



A Maharatna Company

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-1150-001-110-PVM-W-110B

Date : 04/12/2024

From : MANOJ PANDEY
ENGINEER

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. : HWR-STG-001

Orgn. Drg. No. : 1150-001-110-PVM-W-110B

Revision No. : 01

Drg. Title : PAINTING SCHEDULE FOR TG & AUX

App. Category : CAT-I

Release Date : 04/12/2024



Scan to verify

Comments : Approved subject to revision of Drg. no. 1150-001-110-PVM-B-034, Titled-GA drawing of GSC, in line with subject drawing.



Engineering Division
ISO 9001:2008 Certified



अभियंत्रिकी कार्यालय परिसर, प्लॉट नं.- ए 8ए, सेक्टर-24, पोस्ट बॉक्स नं.- 13, नोएडा (उ.प्र.) पिन-201 307

टेलिफोन नं.- 0120-2410333, 2410116 फैक्स-0120-2410136, 2410137

पंजीकृत कार्यालय: एनटीपीसी भवन, स्कोप कॉम्प्लेक्स, 7 इन्स्टीट्यूशनल एरिया, लोधी रोड, नई दिल्ली-110 003

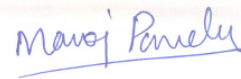
टेलिफोन नं.- 011-24361018 फैक्स-011-24361018, वेबसाइट: www.ntpc.co.in



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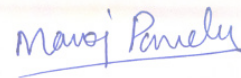
Telephone No: 011 24360100 Fax: 011 24361018, Website: www.ntpc.co.in



PROJECT: SINGRAULI SUPER THERMAL POWER PROJECT STAGE-III (2X800 MW)
CUSTOMER: NTPC LIMITED 
DOCUMENT TITLE: PAINTING SCHEDULE FOR TG & AUX NTPC DOCUMENT NO 1150-001-110-PVM-W-110B DOCUMENT NO.: HWR-STG-001 REV-02; DATE: 09-11-2024
 BHARAT HEAVY ELECTRICALS LTD UNIT: HEEP, RANIPUR, HARIDWAR

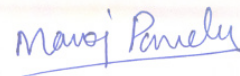
Rev	Date	Prepared by	Approved by	Remarks
00	24.09.2024	Pardeep Kumar	Swapan Kumar Bhattacharya	First submission
01	16.10.2024	Munendra Mittal	Swapan Kumar Bhattacharya	Second submission
02	09.11.2024	Munendra Mittal	Neeraj Verma	Third submission

Standard note: “BHEL confirms that this document meets all the contract requirements including safety and statutory requirements and facilitate ease of operation and maintenance. In case any deviation is found, BHEL shall carry out all required changes/ modifications without any cost implications to NTPC. In addition, Penalty on account of noncompliance of contract specification as deemed fit by the Employer (NTPC) shall be recovered”.



CRS- Document: PAINTING SCHEDULE FOR TG & AUX (1150-001-110-PVM-W-110B) Rev.01		
PROJECT: 2x800MW Singrauli		
CONDENSER AND HEAT EXCHANGERS		
SL no.	NTPC Observations Dated: 04/10/2024	BHEL HWR Reply Dated 15/10/2024
1	For Gland steam condenser DFT 200 mm IN TALCHER and other previous projects	Recommended painting for GSC is in line with NTPC spec. SPECIFICATION SECTION VI, PART-B,SUB-SECTION - A-12 Clause 1.06.09 (b). Since GSC falls under equipment with high temperature. Hence, two coats of aluminium paint shall be done on the equipment with total DFT 40micron (min).
2	To be painted Blue as per NTPC standard colour coding scheme	
TURBINE INTEGRAL PIPING & AUXILIARIES		
1	In Talcher and other previous projects painted colour is black 9011	Noted and has been revised in line with NTPC standard colour coding scheme, Talcher and previous projects.
2	To be painted black as per NTPC standard colour coding scheme	Noted and has been revised in line with NTPC colour coding, Talcher and previous projects.

