Boiler Auxiliary Plant , Bharat Heavy Electricals Limited , Ranipet Tamilnadu- 632406

Purchase Department

Enquiry No: BAP/PUR/IAA/9550165E dt.07.05.2015
Due on:03.06.2015

Item : Inner Arm Assy

Synopsis :

(i) **Annexure-I**
(a) Part-A : Pre-Qualification Requirement
(b) Part-B : Description of item , Quantity details , Drawing and Relevant specification
(c) Part-C : General Terms and Conditions of Tender

(ii) **Annexure-II :** Supplier Registration Form (SRF)

(iii) **Annexure-III :** Commercial terms and conditions Annexure , MSME split provision & CA certificate format.

Contact Details

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Offers of those vendors is acceptable at our end who meets the requirement as stated in Part-A of Annexure-I (Pre Qualification Requirement) of this tender

Annexure–I (Part-A) To Open Tender ref: BAP/PUR/IAA/9550165E dt.07.05.2015
For Supply Of "Inner Arm Assy" , Due on : 03.06.2015
Prequalification Requirement (PQR)

- The bidder shall have experience of having successfully executed general fabrication of mild steel components and have successfully manufactured and supplied as per applicable codes and standards during the last three (3) years. The bidder must provide necessary supporting documents as proof in respect of the eligibility criteria mentioned below:

  "One completed work of general fabrication meeting the given Technical specification/Drawings"
- The manufacture/supplier must be having their own fabrication shed with adequate plants and machineries to carry out the general fabrication to manufacture and supply of the indented items to ensure quality product with timely delivery. Details such as a) Address b) Contact Person etc. of the should be furnished.
- The Manufacturer must submit copies of Work Order/ Purchase Order and Client's certificate detailing about (i) Time of Completion, (ii) Quality of Work & (iii) Value of work completed for the general fabrication the bidder manufactured and supplied. Bidder shall submit documentary evidence in detail in respect of their claim for the experience as stated above giving complete details of work done including client's name & address, detail scope of work, value of work and date of commencement & date of completion. Copies of the work order/contract, completion certificate, etc.
- The bidder should procure raw materials from the reputed sources and should be able to furnish the test certificates.
- The bidder should employ the skilled man power as required for the intended component manufacturing meeting design drawing requirements.
- The bidder should have necessary quality procedures/plans in place to ensure component quality.
- The bidder should have all required plant and machineries (Viz Welding, Grinding, Drilling, Press of required capacity, Machining etc.) in house to ensure complete manufacturing and supply of the intended component.

- The bidder shall not be black listed by any State/Central Department or PSU or Autonomous bodies. The Applicant must submit a duly notarized Affidavit to this effect. Bids received without this declaration in original shall stand automatically rejected.
- The applicant must submit information of on-going litigations and litigations had in the past five years. In the event that the applicant has no litigations either in process or in the past 5 years, an Affidavit to this effect, duly notarized must be submitted in original.
- Offers of the Vendor/Supplier not agreeing/failing to submit required documents to any of the above will be liable for rejection.

Annexure–I (Part-B) To Open Tender ref: BAP/PUR/IAA/9550165E dt.07.05.2015
For Supply Of "Inner Arm Assy" , Due on : 03.06.2015
Description of Item, Qty , Drawing and Relevant Specification

Sl No	Description of Itrm	Qty	Unit	Delivery Destination
01	942850010000 Inner Arm Assy As Per Drg : 6172-0030/02.	**35000**	**No**	BHEL/Stores/Ranipet

Painting : Please refer "*PRQA 590/Rev 01 , Sl no 4.1 (Page#10)"*

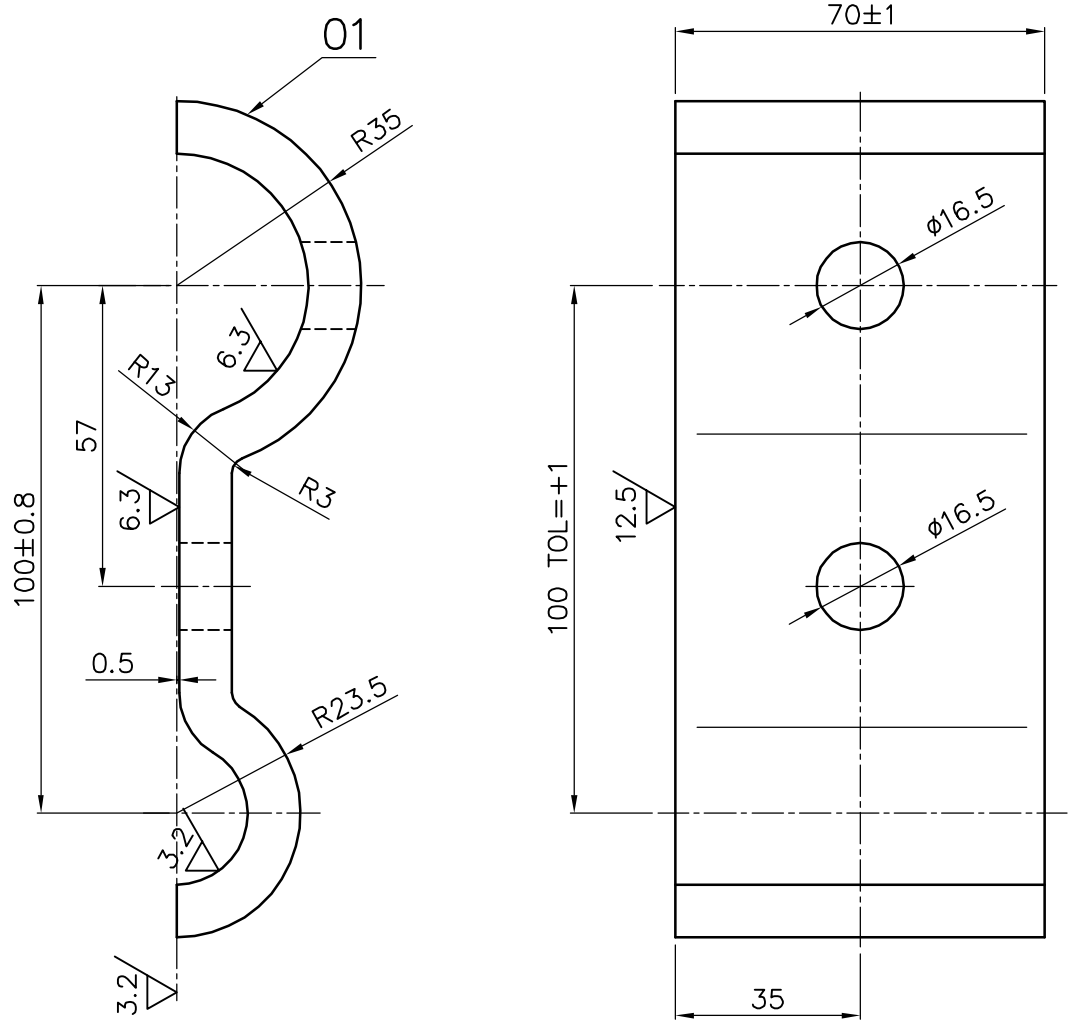
Un Tolerenced Dimension : Please refer QWI "PRQA 500"

