



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

OCT 07 1985

MEMORANDUM FOR: Vincent S. Noonan, Director
Comanche Peak Project

FROM: Charles J. Haughney
Comanche Peak Project

SUBJECT: COMANCHE PEAK RESPONSE TEAM
VERIFICATION AND CORRECTIVE ACTION
ACTIVITIES

A review was conducted of the ongoing Comanche Peak Response Team (CPRT) activities during the period of September 23-26, 1985. The principal CPRT activities in progress at the present time are those associated with the:

1. - Stone Webster (SWEC) Design Verification Effort
2. - Ebasco Design Verification Effort
3. - TERA Design Verification Effort
4. - QA/QC Construction Verification Effort
5. - TRT Issue Specific Action Plans Implementation

1. Stone Webster Design Verification Effort

This effort will involve a reanalysis of Unit #1 large bore Class 2 and 3 piping and supports and an evaluation of non-Westinghouse designed supports on Class 1 piping. In addition, for Unit #1, a sample reanalysis of small bore Class 2 and 3 piping will be performed. For Unit #2, similar work will be performed for large bore piping and supports; however, the reanalysis will include 100% of Class 2 and 3 small bore piping. The reanalysis effort will be performed utilizing established SWEC techniques. TERA is conducting the third-party overview of this activity.

a. Current Activities

- (1) Staffing for the project is proceeding well with personnel being assigned from SWEC's New York, Houston, Boston, Cherry Hill, and Toronto offices.
- (2) SWEC is in the process of completing two key procedures necessary for their portion of the piping and support verification work. Comanche Peak Project Procedure (CPPP) #7 - "Design Criteria for Pipe Stress and Pipe Supports" is expected to be issued by October 11. CPPP #6 - "Pipe Stress Analysis for As-built ASME Class 2 and 3 Piping Systems" is expected to be issued by October 7. Some delay has been experienced in issuing final versions of these procedures because of their length (about 300 pages in the case of CPPP-7) and complexity,

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which has resulted from making them stand-alone documents rather than referencing a large number of in-house SWEC procedures.

- (3) SWEC has completed a sample walkdown of Unit #1 79-14 program to assess the accuracy of existing as-built documentation previously verified by the project. The sample, which was selected from the entire population of Unit 1 ASME large bore supports, examined supports for four attributes as follows: 80 packages for valve location, 200 packages for support location; 200 packages for support functions; 200 packages for valve and support orientation. The last attribute, valve and support orientation, had enough rejects during the walkdown to require a 100% re-survey of all as-built packages prior to re-analysis. NRC staff assisted by contractor engineers from TELEDYNE were on site the week of September 23 to determine the acceptability of this walkdown.
- (4) Of the approximately 300 as-built packages needed by SWEC for reanalysis, 158 had been transmitted from the site to SWEC.

All the original Gibbs and Hill analysis packages had been sent.

- (5) Prior to SWEC's involvement in this re-analysis project, TUGCO in consultation with R. L. Cloud had selected over 100 supports that required modification, SWEC is now reassessing which of these supports should be modified before completion of re-analysis. Preparation of some of these modification packages has begun, with the packages developed under ASME Section XI requirements. TUGCO is using this process as the first major test of its operational modification control program.
- (6) SWEC is in the process of selecting a Unit #1 small bore piping and support random sample to permit stress analysis. They are now in the process of determining the correct representative population to permit adequate sample size selection. This effort is not trivial, since different analysis groups were involved in the original design (TUGCO's Pipe Support Engineering (PSE) and Gibbs and Hill); and some supports were computer analyzed, while some were analyzed by nomograph. TUGCO expects to have a sampling program description ready to present to the staff by the end of October.
- (7) Unit 2 piping and support analysis is just beginning, with the first large bore stress problem scheduled to be run the week of September 23 and two small bore problems to be run the week of September 30.
- (8) Current schedule calls for SWEC to complete Unit 1 work by May 1986 and Unit 2 work by Fall 1986.
- (9) TUGCO considers these SWEC efforts to be producing designs of record for piping and pipe supports. Third party overview of SWEC's efforts are being performed for the CPRT by TERA.

