Bharat Heavy Electricals Limited
Power Sector-Western Region
Shreemohini complex, 345 - Kingsway
Nagpur -440 001
फैक्स FAX: 0712- 3048698- 699/ 3048605 www.bhelpswr.co.in

Ref: BHE/PW/PUR/KTI-BLR/1017-18/Corrigendum 01 **Date** 17/07/2012

To

ALL BIDDERS

Sub: Corrigendum -01 for Issue of Clarifications and Correction in Typographical error

JOB: Collection of materials from BHEL/clientôs stores/storage yard; transportation to site of work; pre-erection checks, pre-assembly if necessary, erection, testing, assistances for commissioning & trial operation, handing over, assistance for performance guarantee test of **Boiler and its Auxiliaries**, Electrostatic Precipitator (ESP) Power Cycle Pipeline, Rotating Machines, insulation, final painting etc of **Unit 1 & Unit 2 of 2x150 MW OPG Power Gujarat** Private Ltd At OPGPGPL Bhadreshawar TPP Distt. Kutch (Gujarat).

Sl No	Tender Specification Number	Unit Number & Project
1	**BHE/PW/PUR/KTI-BLR(Vertical Pkg) U 1/1017**	**150 MW Boiler Vertical Pkg** of **Unit 1**
2	**BHE/PW/PUR/KTI-BLR(Vertical Pkg) U 2/1018**	**150 MW Boiler Vertical Pkg** of **Unit 2**

Bidders to kindly take note of the following:

AA) Correction in Typographical Error

1. Refer Clause 3.3.1.b): ôWater Supply: Further Distribution as per the requirement of Work including supply of materials and executionôat Page 36 of volume IA ôTCCôis inadvertently indicated in the scope of BHEL. **Same is in the Scope of BIDDER.**

2. Title at **Page 59 to 80 of volume IA 'TCC'** is inadvertently indicated as ôAnnexure II ï IBR Weld Joints in the Scope of Contractô Same may be read as ô**Annexure I – Tentative Weight Details'.**

BB) Clarification to the Queries of Bidder

Sl No.	Reference Clause	Bidder's query	BHEL's clarification
1	Chapter-III. Sr. No.3.3.3 (a): Making the water available at single point at Page-37 of Vol IA TCC,	Confirm whether Water supply for living purpose provided by BHEL/Customer is chargeable or free of cost.?	Water supply for living purpose shall be provided by BHEL/Customer free of cost.
2	Chapter-VI, Clause No. 16.2.a at Page 108 of Vol I A TCC.	Annexure-III ôPainting Schemeôindicated in clause is not available in the tender.	Painting scheme as referred in Cl. No. 16.2.a) is attached herewith. Painting scheme for Ranipet Supplies and Piping refers to Hindalco Mahan Project and same will be applicable for subject Project also.

All other Terms and conditions of the Tender Specification shall remain unaltered unless expressly amended by BHEL in writing.

Bidders are requested to submit as a part of Technical Bid, a copy of this corrigendum duly countersigned by the authorized signatory and stamped with the Official seal as a token of Bidder's unqualified acceptance of this corrigendum.

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Ref: BHE/PW/PUR/KTI-BLR/1017-18/Corrigendum 01 **Date** 17/07/2012

This letter is hosted as file titled "Corrigendum-01 (Clarification-1017-18)" against NIT-12269 in BHEL web page (www.bhel.com→Tender Notifications → View Corrigendum).

Thanking you,

Yours faithfully,

AGM (Purchase)

Encl: Painting Scheme

BHARAT HEAVY ELECTRICALS LIMITED
Tiruchirappalli - 620 014

PAINTING SCHEME FOR M/s.OPG POWER GUJARAT PVT. LIMITED 2 X 150 MW BHADRESHWAR, KUTCH, GUJARAT CUSTOMER NO: U1/ 0170 & U1/ 0171

Prepared by	L. Gragori Manager / P. Lab		Document No: Q: PL: C3 - PS /170
Reviewed by	S.Dhanabal DGM/Product Eng. / FB		Revision No: 00 Dated: 05-10-2009
Approved by	Dr.G.Ravichandran SDGM /P. Lab		Sheet No. : 1 of 11

N/ CHEM/CONTRACTS 09/OPG POWER GUJRAT PVT LTD_00.DOC.