CRS- Document: PAINTING SCHEDULE FOR TG & AUX (1150-001-110-PVM-W-110B) Rev.02				
PROJECT: 2x800MW Singrauli				
CONDENSER AND HEAT EXCHANGERS				
S.NO.	NTPC Observations Dated: 04/10/2024	BHEL HWR Reply Dated 15/10/2024	NTPC Observations Dated: 05/11/2024	BHEL HWR Reply Dated 08/11/2024
1	For Gland steam condenser DFT 200 mm IN TALCHER and other previous projects	Recommended painting for GSC is in line with NTPC spec. SPECIFICATION SECTION VI, PART-B, SUB-SECTION - A-12 Clause 1.06.09 (b). Since GSC falls under equipment with high temperature. Hence, two coats of aluminium paint shall be done on the equipment with total DFT 40micron (min).	As per GA drg of GSC & (Drg. no. 1150-001-110-PVM-B-034), Epoxy paint & primer with total DFT 180 microns is provided that is also in line with Talcher-III & Lara-II. Further, in case of heat resistant AL paint, BHEL to revise the GA drg. of GSC to include thermal insulation on GSC as per provisions of Sub-Section A-13, Part-B.	NOTE, Updated GA drawing of GSC (Drg. no. 1150-001-110-PVM-B-034) shall be submitted for approval.
TURBOGENERATOR AND AUXILIARY SYSTEMS				
Sl. No.	NTPC Remark		BHEL Reply	
1	Tag/Band color of White 9010 shall also be mentioned in remarks for all equipment, as applicable. Refer comments marked on Rev-0 of subject document.		Document updated in remarks column as per comments on Rev-0.	



STEAM TURBINES & AUXILIARIES

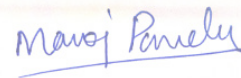
Painting Scheme 1.

Paint (Coat)	Paint Type	No. of coat	Total DFT*
Primer Paint	: Epoxy base Zinc rich primer paint	2 Coat	70
Intermediate Paint	: Epoxy TiO ₂ Pigmented Polyamide Cured Paint	1 Coat	70
Finish (Final) Paint	: Aliphatic Acrylic 2 Pack Polyurethane Finish paint	2 Coats	60
Total DFT			200

Details of Color Scheme:

(Legend: W-at BHEL works; V- at vendor's works; S-at site; N A -Not applicable)

No	Assembly	Shade as per IS-5 or Eq.	Primer	Int. Paint	Final Paint	Touch-up	Remarks
a	Bearing pedestals with assembled parts (outer unmachined surfaces)	Light Blue RAL 5012	W	W	W	S	
b	Front walls & Side Walls of LPT (Outer unmachined surfaces)	Light Blue RAL 5012	W	W	W	S	
c	Rupture Diaphragm	Light Blue RAL 9011	W	W	W	S	
d	LP upper parts (outer unmachined)	Light Blue RAL 5012	W	W	W	S	
e	Suspension arrangement for LPBP & overload valves (unmachined)	Graphite Black RAL 9011	V	V	V	S	
f	Shaft Supports(IP & LP) & Casing Supports	Light grey ISC No. 631	W	W	W	S	
g	Assy fixture for HPT (unmachined)	Light Blue RAL 5012	W	W	W	S	
h	Turning over device (unmachined) for	Light Blue RAL 5012	W	W	W	S	
i	Assy tools for main turbine (unmachined surfaces)	NA	W	W	W	S	TRP HE 1712 (Light Green/Light brown) (Rust preventive)
j	Assy. device for valves & Support for valves	NA	W	W	W	S	Red oxide primer Grease TRP HE 1712 (Light Green/Light brown) (Rust preventive)



k	Support of Breech block (Valve support)	NA	W	W	W	S	TRP HE 1712 (Light Green/Light brown) (Rust preventive)
l	Mounting frame of bearing shell	Graphite Black RAL 9011	W	W	W	S	
m	Shaft Lifting device (LPT)	Light Blue RAL 5012	W	W	W	S	
n	Grating Coverings for LPT	NA	W	W	W	S	Red oxide primer Grease
o	Shaft seal lifting device & dev. Axial holding of LP	Light Blue RAL 5012	W	W	W	S	
p	Stretching device for Breech Block & Breech Nut Heating Device	NA	V	V	V	S	
q	Hand barring gear	NA	W	W	W	S	TRP HE 1712 (Light Green/Light brown) (Rust preventive)
r	Hydraulic Turning motor	Light Blue RAL 5012	V	V	V	S	

Following Items are not painted as these are of Stainless Steel
Compensators


PAINTING SCHEME NO	TYPE OF PAINT	COMPONENTS
2.	Heat resistant Aluminum paint (IS 13183) No. of coats: -2, Total DFT- 40µm	1. Casing and covers of valves (outside) 2. HPT & IPT outer casing & IPT supporting arm for Push-Rod (Outer Unmachined) 3. HP & IP stop and control valve casings outer (Unmachined) 4. Overload Valve & overload valve casing assembly 5. Cross over Pipe. 6. LP shaft seal casing.

