भारत हेवी इलेक्ट्रिकल्स लिमिटेड
(भारत सरकार का उपक्रम)
BHARAT HEAVY ELECTRICALS LIMITED
(A Govt. of India Undertaking)

TCN - 01

Ref: PSER:SCT:MUZ-B1206:TCN-01 Date: 25-05-2011

| | | |
|---|---|---|
| Sub | Tender change notice (TCN) 01. | |
| Job | (i) PACKAGE-A: Erection, testing, commissioning, trial run, handing over etc of boiler, rotating machines & duct, ESP, critical piping, misc piping, boiler integral piping, insulation & final painting etc of u # 1 for 2x195 MW units for KBUNL, Muzaffarpur Project, Bihar and (ii) PACKAGE-B: Erection, testing, commissioning, trial run, handing over etc of boiler, rotating machines & duct, ESP, critical piping, misc piping, boiler integral piping, insulation & final painting etc of u # 2 for 2x195 MW units for KBUNL, Muzaffarpur Project, Bihar. | |
| Ref | 1.0 | Tender no PSER:SCT:MUZ-B1206:11 |
| | 2.0 | BHEL's NIT, vide reference no PSER:SCT:MUZ-B1206:2407, dated 13-05-2011. |
| | 3.0 | All other pertinent issues till date. |

With reference to above, following points, relevant to tender, may please be noted and complied with while submitting offer.

1.0 Painting Schedule, no 0350-180-01RN-PVM-H-018,REV01 for tender purpose.
2.0 Painting Schedule, no 0350-180-01HY-PVM-H-007,REV00 for tender purpose.
3.0 Revised `No deviation certificate' as per enclosed Annexure-2. Bidder to submit `No deviation certificate' as per attached format only.
4.0 All other terms & conditions shall remain unchanged.

Thanking you,

Yours faithfully,
for BHARAT HEAVY ELECTRICALS LTD

Engineer (SCT)

Encl
As above.

पावर सेक्टर पूर्वी क्षेत्र (मुख्यालय)
POWER SECTOR EASTERN REGION, DJ-9/1, SECTOR-II, SALT LAKE CITY, KOLKATA - 700 091
फैक्स/Fax : (033) 23211960 फोन/Phone : बोर्ड/EPABX : 23211691/ 23211798/ 23211795

| RANIPET | **Bharat Heavy Electrical Limited**<br>Boiler Auxiliaries Plant - RANIPET - 632 406 | BHEL Doc Ref | **PR: QA: 814** |
|---|---|---|---|
| | | Rev.No. | **02** |
| | | Date: | **21 10 2010** |

**NTPC DOC. NO 0350-108-01RN-PVM-H-018 REV 01**

# MUZAFFARPUR THERMAL POWER PROJECT, STAGE- II, 2 X 195 MW

## Painting schedule for APH, ESP FAN and Gates & Damper (Main plant Package),

## CONTRACT NO: CS- 0350 -108 -2-LOI-001 DT 12 03 2010 (BHEL RPT WO NO R212, R213)

| Prepared By | Reviewed By | Approved BY |
|---|---|---|
| | | |
| **Issued & Controlled by: Quality Assurance** | | |

| | | | |
|---|---|---|---|
| RECORD OF REVISIONS | REV 00 | Original Issue | DT 18 09 2010 |
| | Rev 01 | Revised based on NTPC comments DTD 01 10 2010 | DT 04 10 2010 |
| | Rev 02 | Revised based on NTPC Tele - conversation on 21 10 2010 | DT 21 10 2010 |

| Sl No | Surface Location | PGMA | Surface Preparation | Primer | | Finish | | Total DFT in (μ m) Min. |
|---|---|---|---|---|---|---|---|---|
| | | | | Paint | DFT (μm) min. | Paint | DFT (μm) min. | |

**I - Air Pre Heater (APH)**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 01 | Module assembly, | | 52 010 | Power Tool Cleaning to St3 (SSPC-SP3) | Red Oxide Zinc Phosphate Primer to IS: 12744(Two coats) | 50 | -- | -- | 50 |
| 02 | Heating Element with baskets | | 52 010 | -Do- | Temporary Rust preventive Oil application (Wet)<br>**Note:** Heating elements are assembled in module assy after dipping in the rust preventive fluid | | | | |
| 03 | Rotor Post assembly | | 52 011 | -Do- | Red Oxide Zinc Phosphate Primer to IS: 12744(Two coats) | 50 | -- | -- | 50 |
| 04 | Pin rack assembly | | 52 012 | --- | Temp rust preventive | 20 | -- | --- | 20 |
| 05 | Radial seals | T Bars | 52 013 | Power Tool Cleaning to St3 (SSPC-SP3) | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| | | Seals | | | Temporary rust preventive oil | 20 | -- | - | 20 |
| 06 | Rotor Housing assembly | Insulated side | 52 030 | Do | Heat Resistant Aluminum Paint Gr 2 to IS 13183(Two coats) | 40 | -- | - | 40 |
| | | Flue gas swept surface | | | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| 07 | Hot and Cold End Connecting Plate assembly | Insulated side | 52 041<br>52 042 | Do | Heat Resistant Aluminum Paint Gr 2 to IS 13183(Two Coats) | 40 | -- | - | 40 |
| | | Flue gas swept surface | | | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| 08 | Axial seals | | 52 054 | -Do- | Temp. Rust Preventive Oil | 20 | -- | -- | 20 |