RECORD OF REVISIONS

Rev. No	Date	Details of revision	Remarks
00	05-10-2009	NEW	BHEL STD Painting scheme for Coastal/Refinery Atmosphere.

Sr. No.	Item No.	Description	Surface Preparation & Surface Profile	Primer coat		Intermediate Coat		Finish coat			Total DFT µm (min)
				Paint	No. of Coats / DFT	Paint	No. of coats	Paint	No. of coats	Shade	
1.1	1AC	Drum (Except Internals) **04** – 114, 116, 118, 124, 126, 128, 210, 212, 214, 270	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744	1 / DFT= 30µm per coat	--	--	Synthetic Enamel paint (Long Oil Alkyd) to IS 2932	2 DFT= 20µm per coat	Inter-national Orange Shade No: 592 of IS 5	70
1.2	1AC	Drum Suspension **04** -142, 144, 146, 148	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744	1/ DFT= 30µm per coat	--	--	Synthetic Enamel paint (Long Oil Alkyd) to IS 2932	2 DFT= 20µm per coat	Inter-national Orange Shade No: 592 of IS 5	70
1.3	5	Drum Internals **04** – 134, 136, 138 Other Machined Components: **43** – 101, 102, 103, 104, 105, 106, 107	SSPC-SP1 or SP3 Solvent / Power Tool Cleaning	Rust Preventive Fluid to PR: CHEM: 09 – 04	1 DFT=20µm per coat	--	--	--	--	--	20
1.4	1AE	Drum Transport Structures **04** - 194, 196, **35** - 391, 810	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744	1 DFT= 30µm per coat	--	--	Synthetic Enamel paint (Long Oil Alkyd) to IS 2932	2 DFT= 20µm per coat	Yellow Shade No: 356 of IS 5	70
2.1	11	Foundation Materials and Pin: **35** - 010, 011, 012, 013, 020, 030, 190 **38** – 010 **39** - 010, 011, 012, 020, 030, 040 48 – 019 & Columns below " 0 " level of PG 35,36, 38 & 39	--	No Paint	--	--	--	No Paint	--	--	--

Sl. No.	Scheme 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	
2.2	1B	Buck Stays and Structural Items: Buck stays **08** – 001, 003, 006, 007, 101, 104, 107, 111, 380, 382, 400, 500, 501, 503, 700, 900, 901, 904, 907, 910 Boiler Supporting Structures **35** – 100, 110, 111, 112, 120, 121, 122, 130, 131, 132, 133, 134, 135, 136, 140, 141, 142, 143, 144, 150, 151, 152, 153, 160, 161, 162, 171, 172, 173, 174, 181, 182, 183, 184, 185, 186, 191, 192, 193, 194, 195, 196, 210, 211, 212, 213, 214, 220, 221, 222, 230, 231, 232, 240, 250, 310, 311, 312, 320, 321, 322, 330, 331, 332, 340, 341, 342, 350, 351, 352, 360, 361, 362, 380, 381, 382, 383, 390,392, 410, 420, 430, 440, 441, 442, 443, 451, 452, 453, 461, 462, 463, 471, 472, 473, 481, 482, 483, 500, 510, 511, 512, 513, 514, 520, 521,522, 523, 524, 530, 531, 532, 533, 540, 541, 542, 550, 551, 552, 561, 562, 563, 571, 572, 573, 581, 582, 583, 591, 592, 593, 594, 595, 596, 597, 598, 599, 610, 612, 613, 710, 711, 712, 713, 715 **36** – 110,120, 130, 150, 200, 210, 211, 212, 220, 221, 222, 230, 231, 232, 240, 241, 242, 250, 251, 252, 260, 261, 262, 270, 271, 272, 280, 281, 282, 290, 291, 292, 300, 301, 302, 310, 311, 312, 313, 314, 315, 316, 320, 321, 322, 323, 324, 325, 326, 327, 330, 331, 332, 333, 334, 335, 340, 341, 342, 343, 344, 345, 346, 347, 348, 350, 351, 352, 353, 354, 355, 360, 361, 362, 363, 370, 371, 372, 380, 381, 382, 383, 390, 391, 392, 393, 394, 395, 396, 397, 410, 420, 430, 490, 491, 492, 510, 520, 610, 612, 620, 621, 630, 631, 632 **38** – 110, 120, 130, 210, 211, 299, 310, 311, 380, 381, 390, 410, 510, 511, 512, 513, 521, 522, 610, 611, 612, 620, 710, 712, 720, 730 **39** - 100, 101, 102, 110, 120, 121, 130, 140, 141, 142, 143, 150, 160, 200, 210, 300, 301, 303, 304, 305, 306, 311, 312, 323, 390, 391, 392, 393, 901 Duct Supports **48** – 005, 015, 025, 045, 055, 065, 085, 105, 115, 125, 145, 155, 185, 195, 200,205, 215, 225, 235, 245, 255, 265, 275, 295, 305, 315, 325, 335, 345, 355, 365, 375, 385, 415, 425, 435, 445, 455, 465, 475, 485, 495, 665, 805, 815, 825, 845, 855, 865, 875, 885, 995 Piping Centre: 80-800 to 882, 920 to 933, 940	SSPC-SP3/ Power Tool Cleaning	HB Chlorinated Rubber based Zinc Phosphate Primer DFT= 50µm per coat	2	--	--	Chlorinated Rubber Based Finish Paint DFT= 30µm per coat	2	Smoke Grey Shade No: 692 of IS 5	160

