



**ENQUIRY  
(INDIGENOUS)**

# BHARAT HEAVY ELECTRICALS LIMITED

( A Government of India Undertaking )  
80, G.N.ROAD, T.NAGAR  
Purchase Department - Piping Centre  
CHENNAI - 600 017.  
TAMILNADU (INDIA)

PHONE :  
GRAMS : BHARATELEC  
FAX NO :  
E-mail :  
Web :

<b>OFFICE COPY</b>	<b>Collective No.</b>	<b>Enquiry Date</b>	<b>Due Date for Quotation</b>
	4010800022	12.12.2008	22.12.2008 <b>Due Date for</b>
Please quote Enquiry No, Date and due date in all correspondences. This is only a request for quotation and not an order			
<b>RFQ No: 4010800022</b>			

Item	Description	Unit	Quantity	Delivery Quantity	Schedule Date
10	159385970001 PIPEDIA2235X18(SPIRAL/LS)IS3589-410MPA TDC: TDC:TDG:07/05 Length: 10000.00	M	20.000	90.00	24.01.09
20	159385970001 PIPEDIA2235X18(SPIRAL/LS)IS3589-410MPA TDC: TDC:TDG:07/05 Length: 10000.00	M	20.000	90.00	24.01.09
30	159385960000 PIPE DIA1626X14 OG (SPI/LONG) IS3589-410 TDC: TDG:07:05 Length: 10000.00	M	32.000	96.00	24.01.09
40	159385960000 PIPE DIA1626X14 OG (SPI/LONG) IS3589-410 TDC: TDG:07:05 Length: 10000.00	M	32.000	96.00	24.01.09
50	159385960000 PIPE DIA1626X14 OG (SPI/LONG) IS3589-410 TDC: TDG:07:05 Length: 10000.00	M	32.000	96.00	24.01.09
60	1593871600UG PIPE 3040X 20 IS3589-410MPA-LS/SPI-UG TDC: TDG:07.05 Length:	M	460.000	460.00	24.01.09
70	1593859700UG PIPE DIA 2235X18 (SPI/LONG)IS3589-410MP TDC: TDG:07:05 Length: 10000.00	M	40.000	100.00	24.01.09
80	159386000001 PIPE 1626 X16-OG 3589 FE 410 LS/SPIRAL TDC: TDG:07:05 Length: 10000.00	M	30.000	30.00	24.01.09
90	1593859700UG PIPE DIA 2235X18 (SPI/LONG)IS3589-410MP	M	60.000	100.00	24.01.09

The offers should reach us before the time of opening of tenders.  
The offers will be opened at 14:30 hours on the due date in the presence of the tenderers who may like to be present.  
Late tenders are liable to be rejected.

Yours faithfully,  
For **BHARAT HEAVY ELECTRICALS LIMITED**  
  
**PRIYA BALAJI**  
Dy. Manager / Purchase  
BHARAT HEAVY ELECTRICALS LIMITED  
T. Nagar, Chennai - 600 017.



# BHARAT HEAVY ELECTRICALS LIMITED

( A Government of India Undertaking )

80, G.N.ROAD, T.NAGAR

Purchase Department - Piping Centre

CHENNAI - 600 017.

TAMILNADU (INDIA)

401080022 / 12.12.2008

11242

TDC: TDG:07:05

Length: 10000.00

100	159385970001	M	50.000	90.00	24.01.09
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PIPEDIA2235X18(SPIRAL/LS)IS3589-410MPA  
TDC: TDC:TDG:07/05  
Length: 10000.00

**General Note:**

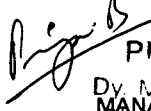
**Enclosures:**

"LD clause has to be confirmed without fail."

**PR Links**

The offers should reach us before the time of opening of tenders.  
The offers will be opened at 14:30 hours on the due date in the presence of the tenderers who may like to be present.  
Late tenders are liable to be rejected.

Yours faithfully,  
For BHARAT HEAVY ELECTRICALS LIMITED

  
PRIYA BALAJI  
Dy. Manager, Purchase  
MANAGER / PURCHASE  
BHEL Piping Centre  
T. Nagar, Chennai - 600 017.



