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DOCKETED
NOV - 7 1985
DOCKETING & SERVICE BRANCH
SECY-NRC

November 4, 1985

Mrs. Juanita Ellis
President, CASE
1426 South Polk Street
Dallas, Texas 75224

Re: Texas Utilities Electric Company, et al.
(Comanche Peak Steam Electric Station,
Units 1 and 2); Docket Nos. 50-445, 50-446, 50-445-2, and 50-446-2

Dear Mrs. Ellis:

This is to notify you that Applicants hereby supplement their response to CASE's December 1, 1980 Second Set of Interrogatories and Requests to Produce. Applicants recently received a document which falls within the scope of Item 13 of those Interrogatories and Requests to Produce. Accordingly, Applicants enclose a copy of the following document:

> August 1985 - Construction Project Evaluation - Comanche Peak Steam Electric Station - Texas Utilities Electric Company - prepared by the Institute of Nuclear Power Operations (INPO) under date of August, 1985

Also enclosed is a copy of letter dated October 28, 1985 from W. G. Counsil and J. W. Beck to Mr. Noonan's attention relating to new TUGCO management appointments.

Sincerely,

Robt A. Wooldridge

Robert A. Wooldridge
Counsel for Applicants

RAW/klw
Enclosures
cc: Service List (as attached)



DS03

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RELATED CORRESPONDENCE

Log # TXX-4608
File # 10004

# TEXAS UTILITIES GENERATING COMPANY

SKYWAY TOWER · 400 NORTH OLIVE STREET, L.B. 81 · DALLAS, TEXAS 75201

October 28, 1985

WILLIAM G. COUNSIL
EXECUTIVE VICE PRESIDENT

DOCKETED
NOV - 7 1985
DOCKETING & SERVICE BRANCH

Director of Nuclear Reactor Regulation
Attention: Mr. Vince S. Noonan, Director
Comanche Peak Project
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NOS. 50-445 AND 50-446
NEW MANAGEMENT APPOINTMENTS

Dear Mr. Noonan:

This letter is to inform you of the following new management appointments:

Mr. Austin B. Scott, Jr. has been appointed Vice President-Nuclear Operations of Texas Utilities Generating Company, effective November 1, 1985. Mr. Scott will direct all nuclear operations at Comanche Peak from an office at CPSES. Mr. Scott comes to TUGCO after having retired this year as Rear Admiral and Commander of the submarine force of the U.S. Pacific Fleet.

Also effective November 1, 1985, Mr. James Kuykendall has been appointed Vice President within the TUGCO Nuclear organization. Mr. Kuykendall will direct engineering administration and health physics from an office based in Dallas. Mr. Kuykendall has been with the Texas Utilities System since 1949 and has served in several management positions at Comanche Peak since 1973.

Mr. Scott and Mr. Kuykendall will report to Executive Vice President, Nuclear Engineering and Operations, W. G. Counsil. Reporting to Mr. Scott will be Dick Jones, Manager, Plant Operations; Ted Jenkins, Superintendent, Operations Support; Tom Gosdin, Superintendent, Support Services; and C. L. Turner, Director, Nuclear Training. Reporting to Mr. Kuykendall will be Dick Kahler, Supervisor, Engineering and Administrative Services and J. D. Edwards, Supervisor, Health Physics.

Resumes for Mr. Scott and Mr. Kuykendall are attached for your information. An FSAR amendment will be submitted which details these organization changes.

Very truly yours,

W. G. Counsil

W. G. Counsil

By: John W. Beck
J. W. Beck
Vice President

JWA/grr
Attachments

Austin B. Scott, Jr. - Vice President, Nuclear Operations

Education:

B. A. Business Administration and Economics - Rice University, 1955

Navy Nuclear Power Training Program, 1961

Experience:

1955 - Junior officer of destroyer, cruiser and two nuclear submarines.

1969 - Commanding officer of nuclear submarine.

1972 - Staff assistant to Admiral Hyman G. Rickover.

1975 - Submarine squadron commander.

1977 - Senior staff officer, Atlantic Fleet Submarine Force. Responsible for monitoring and auditing compliance with the standards of excellence required for the safe operation of nuclear submarines.

1978 - Chief of staff, Atlantic Fleet Submarine Force. Second-in-command to admiral, with responsibility for supervision, operation and maintenance of nuclear submarine reactors and support facilities.

