TEXAS UTILITIES GENERATING CO.

- CPSES -

TUGCO INSTRUCTION
QI-QP-11.3-40 Rev. 19
Page 1 of 12
SEP 10 1984

POST CONSTRUCTION INSPECTION OF ELECTRICAL EQUIPMENT AND RACEWAYS

PREPARED BY: _____ Date 9/6/84

APPROVED BY: _____ Date 9-6-84

APPROVED BY: _____ Date 9-7-84

1.0 REFERENCES

1-A CP-QP-11.3, "Electrical Inspection Activities"

1-B CP-SAP-13, "Temporary System Modifications"

1-C QI-QP-11.3-26/QI-QP-11.3-26A, "Electrical Cable Installation Inspections"

1-D CP-QP-18.0, "Inspection Report"

1-E CP-QP-16.0, "Nonconformances"

2.0 GENERAL

2.1 PURPOSE AND SCOPE

The purpose of this Instruction is to supplement Reference 1-A and to provide the inspection criteria and documentation requirements for performing post construction inspections on Class 1E and Non-Class 1E electrical equipment and raceways within the scope of Reference 1-A.

This inspection is intended to work in conjuction with programs described in References 1-A through 1-E, and is not intended to replace or supercede requirements described therein.

3.0 INSTRUCTION

Post construction inspection shall be performed upon notification from the Building Management Organizations or the TUGCO Site QA Supervisor or his designee.

A craft accompanied post construction inspection walkdown shall be performed by the Electrical QC Inspectors to provide added assurance of the integrity of Class 1E and Non-Class 1E equipment and raceway installation.

Equipment containing temporary system modifications is identified in accordance with Reference 1-8, and documented in accordance with Paragraph 3.1.2 (Item i) of this Instruction.

Where cable tray, cable or other equipment is covered or coated, the documentation initiated by the original inspections shall be sufficient.

3.1 POST CONSTRUCTION INSPECTION

The QC Inspector shall perform a visual inspection to the maximum extent possible without removal of cable tray covers, firewrap and thermolag. A visual inspection shall also be performed inside cabinets, motor termination boxes and M.O.V. operators.

NOTE: The QC Inspectors are cautioned not to move terminal conductors or wire bundles during inspection, since equipment may be energized.

If the inspector determines it necessary to move conductor(s) or wire bundle(s) for inspection purposes, the inspector shall contact his/her supervisor who will coordinate with cognizant personnel to obtain access to the equipment.

3.1.1 Raceway Inspections

3.1.1.1 Lighting raceway inspections shall be performed in accordance with Paragraph 3.3.1.

3.1.1.2 For all other raceways the QC Inspector's inspections shall include the following:

a. Conduit and cable trays shall be free from damage.

b. Conduit fittings (LBD's, etc.) shall have all covers installed after internal inspection has been completed.

c. Pulling aids (i.e., rollers, fish tape, tag rope) have been removed from raceway.

d. Cables are free from damage or debris and are properly identified.

e. Cables are trained, secured and bend radius has not been violated.

f. Power cable spacing has been maintained in accordance with Reference 1-C.

g. Cable slack of two (2) inch minimum is provided at transition points between cable tray sections at different elevations and at conduit entries to cable trays and between Category 1 structures.

NOTE: 1 Covers shall be removed from junction boxes, pull boxes and termination boxes to perform required inspections. The removal of these covers shall be in accordance with project procedures.

3.1.2 Motor and Cabinet Inspections

The QC Inspector shall perform an inspection of Class 1E equipment installations. These inspections shall include the following:

a. Equipment has sustained no visible physical damage.

b. Equipment is clean and free of debris and other detrimental materials.

NOTE: The following attributes are not within the scope of a and b above:

1. Scratches, chips, mars or other cosmetic finish/paint damage.

2. Dust and other similar conditions common to a construction environment that are not detrimental to the equipment, wiring, and internal components

The above conditions will be corrected during the Owner's Management Walk-Down following completion of start-up testing.

c. Equipment filters installed in vent openings where required by drawing.

d. Equipment has been grounded.

NOTE: Step "d" is for personnel safety. Reference to drawings or specifications is not necessary or required.

e. Internal cables are properly trained, bundled and tied with ty-raps in a neat and orderly manner.

f. Conductor insulation free from damage.

NOTE: It shall be necessary to open equipment (i.e., doors, panels) to perform inspections. This shall be in accordance with project requirements and the inspector shall contact his/her supervisor who will coordinate with cognizant personnel to obtain access to the equipment.

g. Cable identification installed.

h. Termination lugs not damaged.

i. Temporary modification tag numbers legible and recorded in Block 14 of Attachment 2 and on Attachment 4.

j. Doors, panels are installed and conditions of gasket materials have not deteriorated or sustained damage.

