एन टी पी सी लिमिटेड
(भारत सरकार का उद्यम)
NTPC Limited
(A Govt. of India Enterprise)
(Formerly National Thermal Power Corporation Ltd.)
(केंद्रीय कार्यालय नोएडा)
Corporate Center NOIDA

Reference : CC-ENGG-8003-001-102-PVM-H-001 **Date :** 17/01/2025

From : Vikas Khare ADDL. GENERAL MANAGER	**To :** BHARAT HEAVY ELECTRICALS LTD NEW DELHI 110049 IN **Cc :** pmgvijay@bhel.in ksbura@bhel.in

Subject : EPC Package, Sipat-Stage-III

Please find enclosed following drawings/ documents for necessary action at your end.

Vendor Drg. No.	:	8003-001-102-PVM-H-001
Orgn. Drg. No.	:	8003-001-102-PVM-H-001
Revision No.	:	00
Drg. Title	:	PAINTING SCHEDULE OF SG
App. Category	:	CATREL
Release Date	:	17/01/2025

Scan to verfiy

Comments : This is an Auto Archive document designed and developed by BHEL. Hence, BHEL has the entire responsibility to ensure fulfillment for technical specification and contractual requirement. Review and approval of the same from NTPC Engineering is not envisaged.

Name of the Project/ Package	:	Sipat Super Thermal Power Project -III 1x800MW, EPC Package, Sipat-Stage-III
Drawing / Document Number	:	8003-001-102-PVM-H-001
Drawing / Document Title	:	PAINTING SCHEDULE OF SG

"We confirm that this document meets all the contract requirements including safety and statuary requirements and facilitate ease of operation and maintenance. In case any deviation is found, the Contractor shall carry out all required changes/ modifications without any cost implications to NTPC. In addition, Penalty on account of non-compliance of contract specification as deemed fit by the Employer shall be recovered"

Endorsement Sheet For Painting schedule

TO BE FILLED IN BY SUPPLIER AT TIME OF SUBMISSION BHEL Doc. No: PL:C3-PS/1856

Project Name	**NTPC SIPAT STPP STAGE III (1X800 MW)**
Contract No	**8003**
Package Name	**EPC PACKAGE**
Main Supplier	**BHEL**
Manufacturer Name	**-**
Project/package Specific Document No.	**8003-001-102-PVM-H-001**
Drawing Title	**PAINTING SCHEDULE OF SG**
Reference Project Name	**NTPC SINGRAULI STPP STAGE III (2X800 MW)**
Reference Contract No	**1150**
Reference Package Name	**EPC PACKAGE**
Reference Main Supplier	**BHEL**
Reference Manufacturer Name	**-**
Reference Project/package Specific document No.	**1150-001-102-PVM-H-006A**
Reference Drawing Title	**PAINTING SCHEDULE FOR SG & AUXILIARIES**

☑ Certified that the item/component is identical to that considered for reference document approval.

☐ That there are minor changes in the item/ component with respect to that considered for reference *PAINTING SCHEDULE* document approval and the same affect the reference document slightly as indicated below

K. SRINIVASAN
MANAGER / PLANT LAB
BHEL-HPBP TRICHY

Date: 07.01.2025

PROJECT ENGG MANAGER

BHEL

NTPC (Approved by/Date/Seal)

CTF

CUSTODIAN NAME

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Corporate Center NOIDA

Reference : CC-ENGG-1150-001-102-PVM-H-006A **Date :** 17/09/2024

From : Anirudh Sood SENIOR MANAGER	**To :** BHEL PEM,NOIDA **Cc :**

Subject : EPC package of Singrauli Stage-III

Please find enclosed following drawings/ documents for necessary action at your end.

Vendor Drg. No.	:	1150-001-102-PVM-H-006A
Orgn. Drg. No.	:	1150-001-102-PVM-H-006A
Revision No.	:	01
Drg. Title	:	PAINTING SCHEME FOR SG & AUXILLIARIES
App. Category	:	CAT-I
Release Date	:	17/09/2024

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Comments : Based on the document submitted through endorsement, the document is approved.