BHEL : PIPING CENTRE : CHENNAI – 600 017

**ENQUIRY NO: 4010800022**

**DATE: 12.12.08**

**IMPORTANT INFORMATION TO BIDDERS.**

1. This Tender is a **TWO PART BID**.  
Type and quantum of work is detailed in "SCOPE OF WORK"
2. The quoted price shall be "FIRM" till the complete execution of the scope.
3. Mode of Operation for Price Bid – Reverse Auction
4. Last date for submission of offer **22.12.08 - Time - 13.30 Hours.**
5. Techno-Commercial Bid Opening Date **22.12.08 - Time - 14.30 Hours.**
6. The above bid shall be sent in a sealed cover duly indicating

**Enquiry No. & date, Tender Opening date and "IS 3589 PIPES - Various Projects – BHUSAWAL, KHAPERKADA, UKAI AND KODERMA"**

**To**

**ADDL.GM / PROCUREMENT**

**BHEL - Piping Centre**

**Old No 93, (New No:80 ) G N Chetty Road**

**T Nagar / Chennai 600 017 . PHONE : 28158819 / 28161299**

**SCOPE OF WORK :**

BHEL requires the below mentioned quantities of various sizes of Welded Pipes – Pipes either **Spiral or Longitudinal Seam Weld** conforming to IS 3589 FE 410 Pipes with Painting and as per TDC-TDG:07:05 and to be delivered to BHEL various project sites. The raw material plate is to be arranged by suppliers themselves.

**LIST OF ITEMS.**

Enq. Sl.no	Pipe Size in MM OD x Thickness	Hydro Test (Bars)	Qty. Mtrs	Destination Project Site	Delivery	Work Order Details
10	2235 x 18 OG /	26	20.0	BHUSAWAL	24.01.09	P 6924-1-80-468-001
20	2235 x 18 OG /	26	20.0	BHUSAWAL		P 6925-1-80-468-001
30	1626 x 14 OG	26	32.0	BHUSAWAL		P 6924-1-80-468-015
40	1626 x 14 OG	26	32.0	BHUSAWAL		P 6925-1-80-468-015
50	1626 x 14 OG	26	32.0	KHAPERKADA		P 6926-1-80-468-016
60	3040 x 20 UG /	18	460	UKAI		P 6965-1-80-468-001
70	2235 x 18 UG /	26	40	UKAI		P 6965-1-80-468-002
80	1626 x 16 OG /	30	30	UKAI		P 6965-1-80-468-003
90	2235 x 18 UG /	26	60	KODERMA		P 6949-1-80-468-011
100	2235 x 18 OG /	26	50	KODERMA		P 6949-1-80-468-012

**Total Weight ~ 944 MT**

**TECHNICAL CUM COMMERCIAL**

**Technical :**

1. The bidder shall supply the Welded Pipes, as per IS 3589 Specification and BHEL TDC. The Bidder shall also comply with the following BHEL documents.
  - a. Technical requirements viz. Length, Edge Preparation, Spider Arrangement, Quality Plan etc, as finalized and agreed in MOU (Enquiry No. BHEL:PC:PUR:CW:IS 3589 : 001 Dt. 24.04.08)
  - b. Painting requirements for CW Piping as per the enclosed Painting QP for Bhusawal, Khaperkada, Ukai and Koderma projects.



BHEL : PIPING CENTRE : CHENNAI – 600 017

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ENQUIRY NO: 4010800022 DT: 12.12.2008

**Commercial :**

1. The prices quoted by the Bidder shall be on F.O.R. Ex-works basis with Freight extra for transportation of Finished pipes to various project sites. Price quoted shall be " FIRM " till the execution of the complete scope with raw material plate in their scope.
2. Payment for freight will be based on per meter.
3. The bidder shall furnish all the breakups as requested in the price bid format as enclosed.
4. The bidder shall clearly indicate the source of supply and all the applicable Taxes / Duties / CESS.
5. Delivery – 24.01.2009.
6. Bidder shall give a minimum validity of 60 days for the price offer.
7. All other commercial terms as finalized and agreed in the MOU (Copy enclosed)

**PRICE :**

The bidder shall provide the price strictly as per the price format annexed herewith. In this addition to the hard copy, the bidder has to submit in soft copy also in excel format ( Preferably in CD ).

- a. Base Price shall include Cost of Raw Material plus conversion cost per Mtr of bare pipe including Edge Preparation and providing Spider Arrangement and Testing as per BHEL TDC : TDG : 07 : 05.
- b. Ordering shall be on FOR - Site basis.
- c. Percentage of applicable Taxes, Duties, CESS, Service Tax on Transportation etc shall be clearly indicated .
- d. Service Tax, if included in Freight or extra, shall be clearly indicated.
- e. A soft copy of the price format with price details are also to be sent along with price bid.

