

|                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                       | <p><b>TELANGANA POWER GENERATION CORPORATION LIMITED</b><br/>         (A Govt. Of Telangana Undertaking)<br/>         Vidyut Soudha, Hyderabad - 500082. www.tsgenco.telangana.gov.in<br/>         Phone: 040 - 23499261,262 Fax: 040 - 23499263.</p>            |
| <p><b>From:</b><br/>         The Chief Engineer,<br/>         Thermal Projects Construction,<br/>         TSGENCO, 3<sup>rd</sup> Floor, A-Block,<br/>         Vidyut Soudha, Khairathabad<br/>         Hyderabad-500 082.<br/> <a href="mailto:cetpctsgenco@gmail.com">cetpctsgenco@gmail.com</a></p> | <p><b>To:</b><br/>         Addl General Manager /Commercial<br/>         M/s Bharat Heavy Electricals Ltd<br/>         Boiler Auxiliaries plant<br/>         Ranipet ,Tamilnadu - 632 406<br/>         Phone : 04172 - 284885<br/>         Fax :04172 241158</p> |

Lr.No.CPP/SE-I/TPC/122/F.Painting/ D.No.154/2015, Dt:10.07.2015

Sir,

Sub: TSGENCO -Kothagudem TPS - Stage VII (1X800 MW) -Painting schedule (Rev 03) for APH, Fans, Gates & Dampers and ESP- Request-Reg.

Ref: 1. Contract No. 3000000003, Dt: 31.12.2014.

2. M/s BHEL Lr: BHEL/TSGENCO Office/KTPS VII/29, Dated :29.06.2015

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Please refer to the letter 2nd cited, where in painting schedule (Rev 03) for APH, Fans, Gates & Dampers and ESP was submitted against the purchase order 1st cited, for TSGENCO's approval.

After careful examination, the painting schedule for (Rev 03) for APH, Fans, Gates & Dampers and ESP is here by approved. A copy of the approved painting schedule is here with enclosed.

It may please be noted that the approval of the painting schedule does not absolve you of your responsibility of supplying the above equipment conforming to relevant specifications and standards and to ensure satisfactory performance of the equipment as per the terms & conditions of the contract.

Encl: A/a

Yours faithfully

  
 CHIEF ENGINEER / TPC

CC to:

1. The Chief Engineer/O&M/KTPS / Paloncha /Khammam(Dist)-507 115
2. The Superintending Engineer/E&M/ / KTPS VII / Paloncha /Khammam(Dist) -507 115
3. Additional General Manager / PMG, M/s BHEL, Power Sector/Project Management Group, Advant Navis Business Park , Sector 142 Noida.
4. General Manager , Development Consultants Pvt., Ltd. Block DG-4 Sector II , Salt lake City ,Kolkata - 700 091
5. Mr.Y.A. Srinivasa Rao,GM/BHEL Camp office,TSGENCO,Vidyut Soudha,Hyderabad.



RANIPET

# Bharat Heavy Electricals Limited

Boiler Auxiliaries Plant

Ranipet – 632 406 Tamil Nadu

BHEL DOC.NO.

PS:KOTH:R824&R4K9

REV. NO.

03

DATE

26-06-2015

TELANGANA STATE POWER GENERATION CORPORATION LTD.,

KOTHAGUDEM TPS (STAGE VII – UNIT #12) 1X800 MW – EPC PACKAGE

KOTHAGUDEM, NEAR PALONCHA VILLAGE, KHAMMAM DIST.,

PAINTING SCHEDULE FOR APH, FANS, GATES & DAMPERS, ESP & AUX.BLR

BHEL Customer No(s): R824 (1 X 800 MW) & R4K9(AUX.BLR) – EPC PACKAGE

| Prepared & Reviewed By                                                                                      | Approved By                                                                                             |
|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| <br>(K. Jothi Arulanandam) | <br>(R. Arunachalam) |

Chief Engineer  
Thermal Projects Construction  
TSGENCO, Viduth Soudha,  
Khairatabad, Hyderabad-82