2. EBASCO Design Verification Effort

This effort involves a complete verification of original design and as-built construction associated with the design and construction of the Unit #1 and #2 electrical cable tray and conduit supports.

a. Current Activities

- (1) Unit 1 Cable Tray Supports - The as-built walkdowns of 531 of the 4527 cable tray hangers have been completed: Ten walkdown teams consisting of an engineer, QC inspector and craft support were working the week of September 23, with a build up to about 25 teams anticipated. This walkdown program should end about mid-December. Ebasco is staffing - up to about 200 engineers to perform the design verification analyses to determine the acceptability of the as-built design. EBASCO design procedures and calculational techniques will be used. EBASCO will design any necessary cable tray support modifications. As an aid during the walkdowns, the walkdown teams are performing a preliminary constructability review to identify and resolve interference problems that will accompany likely support modifications. The engineering effort should end in mid-February.
- (2) ANCO Engineers is performing four categories of testing in support of the Unit 1 cable tray support program. The first category is a system test on ANCO's shake table. The test specifications and procedures were in final development the week of September 23. The other three categories of tests involve three components: 1) a Hilti bolt baseplate connection; 2) cable tray clamps; and 3) a particular support configuration. The purpose of the testing is to verify modelling assumptions performed by Gibbs and Hill and to support modelling planned by the third-party, TERA. The testing schedule presently runs from October 10 to mid-January.
- (3) Unit 1 Conduit Supports - These supports were field installed by craft using generic specs. The conduit routing was not specified by iso, as the the case with most of the Unit 2 conduit supports. The population of safety related and seismically - supported conduit has been determined and has been divided into two groups: 1) power & control; and 2) lighting. Each group will have a sample of 60 runs selected for as-built walkdown and analysis. A run is a uniquely numbered conduit for power and control and a particular circuit for lighting. The walkdowns are scheduled to start the week of 30 September and to complete in about four weeks. The engineering analysis should then complete about mid-December. The need for possible sample expansions or modifications is unknown at this time, as in any resulting slippage in schedule.
- (4) Unit 2 Cable Tray Supports - the as-built walkdowns of 100% of these support is complete. Of the 3833 supports, 2738 have been design verified; and about 25% of these (about 700) require modifications. Drawings for these mods have been transmitted to the Paper Flow Group (PFG) for issue to the craft to allow installation. QC has accepted 203 supports as being properly modified. Present schedule calls for this entire job to complete on April 1, 1986.

- (5) Unit 2 Conduit Supports - Some of this conduit and its supports has not been installed. For example, 3594 conduit supports for runs in the Safeguards and Reactor Buildings have not had isos issued, and 351 supports in the same buildings have been installed and QC accepted.
- (6) About 2800 conduit supports in the Auxiliary Building (common area) were engineered and installed per the same generic spec (S-910) as Unit 1. These supports are being re-evaluated using Unit 2 criteria. The schedule for Unit 2 conduit completion is complex and is actually keyed to system turnover events.
- (7) Corporate Consulting and Development (CCL) has been conducting three categories of tests for conduit supports:
 - (a) Unistrut - Testing of Unistrut members is complete and a test results report is in preparation. About 600 of the 8000 supports using Unistrut will require modifications, based on these test results.
 - (b) Conduit Clamps - Certain Superstrut conduit clamps were field modified to a configuration not supplied or qualified by the vendor. This testing is about to start.
 - (c) Junction Boxes - Some junction boxes have ears welded to the sides. At times, these ears were drilled in the field to allow fastening to a support, a configuration that was not qualified. A test procedure to examine this practice is in preparation.
- (8) Similar to the case with SWEC for piping and pipe supports, EBASCO is producing design drawings of record for electrical raceway supports. Gibbs and Hill still remains the AE of record for the entire CPSES project.

3. TERA Design Verification Effort

TERA is responsible for the Design Adequacy Plan, acts as third party ~~over~~ reviewer for design review, resolution of TRT issue specific action plans for the mechanical, civil and structural areas, tracking all external issues and will prepare an issue a final design adequacy report at the conclusion of their effort.