Prices quoted shall be " FIRM " till complete execution of the scope and bidder shall give **validity** of this price offer for a period of **minimum 60 days** from the date of opening of Bids.



BHEL : PIPING CENTRE : CHENNAI – 600 017


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LIST OF DOCUMENTS ENCLOSED :

1. Painting Quality Plans
  - A. Bhusawal - Painting QP Reference No. 6924 : QPC : 12 Rev 00 Dt. 19.04.08
  - B. Khaperkada – Painting QP Reference No. 6926 : QPC : 12 Rev 00 Dt. 19.04.08
  - C. Ukai - Painting QP Reference No. 6965 : QPC : 12 Rev 00 Dt. 13.10.08
  - D. Koderma -DVC Durgapur Steel TPS - Painting QP Reference No. 6956 : QPC : 01. Rev00 Dt. 07.09.07
2. BHEL TDC : TDG : 07 : 05
3. Price Format

The above documents form part of this tender document and bidder shall ensure that they have received all these along with tender and confirm.

- **Pre Qualified** is the criteria for consideration for other than the BHEL Approved Vendors. After qualifying for registration, the new Vendors, may be considered for future inline with their system and policy. Such Vendors will not be considered in this Enquiry.
- The new Vendors may download Vendor registration forms from BHEL Web Site [www.bhel.com](http://www.bhel.com) and submit all relevant data for formal registration.

  
Manager/Purchase

**PRIYA BALAJI**  
Dy. Manager / Purchase  
BHEL / Piping Centre  
T. Nagar, Chennai - 600 017.

Enquiry No. 4010800022 Dt.12.12.08  
 Price Format for Bhusawal Cooling Water Piping  
 Painting QP Reference No. 6924 : QPC : 12 Rev.00 Dt. 19.04.08

Over Ground - As per Sl.no. 1 and 3 of Painting Scheme

Sl. No	Pipe Size	Material Code	Total Qty in Mtrs	Base Price of Pipe	Extra Coating	inside Coating	Extra Coating	inside Coating	Extra Coating	Outside Coating	Extra Outside Coating	Extra Transportation
				Rate/Mtr (Ex- Works) as per TDC: TDG:07:05	Rate/Mtr based on Zinc Primer - 1 x 50 Microns) - Primer Coat	(Epoxy Rich Zinc Primer - 1 x 50 Microns) - Primer Coat	Rate/Mtr Tar Epoxy - 2 x 100 Microns) - Finish Coat	(Coal Tar Epoxy - 2 x 100 Microns) - Finish Coat	Rate/Mtr Oxide Phosphate - Alkyd Base to IS 12744 - 1 x 30 Microns) - Primer	(Red Zinc Alkyd - Smoke Grey Shade No. 692 of IS 5 - 2 x 20 Microns) - Finish Coat	(Synthetic Long Oil Enamel to IS 2932)	Cost/Mtr of Finished Pipe to Bhusawal Site
1	2235 x 18 OG	159385970001	20									
2	2235 x 18 OG	159385970001	20									
3	1626 x 14 OG	159385960000	32									
4	1626 x 14 OG	159385960000	32									

USE EXCEL FILE -PRICE FORMAT- GIVEN BY US (REFER ENCLOSED PRICE FORMAT)  
 FOR GIVING YOUR OFFER

**Work Order Details**

1. Pipe Dia 2235 x 18 - P 6924 - 1 - 80 - 468 DU 001 - 20 Mtrs
2. Pipe Dia 2235 x 18 - P 6925 - 1 - 80 - 468 DU 001 - 20 Mtrs
3. Pipe Dia 1626 x 14 - P 6924 - 1 - 80 - 468 DU 015 - 32 Mtrs
4. Pipe Dia 1626 x 14 - P 6925 - 1 - 80 - 468 DU 015 - 32 Mtrs



Enquiry No. 4010800022 Dt.12.12.08  
 Price Format for Khaperkada Cooling Water Piping  
 Painting QP Reference No. 6926 : QPC : 12 Rev 00 Dt. 19.04.08