16/7/15

| SL NO | PGMA / DESCRIPTION | SURFACE PREPARATION & SURFACE PROFILE | PRIMER COAT |             | INTERMEDIATE COATE |             | FINISH COAT |             | TOTAL DFT, $\mu\text{m}$ (min.) |
|-------|--------------------|---------------------------------------|-------------|-------------|--------------------|-------------|-------------|-------------|---------------------------------|
|       |                    |                                       | PAINT       | NO OF COATS | PAINT              | NO OF COATS | PAINT       | NO OF COATS |                                 |

## RECORD OF REVISION

| REV NO | DATE       | DETAILS OF RECORD OF REVISION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |  |  |  |  |  |  |
|--------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|
| 0 0    | 22-04-2015 | Original Issue – First Submission                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |  |  |  |  |
| 0 1    | 18-05-2015 | 1. Refer page 2 of 6; General - DCPL Comment – Specification and colour shade – Noted.<br>2. Refer page 4 of 6; SI.No. 4.0, DCPL Comment – Please mention DFT – Noted and incorporated suitably.<br>3. Refer page 5 of 6; SI.No.2, under painting of damaged areas; DCPL Comment – Please mention drawing / document no. – Noted and incorporated suitably<br>4. Refer page 6 of 6; General Note sl.no. h) - DCPL Comment – Clarified suitably and incorporated as a special note under SI.No. 1 of this painting scheme – refer page 3 of 6 for details.<br>5. General BHEL comment: Refer page 3 of 6; SI.No.1 - Fan LOS items deleted from this list, since it is covered in Bought Out Item.                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |
| 0 2    | 08-06-2015 | Revised based on DCPL comments Dtd. 03.06.2015 on Rev.01 as follows;<br>1. Refer page 3 of 6; Clause no. 3.1 - <b>DCPL Comment:</b> Final DFT shall be 140 $\mu\text{m}$ instead of 70 $\mu\text{m}$ for exposed items of APH.<br><b>BHEL Reply:</b> All the these items of APH are coming under boiler roofing area and hence it is inside the building area and accordingly we have incorporated revised final DFT to 120 $\mu\text{m}$ in Rev. 02.<br>2. Refer page 4 of 6; Clause no. 3.2 & 3.3 – <b>DCPL Comment:</b> Final DFT shall be 140 $\mu\text{m}$ instead of 70 $\mu\text{m}$ for exposed items of FAN & ESP<br><b>BHEL Reply:</b> Noted & Incorporated in Rev.02.<br>3. Refer page 4 of 6; Clause no. 4.1 – <b>DCPL Comment:</b> Final DFT shall be 140 $\mu\text{m}$ instead of 70 $\mu\text{m}$ for Gates & Dampers - <95 Deg. Insulated / uninsulated surfaces.<br><b>BHEL Reply:</b> All these Gates & Dampers coming in this category are of cold air application and also will be insulated immediately after erection. Hence, we propose final DFT to 100 $\mu\text{m}$ in Rev. 02 instead of 140 $\mu\text{m}$ . |  |  |  |  |  |  |  |
| 0 3    | 26.06.2015 | Revised based on DCPL comments Dtd.19.06.2015 as follows:<br>1. Refer page 4 of 6; Clause no. 3.2 & 3.3 - DCPL Comment on DFT total – Noted & Incorporated in Rev.03.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |

DOC. REF: PS:KOTH : R824 & R4K9

REV. NO. 0 3

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Chief Engineer (STC)  
 Thermal Projects Construction  
 TSGENCO, Vidyan Soudha,  
 Khairatabad Hyderabad-82

  
 10/7/15

| SL NO | PGMA / DESCRIPTION | SURFACE PREPARATION & SURFACE PROFILE | PRIMER COAT |             | INTERMEDIATE COATE |             | FINISH COAT |             | TOTAL DFT. $\mu\text{m}$ (min.) |
|-------|--------------------|---------------------------------------|-------------|-------------|--------------------|-------------|-------------|-------------|---------------------------------|
|       |                    |                                       | PAINT       | NO OF COATS | PAINT              | NO OF COATS | PAINT       | NO OF COATS |                                 |