Endorsement Sheet For Painting schedule

TO BE FILLED IN BY SUPPLIER AT TIME OF SUBMISSION BHEL Doc. No: PL:C3-PS/1840

Project Name	**NTPC SINGRAULI STPP STAGE III (2X800 MW)**
Contract No	**1150**
Package Name	**EPC PACKAGE**
Main Supplier	**BHEL**
Manufacturer Name	**-**
Project/package Specific Document No.	**1150-001-102-PVM-H-006A**
Drawing Title	**PAINTING SCHEDULE FOR SG & AUXILIARIES**
Reference Project Name	**LARA SUPER THERMAL POWER PROJECT STAGE-II 2x800 MW**
Reference Contract No	**9587**
Reference Package Name	**EPC PACKAGE**
Reference Main Supplier	**BHEL**
Reference Manufacturer Name	-
Reference Project/package Specific document No.	**9587-001-102-PVM-H-006A**
Reference Drawing Title	**PAINTING SCHEDULE FOR SG & AUXILIARIES**

☐ Certified that the item/component is identical to that considered for reference document approval.

☑ That there are minor changes in the item/ component with respect to that considered for reference *PAINTING SCHEDULE* document approval and the same affect the reference document slightly as indicated below

PL:C3-PS/1834, rev. 01, Sheet 6 of 13.

- colour shade black for **hook** is changed to **Signal red** in the painting schedule document.

K. SRINIVASAN
MANAGER / PLANT LAB
BHEL-HPBP TRICHY

Date: 09.09.2024

NTPC (Approved by/Date/Seal)

PROJECT ENGG MANAGER
BHEL

CTF
CUSTODIAN NAME

BHARAT HEAVY ELECTRICALS LIMITED
Tiruchirapalli - 620 014

NTPC – SINGRAULI STPP, STAGE-III (2X800MW) - UNIT-I & II

Ref: PL: C3-PS/1834-Rev.00 & Transmittal ref: CC- ENGG-1150-001-102-PVM-H-006A Dt. 06.09.2024.

BHEL Reply against NTPC comments/ observations on the referred painting schedule as follows

1. **NTPC comment:** Sheet 6 of 13, Sl. No. 8, colour shade shall be signal red for hook.

BHEL reply: Noted & retained.

2. **NTPC comment:** Sheet 8 of 13, Sl. No. 11 – painting schedule depends on temperature as per specs 1.06.11, S. No.5, A-12, Part B.

BHEL Reply: Painting scheme followed as per NTPC spec 1.06.11, S. No.5, A-12, Part B only. Phosphating of forged valves has been proposed as per 1.06.11, Point No.2-Page 6 of 8, A-12, Part B "For valves below 65NB and temperature upto and including 540 DegC, Parkerizing/zinc phosphate corrosion resistant coating is also acceptable in lieu of Aluminum paint".

3. **NTPC comment:** Sheet 8 of 13, Sl. No. 11 (1AS2) – Temperature more than 95^0C for soot blower component, design for temperature >95^0C to be used.

BHEL Reply: DA head valve assembly having design temperature >95^0C is given with heat resistant aluminum paint in note 19, sheet 11 of 13. Other soot blower components having temperature <95^0C only.

4. **NTPC comment:** Sheet 11 of 13, Sl. No. 19 – PS10 not mentioned in spec. Painting schedule as per specs for temperature >95^0C.

BHEL Reply: PS10 refers to heat resistant aluminum IS13183 Gr.I based painting scheme for temperature >400^0C & up to 600^0C. Painting scheme for temperature >95^0C i.e. heat resistant aluminium IS13183 Gr.I (PS10) & Gr.II (PS9) is followed as per NTPC spec.

5. **NTPC comment:** Sheet 11 of 13, Sl. No. 25 – Painting as per applied in steel structure.

BHEL Reply: Noted. As informed in the video conference held on subject, these components are not under the supply scope of BHEL, trichy.

Document is submitted for approval.

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Corporate Center NOIDA

Reference : CC-ENGG-9587-001-102-PVM-H-006A **Date :** 25/06/2024

From : RAMESH CHANDRA SHIAL ENGINEER	**To :** BHARAT HEAVY ELECTRICALS LTD NEW DELHI 110049 IN **Cc :** sudipt@bhel.in dipakbag@bhel.in

Subject : EPC Package

Please find enclosed following drawings/ documents for necessary action at your end.