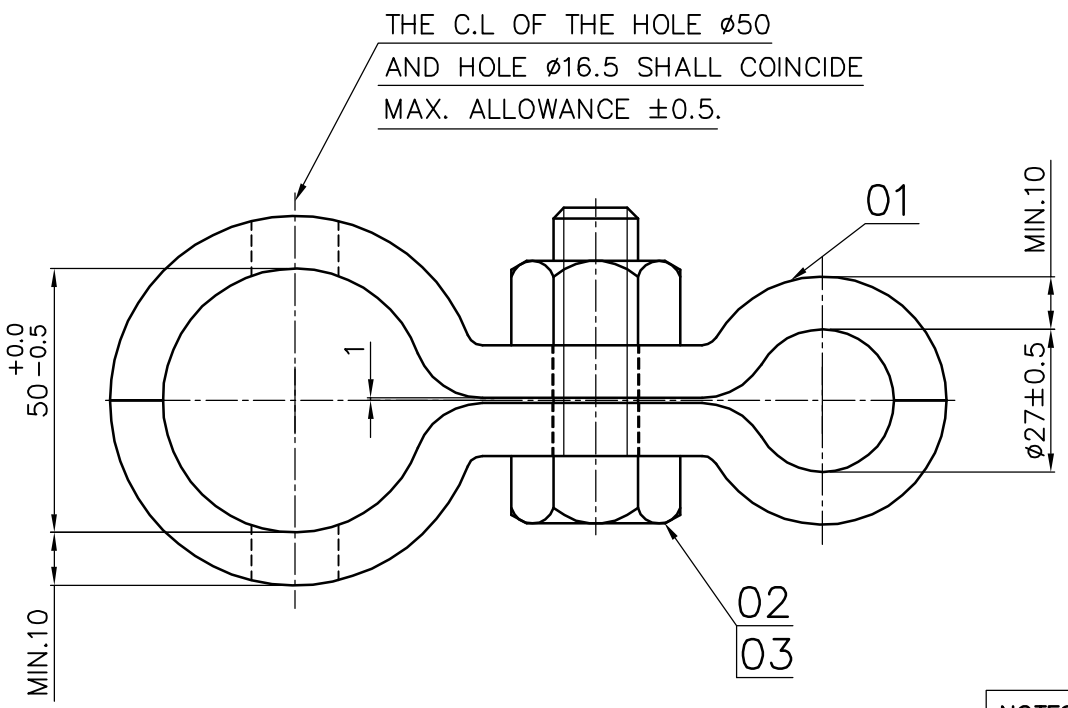
Fabrication : Please refer QWI "QP:ESP:287"

DRAWING NO.

ALL DIMENSIONS ARE IN MILLIMETRES

3.2 / 6.3 / 12.5





NOTES :–
01. FOR FABRICATION REFER RELEVANT QWI
02. FOR UN TOLERENCED DIMENSIONS REFER RELEVANT QWI

Material code: 942850010000

	ITEM NO.	DESCRIPTION	STD	DRAWING NO.	ITEM NO. / VAR NO.	MATL CODE / MATL SPECN	A/C / UNIT / DI	UNIT WT. / QTY.	G.S
	03	NUT HEX P M16				41320 00016 / IS 1364		0.033 / 2	
	02	SCREW HEX P M16X45 Gr 8.8 △02				41238 16045 / IS 1364		0.100 / 2	
	01	FLAT 75X12–220 LONG				150081840000 / IS 2062		1.263 / 2	

NOTE: –

01. MATCH MARKS TO BE PUNCHED ON BOTH HALVES OF INNER ARM ASSEMBLY.
02. INTERCHANGE OF ITEM NO.1 BETWEEN DIFFERENT INNER ARM ASSEMBLY 1:5 IS NOT PERMITTED.
03. THE INNER ARM IS TO BE PRESSED.
04. FACE AND BORE TO BE SQUARE WITHIN 1/2.

PAINTING: – △01

05. MANUAL OR MECHANICAL RUST REMOVAL METHOD SHALL BE FOLLOWED BEFORE PAINTING.
06. ONE COAT OF RED OXIDE ZINC PHOSPHATE PRIMER TO IS:12744 (VARNISH MEDIUM ALKYD) MIN DFT=30 AND TWO COATS OF SYNTHETIC SMOKE GREY ENAMEL PAINT TO IS:2932 MIN DFT=40. TOTAL DFT=70.

REV	DATE	ALTERED : Nadhiya / CHECKED : C.GANESH	REV	DATE	ALTERED : A.PARASU / CHECKED : C.GANESH
02	05.5.14	Fastener Gr 8.8 indicated in BOM	01	05.7.10	NOTE 06 ADDED.

TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT

BHARAT HEAVY ELECTRICALS LTD.,
UNIT: BOILER AUXILIARIES PLANT.
RANIPET – 632 406.

	NAME	SIGN	DATE	NO.OF VAR.
DRN	K.A.PARASU	K.A. Parasu	03.07.2010	
CHD	C.GANESH			
APPD	C.GANESH			

DEPT	GRADE OF UNTOL.DIM	SCALE	WEIGHT (KG).	REF. TO ASSY/OLD DRG.	ITEM NO.	NO. OF ITEMS
AQCS	∅ / M / ∉		2.792	2–74–316–00146 3–79–016–00048		
CODE 862						

TITLE	CARD CODE	DRAWING NO.	REV
INNER ARM	U 01	6172–0030	02

Size A3

Procedure for Surface preparation and Painting

Prepared By	V SUNDARAM SEF/QA	

Reviewed By	B SRINIVASA RAO DGM/QA	
	S RAGHUNATHAN SM/EDC/APH	
	P JAYAKANTH DGM/EDC/AQCS	
	K GOPALASAMY SDGM /EDC/FANS	
	P RAVIKUMAR DGM/ EDC /G&D AND DP	

Approved By	H ANANTHANARAYANAN AGM/QA&OLI	

Record of revision

Rev No.	Effective Date	Details of revision
00	10 10 02	RP0674199 Rev 05 requirements and PRQA 590 rev 12 requirements were fully reviewed and this document is released as Rev 00 taking care of painting requirements of BAP projects. For project specific painting schemes respective CIS or contract specific painting schemes to be referred.
01	22 05 07	Painting requirement are fully reviewed. Red oxide Zinc chromate for primer application (IS 2074) is corrected as Red oxide Zinc phosphate primer (IS 12744) and also number coats & DFT corrected.

1.0 SCOPE

1.1. This procedure specifies requirements for surface preparation and painting and coating, for APH, Fan, ESP, Gates & Dampers and Chimney. (For WEG and Desalination, please refer PRQA: 518/Latest and PRQA: 526/Latest respectively).

1.2. Section I deals with surface preparation schedule and section II deals with painting and coating.

1.3. Special contractual requirements, if any, will be indicated through a separate contract specific documents with customer approval, when required. The linkage will be provided in the CQR issued by QA.

2.0 GENERAL

2.1 This procedure specifies painting requirements to provide adequate protection up to one year in open yard at site.

2.2 No painting shall be applied on the stainless steel, galvanized and any plated surfaces. For estimation of requirements of painting, the approximate area of coverage on non-absorbing surface is as given below: -

SL. No.	Generic nature of paint	Theoretical covering area (Sq.M/litre)	DFT /Coat (Min)	Shade
1	Red oxide zinc phosphate primer to IS 12744	10	30	Red oxide
2	Synthetic enamel paint to IS 2932	10	20	Smoke grey
3	Heat resistant aluminum paint to IS 13183	10	20	Aluminium

2.3 For bought out items, the painting scheme shall be as per purchase specification. If this is not specified in purchase specification, the following is the minimum requirement

a) Primer: One coat of red oxide zinc Phosphate primer to IS 12744- DFT 30 microns
b) Finish: Two coats of synthetic enamel to IS 2932 smoke grey shade No.692 of IS 5. -DFT 20 microns per coat

Section –I

3.0 SURFACE PREPARATION REQUIREMENTS FOR PAINTING AND COATING

3.1. The effectiveness and duration of the protection provided by organic, inorganic and metallic coatings for corrosion protection depends among other things decisively on proper surface preparation. This section deals with the methods of surface preparation, their effectiveness and fields of application.