1979 - Commander of nuclear submarine group. Senior naval officer in Western New England area. Responsible for operations and training of ships and crews based in Groton-New London, Conn.

1981 - Senior staff officer, Navy Department, Pentagon. Second-in-charge of the Submarine Directorate.

1983 - Commander of submarine force, U. S. Pacific Fleet. Responsible for 50 submarines, six support ships and three submarine bases. Directly involved with supervision, operation and maintenance of nuclear submarine reactors and support facilities.

1985 - Joined Texas Utilities Generating Company as Vice President, Nuclear Operations.

James C. Kuykendall - Vice President

Education:

BSME - Southern Methodist University - 1949

Experience:

1949 - Employed by Texas Electric Service Company at the Wichita Falls plant as a Student Engineer, progressing to Junior Engineer. Engaged primarily in training in power plant operation.

1951 - Assigned to the Leon Plant as Senior Engineer progressing to Assistant Plant Superintendent in charge of plant operation.

1957 - Assigned to the Morgan Creek plant as Assistant Plant Superintendent in charge of plant operations. Duties included review of design and construction of the 175 MW No. 5 unit and responsibility for operator training and initial startup of the unit.

1960 - Assigned to the Graham plant as Assistant Plant Superintendent in charge of plant operation. Duties included review of design and contruction of the 240 MW No. 1 unit, assisting with staffing of the plant and responsible for operator training and initial startup of the unit.

1963 - Assigned as Plant Superintendent of the Graham plant. During this period the plant was expanded with the addition of a 375 MW unit.

1971 - Assigned as Assistant to Manager of Production Services. Duties consisted of assisting with consultative services to the seven power plants of the company.

1973 - Assigned as General Superintendent, Comanche Peak Steam Electric Station.

1975 - Completed Westinghouse Initial Operator Training, Phases I, II, and III; received Westinghouse Senior Reactor Operator certification.

1980 - Assigned to present position of Manager, Nuclear Operations.

1985 - Named Vice President.

Activities:

Registered Professional Engineer in Texas
Member - American Society of Mechanical Engineers
Member - American Nuclear Society
Member - Edison Electric Institute - Nuclear Operations Committee

August 1985

Construction Project Evaluation

RESTRICTED DISTRIBUTION



# COMANCHE PEAK STEAM ELECTRIC STATION

Texas Utilities Electric Company

INPO

# EVALUATION

of

# COMANCHE PEAK STEAM ELECTRIC STATION

Construction Project

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Texas Utilities Electric Company



August 1985

# SUMMARY

## INTRODUCTION

The Institute of Nuclear Power Operations (INPO) conducted an evaluation of the Texas Utilities Electric Company's (TUEC) Comanche Peak Steam Electric Station Construction Project, Unit 2, during the weeks of July 8, July 15, and July 29, 1985. The project is located approximately 40 miles southwest of Fort Worth, Texas. The project has two 1,150-MWE Westinghouse pressurized water reactors.

## PURPOSE AND SCOPE

INPO conducted an evaluation at the site to evaluate the control of design and construction processes and to identify areas needing improvement. Information was assembled from discussions, interviews, observations, and reviews of documentation.

The INPO evaluation team examined organization and administration, design control, construction control, project support, training, quality, and test control. The team observed actual work performance and test performance. A portion of the evaluation focused on a detailed vertical path examination through the design and construction of the project, combined with a horizontal examination at several points. The team at the utility's site design office reviewed the design control, and examined in some detail, the installed equipment.

INPO's goal is to assist member utilities in achieving the highest standards of excellence in nuclear plant construction. The recommendations in each area are based on best practices, rather than minimum acceptable standards or requirements. Accordingly, areas where improvements are recommended are not necessarily indicative of unsatisfactory performance.

## DETERMINATION

Within the scope of this evaluation, the team found, except as indicated by the findings, that the systems in place to control the quality of design and construction are being implemented effectively.

The following beneficial practices and accomplishments were noted:

Strong management involvement in project activities and a positive attitude of project personnel contribute to strong teamwork noted throughout the project.

Clean construction work areas enhance worker productivity.

Lessons learned from Unit 1 have been effectively implemented into Unit 2 construction and design.

The paper flow group is effective in ensuring documentation is current and that construction personnel utilize proper documents for performing work.

The snubber protection program is being implemented effectively.

Improvements were recommended in a number of areas. The following are considered to be among the most important areas in need of improvement:

Implementation of some elements of the preventive maintenance program during construction and at turnover to operation.