Over Ground – As per Sl.no. 1 and 3 of Painting Scheme

Sl. No	Pipe Size	Material Code	Total Qty in Mtrs	Base Price of Pipe	Extra Coating	inside Coating	inside Coating	Extra Coating	Outside Coating	Extra Outside Coating	Extra Transportation
				Rate/Mtr (Ex-Works) as per TDC: TDG:07:05	Rate/Mtr based Primer – 1 x 50 Microns) – Primer Coat	(Epoxy Rich Zinc Primer – 1 x 50 Microns) – Primer Coat	(Coal Tar Epoxy – 2 x 100 Microns) – Finish Coat	Rate/Mtr Oxide Phosphate – Base to IS 12744 – 1 x 30 Microns) Primer	(Red Zinc Alkyd – Smoke Grey Shade No. 692 of IS 5 – 2 x 20 Microns) – Finish Coat	Rate/Mtr Enamel Alkyd to IS 2932	(Synthetic Long Oil Finished Pipe to Khaperkada Site
1	1626 x 14 OG	159385960000	32								

USE EXCEL FILE -PRICE FORMAT- GIVEN BY US (REFER ENCLOSED PRICE FORMAT)  
 FOR GIVING YOUR OFFER

Work Order Details  
 1. Pipe Dia 1626 x 14 - P 6926 - 1 - 80 - 468 DU 016 - 32 Mtrs



Enquiry No. 4010800022 Dt.12.12.08  
 Price Format for Ukai Cooling Water Piping  
 Painting QP Reference No. 6965 : QPC : 12 Rev 00 Dt. 13.10.08  
 Under Ground - As per Sl.no. 1 a & 2 of Painting Scheme

Sl. No	Pipe Size	Material Code	Total Qty in Mtrs	Base Price of Pipe	Extra Coating Rate/Mtr (Ex-Works) as per TDC: TDG:07:05	inside Coating Rate/Mtr (Epoxy Rich Zinc Primer-1 x 50 Microns) - Primer Finish Paint	inside Coating Rate/Mtr (Coal Tar Epoxy - 2 x Oxide Phosphate - Alkyd base - IS 12744 - 1 x 30 Microns) - Primer	Extra Coating Rate/Mtr (Red Zinc Phosphate - Alkyd base - IS 12744 - 1 x 30 Microns) - Primer	Outside Coating Rate/Mtr (Red Zinc Phosphate - Alkyd base - IS 12744 - 1 x 30 Microns) - Primer	Extra Transportation Cost/Mtr of Finished Pipe to Ukai Site
1	3040 x 20 UG	1593871600UG	460							
2	2235 x 18 UG	1593859700UG	40							

USE EXCEL FILE -PRICE FORMAT- GIVEN BY US (REFER ENCLOSED PRICE FORMAT)  
FOR GIVING YOUR OFFER

**Work Order Details**

1. Pipe Dia 3040 x 20 UG - P 6965- 1 - 80 - 468 DU 001 - 460 Mtrs
2. Pipe Dia 2235 x 18 UG - P 6965 - 1 - 80 - 468 DU 002 - 40 Mtrs

**Over Ground**

- As per Sl.no. 1 a & 3 of Painting Scheme

Sl. No	Pipe Size	Material Code	Total Qty in Mtrs	Base Price of Pipe	Extra Coating Rate/Mtr (Ex-Works) as per TDC: TDG:07:05	inside Coating Rate/Mtr (Epoxy Rich Zinc Primer-1 x 50 Microns) - Primer Finish Paint	inside Coating Rate/Mtr (Coal Tar Epoxy - 2 x Oxide Phosphate - Alkyd base - IS 12744 - 1 x 30 Microns) - Primer	Extra Coating Rate/Mtr (Red Zinc Phosphate - Alkyd base - IS 12744 - 1 x 30 Microns) - Primer	Outside Coating Rate/Mtr (Red Zinc Phosphate - Alkyd base - IS 12744 - 1 x 30 Microns) - Primer	Extra Transportation Cost/Mtr of Finished Pipe to Ukai Site
1	1626 x 16 OG	159386000001	30							

USE EXCEL FILE -PRICE FORMAT- GIVEN BY US (REFER ENCLOSED PRICE FORMAT)  
FOR GIVING YOUR OFFER

**Work Order Details**

1. Pipe Dia 1626 x 16 OG - P 6965 - 1 - 80 - 468 DU 003 - 30 Mtrs



SHARAT HEAVY ELECTRICALS LIMITED.  
 PIPING CENTRE CHENNAI - 17  
 QUALITY DEPARTMENT.