3.2. This section largely based on ISO 8501 – 1: 1988 that in turn is based on the Swedish standard SS 05 59 00.

3.3. SURFACE PREPARATION METHODS

3.3.1. Surface preparation depends on initial condition of uncoated surfaces. The details of rust level, rust removal methods and characteristics surfaces are given in table 1.0.

3.4. DEFINITIONS AND METHODS OF CLEANING

3.5. CLEANLINESS OF SURFACES.

3.5.1. Cleaning requirements and levels of cleanliness, contaminants such as dirt, oil that will interfere with the adhesion or effectiveness of the proposed coating must be removed. Coats of materials related to the metal (scale, rust) and coats of different materials (e.g. existing coating) should be removed until the agreed level of cleanliness is attained.

3.5.2. Contaminants/coats, both of related material and of materials different from the metal may be removed in one operation if the nature, level and thickness permit this. The required level of cleanliness depends on

- The corrosion protection system selected
- The type of corrosion exposure expected
- The initial condition of the surface being prepared
- The possible rust removal method
- Economic considerations

3.5.3. Generally, the standard levels of cleanliness as in table 1.0 should be used as a basis. This does not cover the removal of weld spatter, weld or flame cutting slag or chips, repair grinding of rolling defects (laminations) deburring and similar operations.

3.6. MECHANICAL METHODS OF REMOVING RUST

3.6.1. Manual rust removal:

3.6.1.1.This applies to standard levels of cleanliness St 2, St3 as per table 1.0 manual cleaning uses wire brush, stripping knife, Swedish scraper, rust removing hammer etc., The method must not damage the metal being derusted. Subsequent cleaning by sweeping or brushing off or by blowing off with dry air.

3.6.2. Mechanical rust removal:

3.6.2.1.This applies to standard levels of cleanliness St2, St3 as per table 1.0 cleaning can be done by mechanically driven rust removing tools viz., rotating wire brush, impact piston devices or rotary descalers, sanding discs etc. The surface areas where the power driven tool cannot enter, manual cleaning should be done. The method must not damage the metal being derusted. Subsequent cleaning by sweeping or brushing off or blowing off with dry air.

3.6.3. Blast cleaning

3.6.3.1.This applies to standard levels of cleanliness Sa 1,Sa 2½,Sa 3 as per table- 1.0. Chemically contaminated surfaces must be pre-washed. Surfaces having coarse rust must be pre-cleaned with impact tools prior to blast cleaning.

3.6.3.2.Compressed air blasting is generally recommended for our operations. It is a freely directed air blasting in blasting cubicles,. Rooms or sheds with re-circulation of blasting abrasives.

3.6.4. REMOVAL OF CONTAMINANTS/COATS OF MATERIAL DIFFERENT FROM THE METAL

3.6.4.1. Surface of metal contaminated with cutting fluid (machine coolant) oil or grease shall be wiped with mineral turpentine/tri-chloroethylene prior to applying any methods of mechanical surface preparation.

3.6.4.2.If any old paint film or rust preventive films are present they may be removed with paint removing jelly.

3.6.4.3.As far as possible the cleaning method should be so chosen that all the scale is removed from the metallic surface to be coated. For heavily scaled metallic surfaces either blasting or pickling may be adopted over and above the requirements called for in the table 1.0.

3.6.5. NOTES TO TABLE 1.0

3.6.5.1.Initial condition of uncoated surfaces (rust grade as per SS 05 59 00)

a) Steel surface largely covered with adhering mill scale but little, if any rust.
b) Steel surface, which has begun to rust, and from which the mill scale has begun to flake.
c) Steel surface on which the mill scale has rusted away or from which it can be scrapped, but with slight pitting visible under normal vision.
d) Steel surface on which the mill scale has rusted away and on which general pitting is visible under normal vision.

3.6.5.2.Standard level of cleanliness equivalent to steel structures painting council of US (SSPC) also given in brackets in table 1.0.

Table 1.0

Standard level of cleanliness	Rust removal method	Initial condition of steel surfaces (Uncoated ref.4.5)	Essential Characteristics of the prepared steel surface
St 2 (SSPC–SP 2)	Thorough hand and power tool cleaning	B, C, D	When viewed without magnification, the surface shall be free from visible oil, grease and dirt, and from poorly adhering mill scale, rust coatings and foreign matter.
St 3 (SSPC SP 3)	Very Through hand and power tool cleaning	B, C, D	As for St 2, but the surface shall be treated much more thoroughly to give a metallic sheen arising from the metallic substrate.
Sa 1 (SSPC SP 7)	Light blast cleaning	B, C, D	When viewed without magnification, the surface shall be free from visible oil, great and dirt, and from poorly adhering mill scale, rust, paint coatings and foreign matter.
Sa 2 (SSPC SP 6)	Thorough blast cleaning	B, C, D	When viewed without magnification, the surface shall be free from visible oil, grease and dirt, and from most of the mill scale, rust, paint coatings and foreign matter. Any residual contamination shall be firmly adhering.

Standard level of cleanliness	Rust removal method	Initial condition of steel surfaces (Uncoated ef.4.5)	Essential Characteristics of the prepared steel surface
Sa 2 ½ (SSPC SP 10)	Very Through blast cleaning	B, C, D	When viewed without magnification, the surface shall be free from visible oil, grease and dirt, and from the mill scale, rust, paint coatings, and foreign matter. Any remaining traces of contaminations shall show only as slight stains in the form of spots or stripes
Sa 3 (SSPC SP 5)	Blast cleaning to visually clean steel.	A,B, C, D	When viewed without magnification, the surface shall be free from visible oil, grease and dirt, and from mill scale, rust, paint coatings and foreign matter. It shall have a uniform metallic colour.

Section -II

4.0 SCHEDULE OF PAINTING AND COATING:

Table 2.0

Sl.No.	Component/PGMA	Surface preparation	Primer	DFT in µm (Min)	Finish	DFT in µm (Min)	Total DFT (Min)
1.0	**Regenerative Air Pre-Heaters**						
1.0.1	Heating element baskets (without elements) 52 010, 024, 025	Power tool cleaning to ST-3 (SSPC SP3)	One coat of red oxide zinc phosphate primer to IS 12744 (varnish medium alkyd)	30	Nil	--	30
1.0.2	Heating elements (with elements) 52 010, 024, 025	--	(*) Temporary rust preventive oil non dry type (Dipping)	--	NIL	--	--
1.0.3	Rotor post assembly machined items of (52 011), Pin rack assembly (52 012) seals (52 013,054,055), sector plates (52 041,042) and machined components of APH.	--	(**) Temporary rust preventive oil Dry type	20	NIL	--	20
1.0.4	**Components in flue gas path and insulated** Rotor post assy (52 011), T bars (52 013), Rotor housing assy. (52 030), Hot and cold connecting plate assy. (52 041,042),	Power tool cleaning to ST-3 (SSPC SP3)	Two coats of red oxide zinc phosphate primer to IS 12744 (varnish medium alkyd)	60	NIL	NIL	60

(*) Specification as per PRQA 522/Rev 00

(**) Specification as per PRQA 523/Rev 00

Sl.No.	Component/PGMA	Surface preparation	Primer	DFT in μm (Min)	Finish	DFT in μm (Min)	Total DFT (Min)
1.0.5	**Components exposed to Atmosphere** Rotor drive assy (52 100), Access door (52 210, Air seal piping (52 211), observation port other than glass part (52 212), Rotor stoppage alarm other than aluminum (52 217), Loose items of Air receiver (52 220), Guide bearing assy (52 261), Support bearing assy (52 262), Oil piping GB, SB (52 271,272) oil circulation unit (52 274), Deluge and wash pipe assy. (52 301,302,401,402) Cleaning device assy (52 325, 326), Cleaning device drive (52 329,429), Thermo couple pipe assy. Other than SS (52 360)	Power tool cleaning to ST-3 (SSPC SP3)	One coat of red oxide zinc phosphate primer to IS 12744 (varnish medium alkyd)	30	Two coats of synthetic enamel paint to IS 2932 shade 692 of IS 5 unless specified otherwise.	40	70
2.0	**TUBULAR AIRPREHEATER**						
2.1	Side walls (external surfaces and internal surfaces).	Power tool cleaning to ST-3 (SSPC SP3)	Two coats of red oxide zinc phosphate primer to IS 12744 (varnish medium alkyd)	60	--	--	60
2.2	Machined surfaces, tubes of TAPH, Tube plates and intermediate plates	---	(**) Temporary rust preventive oil Dry type	20	NIL	NIL	20