Trending of performance indicators to identify potential problem areas needing management attention.

Engineering knowledge and understanding of calculation details prepared by the architect engineer.

Findings and recommendations are listed under the Performance Objectives to which they pertain. Particularly noteworthy conditions that contribute to meeting Performance Objectives are identified as Good Practices. Other findings describe conditions that detract from meeting the Performance Objectives. It would not be productive to list as Good Practices those things that are commonly done properly in the industry since this would be of no benefit to TUEC or to INPO's other member utilities. As a result, most of the findings highlight conditions that need improvement.

The recommendations following each finding are intended to assist the utility in ongoing efforts to improve all aspects of its nuclear programs. In addressing these findings and recommendations, the utility should, in addition to correcting or improving specific conditions, pursue underlying causes and issues.

As part of each evaluation, the team follows up on responses to previous findings, in this case those from reports provided for the self initiated evaluation conducted in October 1982. In areas where additional improvements were needed or where response actions have not been timely, a new finding that stands on its own merit has been written. Thus, this report stands alone, and reference to the previous evaluation reports should not be necessary. For this evaluation, there are two findings related to previous findings.

The findings listed herein were presented to Texas Utilities Electric Company management at an exit meeting on August 20, 1985. Findings, recommendations, and responses were reviewed with Texas Utility Generating Company (TUGCO) management on September 25, 1985. Responses are considered to be satisfactory.

To follow the timely completion of the improvements included in the responses, INPO requests a written status by May 1, 1986.

The evaluation staff appreciates the cooperation received from all levels of Texas Utilities Electric Company.

## TEXAS UTILITIES ELECTRIC COMPANY

Response Summary

Texas Utilities Electric Company (TUEC) supports the Construction Project Evaluation Program that has been initiated by the nuclear utility industry. In keeping with INPO's goals, TUEC is dedicated to achieving the highest standard of excellence in nuclear plant construction.

With these findings, INPO has confirmed areas needing improvement, many of which had been identified by TUEC, and for which improvement programs were previously being developed and implemented. As indicated in the responses to the findings, TUEC has given serious consideration to the recommendations. Positive action has been initiated for the timely completion of each finding.

Concurrent with INPO's evaluation, site management conducted activity evaluations and shares in the conclusions that additional focus should be placed on the following areas:

a. preventive maintenance of selected equipment

b. an expanded trending scope

c. updated and controlled design information

d. enhanced planning and scheduling

TUEC is equally encouraged by INPO's acknowledgement of beneficial practices and accomplishments at Comanche Peak, as well as recognition of programs formulated prior to this assessment. The positive feedback established in this report will provide added motivation for the entire project team. TUEC considers the individuals comprising the project team to be a very important asset.

## ORGANIZATION AND ADMINISTRATION

### MANAGING CORRECTIVE ACTIONS

**PERFORMANCE OBJECTIVE: Managers and supervisors having functional responsibility for activities should have direct involvement in identifying problems, determining underlying cause, and ensuring that timely corrective actions are being taken to prevent the recurrence of similar problems.**

Finding (OA.4-1)

**Improvements are needed in the project corrective action programs.** While changes have recently been made, elements of the non-conformance and trend analysis programs need strengthening. Root cause analyses for non-conformances are not required, and trending reports are not used by some project managers for identifying and resolving problems.

Recommendation

Continue efforts to strengthen project corrective action programs. Implement a structured program to prevent recurrence of non-conforming conditions and to formalize methods for trend analysis. Identify and incorporate project performance indicators into trending programs. Consider using a summary report to disseminate significant results to managers and supervisors.

Response

The program for the upgrading of systematic trending and corrective action is currently being developed. Additional refinements, such as the inclusion of applicable engineering, construction, and quality performance indicators, and a description of the evaluation methodology will be incorporated by December 1985.

The results of trending will be evaluated at the appropriate level of management. Senior project management will be advised regarding the results of trending, evaluation, and corrective action activities on a monthly basis.

The current informal program for the review of nonconformances to prevent recurrence will be procedurally defined in December 1985.

## DESIGN CONTROL

### DESIGN INTERFACES

PERFORMANCE OBJECTIVE: **The design organization's external and internal interfaces should be identified and coordinated to ensure completion of a design that satisfies all input requirements.**

Finding (DC.2-1)

**Some limitations on system operations determined by engineering calculations and/or vendor limits have not been incorporated into appropriate operating procedures.** Examples were noted for the component cooling water system, the auxiliary feedwater system, and the polar crane operation.