Note: Above components are exposed to steam from inside and are covered with insulation (except 06).

Surface Preparation:

- 1- It is necessary that the surface to be painted is free from loose dust, mill scale, rust, grease, oil, old film etc. Surface cleaning and preparation is to be done for all the components as per BHEL standard practice. The surfaces before painting should correspond to standard degree of purity SA 2^{1/2}.
- 2- Checking of surface preparation, measurement of dry paint thickness, adhesion, gloss & finish of painted surface is to be done as per BHEL standard practice.

Manoj Pandey

	STEAM TURBINE ENGINEERING BHEL, HEEP, HARIDWAR INDIA	DOC NO. 1150-001-110-PVM-W-110B	
		REV. - 01	DATE: 11.10.2024

TURBINE INTEGRAL PIPING & AUXILIARIES

Painting Scheme 1.

Paint (Coat)	Paint Type	No. of coat	DFT*
Primer Paint	: Epoxy base Zinc rich primer paint	1 Coat	35
Intermediate Paint	: Epoxy TiO ₂ Pigmented Polyamide Cured Paint	1 Coat	70
Finish (Final) Paint	: Aliphatic Acrylic 2 Pack Polyurethane Finish paint	2 Coats	75
		Total DFT	180


* DFT – Dry Film Thickness (final) in microns.

Details of Color Scheme :

(Legend : W-at BHEL works; V- at vendor's works; S-at site; NA-Not applicable)


No	Assembly	Shade as per RAL	Primer	Int. Paint	Final Paint	Touch-up	Remarks
1	Turbine Integral Piping for Control Fluid System	NA	NA	NA	NA	NA	Painting is not applicable because the piping is in stainless steel.
2	Turbine Integral Piping for Lube Oil System	Grey 9002	V	V	V	S	Painting is only applicable for lines of Oil Vapour Exhaust System because they are in Carbon Steel. Lube Oil Supply line, Lifting Oil Line and Return Oil Line shall not be painted, because their material is Stainless Steel.
3	Turbine Integral Piping for Condensate Spray System	Grey 9002	V	V	V	S	
4	Turbine Integral Piping for CW to Lub Oil Coolers.	Grey 9002	V	V	V	S	Stainless Steel lines (if applicable) are not to be painted.
5	Turbine Integral Piping for CW to HPSU	Grey 9002	V	V	V	S	Stainless Steel lines (if applicable) are not to be painted.
6	Turbine Integral Piping for Turbine Drainage	Grey 9002	V	NA	NA	NA	Pipes are insulated at site. Only Primer Paint (40 microns) as per table above shall be applicable.

Manoj Pandey

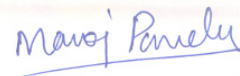
	STEAM TURBINE ENGINEERING BHEL, HEER, HARIDWAR INDIA	DOC NO. 1150-001-110-PVM-W-110B	
		REV. - 01	DATE: 11.10.2024

7	Turbine Integral Piping for Seal Steam System	Grey 9002	V	NA	NA	NA	Pipes are insulated at site. Only Primer Paint (40 microns) as per table above shall be applicable.
8	Turbine Integral Piping for Overload Valve Piping System	Grey 9002	V	NA	NA	NA	Pipes are insulated at site. Only Primer Paint (40 microns) as per table above shall be applicable.
9	Spring Cages	Black 9011	V	V	V	S	
10	Hangers and supports for turbine integral piping	Black 9011	V	V	V	S	
11	Dampers	Black 9011	V	V	V	S	
12	Valves of Turbine Integral Piping	Grey 9002	V	V	V	S	Painting is not applicable for Stainless Steel Valves of TIP. Painting is only applicable for Carbon Steel Valves of TIP. Identification Tag/Band of White 9010 color. Legend in black letters.
14	Control Panel For Lube Oil Purifier	<u>External (Front & Rear)</u> – Grey 9002 <u>External (Side)</u> – Blue 5012 <u>Internal</u> – Blue 5012	V	V	V	S	
15	Lube Oil Purifier	Grey 9002/ Opal Green 6026	V	V	V	S	Identification Tag/Band of White 9010 colour. Legend in black letters.
16	Gear Pump & return Pump (with motors)	<u>Pumps</u> : Grey 9002 <u>Motors</u> : Blue 5012	V	V	V	S	Identification Tag/Band of White 9010 colour. Legend in black letters.
17	Angle Valve (For Turbine Drain)	Grey 9002	V	V	V	S	Identification Tag/Band of White 9010 colour. Legend in black letters.