Sl. No.	Scheme 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	
2.3	1BA	Hangers: **36** - 740, 741, 742, 743, 744	SSPC-SP3/ Power Tool Cleaning	HB Chlorinated Rubber based Zinc Phosphate Primer DFT= 50µm per coat	1	--	--	Synthetic Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 20µm per coat	2	Smoke Grey Shade No: 692 of IS 5	90
2.4	6	Floor grills, Guard plate** **35** – 811 **36** - 010, 810, 811, 812, 813, 814, 815, 816, 840 **38** - 810, 811 **39** – 810, 811, 840, 841	Floor Grills : Hot dip Galvanizing to a coating weight of 610 gm per sq.m (minimum) and to a coating thickness of 85.0 microns (minimum). ** Guard plates will be painted as given in Sl. No. 2.2.								
2.5	1BB	Hand Rails & Posts **35** - 850, 851 **36** - 850, 851, 852, 853 **38** - 850, 851 **39** - 850, 851	SSPC-SP3/ Power Tool Cleaning	HB Chlorinated Rubber based Zinc Phosphate Primer DFT= 50µm per coat	1	--	--	Synthetic Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 20µm per coat	2	Black	90
2.6	1BB	Ladders & Stairs **35** – 820, 821, 822, 823 **36** – 820, 821, 822, 823 **38** – 820, 821 **39** – 820, 830, 831 **48** - 466	SSPC-SP3/ Power Tool Cleaning	HB Chlorinated Rubber based Zinc Phosphate Primer DFT= 50µm per coat	1	--	--	Synthetic Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 20µm per coat	2	Black	90

