



एनटीपीसी लिमिटेड

(भारत सरकार का उद्यम)

NTPC Limited

(A Govt. of India Enterprise)

(Formerly National Thermal Power Corporation Ltd.)

केन्द्रीय कार्यालय नोएडा

Corporate Centre NOIDA

Reference: CC:PE104:3613

Date:02-07-14

From:	R.SHARMA AGM	To:	BHEL-Ranipet BHEL-Ranipet
		CC:	- - -
SUBJECT : GSTPP1, ELECTROSTATIC PRECIPITATOR			
Please find enclosed following drawings/documents for necessary action at your end as indicated in purpose code.			
VENDOR DRG NO:	null		
NTPC DRG NO:	9572-104-RPT-PVM-C-026		
REVISION NO:	03		
DRG TITLE:	ESP Painting scheme		
APP CATEGORY:	I		
RELEASE DATE:	02-07-14		
COMMENTS:	Approved with minor observation.		



Engineering Division
ISO 9001:2008 Certified

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**Bharat Heavy Electricals Limited
Boiler Auxiliaries Plant
Ranipet – 632 406**

BHEL DOC NO.	PS : GADA :ESP : R817-R818
REVISION NO.	03
DATE	23.06.2014



NTPC GADARWARA STPP STAGE – 1 (2 X 800 MW)

PAINTING SCHEDULE FOR ESP PACKAGE

NTPC CONTRACT NO: CS-9572-104-2-FC-NOA-6052

NTPC DRG NO: 9572-104-RPT-PVM-C-026

BHEL RANIPET Customer No(s): R817 & R818 (2X800 MW)

Prepared & Reviewed By	Approved By
	
(K. Jothi Arulanandam)	(R. Arunachalam)

SI No	SURFACE LOCATION	PGMA	SURFACE PREPARATION	PRIMER		FINISH		TOTAL DFT IN (µm min.)
				PAINT	DFT (µm min.)	PAINT	DFT (µm min.)	

RECORD OF REVISION

REV NO	DATE	DETAILS OF REVISION
0 0	24.03.2014	Original Issue - First Submission
0 1	02.05.2014	<p>1. NTPC Comment – “ For ESP Pent House Column structure the painting scheme shall be inline with ESP Supporting Structure as indicated in sl.no. 38 to 40 “ - Refer Sl. No.30 (Page 5 of 7) of this PS. BHEL Reply: Pls refer the attached photograph on page no 9 of 9 for the actual location and position of the ESP Pent House Column. This column is generally a single type column having height of approx.. 3 Mtr and is fully covered under the ESP Roof Sheets. Hence, the painting scheme selected for this item with primer coat of 40 µm and finish coat of 40 µm (Total DFT 80 µm) will be sufficient ie., protection up to erection. This is being followed in all the earlier approved NTPC projects. NTPC may pls consider the painting scheme as proposed.</p> <p>2. NTPC Comment - Refer Note – 5, instead of power tool cleaning NTPC wants manual cleaning - Refer Sl. No. 38 to 40 (Page 6 of 7) of this PS - BHEL Reply: Power Tool Cleaning is better than manual cleaning and hence NTPC may pls permit the power tool cleaning for this case as done in the earlier projects of NTPC.</p> <p>3. NTPC Comment – “ Furnish surface preparation inline with technical specification “ - Refer Sl.No. 2 of 1 under the heading “painting of damaged areas” – Refer page 7 of 7. BHEL Reply: Paint damage will happen only on a localized area and hence as per the technical requirement – surface preparation will be done by power tool cleaning up to the depth of bare metal in order to remove the rust part fully. This is being practiced in all other NTPC projects approved earlier for this case.</p> <p>4. NTPC Comment – “ Self Priming “ to be included - Refer Sl.No. 2 of 1 under the heading “painting of damaged areas” – Refer page 7 of 7. BHEL Reply: Noted and incorporated in Rev. 01.</p>
0 2	28.05.2014	<p>1. NTPC Comment: For ESP Pent House structure painting scheme shall be as given for ESP Supporting Structure sl.no. 38 to 40 – refer sl.no.30 of page no. 6 of 9 of Rev.01. BHEL Reply: Noted and incorporated in Rev.02 – Refer sl.no.30 of page no. 6 of 9.</p>
0 3	23.06.2014	NTPC Comment noted on page 7 & 8 of 9 were noted. and incorporated - refer Rev. 03.