Manoj Puri

	STEAM TURBINE ENGINEERING BHEL, HEER, HARIDWAR INDIA					DOC NO. 1150-001-110-PVM-W-110B
						REV. - 01 DATE: 11.10.2024

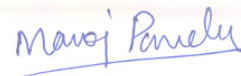
18	Spray Nozzle	NA	NA	NA	NA	NA	Painting is not applicable because the spray Nozzles are in Stainless Steel.
19	HPT Steam Evacuation Valve	Grey 9002	V	V	V	S	Identification Tag/Band of White 9010 colour. Legend in black letters.
20	Dirty/Leakage oil tank & Waste oil tank	Grey 9002	V	V	V	S	Identification Tag/Band of White 9010 colour. Legend in black letters.
21	Oil Module						
21.1	Oil tank (MOT)	NA	NA	NA	NA	NA	Painting is not applicable because the tank is in Stainless Steel.
21.2	MOP, EOP, JOP (With Motors)	Pumps : Grey 9002 Motors : Blue 5012	V	V	V	S	Identification Tag/Band of White 9010 colour. Legend in black letters.
21.3	Oil Vapour Exhauster (including Motor)	Exhauster : Grey 9002 Motors : Blue 5012	V	V	V	S	Identification Tag/Band of White 9010 colour. Legend in black letters.
21.4	Duplex Filter (Lub oil)	Grey 9002	V	V	V	S	Identification Tag/Band of White 9010 colour. Legend in black letters.
21.5	Duplex Filter (Jacking Oil)	Grey 9002	V	V	V	S	Identification Tag/Band of White 9010 colour. Legend in black letters.
21.6	3-way Temperature Control Valve (Motorized) for Lube Oil (with Actuator)	NA	NA	NA	NA	NA	Painting is not applicable because the valves are in Stainless Steel. Identification Tag/Band of White 9010 color. Legend in black letters.



PAINTING SCHEME FOR TURBOGENERATOR AND AUXILIARY SYSTEMS

Sl No	Details								
01	The following are the details of painting scheme:								
	Paint (Coat)		Paint Type		No. of coat		DFT*		
	Primer Paint		: Epoxy based Zinc rich primer paint		2 Coats		70		
	Intermediate Paint		: Epoxy TiO ₂ Pigmented Polyamide Cured Paint		1 Coat		70		
	Finish (Final) Paint		: Aliphatic Acrylic 2 Pack Polyurethane Finish paint		1 Coats		60		
					-----		Total DFT		200

	* DFT – Dry Film Thickness (final) in microns.								
02	Details of Color Scheme :								
	(Legend : W-at BHEL works; S-at site; V-at vendor's works; NA- Not Applicable)								
	No	Assembly	Shade as per IS-5 or Eq.	Primer	Int. Paint	Final Paint	Touch-up	Identification Tag / Band Colour	Remarks
	A	Turbogenerator (Stator, end-shields etc.)	Blue RAL 5012	W	S	S	NA	White RAL 9010	Identification tag/Band of white 9010 colour. Legend in black letters.
	B	Exciter	NA	W	NA	NA	NA		
	C	Exciter Cover	Blue RAL 5012	W	S	S	NA	White RAL 9010	Identification tag/Band of white 9010 colour. Legend in black letters.
	D (i)	S.O. Unit – Air Side (Including Seal oil Pump & excluding Motor of Seal oil Pump)	Grey RAL 9002	W	W	W	S	White RAL 9010	Identification tag/Band of white 9010 colour. Legend in black letters.
	D (ii)	Motor of Seal oil pump-Air side (AC & DC)	Blue RAL 5012	V	V	V	S		
	E (i)	S.O. Unit-H2 Side ((Including Seal oil Pump & excluding Motor of Seal oil Pump)	Grey RAL 9002	W	W	W	S	White RAL 9010	Identification tag/Band of white 9010 colour. Legend in black letters.
	E (ii)	Motor of Seal oil pump-H2 side	Blue RAL 5012	V	V	V	S		
	F	Seal Oil cooler	Blue RAL 5012	W	W	W	S	White RAL 9010	Identification tag/Band of white 9010 colour. Legend in black letters.
	G	Seal Oil Valve Rack	Grey RAL 9002	W	W	W	S	White RAL 9010	Identification tag/Band of white 9010 colour. Legend in black letters.
	H	S.O. Storage Tank	Grey RAL 9002	W	W	W	S	White RAL 9010	Identification tag/Band of white 9010 colour. Legend in black letters.
	I	Liquid Detector Rack	Grey RAL 9002	W	W	W	S	White RAL 9010	Identification tag/Band of white 9010 colour. Legend in black letters.