Sl. No.	Scheme 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	
3.1	10	Components >95° C Un-insulated other than components coming in Gas Path **09** - 001, 002, 003 **21** - 800, 850, 875, 997 **24** – 120, 160, 173, 180, 185, 190, 195, 220, 260, 273, 280, 285, 290, 320, 345, 360, 373, 380, 385, 390, 395, 420, 460, 480, 485, 490, 495, 520, 560, 573, 580, 585, 590, 660, 680, 685, 690, 820, 860, 880, 885 **28** – 220 **42** – 300, 318, 328, 348, 358 **48** - 380	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Grade-I	1 (DFT =20µm per coat)	--	--	Heat Resistant Aluminium Paint to IS 13183 Grade-I	1 (DFT =20µm per coat)	Aluminium	40
3.2	3	Components >95° C **Insulated** **05** - 137, 139, 147, 153, 154, 155, 158, 159, 175, 188, 195, 220, 227, 229, 231, 236, 241, 246, 251, 265, 281, 283, 296, 330, 340, 341, 350, 493, 879, 900 **07** - 101, 102, 104, 106, 107, 108, 109, 200, 201, 202, 203, 204, 211, 212, 214, 215, 216, 217, 218, 221, 222, 223, 225, 226, 229, 231, 232 **10** – 100, 120, 122, 135, 136, 140, 141, 151, 170, 174, 178, 179, 180, 191, 195, 218, 220, 222, 235, 236, 240, 241, 251, 270, 274, 278, 279, 280, 283, 284, 291, 295, 315, 687 **15** – 136, 138, 147, 174, 177, 192, 193, 236, 238, 274, 279, 292, 293, 999 **17** – 138, 177, 776, 807, 900, 903 **18** – 001, 002, 003, 010, 020 **19** – 701, 702, 753, 903 **21** – 600 **24** – 100, 115, 175, 200, 215, 275, 295, 300, 315, 375, 475, 500, 568, 600, 620, 675, **42** - 020, 021, 025, 030, 031, 032, 033, 036, 037, 038, 128, 150, 153, 158, 159, **48** –035,135,202, 204, 207, 208, 212, 214, 217, 221, 222, 224, 227, 228, 229, 232, 234, 242, 244, 252, 254, 261, 262, 264, 267, 272, 274, 276, 282, 284, 292, 294, 302, 304, 307,308, 309, 311, 312, 314, 318, 319, 322, 324, 332, 334, 342, 352, 362, 364, 372, 374, 381, 382, 384, 386, 388, 389, 392, 412, 414, 422, 424, 426, 432, 434, 438, 439, 442, 444, 452, 454, 462, 464, 467, 468, 469, 472, 474, 482, 484, 486, 487, 488, 489, 491, 492, 494, 496, 497, 498, 499, 602, 612, 622, 632, 646, 652, 654, 656, 662, 664, 666, 667, 668, 669, 676, 686, 696	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744	2 DFT= 30µm per coat	-	--	--	--	Red Oxide	60

Sl. No.	Scheme 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	
3.3	2	Heat Exchanger Coils: (SH, RH & Economiser Coils) **11** - 036, 037, 038, 074, 077, 078, 095, 135, 136, 138, 170, 174, 175, 178, 179, 235, 236, 237, 238, 248, 250, 251, 271, 272, 274, 275, 277, 278, 279, 280, 336, 337, 338, 340, 342, 356, 358, 370, 374, 377, 378, 395, 585, 587, 591, 606, 608, 616, 618, 682, 683, 684, 685, 686, 687, 688, 691, 694, 716, 717, 718, 767, 768, 769, 787, 791, 882, 883, 884, 885, 887, 916, 917, 918, 967, 968, 969, 986, 987, 988, 991, 994, 999 **12** – 135, 136, 170, 174, 178, 184, 187, 335, 395, 495, 515, 535, 551, 619, 800, 803, 805, 850, 851, 852, 900, 901, 903, 906, 914, 917, 924, 927, 928, 944, 948, 954, 968, 988, 999 **16** – 077, 079, 132, 235, 236, 237, 238, 256, 275, 277, 279, 281, 377, 379 **19** - 001, 104, 105, 114, 124, 184, 802, 814, 824, 884, 914, 924, 984	SSPC – SP2 or SSPC – SP3 Hand tool / Power tool cleaning	Red Oxide Zinc Phosphate Dip coat primer to PR: CHEM: 09 – 03	1 DFT= 35µm per coat	--	--	--	--	--	35
3.4	3	Components coming in Gas Path other than Coils **06** - 033, 036, 037, 041, 043, 046, 047, 052, 054, 089, 090, 091, 092, 093, 094, 130, 133, 136, 137, 141, 143, 146, 147, 152, 154, 189, 190, 191, 192, 193, 194, 231, 331, 350, 400, 430, 466, 467, 500, 530, 609, 611, 613, 614, 616, 620, 621, 623, 624, 630, 631, 633, 634, 636, 637, 639, 640, 641, 643, 644, 646, 647, 649, 650, 651, 652, 653, 654, 655, 657, 658, 659, 670, 689, 690, 691, 692, 693, 694, 695, 709, 713, 714, 715, 716, 720, 723, 730, 731, 733, 734, 737, 740, 741, 743, 744, 747, 749, 750, 751, 753, 755, 789, 790, 830, 840, 850, 851, 857, 895, 896, 897 **10** – 182, 183, 184, 185 **16** – 988, 999 **19** – 703, 704, 708, 763, 783, 850, 851, 900, 988, 999 **30** – 010, 104, 105, 211, 212, 216, 217, 218, 219, 220, 223, 227, 228, 233, 235, 993, **31** – 101, 102, 103, 104, 105, 108, 301, 993 **32** – 001, 002, 005, 006, 007, 008, 009, 010, 011, 012, 021, 022, 023, 024, 025, 026, 027, 031, 033, 041, 042, 043, 044, 050, 055, 061, 073, 110, 120, 210, 620, 720, 810, 910, 993 **42** - 129	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744	2 DFT= 30µm per coat	- -	--	--	--	Red Oxide	60
3.5	8A	Uninsulated Fuel Pipes **47** – 229, 265, 266. 267, 268, 269 Duct for Tube Mill: **48** – 802, 804, 812, 814, 817, 822, 824, 832, 834, 842, 844, 852, 854, 857, 862, 864, 867, 872, 874, 882, 884,	SSPC-SP3/ Power Tool Cleaning	General purpose Aluminium paint to IS 2339	2	--	--	--	--	Alumunum	40