| Sl No | Surface Location | PGMA | Surface Preparation | Primer | | Finish | | Total DFT in (μ m) Min. |
|---|---|---|---|---|---|---|---|---|
| | | | | Paint | DFT (μm) min. | Paint | DFT (μm) min. | |
| 09 | Bypass seals | 52 055 | Power Tool Cleaning to St3 (SSPC-SP3) | Temp. Rust Preventive Oil | 20 | -- | -- | 20 |
| 10 | Rotor Drive assembly with bracket, Air Motor, Gear Box | 52 100 | -DO- | Red Oxide Zinc Phosphate Primer to IS: 12744(Two Coats) | 40 | Synthetic Enamel to IS 2932 Grey shade 692 of IS 5 (Three Coats) | 60 | 100 |
| 11 | Access door | 52 220 | -DO- | Heat Resistant Aluminum Paint Gr 2 to IS 13183 (TWO COATS) | 40 | -- | -- | 40 |
| 12 | Air seal piping | 52 211 | -DO- | Red Oxide Zinc Phosphate Primer to IS: 12744(Two Coats) | 40 | Synthetic Enamel to IS 2932 Grey shade 692 of IS 5 (Three Coats) | 60 | 100 |
| 13 | Observation port with light | 52 212 | No painting, as the same is made of Glass | | | | | |
| | Other than glass part | -do- | Power Tool Cleaning to St3(SSPC-SP3 | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| 14 | Rotor Stoppage alarm | 52 220 | Made of Aluminium (No painting is required) | | | | | |
| | Other than aluminium | | Power Tool Cleaning to St3 (SSPC-SP3) | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| 15 | Air receiver | 52220 | -DO- | -DO- | 40 | Synthetic Enamel to IS 2932 Grey shade 692 of IS 5 (Three Coats) | 60 | 100 |
| 16 | Lifting beams, special tools, tools & tackles | 52 220<br>52 000<br>52 001 | -DO- | -Do- | 40 | -Do- | 60 | 100 |
| 17 | Guide Bearing Assembly | 52 261 | -DO- | Red Oxide Zinc Phosphate Primer to IS: 12744(Two Coats) | 40 | Synthetic Enamel to IS 2932 Grey shade 692 of IS 5 (Three Coats) | 60 | 100 |

| Sl No | Surface Location | PGMA | Surface Preparation | Primer | | Finish | | Total DFT in (μ m) Min. |
|---|---|---|---|---|---|---|---|---|
| | | | | Paint | DFT (μm) min. | Paint | DFT (μm) min. | |
| 18 | Supporting Bearing assembly | 52 262 | Power Tool Cleaning to St3 (SSPC-SP3) | Red Oxide Zinc Phosphate Primer to IS: 12744(Two Coats) | 40 | Synthetic Enamel to IS 2932 Grey shade 692 of IS 5 (Three Coats) | 60 | 100 |
| 19 | Oil piping Hot end | 52 271 | -DO- | -DO- | 40 | -DO- | 60 | 100 |
| 20 | Oil piping cold end | 52 272 | -DO- | -DO- | 40 | -DO- | 60 | 100 |
| 21 | Oil Circulating Units | 52 274 | -DO- | -DO- | 40 | -DO- | 60 | 100 |
| 22 | Washing manifold & deluge assy and items | 52 301<br>52 302 | -DO- | -DO- | 40 | -DO- | 60 | 100 |
| 23 | Cleaning Device assemblies<br>Tube with nozzle | 52 326 | -DO- | -DO- | 40 | -DO- | 60 | 100 |
| 24 | Cleaning device drive | 52 329 | -DO- | -DO- | 40 | -DO- | 60 | 100 |
| 25 | TC Pipe Assy. (Stainless Steel) | 52 220 | No painting | | | | | |
| | TC Pipe Assy. (Non Stainless Steel part) | 52 220 | Power Tool Cleaning to St3 (SSPC-SP3) | Red Oxide Zinc Phosphate Primer to IS: 12744(Two coats) | 40 | Synthetic Enamel to IS 2932 Grey shade 692 of IS 5 (Three Coats) | 60 | 100 |
| 26 | Commissioning Spares | 52 988 | As per respective items as above. | | | | | |

| Sl No | Surface Location | PGMA | Surface Preparation | Primer | | Finish | | Total DFT in (μ m) Min. |
|---|---|---|---|---|---|---|---|---|
| | | | | Paint | DFT (μm) min. | Paint | DFT (μm) min. | |