Recommendation

Verify that system limitations and precautions have been implemented into operating instructions. Ensure that administrative procedures are in place to incorporate future changes to limits and precautions into operating instructions.

Response

Limiting conditions or operating restraints, as a result of new or revised engineering calculations, will be formally identified by design engineering as considerations for operation. Information provided by design engineering will be reviewed by and utilized, as appropriate, by the Operations Technical (Engineering) Support Group in the development of operating procedures and operator training programs. The verification of these efforts will be accomplished through the systematic quality audit/surveillance program.

The procedure governing the preparation of calculations by engineering will be revised in October 1985 to include the requirement to identify limiting conditions or operating restraints. The revision will include a requirement wherein the calculation cover sheet will reference the formal transmittal, which notifies operations personnel of the limiting conditions observed in the calculation.

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### DESIGN PROCESS

PERFORMANCE OBJECTIVE: **The design process should be planned, implemented, and controlled to produce a design that is complete and of high quality.**

Finding (DC.3-1)

**Improvements are needed in the development and review of some electrical calculations to ensure that all design requirements are addressed.** Some calculations were not available and some calculations identified limitations that have not been resolved. Examples were noted in calculations for voltage drop, cable and battery sizing, and protective relay settings.

**Recommendation**

Review the electrical calculation methodology to ensure that the data used is correct and that the calculations required to support the design have been performed. Resolve any discrepancies or limitations identified by the review.

**Response**

Currently, a program is being developed to enhance the identification, review, and updating of electrical calculations. The program will include measures to resolve any inconsistencies identified. The scope and schedule for this effort will be defined no later than October 1985.

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Finding (DC.3-2)

**Some design considerations for the routing of instrument tubing for high temperature sensing lines and control valve operation have not been updated or evaluated.** Process tap movement data used for the design of instrument tubing arrangements are not reviewed against the movement data from the latest stress analysis. Flexibility requirements for some instrument air tubing installations to air-operated valves in high temperature process lines have not been determined.

**Recommendation**

Implement a program to review expected process line movements against tubing arrangement design information utilized for instrument tap connections and some air-operated valve controls. Assess existing tubing arrangement installations to ensure flexibility requirements have been provided that are based upon the process line analysis.

**Response**

Support requirements for high temperature instrument lines are documented in the installation detail drawing 2323-I-002. The analyses for the support requirements utilize preliminary displacements of the affected piping. Pipe support engineering, by interface agreement, will provide final displacements after as-built configurations are available. I&C engineering will use this information to ensure the as-built configurations are bounded or will perform additional analysis as required to verify the adequacy of the installation. Displacements will be verified for high temperature lines during functional testing and corrective actions taken as necessary.

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Finding (DC.3-3)

**Improvement is needed in the implementation of the environmental qualification (EQ) program.** The assumed start of qualified life for some equipment has not been supported by analysis or other documentation. A qualification report for the 6.9 KV switchgear utilized an ambient temperature that is less than the value stated in the FSAR, and an EQ report for the 480 V load center transformer is incomplete.

**Recommendation**

Evaluate the environmental qualification program to ensure that the qualification data for equipment is complete, and that the analysis supports both the expected temperature conditions and the assumed fuel load start date for components with short qualified life.

**Response**

In order to enhance the EQ program, the following activities will be implemented:

a. To support the commitment for starting qualified life at fuel load, TUGCO will assess short-lived items to ensure the possible impact of a delayed fuel load is not detrimental. The current fuel load projection will be considered. This assessment will be performed prior to the actual fuel load.

b. To ensure EQ results and FSAR statements are consistent, a representative group of equipment EQ packages will be reviewed. Further review and corrective action will be implemented as required. The initial review effort will be completed in January 1986.

c. EQ packages are currently being reviewed for the qualification parameter of ambient temperature. This effort will be completed prior to fuel load.