QUALITY PLAN FOR CW PIPING ( STRAIGHT PIPES SIZE NB ≥ 1000 MM )  
 PROJECT: DVC - DURGAPUR STEEL TPS ( 2 X 500 MW )  
 BHEL CUSTOMER Nos : 0652 , 0653 , 6956 , 6957

QP NO : 6956 : QPC : 01  
 REV. NO : 00  
 DATE : 07.09.2007  
 PAGE : 2 of 2

QA 03 SL No	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY		REMARKS
									M	B	
1	2	3	4	5	6	7	8	9	10	11	
3.0	Coating (External) - Over ground piping.		Major	Visual	100%	Free from all dirt, oil, grease, rust, scale, weldslag, flux deposit, foreign matters etc	HC	HC	P	V	* Total DFT = Primer + Finish 125 microns m.
3.1	Surface preparation of out side surface	Power tool cleaning / Rotary wire brush	Major	Visual & Elcometer	100%	Minimum DFT: 50 microns ✓	HC	HC	P	V	
	Primer	Red oxide Zinc Phosphate primer to IS:12744	Major	Visual & Elcometer Measurement	100%	Minimum DFT: 75 microns ✓	HC	HC	P	W	
3.2	Coating (Internal) - Burried Piping No painting required for pipes buried (under ground) - as Coal Tar Tape wrapping shall be carried out at site. Surface shall be cleaned with wire brush / power tool	Synthetic enamel IS2992 smoke grey shade No.692 As per IS: 5	Major	Visual	100%	Each pipe punched & stenciled As per P.O	HC	HC	P	W	
4.0	Marking & Identification	Work order NO, Du No, Length, Meters Identification.	Major	Visual	100%						

APPROVED PAINT SUPPLIERS  
 (1) BERGER PAINTS  
 (2) SHALIMAR PAINTS  
 (3) ASIAN PAINTS  
 (4) JENSON & NICHOLSON  
 (5) CDC CARBORNE

D. V. C. Letter ref. :  
 DAMODAR VALLEY CORPORATION  
 Electricity Department  
 This approval is for general arrangement only and does not relieve the contractor of responsibility for conformity to specification and correct details and fittings of parts when assembled.  
 Engineer: [Signature] Date: 13.10.07

1 Approved  
 2 Approved except as noted re-submission not required.  
 3 Approved re-submission required.  
 4 Not Approved


**BHARAT HEAVY ELECTRICALS LIMITED.**  
 PIPING CENTRE CHENNAI - 17  
 QUALITY DEPARTMENT.


**QUALITY PLAN FOR CW PIPING ( STRAIGHT PIPES SIZE NB ≥ 1000 MM )**  
 PROJECT: DVC - DURGAPUR STEEL TPS ( 2 X 500 MW )  
 BHEL CUSTOMER Nos : 0652, 0653, 6956, 6957


QP NO : 6956 : QPC : 01  
 REV. NO : 00  
 DATE : 07.09.2007  
 PAGE : 1 of 2

SL No	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		REMARKS
								M	B	
1	1.0 STRAIGHT PIPE: IS 3589 (Longitudinal / spiral welded pipes)	Chemical Mechanical Soundness Dimension Degree of cleanliness	Major Major Major Major Major	Verification Tensile test Hydraulic test or Radiography Measurement Visual	One/ heat One/ heat 100% 10% Random 100%	IS 3589 IS 3589 IS 3589 IS 3589	IS 3589 IS 3589 IS 3589 IS 3589	TC TC TC TC HC	V W W W V	10% witness c BHEL TC - Test certificate HC - History card Register.
2.0	Surface Preparation of pipes	Degree of cleanliness	Major	Visual	100%	Blast clean to near white metal.		HC	V	* Brand Name as approved by BHEL & DVC. Ref page 2
2.1 (a)	Coating (Internal) PRIMER **	Coal tar epoxy primer.	Major	Visual & Elcometer measurement	Each pipe (100%)	Minimum DFT: 50 microns		HC	P	
(b)	OVER COAT **	Coal tar epoxy finish Paint	Major	Visual & Elcometer measurement	Each pipe (100%)	2 coats. DFT: 100 microns min Per coat. Total DFT: Primer + Over coat = 250 microns min. Dry film thickness 250 microns min.		HC	P	* spots identification by BHEL.
(c)	Inspection of Coating	Dry film thickness (DFT) Holiday detection	Major Major	Visual & Elcometer Visual	Each pipe at 5 spots* min 100%	No Holiday		HC	P P	10% witness b BHEL.

**Legend**  
 M : MANUFACTURER / SUBCONTRACTOR.  
 B : BHEL/BHEL Authorized Inspection Agency  
 P : Perform.  
 W : Witness.  
 V : Verification.