Sl.No.	Component/PGMA	Surface preparation	Primer	DFT in μm (Min)	Finish	DFT in μm (Min)	Total DFT (Min)
3.0	**Fans**						
3.1	Foundation materials 55 0XX, 56 0XX	Power tool cleaning to ST-3 (SSPC SP3)	Temporary Rust preventive	20	--	--	20
3.2	Components exposed to atmosphere a) Bearing Pedestals, Base frame, Servomotor assy, shaft with Bearing assy, OGV, IGV (55-1XX,55-2XX 55-3XX). b) Bearing Pedestals, Base frame, Shaft with bearing assy, RVC, IGV, Support for Seal, shaft protecting tube, Spiral casing (if no insulation is applicable), Damper (56-1XX, 56-2XX 56-3XX, 56-4XX) c) Coupling guard (56-8XX, 55-8XX). Tools (56-000,55-000)	Power tool cleaning to ST-3 (SSPC SP3)	One coat of red oxide zinc phosphate primer to IS 12744 (varnish medium alkyd)	30	Two coats of synthetic enamel paint to IS 2932 shade 692 of IS 5 unless specified otherwise.	40	70
3.3	Components in AIR/GAS and under insulation a) Suction chamber, diffuser, housing, OGV, impeller (55-1XX, 55-2XX, 55-3XX), b) Spiral casing, damper, IGV, RVC, impeller, shaft (56-1XX, 56-2XX, 56-3XX 56-4XX). c) Silencer (56-9XX, 55-9XX)	Power tool cleaning to ST-3 (SSPC SP3)	Two coats of red oxide zinc phosphate primer to IS 12744 (varnish medium alkyd)	60	NIL	NIL	60
3.4	Journal area Of shaft (55-1XX, 56-1XX, 55-2XX, 56-2XX, 55-3XX, 56-3XX 56 4XX				**Refer PRQA 341/ Latest**		
3.5	All machined surfaces shall be applied with rust preventive.						

Sl.No.	Component/PGMA	Surface preparation	Primer	DFT in μm (Min)	Finish	DFT in μm (Min)	Total DFT (Min)
4.0	**Electro static precipitator**						
4.1	GD drive Arrangement (7X X10), Drive arrangement for emitting system (7X X17), Inspection doors (7X X23), Drive arrangement for CE rapping (7X X26), Outer roof (7X X42), ESP pent House (7X X55), ESP test equipment (7X X61) Water washing system (7X X66) Tools and tackles (7X 996), Lifting beam (7X X20), Columns (7X X81) Hopper approach platform (7X X 65), Stringer and Guard plates (7X 610).	Power tool cleaning to ST-3 (SSPC SP3)	One coat of red oxide zinc phosphate primer to IS 12744 (varnish medium alkyd)	30	Two coats of synthetic enamel paint to IS 2932 shade 692 of IS 5 unless specified otherwise.	40	70
4.2	Insulator Housing assy.(7X X06), Gas distribution assy.(7X X08),GD rapping mechanism(7X X09), Gas screening (7X X11), Emitting system suspension (7X X13), Emitting electrode rapping (7X X16), Suspension arrangement for CE (7X X19), Frame of Emitting system Top & Bottom and Middle.(7X X21,X22,X32),Shock bars(7X X24), CE Rapping mechanism (7X X25), Ridges(7X X43), Hopper upper and Lower & Middle part (7X X44, X45),Insulator support panel (7X X46), Roof panel assy. (7X X47), Casing structure (7X X28, X48), Casing shell (7X X49), ESP Funnel (7X X50), Splitter&Guidevane (7X X57)	Power tool cleaning to ST-3 (SSPC SP3)	Two coats of red oxide zinc phosphate primer to IS 12744 (varnish medium alkyd)	60	NIL	--	60

Sl.No.	Component/PGMA	Surface preparation	Primer	DFT in μm (Min)	Finish	DFT in μm (Min)	Total DFT (Min)
4.3	Hand rails, post, step treads, Floor grills (89 610,611,7X X65)	Power tool cleaning to ST-3 (SSPC SP3)	One coat of red oxide zinc phosphate primer to IS 12744 (varnish medium alkyd)	30	Two coats of synthetic enamel paint to IS 2932 black shade	40	70
4.4	EE (7X X15)[EE hook, EE suspension hook (7X X13), CE (7X X20)[CE, CE suspension hook (7X X19), Foundation material foe ESP structures& ducts (7X X80).	--	(**) Temporary rust preventive oil Dry type	20	--	--	20
5.0	**Gates and Dampers**						
5.1	Gates and dampers temperature ≤ 95°C (57 XXX)	Power tool cleaning to ST-3 (SSPC SP3)	One coat of red oxide zinc phosphate primer to IS 12744 (varnish medium alkyd)	30	Two coats of synthetic enamel paint to IS 2932 shade 692 of IS 5 unless specified otherwise.	40	70
5.2	Gates and dampers temperature > 95°C (57 XXX)	Power tool cleaning to ST-3 (SSPC SP3)	Two coats of red oxide zinc phosphate primer to IS 12744 (varnish medium alkyd)	60	NIL	--	60
5.3	Gate blades, Machined components of G&D	---	(**) Temporary rust preventive oil Dry type	20	NIL	NIL	20
6.0	**Chimney**						
6.1	Foundation bolt (87 010)	Power tool cleaning to ST-3 (SSPC SP3)	(**) Temporary Rust preventive	20	--	--	20
6.2	Shells-Inside and Un insulated side, base plate (87 100),	Blast Cleaning to Sa 2 ½ (Near white metal with Surface profile 35 – 50 μm)	Two coats of Heat resistant aluminum paint as per IS 13183 (GR I -Up to 600°C,GR II 200°C to 400°C, GR III Up to 200°C)	40	NIL	--	40
6.3	Ducts un insulated, Strakes, (87 150), Painter trolley (87 200)	Power tool cleaning to ST-3 (SSPC SP3)	Two coats of Heat resistant aluminum paint as per IS 13183 (GR I -Up to 600°C,GR II 200°C to 400°C, GR III Up to 200°C)	40	NIL	--	40

Sl.No.	Component/PGMA	Surface preparation	Primer	DFT in μm (Min)	Finish	DFT in μm (Min)	Total DFT (Min)
6.4	Shells –out side insulated (87 100), Ducts- Insulated (87 150)	Power tool cleaning to ST-3 (SSPC SP3)	Two coats of red oxide zinc phosphate primer to IS 12744 (varnish medium alkyd).	60	--	--	60
6.5	Ladders, Hand rails, floor grills, platforms (87 300)	Power tool cleaning to ST-3 (SSPC SP3)	One coat of red oxide zinc phosphate primer to IS 12744 (varnish medium alkyd)	30	Two coats of synthetic enamel paint to IS 2932 black shade	40	70
7.0	**Products meant for overseas application**						
7.1	Internal and External parts of APH, ESP. Fan and Gates and Damper	Blast Cleaning to Sa 2 ½ (Near white metal with Surface profile 35 – 50 μm)	Epoxy red oxide Zinc phosphate primer to IS 13238	30	Epoxy polyamide cured paint to IS 14209	30	60

Note: All componenents covered under different PGMAs are to be painted .In case any component is left out, the same shall be deemed to be included under relevant section.