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## DESIGN OUTPUT

**PERFORMANCE OBJECTIVE: Design output documents should be complete, accurate, understandable, and controlled, and should reflect the highest standards of quality.**

Good Practice (DC.5-1)

**An effective computer data base management program has been implemented to store and retrieve all pertinent information regarding pipe hangers.** The program enables a quick determination of the location of hanger components. For example, if a manufacturer recalls or an IE Bulletin addresses certain hanger components, the exact quantity and location of each component in question can be readily identified. The data base fields include the following:

a. hanger number

b. current calculation revision

c. type of support (spring can, strut, snubber, etc.)

d. manufacturer

e. stress analysis problem number

f. stress analysis nodepoint

g. temperature of pipe

h. insulation type and thickness

i. all loads and displacement

j. support stiffness data

k. snubber/spring data

l. isometric on which hanger appears

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**Finding (DC.5-2)**

**Some electrical documents need upgrading to ensure that all design and installation requirements are incorporated.** Discrepancies were noted in the diesel generator neutral grounding equipment classification, battery installation tolerances, control circuit cable length verification, and lighting level requirements for emergency lighting.

**Recommendation**

Implement measures to ensure that electrical documents reflect design and installation requirements for neutral grounding, equipment classifications, battery installation tolerances, emergency lighting levels, and the verification of installed control circuit cable lengths.

**Response**

Discrepancies identified in the finding will be evaluated and corrective actions taken as necessary. Limiting control cable lengths will be verified to ensure actual lengths are bounded by the analysis.

A program to review drawings by system relative to system turnover will be conducted in the normal design philosophy of the hierarchy of drawings, i.e., mechanical flow diagram to instrumentation and control diagram to electrical schematic to wiring diagram. The program will ensure changes are reflected in the entire hierarchy of drawings, including higher and lower tier drawings. This program has several milestones relative to subsystem turnovers with completion currently scheduled for March 1986.

FSAR update and review for consistency efforts are being accomplished in accordance with the above program. The FSAR is also required to be reviewed for possible revision as part of the engineering review of design changes as established by engineering procedures. This program will be reemphasized.

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## CONSTRUCTION CONTROL

### MATERIAL CONTROL

**PERFORMANCE OBJECTIVE: Material and equipment should be inspected, controlled, and maintained to ensure the final as-built condition meets design, operational and quality requirements.**

Good Practice (CC.3-1) **The implementation of a program for stocking rolled plates used for pipe support saddles has ensured availability of needed materials.** Basic elements of the program are as follows:

a. Master plates, 180 degrees by 3 feet long, and rolled to the required pipe diameter, are purchased. When required for use in a saddle (e.g., 60 degrees by 12 inches long), a piece is cut from a master plate of the appropriate thickness at the site fabrication shop. Combinations of plates can also be used to achieve various thicknesses required by designs.

b. This scheme accommodates any plate requirement and obviates the need for ordering each individual plate rolled to specifications. Typical material control long-lead-time problems, due to the special equipment required for fabrication of this type of part, is minimized.

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Good Practice (CC.3-2) **The snubber installation program is effective in minimizing damage to snubbers while maintaining construction installation schedules.** The major elements of this program are training of personnel, maintenance of equipment in storage, the issuance of snubbers for installation during normal construction, and the protection of snubbers after installation. The program elements include the following:

a. Prior to installing snubbers, workers are trained by manufacturers' representatives using cut-away snubbers to identify the working mechanisms and reasons for care.

b. A poster program has been implemented at the job site that identifies snubbers and the major precautions that must be taken to preclude damage prior to, during, and after installation.

c. Snubbers are maintained in the warehouse under controlled conditions in racks and wooden crates that provide physical separation. All crates and racks are totally enclosed in plastic curtains.

d. Snubbers are issued and installed consistent with system construction schedules after all other components are in place and verified as acceptable for the installation of the snubber. This prevents damage due to snubbers lying in construction areas waiting for installation. Only those snubbers that can be totally installed on a given shift are released to construction personnel.

e. When the installation is complete, each snubber is wrapped with plastic-covered foam rubber to protect it from moisture, dirt, dust, and foreign objects. Highly visible signs are attached to the covering that identifies the installation as a snubber.

f. Project personnel have a positive attitude regarding snubber protection as a result of management involvement and craftsmen indoctrination and training.

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## CONTROL OF CONSTRUCTION PROCESSES

**PERFORMANCE OBJECTIVE: The construction organization should monitor and control all construction processes to ensure that the project is completed to design requirements and that the highest level of quality is achieved.**

Finding (CC.4-1)

**Required clearances between various installed commodities are not being maintained.** Several instances were observed where pipe, cable tray, conduit, and HVAC duct were either located in close proximity or in contact with each other.