**II – FANS**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 01 | Foundation Matl | | 55 011<br>55 031<br>56 021 | Power Tool Cleaning to St3 (SSPC-SP3) | Temporary Rust preventive | 20 | -- | ---- | 20 |
| 02 | FD FAN<br>Static Parts: Insulated | | 55 214 | Do | Red Oxide Zinc Phosphate Primer to IS: 12744(Two coats) | 40 | Synthetic Enamel to IS 2932 Grey shade 692 of IS 5 (Three Coats) | 60 | 100 |
| | Static Parts: Un Insulated & Rotating parts | | | Do | -DO- | 40 | DO | 60 | 100 |
| 03 | PA FAN<br>Static Parts: Insulated | | 55 334 | Do | -DO- | 40 | DO | 60 | 100 |
| | Static Parts: Un Insulated & Rotating parts | | | Do | -DO- | 40 | DO | 60 | 100 |
| 04 | Coupling & Coupling guards for FD & PA fans | | 55 810<br>55 830 | Do | -DO- | 40 | DO | 60 | 100 |
| | Coupling guard for ID fan | | 56 820 | | | | | | |
| 05 | Tools | | 56 000 | -DO- | -DO- | 40 | -DO- | 60 | 100 |
| 06 | ID FAN (Comprising of static parts and rotary parts) | Insulated and Un insulated | 56 229 | Power Tool Cleaning to St3 (SSPC-SP3) | Heat Resistant Aluminum Paint Gr 2 to IS 13183(Two Coats) | 40 | - | - | 40 |
| | | Flue gas Swept surfaces | | | Red Oxide Zinc Phosphate Primer to IS: 12744(Two coats) | 50 | -- | -- | 50 |

| Sl No | Surface Location | PGMA | Surface Preparation | Primer | | Finish | | Total DFT in (μ m) Min. |
|---|---|---|---|---|---|---|---|---|
| | | | | Paint | DFT (μm) min. | Paint | DFT (μm) min. | |
| 07 | Lub Oil System | 55 911<br>55 931<br>56 920 | Power Tool Cleaning to St3 (SSPC-SP3) | Red Oxide Zinc Phosphate Primer to IS: 12744(Two coats) | 40 | Synthetic Enamel to IS 2932 Grey shade 692 of IS 5 (Three Coats) | 60 | 100 |
| 08 | Silencer for FD & PA FAN | 55 911<br>55 931 | -Do- | -Do- | 40 | DO- | 60 | 100 |
| 09 | Seal Air Fan | 56 171 | -Do- | -Do- | 40 | -DO- | 60 | 100 |
| 10 | Base Frame for actuators of FD and PA fans | 55 214<br>55 334 | -Do- | -Do- | 40 | -Do- | 60 | 100 |
| 11 | Commissioning Spares Mandatory spares | 56 988 | As per respective items as above | | | | | |

**IV - Electrostatic Precipitator (ESP)**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 01 | Insulator Housing assy | 79-806 | Power Tool Cleaning to St3 (SSPC-SP3) | Heat Resistant Aluminum Paint Gr 2 to IS 13183 (Two coats) | 40 | -- | -- | 40 |
| 02 | Gas distribution assy | 79-808 | -DO- | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| 03 | GD rapping mechanism | 79-809 | -DO- | -DO- | 50 | -- | -- | 50 |
| 04 | GD drive arrangements | 79-810 | -DO- | Red Oxide Zinc Phosphate Primer to IS: 12744(Two coats) | 40 | Synthetic Enamel to IS 2932 Grey shade 692 of IS 5 (Three Coats) | 60 | 100 |
| 05 | Gas screening | 79-811 | -DO- | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| 06 | Emitting system suspension | 79-813 | Power Tool Cleaning to St3 (SSPC-SP3) | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |

| Sl No | Surface Location | PGMA | Surface Preparation | Primer | | Finish | | Total DFT in (μ m) Min. |
|---|---|---|---|---|---|---|---|---|
| | | | | Paint | DFT (μm) min. | Paint | DFT (μm) min. | |
| 07 | Emitting Electrode rapping | 79-816 | -DO- | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| 08 | Drive arrangement for emitting system | 79-817 | -DO- | Red Oxide Zinc Phosphate Primer to IS: 12744(Two coats) | 40 | Synthetic Enamel to IS 2932 Grey shade 692 of IS 5 (Three Coats) | 60 | 100 |
| 09 | Suspension arrangement for collecting electrode | 79-819 | -DO- | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| 10 | Frame of emitting system – Top | 79-821 | -DO- | -DO- | 50 | -- | -- | 50 |
| 11 | Frame of emitting system – Bottom | 79-822 | Power Tool Cleaning to St3 (SSPC-SP3) | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| 12 | Inspection doors | 79-823 | Power Tool Cleaning to St3 (SSPC-SP3) | Red Oxide Zinc Phosphate Primer to IS: 12744(Two coats) | 40 | Synthetic Enamel to IS 2932 Grey shade 692 of IS 5 (Three Coats) | 60 | 100 |
| 13 | Shock bars | 79-824 | -DO- | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| 14 | CE rapping mechanism | 79-825 | -DO- | -DO | 50 | -- | -- | 50 |
| 15 | Drive arrangements for CE rapping | 79-826 | -DO- | Red Oxide Zinc Phosphate Primer to IS: 12744(Two coats) | 40 | Synthetic Enamel to IS 2932 Grey shade 692 of IS 5 (Three Coats) | 60 | 100 |
| 16 | Frame of emitting system – Middle | 79-832 | -DO- | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| 17 | Outer roof | 79-842 | Power Tool Cleaning to St3 (SSPC-SP3) | Red Oxide Zinc Phosphate Primer to IS: 12744(Two coats) | 40 | Synthetic Enamel to IS 2932 Grey shade 692 of IS 5 (Three Coats) | 60 | 100 |
| 18 | Ridges | 79-843 | -DO- | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |

| Sl No | Surface Location | | PGMA | Surface Preparation | Primer | | Finish | | Total DFT in (μ m) Min. |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Paint | DFT (μm) min. | Paint | DFT (μm) min. | |
| 19 | Hopper Upper part | Insulated Side | 79-844 | -DO- | Heat Resistant Aluminum Paint Gr 2 to IS 13183(Two coats) | 40 | - | - | 40 |
| | | Flue gas Swept surfaces | | -DO- | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| 20 | Hopper Lower & Middle part | Insulated side | 79-845 | Power Tool Cleaning to St3 (SSPC-SP3) | Heat Resistant Aluminum Paint Gr 2 to IS 13183(Two coats) | 40 | - | - | 40 |
| | | Flue gas Swept surfaces | | -DO- | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| 21 | Insulator Support Panel | Insulated side | 79-846 | Power Tool Cleaning to St3 (SSPC-SP3) | Heat Resistant Aluminum Paint Gr 2 to IS 13183(Two coats) | 40 | - | - | 40 |
| | | Flue gas Swept surfaces | | | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| 22 | Roof panel assy | Insulated side | 79-847 | -DO- | Heat Resistant Aluminum Paint Gr 2 to IS 13183(Two coats) | 40 | -- | - | 40 |
| | | Flue gas Swept surfaces | | -DO- | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| 23 | Casing Structure | | 79-848 79-828 | Power Tool Cleaning to St3 (SSPC-SP3) | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| 24 | Casing (Shell, side panels, | Insulated side | 79 849 | -DO- | Heat Resistant Aluminum Paint Gr 2 to IS 13183 (Two coats) | 40 | - | - | 40 |

| Sl No | Surface Location | | PGMA | Surface Preparation | Primer | | Finish | | Total DFT in (μ m) Min. |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Paint | DFT (μm) min. | Paint | DFT (μm) min. | |
| | Gables & GD housing) | Flue gas Swept surfaces | 78 849 | Power Tool Cleaning to St3 (SSPC-SP3) | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| 25 | ESP Funnels | Insulated side | 79-850 | -DO- | Heat Resistant Aluminum Paint Gr 2 to IS 13183 (Two coats) | 40 | - | - | 40 |
| | | Flue gas Swept surfaces | | -DO- | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| 26 | ESP Pent house | | 79-855 | Power Tool Cleaning to St3 (SSPC-SP3) | Red Oxide Zinc Phosphate Primer to IS: 12744(Two coats) | 40 | Synthetic Enamel to IS 2932 Grey shade 692 of IS 5 (Three Coats) | 60 | 100 |
| 27 | Splitters & Guide Vanes | | 79-857 | Power Tool Cleaning to St3 (SSPC-SP3) | Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) | 50 | -- | -- | 50 |
| 28 | ESP test equipment | | 79-861 | -DO- | Red Oxide Zinc Phosphate Primer to IS: 12744(Two coats) | 40 | Synthetic Enamel to IS 2932 Grey shade 692 of IS 5 (Three Coats) | 60 | 100 |
| 29 | Water Washing system | | 79-866 | -DO- | -DO- | 40 | -DO- | 60 | 100 |
| 30 | Tools & Tackles | | 79-996 | -DO- | -DO- | 40 | -DO- | 60 | 100 |
| 31 | Commissioning Spares Mandatory spares | | 79-988 | As per respective items as above | | | | | |
| 32 | Foundation Materials for ESP and Shims of X81 column | | 79-880 | All threaded and other surfaces of foundation bolt and its materials shall be coated with temporary rust preventive fluid and during execution of civil works, the dried film of coating will be removed using organic solvents. | | | | | |
| 33 | Handrails, Posts Step treads, Floor ~~grills,~~ grating | | 89-610, 89-611 79-165 | Hot dip Galvanizing to 610gm per Sq.M (Minimum) and to a coating thickness of 85 microns, after surface cleaning of grating by acid pickling as per relevant Indian Standards. | | | | | |
| 34 | Collecting electrode | | 79-820 | Rust Preventive application | | | | | |