Vendor Drg. No.	:	HPBP-00-9587-328
Orgn. Drg. No.	:	9587-001-102-PVM-H-006A
Revision No.	:	01
Drg. Title	:	Painting scheme for SG & Auxilliaries
App. Category	:	CAT-I
Release Date	:	25/06/2024

Scan to verfiy

Comments : No Comment

BHARAT HEAVY ELECTRICALS LIMITED
Tiruchirapalli - 620 014

NTPC – LARA STPP, STAGE-II (2X800MW) - UNIT-~~I & II~~ III & IV

Ref: PL: C3-PS/1834-Rev.00 & Transmittal ref: CC- ENGG-9587-001-102-PVM-H-006A Dt. 18.03.2024.

BHEL Reply against NTPC comments/ observations on the referred painting schedule as follows

1. **NTPC comment:** Sheet 3, Sl. No. 3, colour shade shall be RAL 5012 for boiler columns/ Girder/ Bracings.

BHEL reply: Colour shade modified for boiler columns, Girder, Bracings in the revised document.

2. **NTPC comment:** Sheet 10, Sl. No. 8 – This includes duct inside surfaces, truss, beams, gusset plate, guide vanes, divider plates, rectifier, divider vanes etc. coming in the gas path.

BHEL Reply: comment included.

3. **NTPC comment:** Sheet 13 of 13 – Finish coat shall be 3 as per talcher approved document.

BHEL Reply: It is typographical error. Finish coat shall be 1 as per contract.

Revised document is submitted for approval.

-******-

BHARAT HEAVY ELECTRICALS LIMITED Tiruchirappalli - 620 014	

NTPC- LARA STPP, STAGE-II (2X800MW)
RAIGARH DIST, CHHATTISGARH
CUSTOMER NO: U8-1834/1835 UNIT – I&II
PAINTING SCHEDULE

NTPC Drawing No: 9585-001-102-PVM-H-006A

Prepared by	**K. Srinivasan** **Manager/ Plant Lab**		**Document No: PL: C3 - PS / 1834**
Reviewed by	**K. Rajmohan** **AGM/ PE/ FB**		**Revision No: 01 Dated: 14-06-2024**
Approved by	**A. Santhakumari** **AGM / Plant Lab**		**Sheet No. 01 of 13.**

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RECORD OF REVISIONS

Rev. No	Date	Details of revision	Remarks
00	**04-03-2024**	New	**Prepared in line with NTPC Bidding Doc. No. CS-9587-001R-2 & related amendments and clarifications to Bidding Documents issued by NTPC.**
01	**14-06-2024**	Sheet 3, Sl. No. 3(i); Sheet 12, Sl. No.2 - RAL 5012 included for primary structures. Sheet 10, Sl. No. 8 – comment included.	Modified as per comments for CAT.II approval by NTPC ‘Transmittal for comments on painting scheme for SG & Auxilliaries’ Ref: CC:ENGG-9587-001-102-PVM-H-006A Dt.18.03.2024.

Sl. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
1 PS10	**Collector & Separator Vessels (Except Internals), Supports** 04 –321,323;	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminum Paint to IS 13183 Gr. I DFT 20 µm per coat	1	--	--	Heat Resistant Aluminum Paint to IS 13183 Gr. I DFT 20 µm per coat	1	Aluminum	40
2 PS5	**Collector & Separator Vessels internals and** Dd items (threaded and machined surfaces only) 04-347;07-331, 360, 361, 362, 393; 08-911,912,913;09-304;12-306, 314, 317, 12-324, 327, 328, 344, 348, 354, 393; 17-304,306,319;19-306,307;21-602, 605, 21-700; 24-352,700,803,813,814,818, 827, 24-842;28-700; 32-700; 35-190, 701,721,722,723,724, 725, 726,727, 35-728, 730;36-700, 701, 721, 722, 723; 39- 700; 41-710;42-700,710;43-710; 45-710;47-710; 48-019,700;65-710;67-710; **Foundation materials**: 35-010, 39-012;	SSPC – SP3 Power Tool Cleaning	Rust Preventive Fluid to PR: CHEM: 09 – 04 DFT=25µm per coat	1	--	--	--	--	--	25
3 (i) PS19C8	**Boiler supporting structures, Columns, Girders, Bracings** 35-131 to 138,141 to 148,151 to 158; 35-181 to 188,211,212; 35-311,312,321,322,331,332,341,342; 35-351,352,361,362,371,372,374,375; 35-511 to 518,521 to 528,531 to 538,	Blast cleaning to SA2 ½ (Near white metal) conforming to ISO 8501-1 with surface profile 40-60 µm	Inorganic Ethyl Zinc Silicate Primer DFT=70µm per coat (refer sheet 12 Sl.no.11 for details)	1	Polyamide cured epoxy with MIO content. Minimum DFT 100µm per coat (refer sheet 12 Sl.no.10 for details)	1	Aliphatic isocyanate cured acrylic finish paint DFT 70µm (refer sheet 12 Sl.no.2 for details)	1	Light Blue Shade To RAL 5012	240