QUALITY ASSURANCE
QWI NO: PR:QA:590 Rev.01 Dtd.02.02.2008
Amendment to Quality Work Instruction (QWI)
Amendment No: A1 **Date:11.10.2013**
Title: *Procedure for Surface Preparation and Painting*

Details of Amendment		
Clause No	**Amended As**	**Basis for Amendment**
Refer Clause no 4.0 – Table 2 and further clause no. 3.2 a) and 3.3 a) of Table.	AP Fan components like Servo Motor Assy, Shaft with Bearing Assy (refer clause 3.2 a) and impeller (refer clause 3.3 a) of table 2.0 Presently Existing Painting Scheme: 1. Primer: one coat of red oxide zinc phosphate primer to IS 12744 (varnish medium alkyd) DFT = 30 µm. 2. Two coats of synthetic enamel paint to IS 2932 shade 692 of IS 5 Unless specified otherwise Finish= 40 µm(Primer+Finish: total DFT-30+40=70 µm) The above painting scheme has been modified as below - only for AP fan components like Servo Motor Assy, Shaft with Bearing Assy (refer clause 3.2 a) and impeller (refer clause 3.3 a) of table 2.0 • Epoxy based Zinc Phosphate Primer (Two Pack system) as per IS:13238 – Two coats and each coat min. 30µm and total DFT will be 60 µm • Finish Paint : Not Applicable	Feedback from RCA Sub-Committee Meeting. Dt-14.05.2013 (For quick drying of paint)

Prepared By (QA)	Reviewed By	Approved By
	QC-Shop	
	QA	

BHEL
RANIPET

BHARAT HEAVY ELECTRICALS LTD.
BOILER AUXILIARIES PLANT
RANIPET 632 406

QUALITY DEPARTMENT

PROCEDURE FOR: ALLOWABLE DEVIATIONS FOR DIMENSIONS WITHOUT SPECIFIED TOLERANCES

EFFECTIVE DATE: 16/01/93

	NAME	SIGNATURE	DATE
PREPARED BY	K NITHIANANDAM		16/1/93
REVIEWED BY	S ANIL KUMAR		16/1/93
APPROVED BY	P H TAMBAKHE	P H Tambakhe	16/1/93

ISSUED BY	: QUALITY ASSURANCE
REVISION	: NIL
DATE	:

DOCUMENT CONTROL NO: [ ]

File Name :PHT.RSU

1. Table 1 given below indicates the permissible variation in Linear Dimension of fabricated and machined components. The corase grade is to be followed for fabricated components and medium grade for machined components.

2. Table 2 given below indicates the permissible deviations for Radii & Chamfers for machined components.

3. Table 3 given below indicates the permissible deviations for Angular dimensions for machined components.

4. Table 4 given below indicates the conditions under which the deviations given in this standard are not applicable.

5. Special rulings may be stated for linear dimensions of welded structures consisting of several assemblies.

6. If closer tolerances than those given in this procedure are necessary, the same shall be indicated in the relevant drawings.

TABLE - 1

Degree of accuracy	Deviations in mm for the nominal size range in mm											
	0.5 * up to 3	Over 3 upto 6	Over 6 upto 30	Over 30 upto 120	Over 120 upto 400	Over 400 upto 1000	Over 1000 upto 2000	Over 2000 upto 4000	Over 4000 upto 8000	Over 8000 upto 12000	Over 12000 upto 16000	Over 16000 upto 20000
f (fine)	± 0.05	± 0.05	± 0.1	± 0.15	± 0.2	± 0.3	± 0.5	± 0.8	-	-	-	-
m(medium)	± 0.1	±0.1	± 0.2	± 0.3	± 0.5	± 0.8	± 1.0	± 2	± 3	± 4	± 5	± 6
g(coarse)	± 0.15	± 0.2	± 0.5	± 0.8	± 1.2	± 2	± 3	± 4	± 5	± 6	± 7	± 8
sg(very coarse)	-	± 0.5	± 1	± 1.5	± 2	± 3	± 4	± 6	± 8	± 10	± 12	± 12

* In the case of nominal sizes below 0.5 mm, the deviations must be specified directly by the side of the nominal size.

TABLE - 2

DEVIATIONS FOR RADII & CHAMFERS

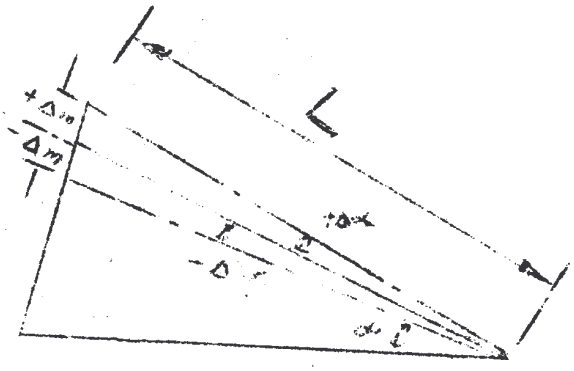
All dimensions are in mm

CLASS OF DEVIATION	RANGE OF NOMINAL DIMENSIONS					
	Above	0.5	3	6	30	120
	Upto and Including	3	6	30	120	315
Fine & Medium		± 0.2	± 0.5	± 1	± 2	± 4

TABLE - 3

DEVIATIONS FOR ANGULAR DIMENSIONS

$\Delta\alpha$=Angle Tolerance in angular units
Δ m=Angle Tolerance in linear units



All Dimensions are in mm

	Length (L) of shorter side of angle in mm							
CLASS OF DEVIATIONS	Above	-	10	50	120	500	800	1250
	Upto & including	10	50	120	500	800	1250	2000
FINE AND MEDIUM	Δm (mm)	± 0.1	± 0.2	± 0.6	± 0.8	± 0.96	±1.125	± 1.5
	$\Delta\alpha$(deg or min)	± 1°	± 30'	± 20'	± 10'	± 4'	± 3'	±2'3"

TABLE - 4
NON APPLICABILITY OF THE STANDARD

STANDARD SPECIFICATION	CONDITIONS FOR TOLERANCING	DIMENSIONS	PRODUCTION METHOD	SPECIAL AGREEMENTS
Where Permissible deviations have been specified	Where higher values than those specified in Table 1 and 2 may be allowed.	For dimensions required to give a certain class of it	Casting, forging, pressing, rolling, welding, flame cutting	Where variations from this standard are agreed upon between the purchaser and the manufacturer
	Where only positive or only negative deviations are desired	For dimensions resulting after assembly		
	Where parts are manufactured separately and are required to be assembled together without any further treatment (selective assembly, spare parts etc)	Where concentricity between parts is required		
		For angular dimensions of a circular division (For example, angular positioning of teeth of clutches)		
		For angular dimensions in precision taps and in pipe bends		
		For dimensions of welded assemblies (unless the part is to be machined)		

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QUALITY DEPARTMENT

AMENDMENT TO QUALITY WORK INSTRUCTIONS (SQP)

QWI NO: QP:ESP:287 REV 00 DATE : 20 06 98
AMENDMENT NO. A 1 DATE : 18.09.00

DESCRIPTION: INNER ARM & OUTER ARM, SHOCK BARS, VERTICAL STAY, VERTICAL BEAM, SUPPORT BEAM AND HAND RAILS, RIDGES AND SHOCK BEAM.