No.	No.	iption	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	15	Constant Load and Variable Load Hangers (CLH / VLH) **(See NOTE 14)** **07** - 400, 401, 402, 403, 404, 405, 410, 420, 431 **10** - 200 **17** – 904, 906, 919, 929 **19** – 901, 904, 905, 906, 907 **24** - 346, 351	Abrasive blast cleaning to Sa 2 ½ 35- 50 microns	Epoxy zinc rich primer to IS 14589 Gr. II %VS=35 (min)	1 DFT=40 µm / coat	--	--	Aliphatic acrylic Poly-urethane paint %VS=40 (min) t	1 DFT=30 µm per coat	Phirozi Blue Shade No. 176 of IS5	70
5.1	1A	Miscellaneous and Casing Sheets: **07**-500, 501, 600, 601, 997, 999, **19** – 101, 102,**21** - 601, 987, **24** - 101, 125, 130, 135, 140, 201, 225, 230, 235, 240, 301, 325, 335, 340, 350, 370, 374, 400, 401, 425, 430, 435, 440, 470, 471, 473, 501, 525, 535, 540, 570, 601, 625, 635, 640, 800, 801, 815, 825, 987, 989, 996, 998 **35** - 994, 995, **36** - 613, 903, 999, **37** - 010, 110, 210, 310, 410, 510, 610, **39** - 302, 924 Fuel Firing: **41** – 100, 110, 200, 310, 320, 330, 340, 350, 390, 410, 420, 430, 450, 460, 470, 997 Steam Blowing Piping: **42** – 002, 003, 005, 010 **42** – 040, 045, 050, 055, 060, 065, 070, 111, 112, 113, 114, 118, 119, 120, 121, 122, 123, 124, 130, 131, 132, 151, 152, 154, 155, 156, 157, 160, 165, 170, 176, 180, 195, 196, 989, 997, 998 **43** – 000, 001, 002, 003, 004, 005, 006, 007, 008, 997, 999 **45** – 050, 120, 160, 161, 180, 181, 220, 221, 260, 261, 321, 325, 326, 401 **47** – 121, 122, 123, 124, 125, 129, 140, 141, 142, 143, 144, 145, 146, 149, 161, 162, 163, 164, 165, 169, 180, 181, 182, 183, 184, 185, 189, 200, 201, 202, 203, 204, 205, 209, 221, 222, 223224, 225, 241, 242, 243, 244, 245, 246, 247, 248, 249, 261, 262, 263, 264, 647, 648, 649, 650, 746, 953, 959, 963 Duct Plates and Expansion Joints: **48** – 002, 004, 007, 011, 012, 014, 017, 018, 022, 024, 028, 032, 034, 040, 042, 044, 052, 054, 062, 064, 066,072, 074, 082, 084, 092, 094, 102, 104, 107, 112, 114, 116, 122, 124, 132, 142, 144, 152, 154, 162, 172, 182, 184, 192, 194 Coal Handling: **65** – 051, 060, 070, 260, 402, 403, 460, 724, 736, 738, 786 **67** – 204, 251, 256, 261, 266, 271, 272, 276, 277, 283, 286, 400, 801, 802, 803, 804, 999 **99** – 201, 299	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744	1 DFT= 30µm per coat	--	--	Synthetic Enamel paint (Long Oil Alkyd) to IS 2932	2 DFT= 20	Smoke Grey Shade No: 692 of IS 5	70
5.2	3	Erection Materials and Commissioning Components: **04** - 988, **05**-993, **06**-993, **07** – 988, 993, **12**-993, **24** – 993, **28** – 993, **35** – 993, **36** – 993, **37** – 993, **38** – 993, **39** – 993, **48** – 988, 993, **65** – 988, **97**-585,**99** – 045, 099, 501, 502	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744	2 DFT= 30µm / coat	--	--	--	--	Red Oxide	60

