T E N D E R S P E C I F I C A T I O N

Sl No	Tender Specification Number	Unit Number & Project
1	**BHE/PW/PUR/NBNT-BLR(Vertical Pkg) U-1 & 3 /743**	**BLOCK-I** Unit-1 & 3 of 4X250MW BRBCL Nabhinagar Boiler Vertical Pkg
2	**BHE/PW/PUR/NBNT-BLR(Vertical Pkg) U-2 & 4/744**	**BLOCK-II** Unit-2 & 4 4X250MW BRBCL Nabhinagar Boiler Vertical Pkg

FOR

COLLECTION OF MATERIALS FROM BHEL/CLIENT'S STORES/STORAGE YARD; TRANSPORTATION TO SITE; ERECTION, TESTING & ASSISTANCE FOR COMMISSIONING, TRIAL OPERATION AND HANDING OVER OF BOILER AND ITS AUXILIARIES, AUXILIARY BOILER, AIR PREHEATERS, DUCTS AND DAMPERS, FUEL PIPING, BOILER INTEGRAL PIPING & ASSOCIATED VALVES, ELECTROSTATIC PRECIPITATOR, FANS, POWER CYCLE PIPING, COAL MILLS AND COAL FEEDERS, CHEMICAL DOZING SYSTEM, INSULATION, FINAL PAINTING ETC OF 4x250 MW BRBCL NABINAGAR THERMAL POWER PROJECT GROUPED INTO BLOCK – I (UNIT 1 & 3) AND BLOCK – II (UNIT 2 & 4)

AT

BHARATIYA RAIL BIJLEE COMPANY LIMITED

NABINAGAR THERMAL POWER PROJECT (4x250 MW)

NABINAGAR, DISTT: AURANGABAD, BIHAR

CORRIGENDUM 01: PAINTING SCHEME ISSUED AS A PART OF PART I -TECHNICAL BID SPECIFICATION (REFER CLAUSE 4.6.15)

BOOK NO.:

BHARAT HEAVY ELECTRICALS LIMITED
(A GOVERNMENT OF INDIA UNDERTAKING)
POWER SECTOR : WESTERN REGION
345, KINGSWAY: NAGPUR 440 001

PAINTING SCHEME

SN.	PGMA / Description	Surface Prepn & Surface Profile	Primer coat		Intermediate Coat		Finish coat			Total DFT
			Paint	No. of Coats	Paint	No. of Coats	Paint	No. of Coats	Shade	um (min)
1 PS 1AC1	Drum (Except Internals),Drum Suspention 04-126,146	SSPC-SP3/ Power tool Cleaning	Red Oxide Zinc Phosphate Primer (Alkayd Base)to IS 12744 DFT=30um per coat	2	.....	.....	Synthetic Enamel paint (Long oil Alkyd) to IS 2932 DFT=20um per coat	3	Inter-national-Orange Shade No:592 of IS 5	100
2 PS5	Drum internals 04-136 43-104,105	SSPC-SP1 / or SSPC – SP3 Solvent / Power Tool Cleaning	SSPC-SP1/ or SSPC – SP3 Solvent / Power Tool Cleaning	1	.....	.....	.....	.....	.....	25
3 PS19 C	Buck stays 08 – 001, 003,006,007,111,380,382,400 08 – 501,503,901,907,910 Boiler supporting structures 35 – 111, 112,121,122,130,140,150, 35 – 211,212,213,214,221,222,231,232 35 – 311,312,321,322,331,332,341,342 35 – 351, 352,361,362,381,382,383,390 35 – 441,442,443,451,452,453,511,512	Blast cleaning to SA2 ½ (Near white metal) with surface profile 35-50 µm	Inorganic Ethyl Zinc Silicate Primer DFT=75µm per coat	1	Epoxy Based MIO /TiO2 Pigmented Intermediate Coat DFT=75µm per coat	1	#Epoxy Finish Coat, DFT=35µm per coat + #Ali.Acrylic PU Paint DFT=30µm per coat	2	Grey Shade To RAL 9002	250
# Out of 2 coats of Epoxy based finish paint, one coat of Epoxy finish paint shall be given at shop / subcontracting works and second coat of Epoxy finish and one coat of aliphatic Polyurethane paint shall be applied at site.										
3 PS19 C	35- 513,521,522,523,531,532,533 Galleries, Stair-ways & inter connecting walkways 36 – 110,130,150,311,312,313,314 36 – 315,316,321 to 327, 331 335,341 to 348,351 to 355, 361 to 363, 391to 395,610,620, 621 38- 110,210,299,310,381,410,510,610, 38-611,710 ID system structures 39 – 101,102,141,142,150,300,301 39 – 304,305,306,820 48- 015,115,145,200,205,225,235,385, 435,465,485,495,665	Blast cleaning to SA2 ½ (Near white metal) with surface profile 35-50 µm	Inorganic Ethyl Zinc Silicate Primer DFT=75µm per coat	1	Epoxy Based MIO /TiO2 Pigmented Intermediate Coat DFT=75µm per coat	1	#Epoxy Finish Coat, DFT=35µm per coat + #Ali.Acrylic PU Paint DFT=30µm per coat	2	Grey Shade To RAL 9002	250
# Out of 2 coats of Epoxy based finish paint, one coat of Epoxy finish paint shall be given at shop / subcontracting works and second coat of coat of aliphatic Polyurethane paint shall be applied at site.Epoxy finish and one										