DETAILS

CLAUSE NO	AMENDED AS	BASIS FOR AMENDMENT/ REMARKS
Note 3.4	This clause note3.4 is Added for Transver ridges: Transverse ridges (7X - X43) - only one joint in each member of the ridges is allowed after obtaining prior approval from engg.	Feed back from engg. (CTQ mom dt:29-4-200)

Prepared by	Reviewed by		Approved by
	Engg/AQCS		
	QC/OLI		
	QA		

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QUALITY DEPARTMENT		
Amendment to Quality Work Instructions (SQP)		
QWI NO: SQP:ESP:287	REV:00	DT. 20/06/98
Amendment no: A 2		DT. 25/01/2001
Description: Inner arm & Outer arm, Shock Bars, Vertical Stay, Vertical Beam, Support Beam, Hand Rails, Ridges and Shock Beam.		

Details of Amendment

CLAUSE NO	AMENDED AS	BASIS FOR AMENDMENT
Note 4.1.1	E 6013 electrode shall be dried in baking oven at 120-130°C until they are used, if the packing were found to be damaged or the electrodes were kept exposed to atmosphere for prolonged period.	Feed back of CTQ MOM dt:12/10/2000

Prepared by	Reviewd by		Approved by
	Engg/AQCS		
	QC/OLI		
	QA	B. Srinivasan	

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BHEL RANIPET	STANDARD QUALITY PLAN FOR ESP(MECHANICAL)	
REF.NO.	REVISION NO.	EFFECTIVE DATE
QP:ESP:287	00	20 06 . 98

TITLE : INNER ARM & OUTER ARM,SHOCK BARS,VERTICAL STAY, VERTICAL BEAM,SUPPORT BEAM AND HAND RAILS,RIDGES AND SHOCK BEAM.

		SIGNATURE
PREPARED BY	:A ELANGOVAN/QA	
REVIEWED BY	:K NITHIANANDAM/QA	
	:P RAJASEKARAN/QC-OLI	
	:T. GNANAPRAKASAM/AQCS	
APPROVED BY	:H ANANTHANAYANAN/QA	

ISSUED & CONTROLLED BY :QUALITY ASSURANCE,BHEL,RANIPET-632406

DOCUMENT STATUS
ISSUED TO:
Mr

☐ INFORMATION COPY

DEPARTMENT: ☐ CONTROLLED COPY NO ☐

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NOTE:IT IS A CONTROLLED COPY ONLY IF THE MARKING AGAINST THE CONTROL COPY IS IN OTHER THAN BLACK COLOUR.OTHERWISE IT WILL BE AN UNCONTROLLED COPY.CHECK FOR CURRENT REVISION ALWAYS.

BHEL RANIPET	STANDARD QUALITY PLAN FOR ESP(MECHANICAL)	
REF.NO.	REVISION NO.	EFFECTIVE DATE
QP:ESP:287	00	20 06 98

TITLE : INNER ARM & OUTER ARM,SHOCK BARS,VERTICAL STAY, VERTICAL BEAM,SUPPORT BEAM AND HAND RAILS,RIDGES & SHOCK BEAM

RECORD OF REVISION

REF	DETAILS OF REVISION	DATE AMENDED/ REVISED
REVISION 00	TOTALLY REVIEWED. MERGED SQP:ESP 264, 267,268,270 & 275 ISSUED AS SQP:ESP:287	20 06 98

	MANUFACTURER'S NAME & ADDRESS	MANUFACTURING QUALITY PLAN	QP:ESP:287	STANDARD QUALITY PLAN
	BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT RANIPET - 632 406. (INDIA) QUALITY ASSURANCE DEPARTMENT	ITEM :INNER ARM & OUTER ARM SHOCK BARS,VERTICAL STAY, VERTICAL BEAM,SUUPORT BEAM, HAND RAILS,RIDGES&SHOCKBEAM	REV : 00 DATE: 20 06 98 PAGE: 03 OF 11	

S.No.	COMPONENT & OPERATION	CHARACTE-RISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY M **	AGENCY C	AGENCY E	REMARKS
1	2	3	4	5	6	7	8	9	D*	10		11
1.0	RAWMATERIALS											
	PLATES/ANGLES SQ,HALLOWS/ TUBES/CHANNEL BEAMS.$$	CHEMICAL AND MECHANICAL PROPERTIES	MAJOR	REVIEW OF TC/RANDOM TESTING	EACH HEAT /LOT AS PER SPECI FICATION	RESPECTIVE MATERIAL SPECIFICATION AS PER THE DRAWING.		TC		V		RAW MATERIALS ARE TAKEN TO STOCK ON VERIFICATION OF TCS/RANDOM TESTING
2.0	INPROCESS CONTROL											NOTE:$$(1)IN THE CASE OF SHOCK BARS HOLLOWS OF VERTICAL BEAM NO JOINT IS PERMITTED FOR LENGTH BUILT UP OF ANGLE/FLAT. (2)VERTICALITY OF VERTICAL BEAMS SHALL BE VERIFIED AND CONTROLLED WITHIN THE LIMITS.
2.1	FLAME CUTTING END TRIMMING& FACING	LAMINATION, CRACKS,DIS-CONTINITIES& END SQUARENESS ON CUT EDGES OF RAW MATERIALS	MAJOR	VISUAL	100%	AS PER AWS D1.1,DRAWING NO CRACKS & LAMINATIONS ARE PERMITTED		R		P	V	
2.2	PRESSING/ MARKING/DRILL ING/MACHINING	LENGTH,PROFI LE,RADIUS,HO LES LOCATION, SIZE,ORIENTA ION,PITCHES	MAJOR	MEASURE MENT/VERI FICATION IN FIXTURE VERTFICATI ON OF CHARACTERI CS (HAND RAILS)	100%	DRAWING		R		P	V	

LEGEND: * RECORDS IDENTIFIED WITH "TICK" SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.
** M:MANUFACTURER/SUB-CONTRACTOR,C:CONTRACTOR/NOMINATED INSPECTION AGENCY,E:CUSTOMER.
R:REPORT,IR:INSPECTION REPORT "P" PREFORM "W" WITNESS AND "V" VERIFICATION AS APPROPRIATE

MANUFACTURER'S NAME & ADDRESS	MANUFACTURING QUALITY PLAN	QP:ESP:287	STANDARD QUALITY PLAN
BHARAT HEAVY ELECTRICALS LTD BOILER AUXIALIARIES PLANT RANIPET - 632 406. (INDIA) QUALITY ASSURANCE DEPARTMENT	ITEM :INNER ARM & OUTER ARM SHOCK BARS,VERTICAL STAY, VERTICAL BEAM,SUPORT BEAM, HAND RAILS,RIDGES&SHOCKBEAM	REV : 00 DATE: 20 06 98 PAGE: 04 OF 11	

S.No.	COMPONENT & OPERATION	CHARACTE-RISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFFRENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY M **	C	F	REMARKS
1	2	3	4	5	6	7	8	9	D*	10		11
2.3	WELDING	a)PROCEDURE QUALIFICATION	MAJOR	REVIEW OF DOCUMENTS	100%	PRE QUALIFIED WELDING PROCEDURE AS PER AWS D1.1		R	P	V	V	
		b)PERSONNEL QUALIFICATION	DO	DO	100%	AWS D1.1		R		P	V	V	
2.4	NDT [I]i)	BUTT WELDS ON STRUCTURES SUPPORT BEAM	DO	LPI	#20%RANDOM	AWS D1.1		R		P	V	V	#:IN CASE OF DEFECTS %AGE SHALL BE INCREASED
	@ &ii)	FILLET WELDS BETWEEN TUBES IN CASE OF PLAIN HAND RAILS	DO	LPI	#10%RANDOM	AWS D1.1		R		P	V	V	NOTE:@ BUTT JOINTS ON TUBES TO BE DONE WITH 45oFF ANG
	[II]i)	FILLET WELDS ON STRUCTURES	DO	LPI	#10%RANDOM	AWS D1.1		R		P	V	V	WELDED & THEN TO BE FLUSH
	& II) @	BUTT WELDS ON PLAIN HAND RAILS	DO	LPI	100%	AWS D1.1		R		P	V	V	GROUND