|     |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                              |                                                                                                                      |   |    |    |                                                                                                                                          |    |     |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|---|----|----|------------------------------------------------------------------------------------------------------------------------------------------|----|-----|
| 1.0 | Steel Structures (External Coatings)<br>ESP - 79-181 Supporting Structure,<br>79-165 Hopper Approach Platform,<br>Stair Stringer Channels, Brackets, Supp Brackets, Frames, Loose Channels, Toe Plates, Stiffener Plates & Angles<br>Gate&Damper - Hood Ladders and other loose structural items for platform. | Blast Cleaning - Near White Metal as per SA 2 1/2<br>Surface area is free from all rust, mill scales and visible residues, foreign materials - Surface roughness min. 35 to 50 $\mu\text{m}$ | Epoxy Zinc Rich Primer to IS: 14589 Gr. II - DFT = 40 $\mu\text{m}$ per coat                                         | 2 | -- | -- | Epoxy polyamide cured finish paint to IS: 14209 DFT = 30 $\mu\text{m}$ per coat<br>Colour shade: Light Grey - Shade no.631 of IS:5       | 2  | 140 |
| 2.0 | Components > 95 ° C Insulated / Coming in Gas path, Commm Spares & Erection Materials of APH, FAN, ESP, & Tools & fixture of FD fan(Aux.Blr)                                                                                                                                                                   | Power Tool Cleaning to St3 (SSPC - SP3)                                                                                                                                                      | Red Oxide Zinc Phosphate Primer (Alkyd Base) to IS: 12744 DFT = 30 $\mu\text{m}$ per coat - Colour shade - Red Oxide | 2 | -- | -- | --                                                                                                                                       | -- | 60  |
| 3.0 | Out Door Equipments (External Surfaces / Un Insulated) -                                                                                                                                                                                                                                                       | Power Tool Cleaning to St3 (SSP52C - SP3)                                                                                                                                                    | Red Oxide Zinc Phosphate Primer (Alkyd Base) to IS: 12744 DFT = 35 $\mu\text{m}$ per coat                            | 2 | -- | -- | Synthetic Enamel paint (long oil alkyd ) to IS: 2932 - DFT = 25 $\mu\text{m}$ per coat - Colour shade - Smoke Grey Shade no. 692 of IS:5 | 2  | 120 |
| 3.1 | APH:<br>52 100,101 Rotor Drive Assy, 52 211 Air Seal pipe, 52 261 Guide Bearing Assy, 52 262 Support Bearing Assy, 52 271, 52 272 Oil Piping, 52 274 Lub Oil Circulation Units, 52 301, 52 302 Wash pipe assy, 52 326, 52 329, Cleaning Equipment & Drive Unit                                                 |                                                                                                                                                                                              |                                                                                                                      |   |    |    |                                                                                                                                          |    |     |

Charan Kumar, Engineer  
 Thermal Projects Construction  
 TSGENCO, Vidyut Soudha,  
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 10/7/15

DOC. REF: PS:KOTH : R824 & R4K9

REV. NO. 0 3

DTD. 26-06-2015

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| SL NO | PGMA / DESCRIPTION | SURFACE PREPARATION & SURFACE PROFILE | PRIMER COAT |             | INTERMEDIATE COATE |             | FINISH COAT |             | TOTAL DFT.<br>μm (min.) |
|-------|--------------------|---------------------------------------|-------------|-------------|--------------------|-------------|-------------|-------------|-------------------------|
|       |                    |                                       | PAINT       | NO OF COATS | PAINT              | NO OF COATS | PAINT       | NO OF COATS |                         |