3.2 INTERNAL WIRING SEPARATION

Separation between field run redundant Class 1E cables and Class 1E/Non-Class 1E cables within a cabinet shall be maintained in accordance with the equipment specification. If the specification gives no separation requirements, the minimum separation distance between redundant Class 1E and Class 1E/Non-Class 1E cables shall be greater than or equal to 6 inches. In cases where the above separation criteria cannot be maintained, barriers shall be installed between the cables.

Barriers used for separation will be as follows (See Attachment 1 for typical examples):

1. Metallic conduit; including Servicair Company FC 33 flexible conduit.

2. Two sheets of fire retardant material separated by a minimum of ½" of air space or thermal insulating material.

3. A single barrier with a 1" maintained air space or thermal insulating material between the components or devices and the barrier.

Redundant Class 1E circuits shall enter in separate apertures and terminate on separate terminal blocks or connectors as shown on G&H design drawings.

Power supply feeds to instrument and control room distribution panels shall be installed in solid enclosed raceways as shown on G&H design drawings. (Example: conduit)

The following cabinets have been analyzed and are exempt from the separation requirements; however, equipment that provides for channel or train separation shall be utilized when available.

Note: TBX for Unit 1 and TCX for Unit 2.

NIS Cabinets	T-X-NIELCA-01	(4 Cabinets)
Solid State Protection System	T-X-ESELSP-01	(Logic & Output Cabinets only)
Solid State Protection System	T-X-ESELTC-01	(Test Cabinets)
Upgrade Protection & Surveillance	T-X-XIELSS-50	
Process Racks	T-X-XIELRK-01 T-X-XIELRK-02 T-X-XIELRK-03 T-X-XIELRK-04	

Protection channel wiring, safety-train wiring, and Non-safety train wiring within panels 1PC1, 1PC2, 1PC3, 1PC4 will be in different wire bundles. These bundles will be separated to the maximum extent practicable.

3.3 MISCELLANEOUS INSPECTIONS

3.3.1 Lighting Raceway Inspections

The QC Inspector's inspections shall include the following:

a. Conduit shall be free of damage.

b. Lighting restraints shall be free of damage.

c. Distribution panels have sustained no visible damage.

NOTE: Covers shall be removed from distribution panels to perform required inspections.

d. Cables in distribution panels shall be properly trained, secured and bend radius has not been violated.

NOTE: It is not necessary to remove lighting fixtures, or covers from termination boxes, or covers from conduit fittings, internal inspections are not required at this time.

3.4 DOCUMENTATION

When a final inspection has been made on Electrical Equipment, all subsequent inspections will be made on an "In Process" basis. Reinspections will be made only at the direction of the Building Q.C. Supervisor.

When unsatisfactory conditions are identified, the respective inspection attribute on the IR, Attachment 2, shall be checked "Unsat" and the unsatisfactory condition shall be clearly and concisely recorded on the Post Construction Deficiency Report Attachment 3, for raceway and the Electrical Equipment Deficiency Report Attachment 4, for equipment.

In large rooms or areas, where it will require more than one day to complete the inspection, the inspector shall number the sequential deficiency items beginning with the next sequential number from the previous inspection.

NOTE: In no cases shall the sequential numbers be duplicated on deficiency lists in one room or area.

The Building Paper Flow Group shall be responsible for status maintenance and tracking of IR's and respective deficiency reports.

Inspection Reports shall be processed in accordance with Reference 1-D.

Post Construction Deficiency Reports that were prepared and issued in accordance with previous revisions to this instruction shall be processed and closed out according to the following:

a. Status logs shall be manually maintained under the direction of the cognizant QC Supervisor to status and control the open Deficiency Reports.

b. The Deficiency Reports shall be routed to the cognizant Construction Supervisor for correction/resolution of the reported deficiencies.

c. Following correction/resolution of the deficiencies, the affected items shall be re-inspected and documented on the applicable Inspection Reports. The responsible QC Inspector shall attach the applicable Deficiency Report to each Inspection Report.

3.5 NONCONFORMANCES

Nonconformances shall be reported and identified in accordance with Reference 1-E.

Previously reported nonconformances identified during this inspection, or nonconformances reported as a result of this inspection shall be referenced in block 14 of Attachment 2 and on Attachment 4.

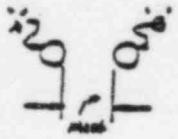
Open Post Construction Inspection Reports may be closed by an NCR per Reference 1-D.

ATTACHMENT 1

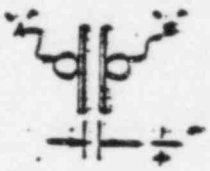
Internal Separations

1. CABLE-CABLE
   A) FREE AIR

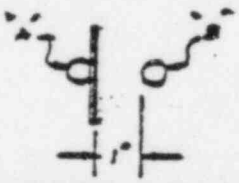
   B) WITHIN APPROVED FIRE STOP MATERIAL



2. CABLE-BARRIER (DOUBLE BARRIER SEPARATED BY 1/4" AIR SPACE OR APPROVED THERMAL INSULATING MATERIAL)



3. CABLE-BARRIER (SINGLE BARRIER)



1" MINIMUM AIR SPACE OR THERMAL INSULATING MATERIAL ON ONE SIDE. CABLE, COMPONENT, ETC., MAY TOUCH ON OPPOSITE SIDE.