LEGEND: * RECORDS IDENTIFIED WITH "TICK" SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.
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R:REPORT,IR:INSPECTION REPORT,"P" PERFORM,"W" WITNESS AND "V" VERIFICATION OF DOCUMENTS,
TC:TEST CERTIFICATES,"CHP"(CUSTOMER HOLD POINT):CUSTOMER SHALL IDENTIFY IN COLUMN "F"

MANUFACTURER'S NAME & ADDRESS	MANUFACTURING QUALITY PLAN	QP:ESP:287	STANDARD QUALITY PLAN
BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT RANIPET -- 632 406. (INDIA) QUALITY ASSURANCE DEPARTMENT	ITEM :INNER ARM & OUTER ARM SHOCK BARS,VERTICAL STAY, VERTICAL BEAM,SUPPORT BEAM, HAND RAILS,RIDGES&SHOCKBEAM	REV : 00 DATE: 20 06 98 PAGE: 05 OF 11	

S.No.	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY M **	C	E	REMARKS
1	2	3	4	5	6	7	8	9	D*	10		11
2.4	CONTD..	DIMENSION AND SIZE	MAJOR	VISUAL & MEASUREMENT	100%	DRAWING		R		P	V	V	
2.5	HEAT TREATMENT & HARDNESS IN THE CASE OF OUTER ARM												
	HAMMER AND PLATE	HARDNESS	MAJOR	MEASUREMENT	AS PER IS 2500 PART I IL -III,AQL -4%	DRAWING		R		P	V	V	
3.0	DIMENSIONAL CONTROL												
		TUBEØ & THICKNESS,OVERALL DIMENSIONS OF ASSY,HOLES LOCATION, SIZE, ORIENTATION AS PER DRG. TWIST,BEND, STARIGHTNESS ##	CRITICAL	MEASURMENT. VERIFICATION IN FIXURE/ LAYOUT DEPENDING UPON THE CASE	100%	DRAWING		R		P	V	V	##:VERIFY FRAME ANGLE (Ø)(W.R.T FIXING PLATE) IN THE CASE OF HAND RAILS DURING FITUP ASSY

LEGEND: * RECORDS IDENTIFIED WITH "TICK" SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.
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R:REPORT,IR:INSPECTION REPORT,"P" PERFORM,"W" WITNESS AND "V" VERIFICATION AS APPROPRIATE.
TC:TEST CERTIFICATES,"CHP"(CUSTOMER HOLD POINT):CUSTOMER SHALL IDENTIFY IN COLUMN "E"

	MANUFACTURER'S NAME & ADDRESS	MANUFACTURING QUALITY PLAN	QP:ESP:287	STANDARD QUALITY PLAN
	BHARAT HEAVY ELECTRICALS LTD BOILER AUXIALIARIES PLANT RANIPET - 632 406. (INDIA) QUALITY ASSURANCE DEPARTMENT	ITEM :INNER ARM & OUTER ARM SHOCK BARS,VERTICAL STAY, VERTICAL BEAM,SUUPORT BEAM, HAND RAILS,RIDGES&SHOCKBEAM	REV : 00 DATE: 20 06 98 PAGE: 06 OF 11	

S.No.	COMPONENT & OPERATION	CHARACTE-RISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY M **	C	E	REMARKS
1	2	3	4	5	6	7	8	9	D*	10		11
3.0	CONTD.. IN THE CASE OF INNER ARM:	STRESS RELIEF GAP BET FLATS$	MAJOR	TEMPERATURE CONTROL	100%	DRAWING		R		P	V	IN THE CASE OF SHOCK BARS OF FLAT TYPE $:WITH TEMP PLATE ##:SMALLER & BIGGER HOLES SHALL BE MACHINED KEEPING TWO HALVES TOGETHER AND DRILLING SHALL BE DONE IN FIXURE
	MACHINING/ DRILLING	DIMENSIONS/ FINISH ##	MAJOR	MEASUREMENT	100%	DRAWING		R		P	V	V
	DIMENSION	OVERALL DIMN OF ASSY	MAJOR	DO	AS PER IS 2500 PART I IL-III,AQL 4%	DRAWING		R		P	V	V
4.0	FINAL INSPECTION,SURFACE CLEANING AND PAINTING	MARKING AND PRESERVATION	MAJOR	VISUAL	100%	DRAWING,PAINTING SCHEDULE RP0674199 LATEST,PRQA:590		R		P	V	V
5.0	PACKING	STURDINESS OF PACKING, GROSS WEIGHT,NO OF PIECES INDICATION	MAJOR	VISUAL	100%	AS PER PACKING DRAWING		R		P	V	V

LEGEND: * RECORDS IDENTIFIED WITH "TICK" SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.
** M:MANUFACTURER/SUB-CONTRACTOR,C:CONTRACTOR/NOMINATED INSPECTION AGENCY,E:CUSTOMER.
R:REPORT,IR:INSPECTION REPORT,"P" PERFORM,"W" WITNESS AND "V" VERIFICATION AS APPROPRIATE.
TC:TEST CERTIFICATES,"CHP"(CUSTOMER HOLD POINT):CUSTOMER SHALL IDENTIFY IN COLUMN "E"

1.0 NOTE.1.0 GENERAL REQUIREMENTS

1.1 Any additional requirement for a specific contract shall be referred separately.

1.2 Raw materials used shall conform to the grades specified in the drawing & GMS.

1.3 Raw material shall be free from harmful visual defects like cracks,seams,laps,laminations,heavy pittings etc.

1.4 Fabricators shall check all the supplied raw materials for dimensions, bend , camber etc. , Straightening wherever necessary must be carried out before assy and welding.

1.5 Substitution of materials and Joints (For Support Beam) shall be done with the prior approval of EDC/AQCS.

1.5.1 No joint is permitted on the angle or flat to make up length in the case of shock bar. No joint is permitted to make up the length in the case of vertical beam and stay also.

1.6 Fabricator to impose sufficient process control,necessary stage inspection so that the components made are consistent in quality and conforms to the drawing and specification. It is the responsibility of the fabricator to adopt sufficient measures to avoid Non conformances.

1.7 Plates having deviations like bend, out of flatness etc shall be corrected before taking up for fabrication.

NOTE 2.0INPROCESS CONTROL

2.1 The general requirements for process control during fabrication are as detailed in QCP:002 (Latest) read along with amendment 1.

NOTE 3.0 MARKING,CUTTING AND PREPARATION

3.1 Angles, tubes, sheets,hollows, Channels, Plates and sheets shall be preferably machine or gas cut. Cut edges shall be dressed smooth to remove all the undulations. Gas cut notches if any shall be filled up and dressed. The edges shall be straight and square.

3.2 SHOCK BARS:Holes on angle meant for fixing huck bolt shall be marked correctly.Orientation,location of first hole ref back mark and pitches shall be verified in advance.In the plates holes shall be located at the centre of the plate. Centre of all holes in the angle shall be in one line. Holes can either be punched or drilled.

3.3 Profiles meant for fixing hand rail tubes shall be marked correctly. The profiles of the Ends of the Railings for joints shall be edge prepared with 45o correctly.

NOTE 4.0. WELDING REQUIREMENTS & WELD INSPECTION

4.1 Electrodes : E6013 Electrodes shall be used for Welding.

4.1.1 E6013 electrodes shall be dried in backing ovens at temperature 100o C , until they are used, If the packing were found to be damaged or the electrodes were kept exposed to atmosphere for prolonged period.