|     |                                                                                                                                                                                                                                                                                                  |                                             |                                                                                              |   |    |    |                                                                                                                                          |   |     |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------------------------------------------------|---|----|----|------------------------------------------------------------------------------------------------------------------------------------------|---|-----|
| 3.2 | FAN:<br>55-214,334 FD/PA Rotor, 55-810, 830, 56-810, 820, 850, 870 Coupling for PA, ID & SA /GR & FD, 55-911, 931 – FD/PA Silencer (un-insulated area), 55-155 GR Fan Rotor, 56-161 Ventilation Fan – Radial, 56-172 Seal Air Fan Rotor, 56-227 Radial ID Fan Rotor 56113 FD Fan rotor (Aux,Blr) | Power Tool<br>Cleaning to St 3 (SSPC – SP3) | Red Oxide Zinc<br>Phosphate Primer (Alkyd Base) to IS: 12744 DFT = 35 $\mu\text{m}$ per coat | 2 | -- | -- | Synthetic Enamel paint (long oil alkyd ) to IS: 2932 – DFT = 35 $\mu\text{m}$ per coat – Colour shade – Smoke Grey Shade no. 692 of IS:5 | 2 | 140 |
| 3.3 | ESP -<br>GD Drive Arrangmt<br>Drive Arrangmt EE<br>Inspection Door<br>CE Rapp drive<br>Outer Roof<br>ESP Performance Test<br>adoption,                                                                                                                                                           | Power Tool<br>Cleaning to St 3 (SSPC – SP3) | Red Oxide Zinc<br>Phosphate Primer (Alkyd Base) to IS: 12744 DFT = 35 $\mu\text{m}$ per coat | 2 | -- | -- | Synthetic Enamel paint (long oil alkyd ) to IS: 2932 – DFT = 35 $\mu\text{m}$ per coat – Colour shade – Smoke Grey Shade no. 692 of IS:5 | 2 | 140 |

Note: All static parts of fan – two coats red oxide zinc phosphate primer to be applied both sides since it will be insulated.(alkyd base) to IS: 12744 DFT=30  $\mu\text{m}$  per coat – Total DFT = 60  $\mu\text{m}$ .

|     |                                                                                                                                                                                                                            |                                         |                                                                                              |   |    |    |                                                                                                                          |   |     |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------|---|----|----|--------------------------------------------------------------------------------------------------------------------------|---|-----|
| 4.0 | Gates & Dampers<br>> 95° C Insulated / Un-Insulated surfaces:<br>57-053, 57-063, 57 203, 57 223 57 270, 57 273, 57-293, 57-303, 57-313, 57-343, 57 373, 57 433 57 460 57 470, 57 480 57 490 57430, 57370 57603,57613,57623 | Power tool<br>cleaning to St3(SSPC-SP3) | HR Aluminium Paint to IS: 13183 Gr. II (up to 400 ° C) DFT = 20 $\mu\text{m}$ per coat       | 1 | -- | -- | HR Aluminium Paint to IS: 13183 Gr. II (up to 400 ° C) DFT = 20 $\mu\text{m}$ per coat                                   | 1 | 40  |
| 4.1 | Gates & Dampers<br>< 95 ° C Insulated / Un-Insulated surfaces:<br>57 010, 57 013, 57 033, 57 083, 57 110, 57 143, 57 160, 57 173, 57 173,                                                                                  | Power tool<br>cleaning to St3(SSPC-SP3) | Red Oxide Zinc<br>Phosphate Primer (Alkyd Base) to IS: 12744 DFT = 30 $\mu\text{m}$ per coat | 2 | -- | -- | Synthetic Enamel paint (long oil alkyd ) to IS: 2932 – DFT = 20 $\mu\text{m}$ per coat – Colour shade – Smoke Grey Shade | 2 | 100 |

DOC. REF: PS:KOTH : R824 & R4K9

REV. NO. 03

DTD. 26-06-2015

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Chief Engineer  
Thermal Projects Construction  
TSGENCO, Vidyan Soudha,  
Khalirahad U.

| SL NO | PGMA / DESCRIPTION | SURFACE PREPARATION & SURFACE PROFILE | PRIMER COAT |             | INTERMEDIATE COATE |             | FINISH COAT |             | TOTAL DFT. $\mu\text{m}$ (min.) |
|-------|--------------------|---------------------------------------|-------------|-------------|--------------------|-------------|-------------|-------------|---------------------------------|
|       |                    |                                       | PAINT       | NO OF COATS | PAINT              | NO OF COATS | PAINT       | NO OF COATS |                                 |