- (1) TERA personnel responsible for the Design Adequacy Plan were not on site during the week of September 23. Their activities are now being examined by the NRC staff's design adequacy team, which will separately communicate the results of their review.
- (2) TERA's onsite personnel assigned responsibilities for mechanical, civil, and structural ISAPs provided status of their progress, which is included with the status of all ISAPs in paragraph 5 of this memorandum.

4. QA/QC Construction Verification Effort

This effort encompasses a statistically based sample reinspection or QC accepted construction work supplemented by a review of related quality documentation. The lead contractor is Evaluation Research Corporation (ERC).

a. Current Activities:

- (1) The administrative control procedures for this effort are complete and issued. Overall control of this effort is also contained in a Management Plan, which describes how the 10 CFR 50 Appendix B 18 criteria are or are not applicable to this effort.
- (2) The 26 hardware population descriptions for ISAP VII c have been completed. It is estimated that, in the absence of any future sample expansions that may arise, about 2200 inspection packages will be required to conduct all the reinspections. As of September 23, 948 of these packages had been issued and 693 packages had been used in the field for reinspection. By this coarse measure, about one third of the field activities associated with reinspections have been completed.
- (3) The 26 hardware populations, involve about 160,000 items from which the statistical and engineered samples will be drawn.
- (4) 614 Deviation Reports (DRs) had been issued with 199 of these determined to be valid. Some of the remainder had not been through a complete validity check. Valid DRs are sent to TUGCO where a TUGCO Inspection Report and NCR are generated for corrective action and dispositioning. This latter process maintains the facility inspection of record in TUGCO control.
- (5) Evaluations of valid DRs for safety significance was underway. This evaluation process was complex and typically involved engineering analysis and calculations to assess the effects of a particular deviation. 71 valid DRs had been determined to be not safety significant, and others were being evaluated.
- (6) The review of documentation packages had just begun. This effort is used to assess items that are inaccessible or processes that are non-recreateable. Of the approximately 2100 documentation review packages to be issued for all 26 populations, 304 packages had been issued; and of these 304, 101 had been reviewed. This review had resulted in 108 DRs, but none of these DRs had been through the validity checks.
- (7) Staffing for the QA/QC effort was near its peak with 160 persons on site the week of September 16 and an expected peak of about 180 in October.
- (8) The schedule for this effort is now expected to complete in February 1986, barring and significant increases in the scope of reinspection or document review that could result from sample expansions.

- (9) RIV has been able to maintain its goals of witnessing 10% of the reinspections and independently inspecting 5%.

5. TRT Issue Specific Action Plans-Implementation

Each of the SSER's prepared as a result of the TRT inspections resulted in specific actions required by TUEC to resolve outstanding deficiencies. For each of the issue specific items TUEC has developed action plans and is in the process of implementing them. As of each of the action plans is completed a results report will be prepared for each item. The specific details for each of the following TRT issue specific items can be found in the respective SSERs or in the Program Plan under Appendix C.

a. Current Activities:

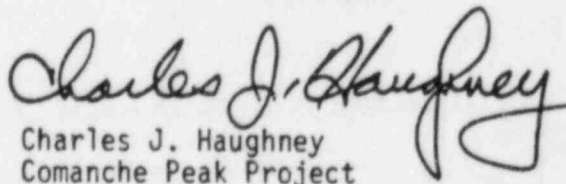
The following is a listing of the TRT items and their status at the time of the site review:

<u>ITEM</u> (ISAP No.)	<u>STATUS</u>
. Heat Shrinkable Insulation Sleeves (I.a.1)	. Action completed. Preparing results report.
. Inspection Reports on Butt Splices (I.a.2)	. Action complete. Results report in review cycle.
. Butt Splice Qualification (I.a.3)	. Pull testing of butt splices removed from service complete. Report in preparation.
. Agreement Between DWGS and Field Term's (I.a.4)	. Results report in review cycle
. NCRs on Vendor Installed Amp. Terminal Plugs (I.a.5)	. Work completed. Revising result report.
. Flexible Conduit To Flex. Conduit Separation (I.b.1)	. Additional analysis in progress.
. Flex. Conduit to Cable Separation (I.b.2)	. Additional analysis in progress.
. Conduit to Cable Tray Separation (I.b.3)	. Actions completed. Results report in review cycle.
. Barrier Removal (I.b.4)	. Actions completed. Revising results report.