| Sl No | Surface Location | PGMA | Surface Preparation | Primer | | Finish | | Total DFT in (μ m) Min. |
|---|---|---|---|---|---|---|---|---|
| | | | | Paint | DFT (μm) min. | Paint | DFT (μm) min. | |
| | Lifting beam | 79-820 | Power tool cleaning to St3 | Red Oxide Zinc Phosphate Primer to IS: 12744(Two Coats) | 40 | Synthetic Enamel to IS 2932 Grey shade 692 of IS 5 (Three Coats) | 60 | 100 |
| 35 | Emitting Electrode | 79-815 | Rust preventive application on Hook (Electrode Wire is Stainless Steel) | | | | | |
| 36<br>37<br>38 | Supporting structure for ESP (#)<br>Hopper approach platform (For items other than mentioned in s.no.33)<br>Stringer for stairs case and guard plates, frames/Brackets for galleries, walkways & Staircases | 79-881<br>79-165<br>89-610 | Blast Cleaning to Sa 2 ½ (Near white metal with Surface profile 35 – 50 μm) | **Primer:** Self curing Inorganic Zinc Silicate primer (Solid by Volume min 60%).DFT = 75μm minimum<br>**Intermediate coat**: Polyamide cured Epoxy based pigmented TiO2 paint (volume solids min 60%). DFT = 75 μm minimum<br>**Finish Coat:** Epoxy based polyamide cured finish paint (Solids by volume min 60%) DFT = 75 μm minimum + Aliphatic Polyurethane paint (Solids by volume min 40%) DFT= 25 μm.<br>**Note:**<br>a) Out of two coats of Epoxy polyamide cured finish paint, one coat to be applied at shop/subcontracting works to DFT- 35 microns minimum (Shade 692 of IS 5). And Second coat of epoxy finish paint to DFT 40 Microns followed by one coat of polyurethane paint to DFT 25 Microns shall be applied at site either by spray or brush.(Shade GREY- RAL 9002)<br>b) The total paint thickness (Primer + Intermediate + Finish with polyurethane) shall be minimum 250microns<br>c) Thickness of individual coat shall be ensured separately and the same shall meet the specified minimum thickness of each coat as given above. | | | | |

(#) For portion of steel surfaces embedded in concrete, the surface shall be prepared by power tool cleaning to ST3 and provided with primer coat of chlorinated rubber based zinc phosphate primer of Min. 50 micron DFT.

| Sl No | Surface Location | PGMA | Surface Preparation | Primer | | Finish | | Total DFT in (μ m) Min. |
|---|---|---|---|---|---|---|---|---|
| | | | | Paint | DFT (μm) min. | Paint | DFT (μm) min. | |

**V Gates and dampers.**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 01 | Gates and Dampers | Temperature > 95 º C | 57 XXX | Power Tool Cleaning to St3 (SSPC-SP3) | Heat Resistant Aluminum Paint Gr 2 to IS 13183 (Two coats) | 40 | -- | - | 40 |
| 02 | Gates and Dampers | Temperature ≤ 95 º C | 57 XXX | Power Tool Cleaning to St3 (SSPC-SP3) | Red Oxide Zinc Phosphate Primer to IS: 12744(Two Coats) | 40 | Synthetic Enamel to IS 2932 Grey shade 692 of IS 5 (Three Coats) | 60 | 100 |
| 03 | Platform (Item other than in SL. No 04 | -- | 57 466 | Power Tool Cleaning to St3 (SSPC-SP3) | Red Oxide Zinc Phosphate Primer to IS: 12744(Two Coats) | 40 | Synthetic Enamel to IS 2932 Black shade (Three Coats) | 60 | 100 |
| 04 | Hand rails, Posts, Floor ~~grills~~, grating | -- | 57 466 | Hot dip Galvanizing to 610 gm per Sq.M (Minimum) and to a coating thickness of 85 microns, after surface cleaning of grating by acid pickling as per relevant Indian Standards. | | | | | |

