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REINSPECTION OF COATED STEEL SUBSTRATES FOR WHICH DOCUMENTATION IS MISSING OR DISCREPANT	PREPARED BY: <u>R.A. Cummings</u>		12/15/81			
	APPROVED BY: <u>[Signature]</u>		12/16/81			
	APPROVED BY: <u>B.C. Dalt</u>		12/17/81			
<p>1.0 <u>REFERENCES</u></p> <p>1-A Nonconformance Report Numbers C-81-01370 through C-81-01373 and C-81-01567</p> <p>1-B CP-QP-18.0, "Inspection Reports"</p> <p>1-C CCP-30, "Coating Steel Substrates Inside Reactor Buildings and Radiation Areas"</p> <p>1-D CCP-30A, "Coating Steel Substrates Inside Reactor Buildings and Radiation Areas"</p> <p>1-E QI-QP-11.4-1, "Inspection of Steel Substrate Surface Preparation and Primer Application"</p> <p>1-F QI-QP-11.4-5, "Inspection of Steel Substrate Primer Repair and Seal and Finish Coat Application and Repair"</p>						
2.0 <u>GENERAL</u>						
<p>2.1 <u>PURPOSE AND SCOPE</u></p> <p>This instruction shall describe methods utilized by Quality Control in the measurement of the dry film thickness (DFT) and adhesion to steel substrates of existing coating applications described in Reference 1-A using the Mark II Tooke Gage and the Elcometer 106 Adhesion Tester respectively. The above tests are destructive in nature which will necessitate a repair of the coating system at each spot test location.</p>						
<p>3.0 <u>INSTRUCTION</u></p> <p>For each area of 100 square feet or less of coated surface for which documentation is missing or discrepant the tests discussed in Paragraphs 3.1 and 3.2 and the visual inspection in Paragraph 3.3. shall be performed.</p>						

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3.1 TOOKE TEST (SCRATCH TEST)

The scratch test shall be performed by using a Mark II Tooke Inspection Gage using a 2X tip.

Each test made with the Tooke gage shall be compared to a reading of the total system obtained using a calibrated Elcometer Inspection DFT gage or equivalent. The reading obtained with the 2X tip of the Tooke gage shall not vary by more than ± 0.5 mils from the reading obtained with the Elcometer Inspection DFT gage. Any Tooke gage reading which is not within ± 0.5 mils of the corresponding DFT gage reading shall be discarded.

Five separate readings shall be taken for each 100 square feet area or less. Dry film thickness shall be as follows:

	<u>Any Single Reading</u>	<u>Average of Five</u>
CZ 11 Primer	1.5 - 5.5	2.0 - 4.5
D 6	1.5 - 5.5	2.0 - 5.0
Total Coating System	7.0 - 11.5	7.0 - 11.0

In the event that any reading(s) is found to be outside of the acceptable primer thickness range, additional readings shall be taken to determine the extent of the unacceptable area. Such additional testing shall be documented in the "Remarks" section of Attachment 1.

NOTE 1: Steel substrates identified in Reference 1-A on which only the primer coat has been applied (no seal or topcoat) shall be inspected for DFT per Reference 1-F. However, these surfaces must still be inspected per Paragraph 3.2.

3.2 ADHESION (PATCH) TEST

The QC inspector shall perform an Adhesion (Patch) Test on each area of 100 square feet or less which is scratch tested per Paragraph 3.1. A calibrated Elcometer 106 Adhesion Tester shall be used to measure the tensile strength of adhesion of the coating system to the steel substrate. Each test shall consist of three individual dollies tested to failure.

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Criteria: The minimum acceptable strength per dolly shall be 200 psi.

For any dolly failing the minimum strength criteria, four additional dollies shall be adhesion tested at approximately one foot from the failing dolly and spaced radially at approximately 90 degree intervals. If any of the additional four dollies should fail the minimum strength criteria, the test results shall be promptly reported to Civil Engineering for evaluation and resolution. Test results on the four additional dollies shall be documented in the "Remarks" section of the IR.

NOTE 2: In the case in which all four of the additional dollies pass the minimum strength criteria, test failures on any of the original three dollies shall still be documented as "unsatisfactory" on the IR.