<u>ITEM (ISAP No.)</u>	<u>STATUS</u>
. Electrical Conduit Supports (I.c)	. Analysis in progress and walkdown to start September 30.
. QC Inspector Qual's (I.d.1)	. Electrical Inspector Qualifications Review Completed. Reinspection of one inspector's work in progress. Review of ASME inspector qualifications in progress
. Guidelines for Admin. of QC Inspector Test (I.d.2)	. Review completed. Preparing results
. Reinforcing Steel in the Reactor Cavity (II.a)	. Work Completed. Results report in review cycle.
. Concrete Compression Strength (II.b)	. Field work completed. Preparing results report.
. Maint. of Air Gap Between Concrete Buildings (II.c)	. Mapping of air gaps is complete. Trial effort for removal of concrete and debris to start in October.
. Seismic Design of Control Room Ceiling Elements (II.d)	. Gibbs & Hill design of new ceiling complete. TERA reviewing design. Final design should be on site in mid October.
. Rebar in the Fuel Handling Building (II.e)	. Review scope expanded. Evaluation continuing.
. Hot Functional (HFT) Data Packages (III.a.1)	. Review completed. Results report in review cycle.
. JTG Approval of Test Data (III.a.2)	. Work complete. Results report in review cycle.

<u>ITEM (ISAP No.)</u>	<u>STATUS</u>
. Technical Specification For Deferred Tests (III.a.3)	. Work complete. Results report in review cycle.
. Traceability of Test Equipment (III.a.4)	. Work complete. Results report in review cycle.
. Conduct of CILRT (III.b)	. Work complete. Preparing results report.
. Prerequisite Testing (III.c)	. Evaluation complete. Preparing results report.
. Preoperational Testing (III.d)	. Review completed. Preparing results report.
. Skewed Welds in NF Supports (V.a)	. Sample inspected. Engineers evaluating results.
. Steam Generator Anchor Bolts (V.b)	. Work on "Hold". Awaiting completion of evaluation of upper lateral support by Gibbs and Hill.
. Design Consideration For Piping Systems Bet. Seis CAT I & Non-Seismic Cat I Bldgs. (V.c)	. Reanalysis completed. Preparing results report. Data to be transferred to SWEC for piping reanalysis.
. Plug Welds (V.d)	. Inspection complete. Report in preparation.
. Installation of Main Steam Pipes (V.e)	. All field work complete. Preparing results report.
. Gap Between Reactor Vessel Insulation & Biological Shield Wall (VI.a)	. Design change and critical space review in progress. Preparing sample population list.
. Polar Crane Shimming (VI.b)	. Crane test complete, results being reviewed. Girder seat inspection scheduled for mid- October.

<u>ITEM (ISAP No.)</u>	<u>STATUS</u>
. Material Traceability (VII.a.1)	. Review pending input from other reinspection activities.
. Non-conformance and Corrective Action Systems (VII.a.2)	. Review of various corrective action systems continues.
. Document Control (VII.a.3)	. Review pending results from VII.c document review.
. Audit Program and Auditor Qualification (VII.a.4)	. Results report in review cycle.
. Management Assessment (VII.a.5)	. Review in progress. Examining INPO and other utility programs.
. Exit Interviews (VII.a.6)	. Review in progress. Examining other utility programs.
. Housekeeping and System Cleanliness (VII.a.7)	. Review and inspection in progress.
. Fuel Pool Liner Documentation (VII.a.8)	. Review of travellers in progress.
. Onsite Fabrication (VII.b.1)	. Sample selection in progress.
. Valve Disassembly (VII.b.2)	. Valve inspections complete, drafting results report
. Pipe Supports (VII.b.3)	. Preparing inspection checklists.
. Hilti Bolts (VII.b.4)	. Developing torque test program.
. Electrical Raceway Supports (VII.b.5)	. Selected sample, preparing inspection packages.


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