**General Notes:**

1) No painting is required for Galvanized items, non-ferrous items.& stainless steel items , except as indicated above.
2) Machined items are to be applied with one coat of temporary rust preventive oil.
3) PGMAs under sub-vendor items viz SCAPH, Pent house ventilation fan & its coupling, seal air fan coupling, Fan coupling support, bearing and sub delivery components of ESP, etc are not indicated. However the Painting scheme for all items supplied by all vendors and BOI including SCAPH, Pent house ventilation fan & its coupling, seal air fan coupling, Aux.fan coupling support bearing etc.under the scope of BHEL shall be same as for main equipment covered in this document.
4) In components, wherever plates /sheets of thickness less than or equal to 5 mm and rods are used, power tool or hand tool cleaning to SSPC-SP3/SP2 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 be painted. Incase any component is left out, the same shall be deemed to be included under the relevant section

| Sl No | Surface Location | PGMA | Surface Preparation | Primer | | Finish | | Total DFT in (μ m) Min. |
|---|---|---|---|---|---|---|---|---|
| | | | | Paint | DFT (μm) min. | Paint | DFT (μm) min. | |

**PAINTING OF DAMAGED AREAS**

(Areas where paint has deteriorated badly by erosion and areas where the paint film has lost its adhesion and where the steel has rusted appreciably, should be repainted as per following)

| | | |
|---|---|---|
| Paint damaged components falling under sl.No.36 to 38 of ESP | **Surface Preparation**: Power tool cleaning to bare metal to minimum 6 inches adjoining area with existing coating | Application of One coat of self priming Epoxy touch up primer of 100 microns immediately after surface preparation as per specification , followed by intermediate coat, finish coat & final finish coat in line with technical specification |
| Paint damaged components falling under other serial Nos. | **Surface Preparation**: Power tool cleaning to bare metal | Primer, and Finish: As given in respective scheme |

| Sl No | Surface Location | PGMA | Surface Preparation | Primer | | Finish | | Total DFT in (μ m) Min. |
|---|---|---|---|---|---|---|---|---|
| | | | | Paint | DFT (μm) min. | Paint | DFT (μm) min. | |

PAGE 13 IS NOT PART OF PAINTING SCHEDULE, IT CONTAINS CLARIFICATIONS GIVEN BY BHEL. HENCE THIS SHALL BE READ AS A SEPARATE DOCUMENT.

**Quality Assurance**

BAP QA MECH 10
DTD 21 10 2010

Sir,

Sub: Revised painting schedule (PRQA 814 Rev 01) for MUZAFFARPUR TPS, 2x195 MW Reg.
Ref: NTPC DOC No 0350-108-01RN-PVM-H-018 REV 00 Cat II approval DTD 01 10 2010

Based on the NTPC comments on painting schedule meant for APH ESP ,FAN and GD for the above project, we have revised the painting schedule (PRQA 814 /Rev 01) incorporating the NTPC comments except the following . Our clarification /justification are as below

| SL No | NTPC comments | BHEL clarification/Justification |
|---|---|---|
| 01 | Page No 9 of 12 SL No 33.<br>Page No 11 of 12 SL No 04<br>• Gratings to be blast cleaned to Sa 2+ 2 ½ finish of Swedish standard SIS - 05-5900 before hot dip galvanizing. | As requested by BHEL, surface cleaning of grating by acid pickling as per relevant Indian standard is technically acceptable .This shall be followed by hot dip galvanization at the rate of 610 gm/Sq.m |
| 02 | Page No 11 of 12 Gates and Damper<br>• Include painting details for flue gas swept surfaces under this section as covered in SIMHADRI –II | Painting schedule for Gates and Damper is corrected as "less than and more than 95 Deg. Centigrade" in all recent work orders after SIMHADRI II (MAUDA 2x500 mw , VINDHYACHAL 2x500 MW , RIHAND 2x500 Mw, NTECL VALLUR 3X500 MW and the same was accepted approved by NTPC /NOIDA based on the feed back from NTPC RIO RANIPET and also to avoid different paint application in one gate / Damper . |
| 03 | Page No. 12 of 13<br>• Primer DFT 100 microns for damaged components falling under SL No 36 to 38 of ESP | Accepted .Accordingly corrected to 100 microns |

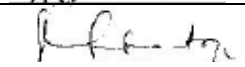
(V SUNDARAM)
QUALITY ASSURANCE

**BHARAT HEAVY ELECTRICALS LIMITED**
**RAMACHANDRAPURAM::HYDERABAD-32**

**PULVERISERS ENGINEERING**

**MUZAFFARPUR THERMAL POWER PROJECT**
**STAGE-II (2X195 MW)**

# PAINTING SCHEDULE FOR BOWL MILLS

| | | | |
|---|---|---|---|
| PREPARED BY | RAJESH RANJAN |  | DOCUMENT NO:BA/PS/NTPC/MUZAFFARPUR/00<br>REV. NO: 00 , DATED 25.11.2010<br>SHEET : 01 OF 08<br><br>**NTPC Drg No. 0350-108-01HY-PVM-H-007** |
| REVIEWED BY | AMAN SURIN |  | |
| APPROVED BY | SATISH GHATGE |  | |