|     |                                                                                                                                              |                                                                                                                                                                                                                                                                        |  |  |  |  |  |                 |  |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|-----------------|--|
|     | 57 209, 57-491                                                                                                                               |                                                                                                                                                                                                                                                                        |  |  |  |  |  | no. 692 of IS:5 |  |
| 5.0 | Foundation Materials for all Fans, Collecting Electrode, Hook for EE, Gate Blades, Pins & Pin Rack for APH and all other machined components | All Threaded and other surfaces of foundation bolts and its materials shall be coated with Temporary Rust Preventive Fluid. During execution of civil works, the dried film of coating shall be removed using organic solvents.                                        |  |  |  |  |  |                 |  |
| 6.0 | Hand Rail Post, Bend, ERW Tubes, Floor Grills and Step Treads for ESP & Gates                                                                | Hot Dip Galvanizing to a coating weight of 610 g/m <sup>2</sup> (minimum) and to a coating thickness of 85.0 microns (minimum)<br><b>Note:</b> The guard plates, hood ladders and stringer channels shall be painted as per SL.No.1 of this painting scheme prescribed |  |  |  |  |  |                 |  |

### PAINTING OF DAMAGED AREAS

| SL NO | PGMA / DESCRIPTION                                      | SURFACE PREPARATION & SURFACE PROFILE | PRIMER COAT                                                                              |             | INTERMEDIATE COATE |             | FINISH COAT                                                                                                                        |             | TOTAL DFT. $\mu\text{m}$ (min.) |
|-------|---------------------------------------------------------|---------------------------------------|------------------------------------------------------------------------------------------|-------------|--------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------|
|       |                                                         |                                       | PAINT                                                                                    | NO OF COATS | PAINT              | NO OF COATS | PAINT                                                                                                                              | NO OF COATS |                                 |
| 1     | Paint damaged components fall under SL.no.1             | Power tool cleaning to bare metal     | Epoxy Zinc Rich Primer to IS: 14589 Gr.II - DFT = 40 $\mu\text{m}$ per coat              | 2           | --                 | --          | Epoxy polyamide cured finish paint to IS: 14209 DFT = 30 $\mu\text{m}$ per coat<br>Colour shade: Light Grey - Shade no.631 of IS:5 | 2           | 140                             |
| 2     | Paint damaged components fall under SL.no.2, 3, 4 & 4.1 | Power tool cleaning to bare metal     | As per this painting schedule as referred in sl.nos mentioned against each as applicable | --          | --                 | --          | As per this painting schedule as referred in sl.nos mentioned against each as applicable                                           | --          |                                 |

  
**Chief Engineer**  
 Thermal Projects Construction  
 TSGENCO, Vidyut Soudha,  
 Khairatabad, Hyderabad-82

| SL NO | PGMA / DESCRIPTION | SURFACE PREPARATION & SURFACE PROFILE | PRIMER COAT |             | INTERMEDIATE COATE |             | FINISH COAT |             | TOTAL DFT. $\mu\text{m}$ (min.) |
|-------|--------------------|---------------------------------------|-------------|-------------|--------------------|-------------|-------------|-------------|---------------------------------|
|       |                    |                                       | PAINT       | NO OF COATS | PAINT              | NO OF COATS | PAINT       | NO OF COATS |                                 |

## General Notes

- Surfaces not easily accessible after shop assembly shall be treated before –hand and protected for life of the equipment as per this painting scheme as applicable.
- Heating Element of APH shall be dipped in Rust Preventive Oil (Non Dry Type)
- Paint damage – any areas where paint got damaged shall be applied with primer and finish as given in this painting schedule.
- No painting is required for Galvanized, non ferrous and stainless steel items except as indicated above.
- Machined items are to be applied with one coat of temporary rust preventive oil.
- All the 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 PGMA.
- PGMA's and its items coming under BOI are not indicated in this painting schedule. However, respective Engg document for all BOIs shall be referred. Wherever it is not specified, it shall be as per the painting schedule of the applicable PGMA.
- The paint DFT has to be ensured by taking average of 15 readings ie., in a close circle of 30mm three readings have to be noted, like wise five different locations for a given single job have to be selected and total 15 readings – average have to be noted in the DR with paint peel off test evidence in the DR which has to be pasted for BH&L review and compliance.

  
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