Recommendation

Ensure clearance requirements are established, understood, and are adhered to during the installation process. Perform inspections to identify clearance nonconformances, and implement corrective actions as appropriate.

Response

Commodity clearance criteria, separation tolerances, and concerns identified in the evaluation will be reviewed by engineering no later than December 1985. When this assessment is completed, training will be provided for construction, quality, and technical personnel.

Current construction verification programs, which verify separation as an inspection attribute at acceptance of the installation, will be augmented with a final verification program at the point of area/room completion turnover.

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Good Practice (CC.4-2)

**The detail erection criteria and the utilization of trained and experienced craft personnel for instrument tubing and tubing support installations have substantially reduced the field design engineering support effort.** Installation detail sheets provide directions to the craft for proper tubing slope, tubing support spacing, expansion loops, high point vents, support location, support type, and configuration of standard supports. To ensure proper implementation of the criteria for each installation, a field engineer performs an inspection prior to the QC inspection. This precludes the need for the development of erection isometrics normally performed by a field engineering group.

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Finding (CC.4-3)

**Cable trays are not always protected from damage in the construction environment.** Some cable trays were noted with support rungs bent or broken.

Recommendation

Increase emphasis on the protection of installed raceways, giving particular attention to the prohibition of walking in and rigging from cable trays. Repair or replace damaged trays as necessary.

Response

Increased emphasis of the existing program to provide protection for the electrical raceway system was initiated in August 1985 and will be completed in December 1985. Specific topics addressed in this effort include the detrimental effects of rigging and personnel use. Reemphasis of this program will be ongoing throughout the construction cycle.

To ensure the adequacy of the final system installation, any discrepancies will be identified and corrected during the performance of the final QC raceway inspection. All discrepancies currently identified will be dispositioned by December 1985.

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## QUALITY WORKMANSHIP

**PERFORMANCE OBJECTIVE: The project should focus its efforts on achieving quality through the work force, with verification by the inspection force.**

Finding (CC.5-1)

**Additional emphasis needs to be placed on erecting conduit supports and instrumentation correctly the first time.** Some installations were observed to be made incorrectly and trend reports show that many deficiencies are not identified and corrected by craftsmen or foremen prior to final quality control inspection.

Recommendation

Require craft supervisors to monitor work activities to a sufficient degree to ensure that quality work is being performed. Hold supervisors accountable for verifying the quality of work before QC inspections are performed.

Response

Increased accountability has been placed on supervision and construction personnel for the proper and correct commodity installation prior to QC inspection.

Senior project management is currently involved on a personal basis in the emphasis of quality construction practices. These actions have been accomplished through separate correspondence issued to each employee by the Executive Vice-President of TUGCO-Nuclear and the Chief Executive Officer of the Constructor. In addition, the "Managing for Quality" training program, implemented for all supervisory personnel through the foreman level, is an active and ongoing effort. This programmatic training is continuing to the craft level so that each craftsman will understand his responsibilities to report and correct deficiencies prior to QC inspection.

Supporting overview activities by Safeteam personnel, project management, and crew auditors provide additional avenues to emphasize foreman and supervisor accountability.

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## PREVENTIVE MAINTENANCE

PERFORMANCE OBJECTIVE: The construction preventive maintenance program preserves original integrity and provides protection to permanent plant equipment to ensure optimum performance and reliability that meet design, operational, and safety requirements. Its effective implementation helps to make certain that the equipment will not degrade during the construction and testing phase.

Finding (CC.8-1)

**Some equipment is not receiving required preventive maintenance (PM).** Problems were noted in the PM of some pumps, motors, and motor-operated valves. Some equipment that has been turned over by construction is not included in the operations PM program.

**Recommendation**

Review the PM program to ensure that all required equipment is included and that manufacturer's recommendations are considered. Initiate appropriate actions to correct the deficiencies identified. Ensure that PM requirements continue to be satisfied during the turnover process and after turnover to operations.

**Response**

The construction PM program will be reviewed no later than December 1985 to ensure that all appropriate equipment is included. This review will also ensure the manufacturer's recommendations are considered. In accordance with project practices, all limitorque valve operators will be inspected and refurbished as required by factory-trained personnel. This activity will take place as part of the prerequisite test program.

In August 1985, operation's personnel began a weekly review of completed system turnovers. This review is intended to ensure the inclusion of affected equipment in the operations maintenance program. This schedule has replaced the former quarterly review.