For structural steel, all coats shall be applied at shop.

S. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
3 (ii) PS19C4	<u>Galleries, Stair-ways & inter connecting Walkways</u> 36-111 to 113,151 to 153,311 to 316,321 to 326,331 to 338,341 to 346,351 to 356,361 to 366,371 to 377,381 to 383,391 to 395,610,613,620,621,630,631,740; 38-210,299,310,410,510,610,710; <u>ID system structures.</u> 39-101,102,141,142,150,299,300; 39-304,305,306,993; <u>Duct supports</u> 48-015,115,145,205,225,265,385,435,465; 49-485,495,665; <u>Buck stays</u> 08-001,003,006,007,111,380,501; 08-503,901,910; <u>Platforms & Beams:</u> 35-213,214,221,222,231,232; 35-381 to 388,390,441 to 448,451 to 458,995;	Blast cleaning to SA2 ½ (Near white metal) conforming to ISO 8501-1 with surface profile 40-60 µm	Inorganic Ethyl Zinc Silicate Primer DFT=70µm per coat (refer sheet 12 Sl.no.11 for details)	1	Polyamide cured epoxy with MIO content. Minimum DFT 100µm per coat (refer sheet 12 Sl.no.10 for details)	1	Aliphatic isocyanate cured acrylic finish paint DFT 70µm (refer sheet 12 Sl.no.2 for details)	1	Grey White Shade To RAL 9002	240
4 PS9	<u>Components >95° C Insulated other than components in Sl.No.7 &9</u> <u>Max temperature 400 deg.C</u> Ring Headers, Down Comers, Hot air Headers outside the gas path etc. 05-137,147,155,227,231,251,327,330,350; 07-102,110,125,217,223,231,232; 12-178, 850,852, 900; 17-407,476,807; 18-001,002,010,701; 19-701,702,903;21-600;24-811, 824,828; 24-836,837;	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr. II DFT 20 µm per coat	1	--	--	Heat Resistant Aluminium Paint to IS 13183 Gr. II DFT 20 µm per coat	1	Aluminum	40

For structural steel, all coats shall be applied at shop.

Sl. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate Coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
4 PS9 (Contd.)	Hot Air: 48-018,022,116,200,202,204,207,208,212; 48-214,222,224,262,264,267,662,664,667; Flue Gas: 48-372,382, 384,386, 48-432,434,462,464,482,484,492,494,496,498;	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr. II DFT 20 µm per coat	1	--	--	Heat Resistant Aluminium Paint to IS 13183 Gr. II DFT 20 µm per coat	1	Aluminum	40
5 PS 9	**Components >95° C uninsulated other than components coming in gas path.** Temp: >95°C & <400°C 24-807,820,860,865,867;42-200,300; Instrument tappings, doors: 48-200,915;	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr. II DFT 20µm per coat	1	--	--	Heat Resistant Aluminium Paint to IS 13183 Gr. II DFT 20µm per coat	1	Aluminum	40
6 PS 10	Components uninsulated other than components coming in gas path. (Temp: >400°C & <600°C) 09-003,004,005; 28-220; Components insulated (Temp: >400°C & <600°C) RH & SH headers 10-135,174,176,178,191,235,274,276,278,283, 10-284,285,291; 15-136, 178,236,278;	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr. I DFT 20 µm per coat	1	--	--	Heat Resistant Aluminium Paint to IS 13183 Gr. I DFT 20 µm per coat	1	Aluminum	40
7 PS2	**Loose tubes, SH, RH & Eco. coils** 11-074,078,374,378,406,467,469, 11-487,491,494,606,608,684,694,716,717,718, 11-767,768,769,787,791,916,917,918,967,968, 11-969,987,991;12-179,181,184,187,368, 12-405,514,524,544,554; 12-800,803,805,862,903,914,917,924,927,928,944,948; 12-954,968; 16-201,202,203,270,278,379; 19-092,402,804,814,824,853,884,914,924,984;	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*	--	--	No paint	No paint	Red Oxide	35

*-In lieu of dip painting, 2 coats of brush painting of Red Oxide Zinc Phosphate primer to a coating thickness of 60µ is also permitted in line with Sr.No.9.