No.	No.	ption	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	
6.1	10	Cast carbon steel valves (Conventional) Cast alloy steel valves (Conventional) All API valves, QCNRV, SV & SRV Silencers, Water Level gauge HP / LP system 22-101,889	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr.I	2	--	--	--	--	--	40
6.2	--	Forged valves	Phosphating	coating weight of 1500 mg per sq.ft.	--	--	--	--	--	--	--
6.3	1AS1	Soot Blower components 20-001,003,004,021,051,054,201,204,301,304,331,511,794,801,821,831,962,972	SSPC-SP3/ Power Tool Cleaning	HB Chlorinated Rubber based Zinc Phosphate Primer DFT= 50µm per coat	1 DFT= 50µm per coat	--	--	Synthetic Enamel paint (Long Oil Alkyd) to IS 2932	2 DFT= 20	Verdigris Green Shade No. 280 of IS5	90
6.4	36	On Shore OFE Components	SSPC-SP3/ Power Tool Cleaning	HB Chlorinated Rubber based Zinc Phosphate Primer DFT= 50µm per coat	2	--	--	Chlorinated Rubber Based Finish Paint DFT= 30µm per coat	2	French Blue Shade No: 166 of IS 5	160
6.5	35	Off Shore Components	SSPC-SP3/ Power Tool Cleaning	High Build Epoxy Mastic Aluminium Primer-	1 DFT= 100µm per coat	--	--	Aliphatic acrylic Poly-urethane paint To IS13213 %VS=40 (min)	1 DFT=30 µm per coat	French Blue Shade No: 166 of IS 5	130
6.6	8A	Hand Wheels	SSPC-SP3/ Power Tool Cleaning	General Purpose Aluminium Paint to IS 2339	2 DFT= 100µm per coat	--	--	--	--	--	40

PS for Arrows shall be as per valves and the final shade will be 'Post Office Red-Shade No. 538 of IS 5

1. **This painting scheme covers a comprehensive list of PGMAs being used in 125 / 150/ 210 / 250 / 500 MW and Industrial Boilers under Fossil Boilers working in coastal/Refinery environment, in an effort to standardise the painting scheme. Therefore, the entire list of PGMAs will not be applicable for any specific project and only those PGMAs applicable for the project may be used, while choosing the painting scheme applicable.**

2. Rust Preventive coating should be given on HSFG Bolt and Nut threads.

3. All threaded & machined surfaces and retainers are to be applied with a coating of Temporary Rust Preventive oil.

4. All surfaces of foundation 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.

5. PGMAs under Sub-Vendor items are not indicated. Please refer respective Engineering Document for all sub-vendor items. Wherever it is not specified, it shall be as per the painting scheme of the applicable PGMA.

6. No painting is required for Aluminium, Stainless Steel components and galvanized items. Abrasive blast cleaning to SSPC-SP6 (Sa 2) grade shall be done to prepare the surface of hot worked pipes prior to application of primer.

7. Wherever **inside surfaces** of components under PGMA 48 – XXX, need protection till erection, and all running meter items for spares and main item two coats of Red-oxide zinc phosphate primer paint to IS12744 to a DFT of 60 microns shall be applied, after power tool cleaning. 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.

8. The Temporary Rust Preventive coating that has already been applied on any component, 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).