SN.	PGMA / Description	Surface Prepn & Surface Profile	Primer coat		Intermediate Coat		Finish coat			Total DFT
			Paint	No. of Coats	Paint	No. of Coats	Paint	No. of Coats	Shade	um (min)
4 PS9	Components >95° C Insulated/Uninsulated other than components in Column 5 &7 Ring Headers,Down Comers,Hot air Headers outside the gas path etc. 05-137,139,147,158,159,227,229,231,251 18-002,003,010,020 10-135,178,191,195,218,235,278,283,291 10-295,315,687 15-174,177,279 17-807; 19-701,702,903 21-600; 24-300,315,375 42-020,030,070,120,128,150,152,154,157, 42-158 48-032,202,207,212,222,232,372,382,386 48-388,432,438,439,462,468,482 48-486,489,492,494,662, 667	SSPCSP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr.II/DFT 20 µm per coat	2	….	….	…..	….	…	40
5 PS2	Loose tubes, SH, RH & Eco.coils, 11 – 036,038,077,078,095,336,338 11 – 377,378,395,606,608,716,717,718,767, 11-768,769,787,791,916,917,918,967,968 11-969,987,991 12-178,395,495,515,619,803,805,850 12-852,900,903,906,914,917,924,927 12-928,944,948,954,968 16 – 077,079,377,379 19-814,824,884,914,924,984	SSPC – SP2 or SSPC – SP3 Hand tool / Power tool cleaning	Red Oxide Zinc Phosphate Dip coat primer to PR: CHEM: 09 – 03 DFT=35µm per coat	1	….	….	….	…	….	35
6 PS1A1	Components < 95° C Insulated 07-500,601 21-601,987 24-301,325,335,340,350,374,987,989 36-613,740 37-010 39-302; 41-350,390 42-002,005,010,065 43-004,005 45-321,325,326,47-261,263 48-012,022,112,132,142,152 65-736, 67-204,272,276,283,801,802,803	SSPCSP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744 DFT= 30µm per coat	2	….	….	Syn. Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 20µm per coat	2	Smoke Grey Shade No: 692 of IS5	80