Sl. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate Coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
8 PS1A1	**Miscellaneous and casing sheets** 04-147,547; 07-409,431,460,461,462,502,503,509,531,560; 12-506,600,906,907;17-919;21-601,604,606; 24-350,351,354, 801,804,805,806,808,809, 24-810,815,817,825,826,835,840,841,855, 24-950,955,960,966 to 969;30-233,234; 36-396,398,611; 38-611; Fuel firing: 41-350,390,500,997; **Steam blowing piping** 42-001,002,005,010,046,065,070,120,152,154, 42-157,997; 43-004,005,104,105,200,997; 45-200,801,802, 804,805,858,997; 47-281,283, 858,997; **Duct plates, expansion joints** 48-911,912; Coal Feeding 65-736,997; 67-204,272,276, 283,801,802,803,997; 95-088,091,485;96-186;97-585, 592; $Handling equipment:99-099,100,300,400; Impulse lines: 24-800 Seal air ducting: Cold Air duct:48-012,014, 112,114, 141; Tempering Air: 48-142,144;	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744 DFT= 30µm per coat	2	--	--	Synthetic Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 20µm per coat	2	Smoke Grey Shade No: 692 of IS5	100

$ - Final Shade is Golden yellow for under hung crane, Chain Pulley Block, Ratchet Lever and Trolley with hoist. Black shade for Hook.

Sl. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
9 PS3	<u>Components >95° C coming in the gas path, Headers, Commissioning Spares &erection Materials etc.,</u> 06-400,401,431,434,437,441,444, 06-447,451, 453,455,500,501,515,731,732, 06-734,735,737,741,744,745,747,751,752,753, 06-755, 759; 07-309,315,316,318,423, 993; 10-182,183,184,185; 11-474; 12-993;17-174,504,506,900,903; 19-704,753,763,783,793,802,850,851,852; 21-987,988; 24-822,823, 987,988, 989, 993; 30-103,105,212,215,219,223,224,235; 31-010,104; 32-010,210,810; 35-993; 36-993;37-010;38-993; 41-988; 42-858,988; 48-993; 65-200; 67-200; 95-988;96-193; 97-282,287,297,298,407,577,590,591; 97-593,596,599;99-501,514;	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744 DFT= 30µm per coat	2	--	--	No paint	No paint	Red oxide	60
10 PS6	<u>Hand rails and posts, ladders / rungs</u> 35-821,822,823,851; 36-820,821,822,823,851,852,853; <u>Floor Grills, Step treads</u> 35 – 811,812; 36-811,812,813,814; 38-810,820,850; 39-810,820,850;	SSPC – SP8/ Acid pickling	Hot dip Galvanizing to a coating weight of 610 g/m^2 (minimum) and to a coating thickness of 87µm. Refer Notes given below **							

Notes **: The Guard plates, Hood Ladders, Stringer channels, angles and plates shall be painted as per painting scheme prescribed in Sl. No: 03.

PAINTING SCHEME FOR VALVES

Sl.No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
11 @PS 9/10	Cast carbon steel valves (Conventional) Cast alloy steel valves (Conventional) All API valves, QCNRV, SV & SRV Silencers, 21-800,825; 24-885; Safety valves & ERV 21-850; 24-880,881,883;	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr.II/I DFT= 20µm per coat	1	--	--	Heat Resistant Aluminium Paint to IS 13183 Gr.II/I DFT= 20µm per coat	1	Aluminum	40
	Forged valves	Chemical cleaning	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	100
	HP / LP system	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr.I DFT= 20µm per coat	1	--	--	Heat Resistant Aluminium Paint to IS 13183 Gr.I DFT= 20µm per coat	1	Aluminum	40