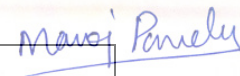


J	S.O. Piping & S.O. system impulse piping	Grey RAL 9002	V/ W	S	S	NA	Light Brown ISC 410	Legend - SO
K	Gas Unit	Grey RAL 9002	W	W	W	S	White RAL 9010	Identification tag/Band of white 9010 colour. Legend in black letters.
L	H2 Distributor	Grey RAL 9002	W	W	W	S		
M	CO2 Distributor	Grey RAL 9002	W	W	W	S		
N	N2 Distributor	Grey RAL 9002	W	W	W	S		
O	CO2 Vapouriser	Grey RAL 9002	W	W	W	S		
P	Refrigeration Gas Dryer	Grey RAL 9002	V	V	V	S		
Q	H2 Piping	Grey RAL 9002	W	S	S	NA	Canary Yellow ISC 309	Legend - H
R	CO2 Piping	Grey RAL 9002	W	S	S	NA	Canary Yellow ISC 309	Legend – CO2
S	Gas system impulse piping	Grey RAL 9002	W	S	S	NA	Canary Yellow ISC 309	
T	ACW Piping for H2 coolers	Grey RAL 9002	W	S	S	NA	Sea Green ISC 217	Legend - ACW
U	Bearing Vapour Exhauster	Grey RAL 9002	V	V	V	S		
V (i)	PW pump & filter unit (Including PW Pump & excluding Motor of PW Pump)	Grey RAL 9002	W	W	W	S	White RAL 9010	Identification tag/Band of white 9010 colour. Legend in black letters.
V (ii)	Motor of PW Pump	Blue RAL 5012	V	V	V	S		
W	PW coolers	Blue RAL 5012	V	V	V	S	White RAL 9010	Identification tag/Band of white 9010 colour. Legend in black letters.
X	PW Piping & impulse piping	Grey RAL 9002	W	S	S	NA	Sea Green ISC 217	Legend - DMW
Y	PW tank	Grey RAL 9002	W	W	W	S	White RAL 9010	Identification tag/Band of white 9010 colour. Legend in black letters.
Z	Hanger & Pipe supports	Black RAL 9011	W	S	S	NA		
AA	Ion Exchanger	Grey RAL 9002	W	W	W	S		

Note (For painting in BHEL scope at site):- For painting work at Site, Identification tags and for touch-up paints (if required), procurement of painting materials and execution of painting work are in scope of BHEL Site Office (PS-Region).

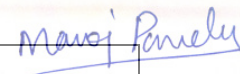
CONDENSER AND HEAT EXCHANGERS

SI No								
	Following painting scheme is selected based on specification for all components except Gland Steam Condenser:							
	Paint (Coat)	Paint Type			No. of coat	DFT*		
	Primer Paint	: Epoxy base Zinc rich primer paint			2 Coat	70		
	Intermediate Paint	: Epoxy TiO ₂ Pigmented Polyamide Cured Paint			1 Coat	70		
	Finish (Final) Paint	: Aliphatic Acrylic 2 Pack Polyurethane Finish paint			2 Coats	60		
	Total DFT 200 microns							
	For Gland Steam Condenser:							
	Paint (Coat)	Paint Type			No. of coat	DFT*		
	Finish (Final)	: Heat Resistant Aluminium paint (Gr-1 as per IS :13183)			2 Coats	40		
	Total DFT 40 micron							
	* DFT – Dry Film Thickness (final) in microns.							
A.	Details of Color Scheme (Outside Surfaces):							
	(Legend: W-at BHEL works; V- at vendor's works; S-at site; NA-Not applicable)							
		Assembly	Shade as per IS-5 or Eq.	Primer	Int. Paint	Final Paint	Touch-up	Re-marks
	1	Condenser	Blue RAL 5012	W	W	S	NA	
	2	L.P. Heater No.1&2	Blue RAL 5012	W	W	W	S	
	3	Turbine Oil Cooler (PHE Type)	Blue RAL 5012	V	V	V	S	All surface other than stainless steels shall be painted.
	4	Gland Steam Condenser	Al-Paint (Gr-1 as per IS :13183)	NA	NA	W	NA	
	5	Hydrogen Coolers	Grey RAL 9002	W	W	W	S	