SI No	SURFACE LOCATION	PGMA	SURFACE PREPARATION	PRIMER		FINISH		TOTAL DFT IN (µm min.)
				PAINT	DFT (µm min.)	PAINT	DFT (µm min.)	

1. ELECTROSTATIC PRECIPITATOR (ESP OR EP)

1	Insulator Housing Assy	7X - X06	Power Tool Cleaning to st3 (SSPC-SP3)	Heat Resistant Aluminum paint to IS 13183 Gr. II (up to 400° C) (Two Coats)	40	NIL	--	40
2	Gas Distribution Assy	7X - X08	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coast)	50	NIL	--	50
3	GD Rapping Mechanism	7X - X09	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coast)	50	NIL	--	50
4	GD Drive Arrangements	7X - X10	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coast)	40	Synthetic Enamel to IS 2932 Smoke Grey Shade No. 692 of IS 5 (Two Coats)	40	80
5	Gas Screening	7X - X11	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coast)	50	NIL	--	50
6	Emitting System suspension	7X - X13	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coast)	50	NIL	--	50
7	Emitting Electrode –Hook Part	7X - X15	Rust preventive application on Hook part Only (Electrode Wire is Stainless Steel)					
8	Emitting Electrode Rapping Mechanism	7X - X16	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coast)	50	NIL	--	50
9	Drive Arrangement For Emitting System	7X - X17	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coast)	40	Synthetic Enamel to IS 2932 Smoke Grey Shade No. 692 of IS 5 (Two Coats)	40	80
10	Suspension Arrangement For Collecting Electrode	7X - X19	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coast)	50	NIL	--	50
11	Collecting Electrode	7X - X20	Rust Preventive Fluid Application					

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				PAINT	DFT (µm min.)	PAINT	DFT (µm min.)	
12	Lifting Beam for Collecting Electrode	7X - X20	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	40	Synthetic Enamel to IS 2932 Smoke Grey Shade No. 692 of IS 5 (Two Coats)	40	80
13	Frame Of Emitting System- Top	7X - X21	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	50	NIL	--	50
14	Frame Of Emitting SystemBottom	7X - X22	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Prime to IS: 12744 (Two coats)	50	NIL	--	50
15	Inspection /Access Door	7X - X23	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	40	Synthetic Enamel to IS 2932 Smoke Grey Shade No. 692 of IS 5 (Two Coats)	40	80
16	Shock Bars	7X - X24	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coast)	50	NIL	--	50
17	Collecting Electrode (CE) Rapping Mechanism	7X - X25	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	50	NIL	--	50
18	Drive Arrangments for CE Raping	7X - X26	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	40	Synthetic Enamel to IS 2932 Smoke Grey Shade No. 692 of IS 5 (Two Coats)	40	80
19	ESP Roof Beams	7X - X28	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	50	NIL	--	50
20	Frame of Emitting System – Middle	7X - X32	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	50	NIL	--	50
21	Outer Roof –EP	7X - X42	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (two coats)	40	Synthetic Enamel to IS 2932 Smoke Grey Shade No. 692 of IS 5 (Two Coats)	40	80
22	Hopper Ridges	7X - X43	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	50	NIL	--	50