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## PROJECT SUPPORT

### INDUSTRIAL SAFETY

**PERFORMANCE OBJECTIVE: The construction site industrial safety program should achieve a high degree of personnel safety.**

Finding (PS.1-1)

**Some aspects of the confined space entry program need improvement.** The site procedure is not sufficiently specific in covering some aspects of safety precautions required for entry into confined spaces, and some personnel are not familiar with the program requirements.

Recommendations

Revise the confined space control procedure to provide a more comprehensive description of the safety requirements for confined space entry. Ensure that all confined spaces are properly posted and craftsmen and craft supervision are notified when requirements are changed. Implement a program to ensure that personnel required to enter a confined space are trained on the requirements of the procedure and use of the air sampling equipment. INPO Good Practice OA-101, "Safe Work Procedure for Enclosed Volumes," may be of assistance in this effort.

**Response**

The confined space industrial safety program will be reviewed and revised by October 1985. In August 1985, a requirement to post entry permits at the point of entry into a confined space was implemented. Also, safety meeting training was revised to include additional attention to confined space control and the use of monitoring equipment. During routine inspections, field safety inspectors are now required to check confined spaces to ensure employee safety and compliance with safety procedures.

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### PROJECT PLANNING AND SCHEDULING

**PERFORMANCE OBJECTIVE: Project plans and schedules are prepared and provide management with the information necessary to control the project.**

Finding (PS.2-1)

**Improvement is needed in schedule management to support project goals.** The following problems were noted:

a. Walkdowns of cable routes in series by craftsmen, engineers, and QC inspectors are causing delays in identifying and correcting deficiencies.

b. All subsystems with missed turnover dates are being expedited to the same degree, rather than focusing management attention on subsystems that are most critical.

c. Reports contain differing and undefined milestone date terminology for completion dates.

d. Some management status reports contain incomplete and conflicting information.

**Recommendation**

Implement methods to more efficiently prepare electrical raceways for cable pulling. Prioritize subsystem turnover requirements. Establish consistent commitment dates to be used to establish work priorities. Revise the present content of status reports to strengthen focus on existing problems and emerging issues.

**Response**

Recent management attention has been directed to the review and reduction of administrative restraints to cable pulling. Efforts to date have included the realignment of activities to take place simultaneously as opposed to consecutively. Concentrated efforts as a result of earlier management concerns have resulted in several reconstructed scheduling activities. Critical system and subsystem turnovers are being prioritized and responsibilities for action defined. Daily meetings involving concerned parties are conducted to ensure problems are identified and resolved for schedule-critical activities.

In order to focus attention to issues having impact on critical path work, management reports have been revised to reflect a more clear and concise format.

The results of these efforts will involve a continuous overview of the scheduling process by senior managers to ensure timely completion of project goals.

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## PROJECT PROCUREMENT PROCESS

**PERFORMANCE OBJECTIVE: The project procurement process should ensure that equipment, materials, and services furnished by suppliers or contractors meet project requirements.**

Good Practice (PS.3-1)

**The formation of a paper flow group (PFG) to prepare, handle, and control the issue of all work packages to the field has enabled the project to establish rigorous control of documentation without hindering work activities.** The significant features of the PFG organization are as follows:

a. All work on site is performed to the requirements contained in individual work packages. Each package contains original documents including drawings, authorized design changes, material requisition and traceability documentation, QC inspection reports, NCRs, procedures, and other appropriate documents. Maintaining all related documents in one readily available and up-to-date package increases document accountability and avoids having to assemble documents, prepared at various times from various sources, for final review.

b. All work packages are issued from and returned to the PFG at the start and completion of each shift respectively. Before issue, each package is reviewed to ensure that it contains only the latest revision of each document. Similarly when returned to the PFG, each package is inspected to confirm proper and complete content. The work package review generally takes place during the night shift.

c. The PFG provides the effective method of ensuring that document revisions are issued expeditiously to the point of work in the field.

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**Finding (PS.4-2)** **Control of vendor manuals needs improvement.** Changes to manuals that effect site procedures are not always reviewed for impact by responsible disciplines. Technical information supplied by vendors sometimes is not incorporated into the respective manuals. Some vendor manuals in use are not in the document control system.

**Recommendation** Implement improved controls in the vendor manual control program to correct deficiencies noted. INPO Good Practice MA-304, "Control of Vendor Manuals," could be of assistance in this effort.