	6	Air Exhauster for Gland Steam Condenser	Grey RAL 9002	V	V	V	S	
	7	PTFE Sliding Support Bearing for Condenser	Blue RAL 5012	V	V	V	NA	
	8	Condenser Air Evacuation Equipment	Blue RAL 5012	V	V	V	NA	
	# For painting work at Site, paint & painting materials are to be arranged at site by BHEL-Site.							

B.		Details of Painting (Inside Surfaces):						
		Assembly	Shade as per IS-5 or Eq.	Primer	Int. Paint	Final Paint	Tou ch-up	Remark
	01	Condenser:						
		I) Cooling water side surfaces (water boxes inside)	Black	W (DFT 70 microns) (Epoxy based Zinc rich primer)	--	S (High Build Black Coal Tar Epoxide Paint, Total DFT 0.25mm)	NA	
		II) Tube plate surface towards water box side.	-do-	S @	--	-do-	-do-	After tubing.



		III) Shell side inside surfaces (steam side)	Shell side inside surfaces are supplied coated with Steam Washable Paint at Works. This paint is to be washed before commissioning	
	02	DELETED	DELETED	L.P.Heater No.1/2 & Gland Steam Condenser are supplied with Nitrogen filled. Hence inside painting is not applicable.
	## For painting work at Site, paint & painting materials are to be arranged at site by BHEL-Site.			

@ Tube plate surface is supplied painted with steam washable paint which is to be cleaned before applying Primer on water box side surface.



A Maharatna Company

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(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-9587-001-151-PVM-G-002

Date : 01/01/2025

From : ANAND KUMAR
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Subject : EPC Package

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

Vendor Drg. No. : PYAZ4M213831603
Orgn. Drg. No. : 9587-001-151-PVM-G-002
Revision No. : 00
Drg. Title : PAINT SCHEDULE
App. Category : CATREL
Release Date : 01/01/2025



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Comments : This is Auto Archive drawing / document developed & released by BHEL. Review & approval of the same by NTPC Engineering is not envisaged.



Engineering Division
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अभियंत्रिकी कार्यालय परिसर, प्लॉट नं.- ए 8ए, सेक्टर-24, पोस्ट बॉक्स नं.- 13, नोएडा (उ.प्र.) पिन-201 307

टेलिफोन नं.- 0120-2410333, 2410116 फैक्स-0120-2410136, 2410137

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टेलिफोन नं.- 011-24361018 फैक्स-011-24361018, वेबसाइट: www.ntpc.co.in

ENGINEERING OFFICE COMPLEX, Plot No: A-8A, Sector-24, Post Box No: 13, Noida (UP), Pin-201 307

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Name of the Project/ Package : LARA SUPER THERMAL POWER PROJECT STG-II, EPC Package

Drawing / Document Number : 9587-001-151-PVM-G-002



Drawing / Document Title : PAINT SCHEDULE


“We confirm that this document meets all the contract requirements including safety and statutory 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”

	Project :	2 x 800 MW LARA SUPER THERMAL POWER PROJECT (STAGE-II)	Document No.	
			BHEL	PY-AZ-4-M213-8316-03
	Customer :	NTPC Limited	Customer	9587-001-151-PVM-G-002
	Package :	Fire Protection & Detection System	REV. 00	
			Date: 31.12.2024	Page 1 of 2

Standard Note:

We confirm that this document meets all the contract requirements including safety and statutory 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 noncompliance of contract specification as deemed fit by the Employer shall be recovered.