SN.	PGMA / Description	Surface Prepn & Surface Profile	Primer coat		Intermediate Coat		Finish coat			Total DFT
			Paint	No. of Coats	Paint	No. of Coats	Paint	No. of Coats	Shade	um (min)
7 PS3	Components >95° C coming in the gas path 06-400,631,633,634,637,641,643 06-644,647,651,653,655,670 07-102,104,106,107,215,216,217, 07-218,223,225,226,231,232 10- 182,183,185 12-993 19-850,851 30-105,211,212,219,220,235 31-010,102,104,105,993 32-010,110,120,310,410,510,710 36-993 48-993	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744 DFT= 30µm per coat	2	….	….	….	….	….	60
8 PS6	Hand rails and posts, ladders / rungs 35 – @ 821,822, @823,851 36 – @820,851,852,853 38 – @820,850 39 – @850 Floor Grills, Step treads 35 – 811,36-811,812,813,814 38 – 810, 39 – 810	a) Hot dip Galvanizing to a coating weight of 610 gm per sq.m (minimum) and to a coating thickness of 87.0 microns (minimum). Refer Notes given below **								
Notes **: The Guard plates and Stringer channels shall be painted as per painting scheme prescribed in Sl..No: 03										
9 PS 10	Cast carbon steel valves (Conventional) Cast alloy steel valves (Conventional) All API valves, QCNRV, SV & SRV Silencers 21-800,825,850 24-320,360,365,380,385; 42-300 Seal Boxes & Doors etc. 09-001,002,003;28-220	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr.I	2	….	….	…	….	….	40
	Forged valves	Phosphating	To a coating weight of 1500 mg per sq.ft.	….	….	….	…	….	….	….
1AS2	Soot Blower components 20-051,054,201,204,511,794,962	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744 DFT= 30µm per coat	2	….	…	Syn. Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 20µm per coat	2	Verdigris Green Shade No. 280 of IS5	80
	HP / LP system	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr.I	2	….	…	…	…	…	40

SN.	PGMA / Description	Surface Prepn & Surface Profile	Primer coat		Intermediate Coat		Finish coat			Total DFT
			Paint	No. of Coats	Paint	No. of Coats	Paint	No. of Coats	Shade	um (min)
10 PS15	For CLH & VLH* PGs 07,08,12,17,19,21,24,47,48 &80 07- 402 to 405, 420,431 17-904,919,929 19-905 to 907	Abrasive blast cleaning to Sa 2 ½ 35- 50 microns	Abrasive blast cleaning to Sa 2 ½ 35- 50 microns	1	Epoxy zinc rich primer To IS 14589 Gr.II %VS=35, (min) DFT=40 microns per coat	...	Aliphatic acrylic Polyurethane paint %VS=40.0 (min) DFT=30.0 microns per coat	1	Phirozi Blue Shade No. 176 of IS5	70
11 PS8A	Components > 95 C, un-insulated Fuel pipes 47-266,267,268,269	SSPC-SP3/ Power Tool Cleaning	SSPC-SP3/ Power Tool Cleaning	2	General purpose Aluminium paint to IS 2339	...	...	...	Alumunum	40
12 PS 1BE	All Columns below '0' level (embedded in concrete) PGs 35,36,38 39	SSPC-SP3/ Power Tool Cleani	SSPC-SP3/ Power Tool Cleani	1	HB Chlorinated Rubber Based Zinc Phosphate primer %VS=40, (min) DFT=50 microns per coat	...	...	...	Grey	50
For components other than CLH & VLH, Painting scheme shall be as given in Sl. No. 6										