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				PAINT	DFT (µm min.)	PAINT	DFT (µm min.)		
23	Hopper Upper part	Insulated side	7X - X44	Power Tool Cleaning to St3 (SSPC-SP3)	Heat Resistant Aluminum paint to IS 13183 Gr. II (up to 400° C) (Two Coats)	40	NIL	--	40
		Flue Gas Swept Surface			Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	50	NIL	--	50
24	Hopper Middle & Lower part	Insulated side	7X - X45	Power Tool Cleaning to St3 (SSPC-SP3)	Heat Resistant Aluminum paint to IS 13183 Gr. II (up to 400° C) (Two Coats)	40	NIL	--	40
		Flue Gas Swept Surface			Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	50	NIL	--	50
25	Insulator Support Panel	Insulated Side	7X - X46	Power Tool Cleaning to st3 (SSPC-SP3)	Heat Resistant Aluminum paint to IS 13183 Gr. II (up to 400° C) (Two Coats)	40	NIL	--	40
		Flue Gas Swept Surface			Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	50	NIL	--	50
26	Roof Panel Assy	Insulated Side	7X - X47	Power Tool Cleaning to st3 (SSPC-SP3)	Heat Resistant Aluminum paint to is 13183 Gr II (up to 400° C) (Two coats)	40	NIL	--	40
		Flue Gas Swept Surface			Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coast)	50	NIL	--	50
27	Casing Structure		7X - X48	Power Tool Cleaning to st3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	50	NIL	--	50
28	Casing (Shell, Side Panels, Gables & GD Housing)	Insulated Side	7X - X49	Power Tool Cleaning to st3 (SSPC-SP3)	Heat Resistant Aluminum paint to is 13183 Gr II (up to 400° C) (Two coats)	40	NIL	--	40
		Flue Gas Swept Surface			Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	50	NIL	--	50

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					PAINT	DFT (µm min.)	PAINT	DFT (µm min.)	
29	ESP Funnel Assy	Insulated Side	7X - X50	Power Tool Cleaning to st3 (SSPC-SP3)	Heat Resistant Aluminum paint to is 13183 Gr II (up to 400° C) (Two coats)	40	NIL	--	40
		Flue Gas Swept Surface			Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	50	NIL	--	50
30	ESP Pent House – Columns only		7X - X55	Painting Scheme shall be inline with PGMA 7X – X81 (ESP Supporting Structure) – Refer Sl.no. 40.					
31	ESP Pent House – Other items other than sl.no. 30.		7X - X55	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	40	Synthetic Enamel to IS 2932 Smoke Grey Shade No. 692 of IS 5 (Two Coats)	40	80
32	Splitters & Guide Vanes		7X - X57	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	50	NIL	--	50
33	ESP Performance Test Equipment		7X - X61	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	40	Synthetic Enamel to IS 2932 Smoke Grey Shade No. 692 of IS 5 (Two Coats)	40	80
34	Water Washing System		7X - X66	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	40	Synthetic Enamel to IS 2932 Smoke Grey Shade No. 692 of IS 5 (Two Coats)	40	80
35	Foundation Materials for ESP		7X - X80	All Threaded and other surfaces of foundation bolt and its materials shall be coated with temporary rust preventive fluid. During execution of civil works the dried film of coating will be removed using Organic Solvents.					
36	Hand Rail Post, Bend ,ERW Tubes ,Floor Grill and Step Tread		7X - X65 89 - 611 89 - 612 89 - 613	Hot Dip Galvanizing to 610 gm sq. Meter (minimum) and to a coating thickness of 87 µm (minimum)					
37	Commissioning Spares		79 - 988	As per respective item , as listed in the painting schedule					
38	Tools & Tackles		79 - 996	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats)	40	Synthetic Enamel to IS 2932 Smoke Grey Shade No. 692 of IS 5 (Two Coats)	40	80