31.12.24	00	First Submission	Aviral	Kamaluddin	PCS
Date	Rev	Description of Revision	PREP.	CHD	APPD
CUSTOMER:  A Maharatna Company		NTPC LIMITED			
CONTRACTOR: 		BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION, HYDERABAD			
		BHEL Doc. No: PY-AZ-4-M213-8316-03			Rev: 00
PACKAGE		FIRE PROTECTION & DETECTION SYSTEM			
TITLE		PAINT SCHEDULE - FIRE PROTECTION SYSTEM			
PREPARED BY		AVIRAL		31-12-24	
CHECKED BY		KAMALUDDIN		31-12-24	
APPROVED BY		PCS		31-12-24	

		<div>BHARAT HEAVY ELECTRICALS LIMITED</div> <div>PROJECT ENGINEERING & SYSTEMS DIVISION</div> <div>HYDERABAD-32</div>			
PAINTING SCHEDULE FOR FIRE PROTECTION SYSTEM (FPS)					
1. Paint requirement FOR Over-ground (GI Pipe) pipes normally empty but periodically charged with water .					
SL No	Name of the item	Type	Number of coat	DFT of each layer in micron	Remark
1	Primer	Etch Primer: micaceous iron oxide (MIO)	2	6	
2	Final Paint	Synthetic Enamel paint (Long Oil Alkyd) to IS2932.	3	25	Shade : RAL3000 PO RED
		Total DFT in micron		87	
Note: Surface preparation shall be done either by manually or by any other approved method.					
2. Paints for external surfaces protection of piping / fittings/ Structural steel for piping, and other FPS items (Carbon steel /Mild Steel) to be installed indoor and outdoor.					
SL No	Name of the item	Type	Number of coat	DFT of each layer in micron	Remark
1	Primer	Red Oxide Zinc Phosphate primer to IS 12744 (Alkyd base)	1	30	
2	Final Paint	Synthetic Enamel paint (Long Oil Alkyd) to IS2932.	3	25	Shade : RAL3000 PO RED shade for structural steel: Dark Admiralty Grey colour shade 632
		Total DFT in micron		105	
Note: 1. Surface preparation shall be done by means of Degreasing and Mech. Cleaning with wire brushing/hand tool (SP6 as applicable).					
3. Paints for external surfaces protection of Deluge valve, water monitor etc. to be installed indoor and outdoor.					
SL No	Name of the item	Type	Number of coat	DFT of each layer in micron	Remark
1	Primer	Zinc filled epoxy Primer	1	35	
2	Final Paint	Aliphatic Polyurethane	3	30	Shade : RAL3000 PO RED
		Total DFT in micron		125	
Note: 1. Surface preparation shall be done by means of Degreasing and Mech. Cleaning with wire brushing/hand tool (SP6 as applicable).					
Note:					
1	Paint shall be as per IS 2932.				
2	Painting not required on a. Uninsulated austenitic stainless steel, b. Plastic and/or plastic coated materials and c. Non-ferrous materials like aluminum.				



A Maharatna Company

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-1150-001-102-PVM-B-001B

Date : 14/10/2024

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. : HPBP-00-1150-192
Orgn. Drg. No. : 1150-001-102-PVM-B-001B
Revision No. : 01
Drg. Title : PAINTING SCHEME FOR LP PIPING
App. Category : CAT-I
Release Date : 14/10/2024



Scan to verify

Comments : No Comments



Engineering Division
ISO 9001:2008 Certified



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COMMENT RESOLUTION SHEET

Dt: 10-09-2024

PROJECT : NTPC SINGRAULI SUPER THERMAL POWER PROJECT- STAGE III (2X800 MW)

BHEL Doc No : 1840:QPC:12 Rev 01

NTPC Doc No : 1150-001-102-PVM-B-001B





Document Description : PAINTING SCHEME FOR LP PIPING

Sl. No.	NTPC COMMENT	BHEL's REPLY
1.	Please include the details of painting for the compressed air system as per Part-B, Sub-section-A-16.	As only galvanized piping is in the piping scope for the compressed air system, painting is not applicable as per S. No:4 of the painting scheme.
2.	Primer & painting of buried pipe shall be done as per clause no. 2.09.03, Sub-Section A-09, LP Piping, Part-B, Section-VI of technical specifications.	Noted and updated in Notes-S. No: 6
3.	Drawing no. to be corrected.	Noted and modified the drawing no.
4.	BHEL to provide referred codes to NTPC as per Spec requirement.	The referred codes are standard documents and are readily available in open domain.
5.	<p>INCLUDE IN NOTES:</p> <p>5)Surface preparation, priming and painting of all non-insulated above ground piping except galvanized steel piping & stainless steel piping. Paints and varnishes, primers, thinners etc. as required for anti-corrosive protection of piping above ground</p> <p>6)anti-corrosive protection anticorrosive tape or coating wrapping on the external surfaces of pipes to all directly buried piping including galvanized carbon steel piping shall be provided.</p>	<p>Noted and updated in Notes-S. No: 5</p> <p>Noted and updated in Notes-S. No: 6</p>

Based on the above clarifications, NTPC is requested to approve the PAINTING SCHEME FOR LP PIPING.