@ Heat resistant silicone based aluminum paint to IS 13183 Gr.II shall be applied for temperature up to 400 deg.C, Gr. I shall be applied for temperature >400 deg.C and up to 600 deg.C

Sl. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
12 PS15	**<u>For CLH & VLH*</u>** PGs 07,08,12,17,19,21,24,47,48 &80 07-402,403,405;12-517,528; 17-904,906; 19-506,507,904,905, 906,907; 24-353; 48-206,395;	Blast cleaning to SA2 ½ (Near white metal) with surface profile 35-50 µm	Epoxy zinc rich primer To IS 14589 Gr. II (latest) %VS=35, (min) DFT=40 microns per coat	1	--	--	Aliphatic acrylic Poly-urethane paint to IS13213 (latest) %VS=40.0 (min) DFT= 30.0 microns per coat	1	Phirozi Blue Shade No. 176 of IS5	70
13 PS8B	**<u>Components > 95ºC, un-insulated Fuel pipes</u>** 47-200, 289;	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr. I DFT 20 µm per coat	1	--	--	Heat Resistant Aluminium Paint to IS 13183 Gr. I DFT 20 µm per coat	1	Aluminum	40
14 PS 1BE	All Columns below '0' level (embedded in concrete) PGs 34,35,36,38, 39	SSPC-SP3/ Power Tool Cleaning	HB Chlorinated Rubber Based Zinc Phosphate primer %VS=40, (min) DFT=50 microns per coat	1	--	--	No paint	No paint	Grey	50

*- For components other than CLH & VLH, painting scheme shall be as given in Sl. No. 8.

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 with Temporary Rust Preventive Fluid and during execution of civil works; the dried film of coating shall be removed using organic solvents.

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. ref no: QS-01-DIV-W-4, Rev.00.

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. This painting Schemes is valid for only Customer No: U8/1834 & 1835, NTPC LARA - 2X800 MW.

7. No painting is required for Stainless Steel, non-ferrous & galvanized components.

08. Wherever inside surfaces of components under PGMA 48 – XXX & others, 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. This includes duct inside surfaces, truss, beams, gusset plate, guide vanes, divider plates, rectifier, divider vanes etc. coming in the gas path.

09. The Temporary Rust Preventive coating that already been applied on any components, tubes, pipes etc., shall be visually inspected for good adherence. If the coating is intact, direct coating of alkyd based red oxide paints over the coating is permitted. In case, the coating has peeled off over a large area, then the coating is to 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 required for primer paint application shall be SSPC – SP2 (equivalent – Hand Tool cleaning).

10. In components, wherever plates / sheets of thickness less than or equal to 5 mm and rods of ≤25mm/tubes/drain pipes & bent rods 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.8.

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 paintings, making good any damaged shop painting and completing any unfinished portion of the shop coat shall be carried out as per clause applicable painting scheme.

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, bent rods, small plates etc. which are not having feasible dimensions for blast cleaning, painting scheme of Sl.No.8 shall be followed.

15. For very small components with weldable primer at edges, the entire component shall be applied with weldable primer. Structural members having welded connections at site, relevant area can be painted with primer paint instead of Weldable primer.

16. Painting scheme for all temporary structures like 04-196 shall be PS 1AE i.e. 1 coat of Red oxide Zinc Phosphate primer (Alkyd Base) to IS 12744-DFT-30μ 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. These are to be cut & removed at site after erection. (It excludes components covered under Sr. No. 3 & 9 of description table).

17. For internal protection of Pipes, tubes, headers and other pressure parts, Volatile Corrosion Inhibitor (VCI) pellets shall be put (after sponge testing/ draining/ or drying) and subsequently end capped. The dosage of VCI pellets shall be approximately 100 g/ Cu.m. For tubes typically 4 – 5 tablets per end are to be put. For C & I items the dosage of self-indicating Silica Gel (colourless) shall be 250 g/ cu.m. (About 2 to 3 bags weighing approximately 100 grams each). VCI pellets shall not be used for stainless steel components and its composite associates.

18. All threaded components of spring assemblies and turnbuckles shall be galvanized and achromatized to 15 microns minimum thickness.

