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SURVEILLANCE AND INSPECTION OF CONCRETE ANCHOR BOLT INSTALLATION	PREPARED BY: <u>LMB 7-11-84</u> <u>Michael D. Warner</u> 7/9/84 DATE			
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1.0 REFERENCES

- 1-A SS-30, "Structural Embedment"
- 1-B 35-1195-CEI-20, "Installation of "Hilti" drilled-in Bolts"
- 1-C CP-QP-18.0, "Inspection Report"
- 1-D CP-QP-16.0, "Nonconformances"

2.0 GENERAL

2.1 SCOPE

This procedure describes the Quality Control Program that has been established to verify the adequacy of concrete anchor installations at Comanche Peak Steam Electric Station in accordance with Reference 1-A and 1-B. The requirements of this Procedure apply to all concrete anchor installation in Category I Structures at Comanche Peak Steam Electric Station, including those utilized for both ASME and Non-ASME components.

2.2 DEFINITIONS

Inspection - the act of performing surveillance, verification or witnessing of an act to assure quality objectives have been reached.

2.3 QUALITY INSTRUCTIONS

Quality Instructions shall be prepared delineating the various inspection attributes that must be performed to assure quality. These instructions will be subordinate to this Procedure.

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3.0 PROCEDURE

3.1 INSPECTION FREQUENCY AND SCOPE

Frequencies of inspections shall be determined jointly by the Quality Control Supervisor and the Quality Engineering Group based on field installation activities. These inspections shall be accomplished by assigned Inspectors in accordance with the established frequency. Inspection frequencies for various electrical, instrument and mechanical applications vary; the following are the required minimum frequencies for the various activities.

3.1.1 Installation

Surveillance of installation activities at a frequency directed by the Quality Engineering Supervisor to verify a high confidence level.

3.1.2 Abandoned Bolt Holes

Abandoned bolt hole patching will be verified by the QC Inspector on a frequency commensurate with construction activities as determined by the Quality Engineering Supervisor.

3.1.3 Torquing

Torquing requirements for the various discipline applications shall be as follows:

- a. For all pipe supports (mechanical) and cable tray supports (electrical), at least one (1) concrete anchor bolt per base plate shall be witnessed or verified.
- b. Where electrical boxes (this includes fixture boxes) mount directly to building concrete, or where conduit or tubing is mounted to the building structure with one (1) hole straps, the inspection/witness attribute shall be accomplished on one (1) bolt for each fixture per unit, section or assembly.
- c. Where concrete anchors are used to mount electrical equipment panels, junction boxes, instrument and conduit supports, one (1) anchor bolt per unit or assembly shall be witnessed or verified.

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d. Lighting fixtures requiring seismic restraints shall have at least one (1) bolt on each seismic bracket witnessed or verified.

e. Holes and bolts that are to be reworked shall be witnessed or verified.

Other items not identified above that require inspection of concrete anchor bolts will have all the bolts for the applicable installation witnessed or verified.

3.1.4 Super Kwik Hilti Bolts

Star stamping of all Super Kwik Hilti Bolts shall be verified by the QC Inspector. Additionally, QC shall maintain and control the star stamp.

3.1.5 Spacing

When verifying or witnessing Hilti Bolt torquing, per the requirements of paragraph 3.1.3 above, concrete anchor bolt spacing for all bolts on that item shall be checked.

3.2 INSPECTION PLANNING

Quality Engineering, working jointly with assigned Quality Control (QC) personnel, shall plan inspections to result in maximum utilization of qualified manpower without compromising the quality objectives as stated in Section 3.1 above. Those planning efforts shall result in an Inspection Report (IR) per the provisions of Reference 1-C detailing the items to be inspected.

3.3 INSPECTION TECHNIQUES

Quality Control (QC) personnel shall accomplish the inspection efforts as directed by the Quality Control Supervisor or his designee using surveillance witnessing and/or monitoring techniques.

These techniques will consist of, but are not necessarily limited to, the use of precision measuring devices to physically measure the bolt or hole, witnessing of drilling and installation activities and post installation measuring activities to verify installation parameters.

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Results shall be documented on the IR in sufficient detail to permit evaluation of the quality of the installation efforts without recourse to the Inspector. The Inspector shall complete and attach supplementary sheets to the IR if necessary to achieve the objective. The Inspection Attributes shown on the IR are the minimum inspections to be accomplished and may be expanded if installation conditions warrant with the approval of the Quality Control Supervisor or his designee.

NOTE: Inspection of non-seismic equipment and systems shall be completed on a room or area basis. This inspection should be coordinated such that the inspection shall take place after construction is virtually complete in the room or area.

NOTE: In the past, some inspections have been documented on the Operation Traveler.

3.4 NONCONFORMANCES

Nonconformances shall be reported as outlined in each Quality Instruction in accordance with Reference 1-D.

3.5 DOCUMENTATION

Inspection Reports and/or Quality Instructions shall be prepared and issued delineating the method(s) of inspection and applicable criteria to be used in performing that inspection. Quality Instructions detail the documentation required to be completed to provide objective evidence of compliance with specified Engineering/Construction criteria. These records shall be reviewed, processed and filed in accordance with CPSES requirements for QA Records.