For BHEL

 BHARAT HEAVY ELECTRICALS LIMITED PIPING QUALITY ASSURANCE & CONTROL DEPT, TRICHY			PAINTING SCHEME FOR LP PIPING (ACW / ECW / Plant water, Air Piping, etc...,) PROJECT : NTPC SINGRAULI SUPER THERMAL POWER PROJECT- STAGE III (2X800 MW) BHEL CUSTOMER Nos : 1840,1841								QPNo: 1840;QPC:12 REV.NO: 01 Dt : 10.09.2024	
Sl. NO	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat			Finish coat			Total DFT Microns (Min.)	REMARKS
			Primer	No of coats	Paint	No of coats	Shade	Paint	No of coats	Shade		
1	2	3	4	5	6	7	8	9	10	11	12	13
1	(a) Internal Surface - ACW Pipe (for pipe - dia - 1000 mm and above)	Blast Cleaning SSPC SP-10 SA 2½ (Refer Note 1)	Epoxy based Zinc rich Primer (Refer Note 2)	1 (50 Microns Min. per coat)	-----	-----	-----	Coal tar epoxy (Refer Note 2)	2 (75 Microns Min. per coat)	-----	200 Microns (Refer Note 3)	(Refer Note 3)
	(b) Holiday test (Refer Note 3)	Holiday testing by low voltage (75 Volts Min.) wet sponge Holiday detector or by High voltage (Voltage per micron of DFT is as recommended by Paint Manufacturer subjected to minimum of 5V / Micron). Holiday test Equipment to be calibrated before testing.										
2	External Surface of ACW --Buried Piping / Encased in concrete (Temporary Protection for transportation from works to site). **Further protection to be done by BHEL Erection Group as per Contract requirement.	SSPC-SP3 / Power Tool Cleaning	Red Oxide Zinc Phosphate (Alkyd base to IS 12744)	1 (30 Microns per coat)	-----	-----	-----	-----	-----	-----	30 Microns	
3	External Surface a) Over ground piping of ACW (For all diameters) b) External Surface of ECW, Plant water (For all diameters)	SSPC-SP3 / Power Tool Cleaning	Red Oxide - Zinc Phosphate (Alkyd base to IS: 12744)	2 (25 Microns per coat)	-----	-----	-----	Synthetic enamel Long oil Alkyd to IS: 2932	3 ** (35 microns per coat)	Smoke Grey (Shade No. 692 of IS: 5)	120 at shop + 35 at site	** (2 coat at shop + 1 coat at site)
4	Galvanised and Stainless steel Piping	No painting										
Notes: 1 Blast cleaning to near white metal to obtain roughness as per epoxy paint data sheet. 2 Application of Epoxy based Zinc rich Primer, Coal Tar Epoxy shall be done as per manufacturer's data sheet / recommendation, meeting the thickness requirements as per this document. 3 Testing requirements like DFT, holiday test shall be as per BHEL approved QP with Witness by BHEL / BHEL nominated inspection agency. 4 Colour shade shall be as per NTPC colour coding scheme. 5 Surface preparation, priming and painting of all non-insulated above ground piping except galvanized steel piping & stainless steel piping shall be as mentioned in the above painting scheme 6 For External Surface of ACW --Buried Piping / Encased in concrete, painting scheme for Temporary Protection for transportation from works to site is mentioned in S. No: 2. **Further protection to be done by BHEL Erection Group for Coating and wrapping/ Anti corrosive Protection Coal tar tape on the External Surface of ACW --Buried Piping / Encased in concrete as per Contract requirement.												
								For NTPC use MDL No : 1150-001-102-PVM-B-001B			Page 1/1	
PREPARED BY :			REVIEWED BY:		APPROVED BY:							
M MANOJ PANDI MGR/QA			K. SARANYA MGR/QA		S JEGAN SR.MGR/Q							