**Response** Improvements in the control of vendor manuals have been initiated via a management directive to verify information that is currently in use. This directive includes a requirement to review all vendor data files in engineering. Obsolete information will be purged, and information that is not controlled by the operations document control center (DCC) will be incorporated into the controlled vendor information packages. This activity will be completed in November 1985. Further, additional vendor data received by the project will be controlled centrally by operations DCC and distributed to the necessary users. The verification of these efforts will be accomplished through the systematic quality audit/surviellance program.

Engineering personnel will receive additional training in October 1985 to require confirmation that vendor data is complete and applicable prior to its use.

The INPO Good Practice for the control of vendor manuals will be reviewed for its applicability by October 1985.

## TRAINING

### GENERAL TRAINING AND QUALIFICATION

**PERFORMANCE OBJECTIVE: The training program should ensure that all employees receive indoctrination and training required to perform effectively and that employees are qualified as appropriate to their assigned responsibilities.**

Good Practice (TN.3-1) **An effective supervisor's training program has been implemented to develop the skills of managers and supervisors to communicate effectively with construction personnel.** The program is used for training responsible personnel in all organizations. Program elements and accomplishments are as follows:

a. The program covers the supervisor's role in motivation of workers, communication methods, expected conduct from employees, plant safety, achieving quality construction, and productivity on the project.

b. The program has been successful as evidenced by craft workers' positive attitudes in achieving quality construction and craftsmen comments about management's interest in their daily needs and suggestions for improvements.

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Good Practice (TN.3-2) **The project training program for electrical craftsmen ensures uniformity of skills and an understanding of work procedures required for acceptable installations.** All new electricians receive training prior to making field installations. The program has been effective in developing a good attitude of the craft, an awareness of the need for quality work, and the necessity for following procedures. Principle program elements are as follows:

a. Specific procedural training has been developed for the installation of raceways, cables, and cable terminations. Training in procedures is conducted using qualified instructors, videotapes, and classroom discussions.

b. Each craftsman is trained by performing "mockup" work before being sent to the field. Conduit, tray, and supports are installed between two pieces of equipment by the electricians being trained for raceway installations. Using the trainee-installed raceway, the cable pulling trainees pull cable from one piece of equipment to the other applying techniques that will be used in the field. After the cable has been pulled, the terminator trainees tie the cable inside the cabinets, prepare the ends for terminations, and connect the conductors to the end device.

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## TEST CONTROL

### TEST PLANNING

**PERFORMANCE OBJECTIVE: Testing activities should be controlled effectively through the use of detailed plans and schedules.**

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| Finding (TC.3-1) | **Planning for testing activities needs improvement.** Short-term schedules are not used to plan for daily test activities. Prerequisite construction testing is not included on the start-up schedule. Hydrostatic testing is not included in the start-up testing schedule logic. |
| Recommendation | Upgrade the detailed planning for testing activities. Particular attention should be given to scheduling day-to-day activities. Issue short-term schedules to identify specific testing activities. Include construction prerequisite testing and hydrostatic testing in the start-up schedule. |
| Response | In August 1985, more emphasis was placed on the start-up schedule with the assignment of system specialists to follow and coordinate all critical activities. The specialists will coordinate the interdisciplinary activities of building construction and start-up. The assignment of these specialists, to be completed in October 1985, will centralize completion responsibilities. Furthermore, daily meetings are held by the Assistant Project General Manager to expedite turnover of the most critical systems and other start-up concerns. Engineering, startup, procurement, and building managers and system specialists are required to attend these meetings. The most critical systems are identified by start-up per review of the turnover schedule.<br><br>Hydrostatic testing has been included in the construction schedule and prerequisite testing will be included in the start-up schedule. |

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### TESTING PROCEDURES AND DOCUMENTS

**PERFORMANCE OBJECTIVE: Test procedures and documents should provide appropriate direction and should be used effectively to perform plant testing.**

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| Good Practice (TC.5-1) | The Start-up Administrative Procedure for pre-turnover system walkdowns provides very complete and detailed guidance as to equipment conditions to be observed during the walkdown. The procedure is used by both construction and start-up personnel |

thus providing standardization for walkdowns. The procedure contains details such as the following:

a. drawings to be used for walkdowns

b. electrical nameplate data to verify

c. mechanical equipment parameters to check

d. instrumentation attributes to verify

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