9. All currently active PGMAs are covered. Requirements for Missing / new PGMA s will be included under the relevant section, following the appropriate paint logic.

10. Ground shade/colour finish paints & identification tag/ band for equipments, piping, pipe service, boiler supporting structures and other boiler components shall be followed as per tender.

11. In components, wherever plates/sheets of thickness less than or equal to 5 mm, tubes/ rods/drain pipe are used, power tool /hand tool cleaning to SSPC-SP3/ SSPC-SP-2 shall be followed and the painting shall be done as described in Sl no: 5.1.
12. Touch-up painting of damaged areas shall be carried out as per clause applicable painting scheme.

13. Only weldable primer shall be applied on surfaces, which require to be welded subsequently at site. At those locations no other paint shall be applied.

14. DUs coming under Constant Load Hangers (CLH) shall be painted as per the system - **PS 15** indicated in Sl. No. 4 of the table. However, for DUs coming under Variable Load Hangers (VLH), the painting shall be as per Painting Scheme PS 1BA indicated in Sl. No. 2.3 of the table. (i.e., one coat of HB Chlorinated Rubber based Zinc Phosphate Primer followed by two coats of Synthetic Enamel Paint –shade smoke grey, total DFT – 90 microns)

15. 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 gm/ 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 gm/ 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.**

16. All threaded components of spring assemblies and turnbuckles shall be galvanized and achromatized to 15 microns minimum thickness.
17. The painting for all temporary structures shall be PS 1AE indicated in Sl.No.1.4 of the table.(i.e. 1 coat of R.O. Zinc phosphate Primer followed by two coats of Synthetic Enamel Paint –shade yellow, total DFT – 70 microns)

Painting Scheme – Details for procurement & application purposes

Sl. No.	Material Code of Paint	Generic nature of paint	Theoretical Covering Capacity Sq. m per Litre	No. of pack	Volume solids, % (min) **	DFT in microns (min) per coat	Shade	Shade No. to IS 5	Mode of appln.	Over coating interval, Hrs.
1	120016131800	Heat Resistant Aluminium paint to IS 13183 Grade I	10	1	-	-	Aluminium	--	Brush / Spray	24
2	120011111900	Red oxide Zinc Phosphate primer paint to IS 12744	10	1	--	--	Red Oxide	--	Brush / Spray	12
3	120011121900	Red oxide Zinc Phosphate Dip coat primer paint to PR: CHEM: 09-03	10	1	--	--	Red Oxide	---	Dip	12
4	120011311200	Long oil alkyd synthetic enamel finish paint to IS2932	10	1	--	--	Reqd. shade	Corrpdg. Shade no.	Brush / Spray	12
5	120011140000	Temporary Rust preventive fluid to PR: CHE: 09 – 04	10	1	--	--	Amber	--	Brush / Spray	12
6	120012141700	Epoxy Zinc rich primer to IS14589 Gr. II	8	2	35	40	Grey	--	Spray	24
7	120013310200	Aliphatic acrylic polyurethane paint to IS13213	10	2	40	30	Phirozi – Blue./French Blue	176/166	Spray	24
8	120017101800	De Oxy Aluminate Weldable Primer- Colour Aluminium	10	1	--	--	Aluminium	--	Brush / Spray	24
9	120014111700	HB CR Based Zinc Phosphate Primer	10	1	40	50	Grey	--	Brush / Spray	12
10	120014300100	CR Based Finish Paint	10	1	30	30	French Blue Smoke Grey	166 692	Brush / Spray	12
11	12001213800	High Build Epoxy Mastic Aluminium Primer-	8	2	80	100	Aluminium	---	Spray	24
12	120011130000	General Purpose Aluminium Paint to IS 2339	10	Dual	20	20	Aluminium	--	Brush / 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. ** Values are indicative.

