to replacing the noncertified wattmeters in Unit 1 with the certified Unit 2 wattmeters prior to hot functional testing of Unit 1 and to procure new Class 1E qualified wattmeters for Unit 2.

Based on the NRC inspector's review of the applicant's assessment, the requirements now in place will provide adequate assurance of proper procurement of future Class 1E meters. The inspector, therefore, finds that this allegation can be closed provided the Unit 1 meters are properly replaced. The replacement of the Unit 1 meters is an open item (445/8845-0-01).

6. Corrective Action Plan (CAP)

The NRC inspector continued to evaluate implementation of the PCHVP by accompanying SWEC engineers during performance of various Field Verification Methods procedures (FVMs) and by review and walkdown of activities previously completed by these walkdown engineers. Follow-up on previously reported items and additional inspections were performed as detailed below:

a. Electrical Components (51053 and 51063)

A follow-up of previously reported minor problems with Packages 88-E1-135-CP1-ECPRCB02 and -11 was made. For CB-11, DCA 75038, Revision 0 was provided to add the missing Servicair barrier to the "as-built" drawings; for CB-02, SWEC determined that the unlisted Servicair

barrier found by the NRC inspector had been noted, but it had "typo" errors in the cable designator and destination device. These were corrected in the package.

The NRC inspector observed cable pulling of 8kv power cables from the startup transformer, 1ST to the 6.9kv switchgear. The cable pulling procedure was available at the scene, ES-100 specification was available at the foreman's office, adequate manpower was available, and particular care was taken to prevent cable damage at bends. A departure from ES-100 using white "Ty-wraps" outside instead of black had already been addressed by the craft and a DCA to allow the change was being processed. The cables are non-Q.

Additionally, on a plant tour, the inspector inquired into work being done on a non-Q cable tray, 14KSDN76. Inspection of the available package, Traveler ECE007088904 revealed the tray was being removed for cable repair (Cable NK1268794, NQNR U1-88-00010). The NRC inspector determined that the documentation was in order and the jobsteps were being properly followed.

The inspector accompanied SWEC engineers on walkdowns for Procedure CPE-SWEC-FVM-EE-064, Revision 2, "Heat Shrinkable Sleeve Installations." Packages were provided for each cable terminating at a particular piece of equipment and included 53 cables at MCC-XEB-2 and 2 cables at CP1-ELDPEC-08. The SWEC engineer recorded the results of the inspections on package covers for later transfer to FVM attachment sheets and NCRs. The NRC inspector, additionally, walked down SWEC previously completed packages for Panels CP1-ECDPEC-11 and CPX-ECPRTC-04A. No violations or deviations were identified.

The NRC inspector also walked down FVM-088 packages for electrical separation for Panels CP1-EPBCND-02 and CP1-ELDPEC-04. No violations or deviations were identified.

The inspector accompanied SWEC engineers on walkdowns of FVM-89 for Work Panel CP1-ECPRCR-13 and for flexible conduit installations included in Packages 89-E5-121, 89-E5-119, 89-E5-151B, and 89-E5-152. SWEC personnel were knowledgeable and thorough on FVM implementation. The NRC inspector noted that several SWEC engineers had been borrowed from the mechanical discipline to perform these walkdowns. Discussions indicated they had been adequately trained for the task, but a follow-up check of training records will be performed.

The NRC inspector also accompanied SWEC engineers on walkdowns of four cable trays included in FVM-89 for as-built cable grips. Packages are based on construction operational travelers and the number of grips indicated in a tray and the number of cables in a bundle did not always match the documentation. All discrepancies were adequately noted for later transfer to NCRs. Further NRC inspection of the processing of the FVM results will be performed in later inspections. No violations or deviations were identified.

7. Plant Tours (51053)

At various times during this report period, the NRC inspectors conducted inspections of the Unit 1 reactor, safeguards emergency diesel generator, auxiliary, and electrical/control buildings. These inspections were conducted to observe work in progress, equipment protection and storage and general housekeeping activities. No significant observations were made during this report period and no violations or deviations were identified.

8. Open Items

Open items are matters which have been discussed with the applicant, which will be reviewed further by the inspector, and which involve some action on the part of the NRC or the applicant or both. An open item disclosed during the inspection is discussed in paragraph 5.

9. Exit Meeting (30703)

An exit meeting was conducted July 6, 1988, with the applicant's representatives identified in paragraph 1 of this report. No written material was provided to the applicant by the inspectors during this reporting period. The applicant did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection. During this meeting, the NRC inspectors summarized the scope and findings of the inspection.