4. CABLE-METALLIC CONDUIT

5. METALLIC CONDUIT-METALLIC CONDUIT
   (including Servicecair flex conduit)

ATTACHMENT 2

COMANCHE PEAK STEAM ELECTRIC STATION

INSPECTION REPORT

SHEET 1 OF 2

ITEM DESCRIPTION: Class 1E Post Construction Inspection	IDENTIFICATION NO.	SYSTEM / STRUCTURE DESIGNATION	
SPEC. NO.	REV.	REF. D.C. DOC. & REV. & CHANGE NO.: QI-QP-11.3-40 Rev.	MEASURE OR TEST EQUIP. IDENT. NO.

☐ IN PROCESS INSPECTION ☐ PRE INSTALLATION VERIFICATION ☐ INSTALLATION INSPECTION ☐ FINAL INSPECTION ☐ PRE TEST INSPECTION

UNDER RESULTS

☐ INSPECTION COMPLETED, ALL APPLICABLE ITEMS SATISFACTORY

☐ INSPECTION COMPLETED, UNSATISFACTORY ITEMS LISTED BELOW

QC INSPECTOR _____ DATE _____

ITEM NO.	INSPECTION ATTRIBUTES	SAT	UNSAT	DATE	QC SIGNATURE
	POST CONSTRUCTION INSPECTION Para. 3.1				
	RACEWAY INSPECTIONS Para. 3.1.1				
1.	Conduit free of damage. Para. 3.1.2.A				
2.	Cable pulling aids removed Para. 3.1.1.2.C				
3.	Cable tray free of damage. Para. 3.1.1.2.A				
4.	Cables free of damage and debris and identified. Para. 3.1.2.D				
5.	Cables trained and secure. Para. 3.1.2.E				
6.	Cable bend radii not violated. Para. 3.1.2.E				
7.	Power cable spacing maintained. Para. 3.1.2.F				
8.	Cable slack minimum provided. Para. 3.1.2.G				
	CABINET INSPECTIONS Para. 3.1.2				
9.	Equipment not damaged. Para. 3.1.2A				
10.	Equipment is clean. Para. 3.1.2B				
11.	Equipment filters installed. Para. 3.1.2C				
12.	Equipment gounded. Para. 3.1.2D				
13.	Internal cables trained/secure. Para. 3.1.2E				
14.	Conductor insulation free of damage. Para. 3.1.2F				
15.	Cable identification installed. Para. 3.1.2G				
16.	Termination lugs not damaged. Para. 3.1.2H				
17	Temporary tag numbered legible and recorded in block 14. Para. 3.1.2I.				
18.	Doors panels installed, gaskets not damaged. Para. 3.1.2J				
	INTERNAL WIRING SEPARATION				
19.	Internal wiring separation in accordance with Para. 3.2.				

E40/01 9/84

ATTACHMENT 2 (Cont)

COMANCHE PEAK STEAM ELECTRIC STATION
INSPECTION REPORT
QI-QP-11.3-40 Rev. ___
Sheet 2 of 2

(SUPPLEMENTAL)

FOR FULL HEADINGS, SEE SHEET 1 NO.

ITEM NO.	INSPECTION ATTRIBUTES	SAT.	UNSAT.	DATE	Q.C. SIGNATURE
	LIGHTING RACEWAY INSPECTIONS				
20.	Conduit free of damage. Para. 3.3.2.A				
21.	Lighting restraints free of damage. Para. 3.2.2.B				
22.	No visible damage to distribution panels. Para. 3.2.2.C				
23.	Cable in distribution panels are properly trained and secured. Para. 3.3.2.D.				
24.	Cable bend radius not violated in distribution panels. Para. 3.3.2.D.				

REMARKS: (DWGS, SPECS, ETC.)

RELATED NCR NO. | L.R. CLOSED ☐ | DATE | SIGNATURE QC INSPECTOR

E40/01 9/84

ATTACHMENT 3

Post Construction Deficiency Report

IR #:_____ ELEV.:_____

ROOM #:_____ AREA:_____

ITEM	DESCRIPTION	CRAFT	QC REINSPECTION	REMARKS

ATTACHMENT 4

ELECTRICAL EQUIPMENT DEFICIENCY REPORT

Page ____ of ____

IR#: _____ T/O: _____ INSPECTOR: _____ ISSUED TO: _____

ROOM#: _____ ELEV.: _____ AREA: _____ ISSUE DATE: _____ RETURN DATE: _____

ITEM	DESCRIPTION	CRAFT	REMARKS