APPROVED BY:   
 G. PRAVEEN KUMAR

PREPARED & APPROVED BY:   
 R. JANARTHANAN

NAME & SIGNATURE:   
 Engineer

DATE: 13.10.07

**DAMODAR VALLEY CORPORATION**  
 Electricity Department  
 This approval is for the arrangement only and does not relieve the contractor of responsibility for conformity to specification and correct details and fittings of parts when assembled.

Approved as per notes/submission not required. **2**  
 Approved as per notes/submission not required. **3**  
 Approved as per notes/submission not required. **4**

QPNo: 6926:QPC:12  
REV.NO: 00  
Dt: 19.04.2008

**PAINING SCHEME FOR LP PIPING**

( CW / ACW / ECW / Plant water, Air Piping, etc., )  
PROJECT NAME : - KHAPERKEDA TPS EXPANSION ( 1 X 500 MW )  
BHEL CUSTOMER Nos : 0642, 6926.

**BHARAT HEAVY ELECTRICALS LIMITED**  
PIPING CENTRE, CHENNAI-17  
QUALITY ASSURANCE & CONTROL DEPT.

REMARKS

Sl. NO	PGMA / Description	Surface Preparation & Surface Profile	Primer coat			Intermediate coat			Finish coat			REMARKS
			No of coats	Paint	Shade	No of coats	Paint	Shade	No of coats	Paint	Shade	
1	(a) Internal Surface - CW Pipe (for pipe dia - 1000 mm and above)	3	4	6	8	9	10	11	12	13		
1	(b) Holiday test (Refer Note 3)											
2	External Surface of CW -Buried Piping / Encased in concrete (e) Temporary Protection to be done at works. (b) Protection coating to be done by BHEL Erection Group at site.##	SSPC-SP3 / Power Tool Cleaning	1								30 Microns	
3	External Surface (over ground piping) of CW/ACW. ( For all diameters)	SSPC-SP3 / Power Tool Cleaning	1				2	Smoke Grey (Shade No. 692 of IS: 5)	250 Microns (Refer Note 3)		70 Microns	
4	External Surface of ECW, Plant water ( For all diameters)	SSPC-SFR / Power Tool Cleaning	1				2	Smoke Grey (Shade No. 692 of IS: 5)	250 Microns (Refer Note 3)		70 Microns	

For buried portion of this piping, Sino: 2(b) coaltar coating is applicable.

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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. Quality of Epoxy shall be done as per manufacturer's data sheet / recommendation, meeting the thickness requirements as per this document.

3. Witness by BHEL / BHEL nominated inspection agency.

4. No painting for Galvanised mild Steels & Iron Pipes.

*(Signature)*

REVIEWED AND APPROVED BY: G.PANNEER SELVAM, SM / QA

PREPARED BY: R.JANARTHANAN, DS/QA

For Customer Use

QPNo:6965:QPC:12

REV.NO: 00  
Dt: 13.10.2008

**PAINTING SCHEME FOR LP PIPING**

( CW / ACW / ECW / Plant water, Air Piping, etc.... )

PROJECT NAME : - GSECL UKAI TPS UNIT - 6 ( 1 X 500 MW )

BHEL CUSTOMER Nos : 0658 , 6965.

**BHARAT HEAVY**

**ELECTRICALS LIMITED**

PIPING CENTRE, CHENNAI- 17

QUALITY ASSURANCE & CONTROL DEPT.

SI NO	PGMA / Descriptor	Surface Preparation & Surface Profile	Primer coat			Intermediate coat			Finish coat			REMARKS	
			Primer	No of coats	Paint	No of coats	Paint	No of coats	Shade	Shade	Total DFT Microns (Min.)		
1	2 (a) Internal Surface - CW Pipe (for pipe dia - 1000 mm and above)	3 Blast Cleaning SSPC SP-10 SA 2 1/2 (Refer Note 1)	4 Epoxy based Zinc rich Primer (Refer Note 2)	5 1 (50 Microns Min. per coat)	6 ---	7 ---	8 ---	9 Coal tar epoxy (Refer Note 2)	10 2 (100 Microns Min. per coat)	11 ---	12 250 Microns (Refer Note 3)	13	
1	(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 CW - Inland Piping / Freased in concrete (a) Temporary protection to be done at works. (b) Protection coating to be done by BHEL Erection Group at site. ##	---	---	---	---	---	---	---	---	---	---	---	---
3	External Surface (over ground piping) of CW / ACW ( For all diameters)	---	---	---	---	---	---	---	---	---	---	---	---
4	External Surface of ECW - Plant water ( For all diameters)	---	---	---	---	---	---	---	---	---	---	---	---
5	Potable water, Instrumentation & Service air piping	---	---	---	---	---	---	---	---	---	---	---	---

No painting for Galvanised pipes and components used.