19. Soot blower components i.e Valve head assembly having high surface temperature (> 200 and <600 deg. C) shall be applied with protective coating as per PS9 (up to 400 deg.C) and PS10 (up to 600 deg.C)

20. Corner plate, sheet channel and fixing pins of PGMA 32-210 shall be painted as per scheme PS3 to total DFT of 60 microns.

21. It is mandatory that for finish coat each layer shall have a permanent DFT and free from any paint defects like sags, wrinkles etc. Total DFT of a component correspond to respective painting scheme has to be ensured and recorded by inspection agency as per QP. Where measured total dry film thickness falls below the specified minimum, an additional coat of finish paint shall be applied.

22. For chequered plates, surface preparation can be power tool cleaning to St3 and painting shall be in line with Sl. No. 8.

23. Handrails, step treads of PGMA under Sl. No. 3 need to be galvanized in line with scheme for handrails (i.e. Sl .No. 10).

24. Inside surfaces of fabricated structure (e.g. Box type column) shall be painted with two coats of red oxide primer paint during fit up stage.

25. Painting of bunker structures to be in line with painting scheme of supporting structures (Sl. No. 3).

26. All steel structures shall be provided with painting as given in the specification. Further, painting system shall also meet the requirements of corrosivity category C3 (durability high) as per ISO 12944.

27. For items meant for Spares and subcontracting where no further processing is involved, the painting scheme selected shall be the same as that of similar product configuration/ description.

Painting Scheme – Details for procurement & application purposes

Sl. No.	Generic nature of paint	Theoretical Covering Capacity Sq.m per Litre.	No. of pack	Volume solids, % (min)	DFT in microns per coat (approx.)	Shade	Shade No. to IS5	Mode of appln.	Over coating interval, Hrs.
1	Epoxy Zinc rich primer to IS14589 Gr.II (latest)	8	2	35	50	Grey	--	Spray	24
2	Two-pack aliphatic Isocyanate cured acrylic finish paint (solid by volume minimum 55% (min) with Gloss retention (SSPC Paint Spec No 36, ASTM D 4587, D 2244, D 523) of Level 2 (after minimum 1000 hours exposure, Gloss loss less than 30 and colour change less than 2.0 Delta – E).	13	2	55	70	Grey white/ Light blue	RAL 9002/ RAL 5012	Airless Spray	24
3	Heat resistant Aluminium paint to IS 13183 Grade I/II (latest)	10	1	-	20	--	--	Brush / Spray	24
4	Red oxide zinc phosphate primer paint to IS 12744 (latest)	10	1	--	30	-	--	Brush / Spray	12
5	Red oxide Zinc Phosphate Dip coat primer paint to PR: CHEM: 09-03	10	1	--	35	--	---	Dip	12
6	Long oil alkyd synthetic enamel finish paint to IS2932 (latest)	17	1	--	20	Reqd. shade	Corrpdg. Shade no.	Brush / Spray	12
7	Temporary Rust preventive fluid to PR: CHE: 09 – 04	10	1	--	25	--	--	--	12
8	General purpose Aluminium paint to IS 2339 (latest)	10	2	--	20	Aluminum	--	Brush	12
9	HB Chlorinated Rubber Based Zinc Phosphate Primer-Colour Grey	8	1	40	50	Grey	--	Brush / Spray	12
10	Two component polyamide cured epoxy based polyamide cured MIO pigmented intermediate coat. (containing lamellar MIO minimum 30% on pigment)	8	2	80	100 (min)	Brown/ grey	--	Airless Spray	24
11	Two component moisture curing zinc (ethyl) silicate primer, metallic Zinc content 80% (min), Zinc dust quality shall be as per ASTM D 520 Type 2.	8	2	60	70 (min)	Grey	--	Airless Spray	24

The covering capacity of paints specified is only approximate.

The paints and Rust Preventive fluid shall be procured from BHEL's approved suppliers.

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 has rusted appreciably, should be repainted as follows)

Sl.No.	Components	Surface Prepa-ration	Primer coat		Intermediate coat		Finish coat			Total DFT µm
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
1	Paint damaged components fall under Sl.no: 3	Power tool cleaning of minimum 6" of surrounding areas to bare metal	Epoxy zinc rich primer to IS 14589 Grade II	2 T.DFT 70µ (min)	As given in scheme	1	As given in scheme	1	As given in scheme	As given in scheme