Ranipet-6

Bharat Heavy Electricals Limited
Boiler Auxiliaries Plant - RANIPET - 632 406

BHEL Doc Ref	**PR:QA: 806**
Rev.No.	**00**
Date:	**18 08 09**

MAHAN ALUMINIUM COMPANY LTD
(6 X 150 MW)
HINDALCO INDS LTD

PAINTING SCHEDULE FOR APH, ESP,G&D&FAN

(CUSTOMER NO: R136,137,R138,R139,R140,R141)

Sl no	AREAS	SURFACE PREPARATION	PRIMER PAINTING	DFT	FINISH PAINTING	DFT	TOTAL DFT
01	EXPOSED SURFACES OF FAN ,ESP ,APH	Power Tool cleaning to St3 (SSPC-SP3)	one coats red oxide Zinc Phosphate Primer to **IS 12744**	30	Two coat of synthetic enamel finish paint to **IS 2932** shade smoke Grey **(shade No 692 of IS 5)-**	40	70
02	SURFACES IN THE GAS PATH,& INSULATED	Power Tool Cleaning to St3 (SSPC-SP3)	Red Oxide Zinc Phosphate Primer to **IS: 12744(Two coats)**	60	-	-	-
03	MACHINED SURFACE	-	Temporary Rust preventive Oil application (Wet)				

Note: *Heating elements are assembled in module assy after dipping in the rust preventive fluid*

neral Notes:

1) No painting is required for Galvanized items, non-ferrous items.& stainless steel items, except as indicated above.
2) 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.

REPARED BY	REVIEWED BY	APPROVED BY

ACTION - 2

PAINTING SCHEME FOR PIPING

QPNO :7059:QPC:11
REV.NO: 00
DATE :20.10.2009

[redacted] QUALITY ASSURANCE & CONTROL DEPT.

PROJECT NAME : -HINDALCO – Mahan Aluminium (6 X 150 MW) BTG

BHEL CUSTOMER Nos :- 7059, 7060, 7061, 7062, 7063, 7064.

Sl. NO	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat			Finish coat			Total DFT Microns (Min.)	REMARKS
			Primer	No of coats & DFT	Paint	No of coats & DFT	Shade	Paint	No of coats & DFT	Shade		
1	2	3	4	5	6	7		9	10	11	12	13
1	Insulated Piping, components (MS / HRH / CRH / Aux Steam lines, ... IBD,CBD tanks)	SSPC-SP3/ Power Tool Cleaning	Red oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744	2 (30 microns per coat.)	-----	-----	-----	-----	-----	-----	60	
2	Uninsulated Piping, components (Spray Water / Condensate lines ...,Tanks & Vessels)	SSPC-SP3/ Power Tool Cleaning	Red oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744	1 (30 microns per coat.)	-----	-----	-----	Synthetic enamel paint long oil alkyd to IS 2932	2 (20 Microns per Coat)	Smoke Grey Shade No 692 of IS 5	70	
3	Structures	SSPC-SP3/ Power Tool Cleaning	Red oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744	1 (30 microns per coat.)	-----	-----	-----	Synthetic enamel paint long oil alkyd to IS 2932	2 (20 Microns per Coat)	Smoke Grey Shade No 692 of IS 5	70	
4	Hangers & Supports - (CLH)	Abrasive Blast cleaning to Sa 2 1/2 (35-50 microns)	Epoxy Zinc rich primer to IS 14589 Gr.II,% VS = 35 Min	1 (40 microns per coat)	-----	-----	-----	Aliphatic Acrylic Polyurethane paint ,%VS = 40 min	1 (30 microns per coat)	Phirozi Blue Shade No.176 of IS 5	70	
5	Hangers & Supports - (VLH)	SSPC-SP3/ Power Tool Cleaning	Red oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744	1 (30 microns per coat.)	-----	-----	-----	Synthetic enamel paint long oil alkyd to IS 2932	2 (20 Microns per Coat)	Smoke Grey Shade No 692 of IS 5	70	
6	Pipe Clamps.	SSPC-SP3/ Power Tool Cleaning	Red oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744	1 (30 microns per coat.)	-----	-----	-----	Synthetic enamel paint long oil alkyd to IS 2932	2 (20 Microns per Coat)	Note 1	70	
7	Stainless steel / Galvanized items	No paint										

Note 1 - Smoke grey shade for Carbon Steel ; White shade for Alloy Steel Clamps.

PREPARED BY :	APPROVED BY:	For Customer use
VIVEKANANDA YELLU, Engr / QA.	G.PANNEER SELVAM, DGM / QA	