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. Witness by BHEL and appropriate inspection agency.

4. No painting for Galvanised and Stainless steel piping.

*[Handwritten Signature]*

PREPARED and REVIEWED BY: G.PANNEER SELVAM, SM / QA

APPROVED BY: P.ELANGOVAR, SDGM / QA


**BHARAT HEAVY ELECTRICALS LIMITED**  
**PIPING CENTRE CHENNAI - 17**  
**QUALITY DEPARTMENT.**

**QUALITY PLAN FOR LP PIPING FABRICATION**  
 (Circulating Water, Aux Cooling Water...)  
**PROJECT NAME :- GSECL UKAI TPS UNIT - 6 ( 1 X 500 MW )**  
**BHEL CUSTOMER Nos : 0668 , 6965.**

**QA 03**

QP NO : 6966 : QPC : 03  
 Rev : 00  
 Date : 13.10.2008  
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SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD			REMARKS	
								M	B	C*		
1			3	4	5	6	7	8	9	10	11	
2.2	Mitre bends, Branch Reducer, Tees, Flange. NDE: for Weld	Fit-up a) Weld fusion b) Weld Profile & Surface defects c) Butt, mitre joints Long Seamwelds	Major Major Major Major Major	Dimension & Root-gap Root back Chip and LPI for OD 1000mm and above. Visual RT RT	100% 100% -do- 10%* 100%	BHEL DRAWING No linear indication ASME B 31.1 Cl. 136.4.2 ASME Sec V/ ASME B 31.1 Cl 136.4.5. -do--	HC HC HC HC HC	P P P P P	V V W W W	V V V V V		
2.3	Rolled and Welded Pipe Spools using IS 2062 plates											*Inclusive of all T-joints.
2.4	Piping Fabrication	a) Butt joints i) Circumferential welds ii) T-joints. b) Fillet Welds Measurement (including ovality)	Major Major Major Major	RT RT LPI Visual & Measurement	10% 100% 100% 100%	-do-- -do-- ASME B 31.1 Cl. 136.4.4 BHEL Drawing	HC HC HC HC	P P P P	W W W W	V V V V		
2.5	Dimension											
3.0	Surface preparation and painting											
4.0	Marking & Identification											
				As per customer approved Painting Scheme. 6965.QPC:12		Paint stenciling & Hand stamping as per BHEL drg./ GMS						
				Workorder DU Number. Maker's Identification	Major Visual	100%						

**Approved By**  
  
**P. ELANGO VAN. SDGM/QA**

**LEGEND:** M : BHEL/BHEL Approved Vendor P : Perform  
 B: BHEL/BHEL Authorized Inspection Agency V : Verification  
 C\* - Random Inspection by Customer/Consultant W : Witness  
 WPS - Welding procedure Specification R : Review of RT film.  
 PQR - Procedure Qualification Report HC - History Card / Register.



**BHARAT HEAVY ELECTRICALS LIMITED**  
 PIPING CENTRE CHENNAI - 17  
 QUALITY DEPARTMENT.

**QUALITY PLAN FOR LP PIPING FABRICATION**  
 (Circulating Water, Aux Cooling Water...)  
**PROJECT NAME :- GSECL UKAI TPS UNIT - 6 (1 X 500 MW)**  
**BHEL CUSTOMER Nos : 0658, 6965.**