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39	Approach Platform For Hopper	7X - X65		<p>Primer Coat : Inorganic Ethyl Zinc Silicate primer (solid by volume min. 60%) DFT =75 µm (min.)</p> <p>Intermediate Coat : Polyamide Cured pigmented TI 02 (solid by volume min. 60%) DFT=75 µm (min.)</p> <p>Finish Coat : Epoxy based polyamide cured finish paint (solid by volume min. 60%) DFT=75 µm (min.) + Aliphatic polyurethane paint (solid by volume min. 40%) DFT=25 µm (min.)</p> <p>Note:</p> <ol style="list-style-type: none"> 1. Out of two coats of Epoxy based polyamide cured finish paint –one coat will be done by shop / sub –contracting works to DFT=35 µm (min.) shade no.692 of IS : 5. 2. Second coat of Epoxy based polyamide cured finish paint to DFT 40 µm (min.) followed by one coat of Aliphatic polyurethane paint to DFT = 25 µm (min.) will be done by BHEL site either by spray or brush – Shade Grey-RAL 9002 3. The total paint thickness (Primer (75 µm)+ Intermediate (75 µm) +Finish with polyurethane (75 µm+25 µm) shall be minimum 250µm. 4. DFT of individual paint coat shall be ensured separately and the same shall meet the specified minimum DFT of each coat as given above. 5. Bottom of base plate including below zero level portion marked in EP Supp Columns which will be embedded in concrete, those surfaces shall be prepared by manual cleaning and provided with primer coat of chlorinated rubber based zinc phosphate primer of min. 50 µm DFT
40	Supporting Structure for ESP (Refer note 5 for surface embedded in concrete)	7X - X81	Blast Cleaning to Sa 2.5 Near White metal with surface roughness profile to 35-50 µm	
41	Stair stringer Channels, Bracket, Supp Bracket, Frames Loose Channels , Toe Plates, Stiffener Plates and Angles for EP Galleries ,Stair and Walk Way	7X - X65 89 - 610		

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				PAINT	DFT (µm min.)	PAINT	DFT (µm min.)	

2. PAINTING OF DAMAGED AREAS

Areas where paint has deteriorated badly by erosion and areas where the paint film has lost its adhesion property and where the steel has got rusted appreciably - these areas are to be repainted as per the following procedure:

SL NO	SURFACE LOCATION	SURFACE PREPARATION	PRIMER, INTERMEDIATE & FINISH
1	Paint damaged Components falling under sl.no. 39 to 41 of ESP	Surface preparation by manual cleaning. Minimum 6" of surrounding areas with existing coat to be roughened by wire brush & emery paper for best adhesion by patch primer	1. Primer: One coat of Self priming Epoxy Zinc rich primer to IS:14589 Gr.II to DFT of 100 µm (min.) 2. Intermediate and Finish: As given in respective scheme as above
2.	Intermediate and Finish: As given in respective scheme as above		Primer and Finish : As given in respective scheme

GENERAL NOTES

1. No painting is required for Galvanized , non-ferrous & stainless steel items, except as indicated above.
2. Machined items are to be applied with coat of temporary rust preventive oil
3. PGMAs covered in sub-supplier (ie., Purchased) items viz., support bearing / slide bearing and other sub-delivery components of ESP etc., are not indicated in the above list. However, the Painting Schedule for all items supplied by all sub-suppliers and BOI under the scope of BHEL shall be same as for main equipment covered in this document.
4. In sub-assy, wherever plates / sheets of thickness less than or equal to 5mm and rods are used - Power Tool or Hand Tool Cleaning to SSPC - SP 3 / SP 2 shall be followed.
5. Ground shade/colour of finish paints and identification tag/band for equipments, fans, piping, pipe services, supporting structures and other components shall be followed as per NTPC doc at site.
6. All components covered under different PGMAs are to painted. Incase any component is left out, the same shall deemed to be included under the relevant section.
7. All threaded and other surfaces of foundation bolts and its materials, insulation pins, Anchor channels, Sleeves shall be coated with temporary rust preventive fluid and during execution of civil works; the dried film of coating shall be removed using organic solvents.

SI No	SURFACE LOCATION	PGMA	SURFACE PREPARATION	PRIMER		FINISH		TOTAL DFT IN (µm min.)
				PAINT	DFT (µm min.)	PAINT	DFT (µm min.)	

ESP Inspection door(79-023), Outer Roof (79-042)and Pent House(79-055)