# PAINTING SCHEME FOR XRP 883 BOWL MILL- MUZAFFARPUR TPP 2x195 MW

| SL. NO | SURFACE LOCATION & PGMAs | SURFACE PREPARATION | PRIMER | | INTERMEDIATE | | FINISH COAT | | | TOTAL DFT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | PAINT (mat.code) | NO.OF COATS | PAINT (mat.code) | No. OF COATS | PAINT (mat.code) | NO.OF COATS | SHADE | µm min. |
| 01 | Journal Assembly 61-088<br>a) Oil swept inside unmachined surfaces | Kerosene Cleaning | - | - | - | - | White crank case sealer (HY5530078052) or Oil resistant Synthetic Enamel (AA5610032563) | 2 | - | 50 |
| | b) Outer Surfaces | Abrasive blast clean to Sa2½ (IS0:8501-1:) | Alkyd Zinc Phosphate<br>IS:12744 | 4 to a DFT of 100 µ | - | - | | - | - | 100 |

# PAINTING SCHEME FOR XRP 883 BOWL MILL-MUZAFFARPUR TPP 2X195 MW

| SL. NO | SURFACE LOCATION & PGMAs | SURFACE PREPARATION | PRIMER | | INTERMEDIATE | | FINISH COAT | | | TOTAL DFT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | PAINT (mat.code) | NO.OF COATS | PAINT (mat.code) | No. OF COATS | PAINT (mat.code) | NO.OF COATS | SHADE | µm min. |
| 02 | Mill Drive and Bowl Assembly (Including Planetary Gearbox and its Lubrication system)<br>61-188<br>a) Inside surfaces | Abrasive blast clean to Sa2½ (ISO:8501-1) | | | - | - | Amine Adduct Cured Epoxy Paint (HY561000 5949) | 2 | WHITE | 50 |
| | b)Outer Surfaces | Abrasive blast clean to Sa2½ (ISO:8501-1) | Alkyd Zinc Phosphate Primer<br>IS:12744 | 2 to a DFT of 40 µ | | | Synthetic Enamel Colour (HY561002 6997) | 3* | Grey RAL 9002 | 100 |

*** Out of 3 Finish coats, 2 are to be done in shop/Subcontract to a DFT of 40 µ and 3rd coat of 20 µ to be done at site. With this 80µ (40µ primer +40µ finish paint ) DFT is to be done at shop and 20µ at site. Thus a total of 100µ DFT is achieved.**

## PAINTING SCHEME FOR XRP 883 BOWL MILL-MUZAFFARPUR TPP 2X195 MW

| SL. NO | SURFACE LOCATION & PGMAs | SURFACE PREPARATION | PRIMER | | INTERMEDIATE | | FINISH COAT | | | TOTAL DFT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | PAINT (mat.code) | NO.OF COATS | PAINT (mat.code) | No. OF COATS | PAINT (mat.code) | NO.OF COATS | SHADE | µm min. |
| 03 | Mill Side and Liner Assembly 61-200 | | | | | | | | | |
| | a) Inside surfaces | Abrasive blast clean to Sa2½ (ISO:8501-1) | Alkyd Zinc Phosphate Primer IS:12744 | 2 | - | - | | - | - | 40 |
| | b) Outer Surfaces | Abrasive blast clean to Sa2½ (ISO:8501-1) | Alkyd Zinc Phosphate Primer IS:12744 | 2 to a DFT of 40µ | - | - | Synthetic Enamel Colour (HY/561002 6997) | 3* | Grey RAL 9002 | 100 |

## PAINTING SCHEME FOR XRP 883 BOWL MILL-MUZAFFARPUR TPP 2X195 MW

| SL. NO | SURFACE LOCATION & PGMAs | SURFACE PREPARATION | PRIMER | | INTERMEDIATE | | FINISH COAT | | | TOTAL DFT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | PAINT (mat.code) | NO.OF COATS | PAINT (mat.code) | No. OF COATS | PAINT (mat.code) | NO.OF COATS | SHADE | µm min. |
| 04 | Separator Assembly 61-300 | | | | | | | | | |
| | a) Inside surfaces | Abrasive blast clean to Sa2½ (ISO:8501-1) | Alkyd Zinc Phosphate Primer IS:12744 | 2 to a DFT of 40µ | - | - | | - | - | 40 |
| | b) Outer Surfaces | Abrasive blast clean to Sa2½ (ISO:8501-1) | Alkyed Zinc Phosphate Primer IS:12744 | 2 to a DFT of 40µ | - | - | Synthetic Enamel Colour (HY561002 6997) | 3* | Grey RAL 9002 | 100 |