**QP NO : 6966 : QPC : 03**  
 Rev: 00  
 Date : 13.10.2008  
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Sl. No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD			REMARKS		
								M	B	C*			
1	2	3	4	5	6	7	8	9			10	11	
1.0	<b>RAW MATERIAL</b>												
1.1	WELDED PIPE -IS 3589, (longitudinal / Spiral) IS -1239, (Black / Galvanised) or as per drawing.	Correctness of Material	Minor	Verification of Specification.	100%	Material Specification as per Col - 2	HC	P	V	V		Material procured as per specification	
1.2	Plate formed Pipes using IS 2062 Plates	Correctness of Material	Minor	Verification of Specification.	100%	Material Specification as per Col - 2	HC	P	V	V		Pipes are procured with 100% hydro test	
1.3	<b>FITTINGS</b>												
1.3.1	IS 1239 Fittings Black/Galvanised Screwed & Socketed. or as per drawing.	Correctness of Material	Minor	Verification of Specification	100%	Material Specification as per Col - 2	HC	P	V	V		Material procured as per specification	
1.3.2	Forged / BW Fitting/ Flanges as per IS-1239 Part II, SA 234, SA105, SA182 or as per drawing.	Correctness of Material	Minor	Verification of Specification	100%	Material Specification as per Col - 2	HC	P	V	V		Material procured as per specification	
1.4	Plates IS:2062 or as per drg.	Correctness of Material	Minor	Verification of Specification	100%	Material Specification as per Col - 2	HC	P	V	V		Material procured as per specification	
2.0	<b>INPROCESS CONTROL</b>												
2.1	Welding	Procedure and performance Qualification details	Major	Verification	Each welder	ASME SEC - IX	WPS PQR	P	V	V			
2.1.1	NDE: For E.P	Edge preparation	Minor	LPI	10%	ASME B 31.1 Cl. 136.4.4	Report	P	W	V			

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P : Perform  
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 HC - History Card / Register.

Approved By  
**P.ELANGOVA N. SDGM/QA**

Prepared and Reviewed By  
**G.PANNEER SELVAM. SM/QA**



**BHARAT HEAVY ELECTRICALS LIMITED**  
 PIPING CENTRE, CHENNAI- 17  
 QUALITY ASSURANCE & CONTROL DEPT.

QPNo: 6924:QPC:12

REV.NO: 00  
 Dt: 19.04.2008

**PAINTING SCHEME FOR LP PIPING**

( CW / ACW / ECW / Plant water, Air Piping, etc... )  
 PROJECT NAME : - BHUSAWAL TPS EXPANSION. ( 2 X 500 MW )  
 BHEL CUSTOMER Nos : 0643 , 0644 , 6924 , 6925.

S.No	P.I./M.A / Description	Surface Preparation & Surface Profile	Primer coat			Intermediate coat			Finish coat			REMARKS	
			Primer	No of coats	Paint	No of coats	Paint	No of coats	Paint	No of coats	Shade		Total DFT Microns (Min.)
			4	5	6	7	8	9	10	11	12		
1	Internal Surface - CW Pipe (for pipe size - 1000 mm and above)	Blast Cleaning SSPC-SP-10 SA 2 1/2 (Refer Note 1)	Epoxy based Zinc rich Primer (Refer Note 2)	1 (50 Microns Min per coat)	---	---	---	Coal tar epoxy (Refer Note 2)	2 (100 Microns Min. per coat)	---	250 Microns (Refer Note 3)	13	
2	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.	---	---	---	---	---	---	---	---	---	---	
3	External Surface of CW -Buried Piping / Increased in concrete / Temporary Protection to be done at works.	SSPC-SP3 / Power Tool Cleaning	Red Oxide Zinc Phosphate (Alkyd base to IS: 12744)	1 (30 Microns per coat)	---	---	---	---	---	---	30 Microns	# by site as per contract requirements.	
4	External Surface (over ground piping) of CW/ACW ( For all diameters)	SSPC-SP3 / Power Tool Cleaning	Red Oxide - Zinc Phosphate (Alkyd base to IS: 12744)	1 (30 Microns per coat)	---	---	---	Synthetic enamel Long oil Alkyd to IS: 2932	2 (20microns per coat)	Smoke Grey (Shade No. 692 of IS: 5)	70 Microns	---	
5	External Surface of ECW, Plant water ( For all diameters)	SSPC-SP3 / Power Tool Cleaning	Red Oxide - Zinc Phosphate (Alkyd base to IS: 12744)	1 (30 Microns per coat)	---	---	---	Synthetic enamel Long oil Alkyd to IS: 2932	2 (20microns per coat)	Smoke Grey (Shade No. 692 of IS: 5)	70 Microns	---	
6	Drainable water, Instrument air & Service Air piping	No painting for Galvanised pipes and components used.	---	---	---	---	---	---	---	---	---	For buried portion of this piping ,Sino: 2(b) coaltar coating is applicable.	

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. Witness by BHEL / BHEL nominated inspection agency.  
 4. No painting for Galvanised and Stainless steel piping.

PREPARED BY : R. JANARTHANAN, DM / QA

REVIEWED and APPROVED BY: G. PANNEER SELVAM, SM / QA

For Customer Use