NOTES:-

1) Rust Preventive Coating should be given on HSFG Bolt and nut threads.
2) Machined surfaces and all retainers are to be applied with a coating of Temporary Rust Preventive oil.
3) All threaded and other surfaces of foundation bolts and its materials, insulation pins, Anchor channels, Sleeves shall be coated
4) Ground shade/colour of Finish paints & identification tag/Band for equipments, pipings pipe service, boiler supporting structures and other boiler components shall be followed as per NTPC doc. No.QS-01-DIV-W-4 (Rev. 1) which is available with BHEL.
5) PGMAs under Sub-Vendor items are not indicated. For all bought-out and sub-vendors items including PGMAs mentioned above falling under the scope of BHEL the same scheme as for main equipment as covered in this document shall be followed.
6) These Painting Schemes are valid for only Customer No: 0669 & 0670 of NTPC – Rihand STPP.
7) No painting is required for Stainless Steel, non-ferrous & galvanized components.
8) Wherever inside surfaces of components under PGMA 48 – XXX, need protection till erection, two coats of Red-oxide zinc phosphate primer paint to IS12744 to a DFT of 60 microns shall be applied, after power tool cleaning.
9) The Temporary Rust Preventive coating that already been applied on any components, tubes, pipes etc., shall be removed by suitable solvents / heating to 350 –400 °C for an hour before primer paint application –but, in this case, it should be ensured that the minimum surface cleanliness
10) In components, wherever plates / sheets of thickness less than or equal to 5 mm and rods/tubes/drain pipes are used, power tool / hand tool cleaning to SSPC – SP3 / SP2 shall be followed and the painting shall be done as described in Sl.No.6.
11) For all commissioning components-erection materials (xx-993) two coats of Red oxide Zinc Phosphate Primer shall be applied to meet the temporary protection till erection, after power tool cleaning.
12) Touch-up painting of damaged areas shall be carried out as per clause 5.01.04,Part B.Sub section V,Section VI of the NTPC Technical Specification.
13) All components covered under different PGMA's are to be painted In case any component is left out, the same shall be deemed to be included under the relevant section based on paint logic approved.
14) For very small components like clamps etc. scheme no.6 shall be followed.
15) For very small components with weldable primer at edges, the entire component shall be applied with weldable primer.
16) Painting scheme for all temporary structures shall be PS 1AE i.e. 1 coat of Red oxide Zinc Phosphate primer (Alkyd Bse) to IS 12744-DFT-30 µ and 2 coats of Synthetic Enamel paint (Long Oil Alkyd) to IS 2932-DFT-2X20µ Shade Yellow –Shade No. 356 of IS 5- Total DFT 70µ.

Painting Scheme – Details for procurement & application purposes

Sl.No.	Generic nature of paint	Generic nature of paint	No. of pack	Volume solids, % (min)**	DFT in microns (min) per coat	Shade	Shade No. to IS5	Mode of appln.	Over coating interval, Hrs.
1	Inorganic ethyl zinc	8	2	60	75	Grey	…	Spray	16
2	Poly amide cured intermediate coat	6	2	60	100	Grey/ Brown	…	##### Spray	24
3	Epoxy based	10	2	40	40	Smoke	692	Spray	24
4	Aliphatic acrylic polyurethane paint	10	2	40	30	Grey Blue.	RAL 9002 176	Spray	24 24
5	Heat resistant	10	1	..	…	…	…	Brush /	24
6	Red oxide zinc	10	1	..	…	…	…	Brush /	24
7	Red oxide Zinc 03-Sep	10	1	…	…	…	…	Dip	12
8	Long oil alkyd synthetic enamel finish paint to IS2932	10	1	…	…	Reqd. shade	Corrpdg. Shade no.	Brush / Spray	12
9	Temporary Rust	10	1	…	…	…	…	…	12
10	Epoxy Zinc rich	8	2	35	40	Grey	…	Spray	24
11	General purpose	10	2	…	20	Aluminum	…	Brush	12
12	HB Chlorinated	8	1	40	50	Grey	…	Brush /	12
## Brush painting is accepted, if recommended by the Paint suppliers. The covering capacity of paints specified is only									
** Values are indicative									

Painting of Damaged Areas

(Areas where the paint has deteriorated badly by erosion and areas where the paint film has lost its adhesion and where the steel

Sl.No.	Components	Surface Preparation	Primer coat		Intermediate coat		Finish coat			Total DFT µm Paint No.
			Paint	No. of (min) coats	Paint	No. of coats	Paint	No. of coats	Shade	
1	Paint damaged components fall under Sl.no: 3	Power tool cleaning to bare metal	Epoxy zinc rich primer to IS14589 Grade II to a DFT of 40 mic/ coat T.DFT 100mic	2	As given in scheme	1	As given in scheme	3	As given in scheme	250
2	Paint damaged components fall under Sl.no: 10	Power tool cleaning to bare metal	One coat of Epoxy zinc rich primer to IS14589 Grade II to a DFT of 40	1	…	…	As given in scheme	1	As given in scheme	70
3	Paint damaged components fall under Sl.no:	Power tool cleaning to bare metal	As given in scheme	As given in scheme	…	….	As given in scheme	As given scheme	As given scheme	As given in scheme

- NOTE: The above painting scheme is only tentative and for information purpose only.