3.3 VISUAL DEFECTS INSPECTION

In addition to the tests in Para. 3.1 and 3.2 the Inspector shall perform a visual inspection of each area of 100 square feet or less in accordance with the following:

- a) Runs/sags - Runs or sags in which the DFT of the total coating system is 11.5 mils or less thick, which show no evidence of mudcracking, are acceptable. Those greater than 11.5 mils shall be repaired in accordance with Reference 1-C or 1-D.
- b) Skips/damaged areas/gross discontinuities such as holidays, voids, and bubbles are not acceptable.
- c) Pinholes - acceptable to the extent allowed by Attachment 2.
- d) Contamination - Embedded foreign materials unacceptable.

3.4 CONTINUITY INSPECTION

The Inspector shall test the continuity of the coated surface of each 100 square foot area using a Tinker and Rasor Model M1 (67.5 volt) holiday detector. 100% of the finish coated surface area shall be tested.

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The applied film shall contain only a minor number of points of discontinuity. No more than two points of discontinuity should occur within an area having a radius of 6 inches as measured from a point of discontinuity (pinholes). No more than 40% of the total number of allowable points of discontinuity should occur within any one area equal to 25% of the total area being coated. The total number of pinhole discontinuities allowed is defined in Attachment 2. No gross discontinuities are allowed.

NOTE 3: The discontinuity inspection shall not be performed unless all results of the inspections in Paragraphs 3.1 through 3.3 are determined to be satisfactory (i.e., no repairs are required).

3.5 DOCUMENTATION

Results of inspections per Paragraphs 3.1 through 3.4 shall be documented on Inspection Report, Attachment 1, in accordance with Reference 1-8. The completed IR shall be forwarded to the PPRV for retention.

3.5 REPAIRS

Repairs of each coating area either scratch-tested or adhesion tested shall be performed in accordance with Reference 1-C or 1-D and reinspection of repaired coatings shall be in accordance with Reference 1-F.

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ATTACHMENT 1

COMANCHE PEAK STEAM ELECTRIC STATION

INSPECTION REPORT

ITEM DESCRIPTION PROTECTIVE COATINGS		IDENTIFICATION NO.	SYSTEM / STRUCTURE DESIGNATION	
SPEC. NO. AS-31	REV.	REF. I.E. SOC. & REV. & CHANGE NO. QI-QP-11.4-23, Rev.	MEASURE OR TEST EQUIP. IDENT. NO.	
<input type="checkbox"/> IN PROCESS INSPECTION	<input type="checkbox"/> PRE INSTALLATION VERIFICATION	<input type="checkbox"/> INSTALLATION INSPECTION	<input type="checkbox"/> FINAL INSPECTION	<input type="checkbox"/> PRE-TEST INSPECTION
INSPECTION RESULTS				
<input type="checkbox"/> INSPECTION COMPLETED, ALL APPLICABLE ITEMS SATISFACTORY				
<input type="checkbox"/> INSPECTION COMPLETED, UNSATISFACTORY ITEMS LISTED BELOW				
ITEM NO.	INSPECTION ATTRIBUTES		SAT	QC INSPECTOR
	PRIME COAT <input type="checkbox"/>	SEAL OR FINISH COAT <input type="checkbox"/>	DATE	SIGNATURE
1.	Perform Tooke test per Para. 3.1 to determine thickness of primer and total system.			
	RECORD: Minimum Spot Test Primer:			
	Maximum Spot Test Primer:			
	Average Spot Test Primer:			
	Minimum Spot Test Total System:			
	Maximum Spot Test Total System:			
	Average Spot Test Total System:			
2.	Perform Adhesion test per Para. 3.2			
	RECORD: Adhesion Test Strength in psi:			
	Dolly #1: Dolly #2: Dolly #3:			
3.	Visual inspection per Para. 3.3			
	a. Surface free of mudcracks.			
	b. Surface free of defects and visually acceptable.			
4.	Perform continuity inspection per Para. 3.4 (only if all items above are satisfactory.)			
REMARKS (OWNER, SPECS, ETC.)				
RELATED NCR NO.	I.R. CLOSED <input type="checkbox"/>	DATE	SIGNATURE	
			QC INSPECTOR	

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ATTACHMENT 2

TOTAL NUMBER OF ALLOWABLE POINTS OF DISCONTINUITY

<u>SURFACE AREA BEING COATED (SQ. FT.)</u>	<u>COND. "C" COMMERCIALY CONTINUOUS</u>
10	5
10-50	10
50-100	20
100-500	30
500-1000	50
1000-5000	75

Gross Discontinuities - None Allowed.