## PAINTING SCHEME FOR XRP 883 BOWL MILL-MUZAFFARPUR TPP 2X195 MW

| SL. NO | SURFACE LOCATION & PGMAs | SURFACE PREPARATION | PRIMER | | INTERMEDIATE | | FINISH COAT | | | TOTAL DFT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | PAINT (mat.code) | NO.OF COATS | PAINT (mat.code) | No. OF COATS | PAINT (mat.code) | NO.OF COATS | SHADE | µm min |
| 05 | Mill Discharge Valve Assembly PGMA-61400<br><br>a) Outer Surfaces | Abrasive blast clean to Sa2½ (ISO:8501-1) | Alkyed Zinc Phosphate Primer IS:12744 | 2 to a DFT of 40µ | - | - | Synthetic Enamel Colour (HY5610026997) | 3* | Grey RAL 9002 | 100 |

## PAINTING SCHEME FOR XRP 883 BOWL MILL-MUZAFFARPUR TPP 2X195 MW

| SL. NO | SURFACE LOCATION & PGMAs | SURFACE PREPARATION | PRIMER | | INTERMEDIATE | | FINISH COAT | | | TOTAL DFT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | PAINT (mat.code) | NO.OF COATS | PAINT (mat.code) | No. OF COATS | PAINT (mat.code) | NO.OF COATS | SHADE | µm min. |
| 06 | Coupling Guard 61-700<br>b) Inside surfaces | Abrasive blast clean to Sa2½ (ISO:8501-1) | Alkyd Zinc Phosphate Primer IS:12744 | 2 to a DFT of 40µ | - | - | | - | - | 40 |
| | b) Outer Surfaces | Abrasive blast clean to Sa2½ (ISO:8501-1) | Alkyd Zinc Phosphate Primer IS:12744 | 2 to a DFT of 40µ | - | - | Synthetic Enamel Colour (HY5610026997) | 3* | Grey RAL 9002 | 100 |

# PAINTING SCHEME FOR XRP 883 BOWL MILL-MUZAFFARPUR TPP 2X195 MW

| SL. NO | SURFACE LOCATION & PGMAs | SURFACE PREPARATION | PRIMER | | INTERMEDIATE | | FINISH COAT | | | TOTAL DFT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | PAINT (mat.code) | NO.OF COATS | PAINT (mat.code) | No. OF COATS | PAINT (mat.code) | NO.OF COATS | SHADE | µm min. |
| 07 | Seal Air Assembly, Coal Sampling Platform, PGMA-67400, Lube Oil System and Loose Items<br><br>a) Outer Surfaces | Abrasive blast clean to Sa2½ (ISO:8501-1) | Alkyd Zinc Phosphate Primer IS:12744 | 2 to a DFT of 40µ | - | - | Synthetic Enamel Colour (HY5610026997) | 3* | Grey RAL 9002 | 100 |

ANNEXURE - 2

FORMAT FOR NO DEVIATION CERTIFICATE
(To be submitted in the bidder's letter head)

BHARAT HEAVY ELECTRICALS LIMITED,
Power Sector - Eastern Region,
Plot no 9/1, DJ Block, Sector – II, Salt Lake City,
Kolkata – 700 091

| | | |
|---|---|---|
| Sub | No Deviation Certificate. | |
| Job | (i) PACKAGE-A: Erection, testing, commissioning, trial run, handing over etc of boiler, rotating machines & duct, ESP, critical piping, misc piping, boiler integral piping, insulation & final painting etc of u # 1 for 2x195 MW units for KBUNL, Muzaffarpur Project, Bihar and (ii) PACKAGE-B: Erection, testing, commissioning, trial run, handing over etc of boiler, rotating machines & duct, ESP, critical piping, misc piping, boiler integral piping, insulation & final painting etc of u # 2 for 2x195 MW units for KBUNL, Muzaffarpur Project, Bihar. | |
| Ref | 1.0 | Tender no PSER:SCT:MUZ-B1206:11 |
| | 2.0 | BHEL's NIT, vide reference no PSER:SCT:MUZ-B1206:2407, dated 13-05-2011. |
| | 3.0 | BHEL's TCN-01, vide reference no PSER:SCT:MUZ-B1206:TCN-01, dated 25-05-11. |
| | 4.0 | All other pertinent issues till date. |

Dear Sirs,

With reference to above, this is to confirm that as per tender conditions, we have visited site before submission of our offer and noted the job content & site conditions etc. We also confirm that we have not changed/ modified the tender documents as appeared in the website/ issued by you and in case of such observance at any stage, it shall be treated as null and void.

We hereby confirm that we have not taken any deviation from tender clauses together with other references as enumerated in the above referred NIT. We hereby confirm our unqualified acceptance to all terms & conditions, unqualified compliance to technical specification, integrity pact (if applicable) and acceptance to reverse auctioning process.

In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit, the deviations shall stand null & void.

We confirm to have submitted offer in accordance with tender instructions and as per aforesaid references.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized
representative of the bidder)