4.2 Pre qualified welding procedure as per AWS D 1.1 (Latest) shall be used.

4.3. Welders employed shall be qualified as per AWS D 1.1 latest . Welders qualified to other codes may also be permitted to carryout welding at the discretion of Inspection Engineers.

4.4 Fillet and butt welds shall be done with a minimum of two layers ,and 6mm fillet or less can be done in single run ensuring complete root fusion.

4.5 Sequence of welding shall be so chosen to balance applied heat and to minimise the distortion.

4.6 NDT as required shall be carried out on splice joints before cover plate welding.

4.7 Arc strike shall not be done straight on the job. Welder shall have a separate piece for striking the arc.

4.8 Weld procedures and welder's qualification are detailed in SIP:NP:07 (Latest)

4.9 All welds shall undergo thorough visual examination to detect the weld defects like undercuts, non-uniform beading,overlaps, excessive concavity or convexity etc.

4.10 Welds shall be neither undersize nor excess than specified, shall be as per drg. Smooth contour shall be maintained.

4.11 Only BHEL approved brands of electrodes shall be used.

4.12 Cleaning of the items shall be thoroughly examined before painting.

NOTE 5.0 FABRICATON AND TOLERANCES

1.) VERTICAL BEAM

5.1 The holes in the square tube shall be drilled right through in one setting.

5.2 The welding of angles with the square tube shall be done carefully maintaining perpendicularity. Welds of the angles with the square hollows shall be ground flush.

5.3 In the square hollows of 80x80 for vertical beams, the fabricator shall exercise proper care to ensure that the drilling is done on the sides where there is no weld seam.

5.4 The beam shall be straight throughout the length. Maximum out of straightness permitted 3mm,which is to be checked in the fixture.

.5 Maximum twist permitted in the vertical beam shall be 2mm.

.6 Hole pitches: within ± 1.0mm

2.) SUPPORT BEAM

.1a) All the dimensions like hole pitches and positions of lifting brackets shall be maintained with referance to the centre of the beam. Transverse centre line (Vertical axis) of the beam as well as centrelines of each bracket shall be punched.

.2b) Supporting beam shall be straight throughout the length. Camber or bow permitted 0.5mm/metre length limited to 5mm max.

.3c) The hole dia shall be within ± 0.5mm.

.4d) Position of holes on Web,with referance to flange shall not deviate more than ± 1mm from Specified.

5e) The total length of beam shall be within ± 3mm.

6f) The deviation on hole pitches must not Exceed ± 1mm.

3) SHOCK BARS

Following tolerances shall be applicable on different dimensions of the shock bar (Angle type)

a) Out of alignment of centre of the hole shall be max. 2mm
b) Shock bar angles shall be straight . Out of straightness shall be within 3mm (Max)
c) No twist is permitted.
d) Shock bar slots to be checked with templates for ensuring gap, width and length between flats(Flat type).

4) VERTICAL STAY

Following tolerances shall be applicable on different dimensions of the VERTICAL STAY
a) Length :+0.0/-2.0mm.
b) Both the ends of the vertical stay shall be in the same axis.Maximum out of alignment of the ends shall be within 2.0mm.
c) Out of straightness 1mm/metre limited to 3mm Max.
d) Both the ends shall be square to the tube axis.

pa

5) PLAIN HAND RAILS

Following tolerances shall be applicable on different dimensions of the plain hand rails.
a) Length ±3.0mm, b) Bow 2mm/metre.and c) Notwist is permitted.

NOTE 6.0 CLEANING,PAINTING AND MARKING

6.1 All the finished products shall be thoroughly cleaned to remove burrs, weld slag, spatters,rust,grease and other foriegn materials.

6.2 Cleaned products except plain hand rails shall be coated with two coats of paints as indicated below.

1. A primer coat of red oxide zinc chrome primer confirmng to IS 2074 shall be applied. Minimum coating thickness of 1st coat 25 microns.

2. A finish coat of synthetic eanamel long oil alkyd confirming to IS 2932 (smoke grey shade) shall be applied. Minimum coating thickness of the 2nd coat 20 microns.

6.2.1 Cleaned plain hand rails shall be coated with two coats of paints as indicated below.

1. A primer coat of red oxide zinc chrome primer confirmng to IS 2074 shall be applied. Minimum coating thickness of 1st coat 25 microns.

2. A finish coat of black eanamel over the primer confirming to IS 2932 shall be applied. Minimum coating thickness of the 2nd coat 20 microns.

Adequate drying time is to be allowed between each coat.

6.3 MARKING

6.31 Each piece shall have the following details stenciled: Stenciling shall be covered with one coat of transperant varnish.

1. Sub-Contractors Code
2. W.O.Number
3. DU Number
4. Gross weight of the packing
5. SI. No

NOTE 7.0 PACKING & PRESERVATION

7.1 All the products shall be packed as per the packing drawing mentioned in GMS.

7.2 Adequate support has to be provided during storage to avoid bending/sagging of vertical beams.

7.3 In each packing the following details shall be legibly stenciled at two places.
wo no: project: du no: Qty in packing:
weight of packing: Fabricator's code:

In addition to the above,sub contracter's code shall be welded/punched and bordered in white paint.

****

Annexure–I (Part-C) To Open Tender ref: BAP/PUR/IAA/9550165E dt.07.05.2015
For Supply Of "Inner Arm Assy" , Due on : 03.06.2015
General Terms and Conditions

***Quantity Split*: The tender quantity will be split in the ratio of 70:30 among L1 and next lowest bidder in ranking who accepts L1 price along with commercial terms and condition.**

Payment Term: 100% with in 45 days (FOR MSE Supplier) and within 90 days (FOR NON MSE Supplier) after receipt and acceptance of material at our end.

The supplier who belongs to MSE category (Micro Small Enterprise) must have to produce CA Certificate indicating their present MSE status in the format enclosed otherwise irrespective of their status , they will be considered as NON MSE and their payment term will be considered as "100% within 90 days inspite of 45 days".

Please fill In Annexure-III of commercial terms and conditions and submit it along with your techno-commercial offer

ESP Purchase, Materials Management,
Bharat Heavy Electricals Limited,
Boiler Auxiliaries Plant, Ranipet - 632 406, **INDIA.**
(A Government of India Undertaking)

Annexure–I (Part-C) To Open Tender ref: BAP/PUR/IAA/9550165E dt.07.05.2015

For Supply Of "Inner Arm Assy" , Due on : 03.06.2015

General Terms & Conditions

A] Submission of Offer

Sealed tenders super-scribed with Tender Number, Due Date, Item Name & Supplier's Name and Validity of the Offer shall be addressed to Manager / Purchase (ESP), Bharat Heavy Electricals Limited, Ranipet – 632 406, Tamilnadu, INDIA, so as to reach him on or before the date and time specified in the tender. It shall contain two sealed covers in one envelope.

Sealed envelope super-scribed, with Tender Number, Item Name, Tender Due Date & Supplier's Name, Validity of the offer/s containing:

Cover I: Techno-Commercial and Unpriced Bid

Sealed Cover super-scribed "Cover I – Techno-Commercial and Unpriced Bid" containing:

a) ***Complete technical Offer*** with details, catalogues, as applicable.

b) ***Un-priced bid*** (i.e. Bid without the Price),

c) ***Filled-in BHEL's Standard Terms & Conditions*** for Procurement of Inner Arm Assy enclosed with the Tender Document,

d) ***All relevant enclosures*** of above documents / formats, if any.

e) ***Deviation summary*** submitted in two parts – giving the summary of technical deviations separately and the commercial deviations separately, if any and

f) ***Supporting documents*** to substantiate equivalent material specifications / sections, where quoted for.

g) ***Clientele list*** with their full address including detail of contact person with phone no., fax no. & e-mail ID (if any) to whom the same / similar items are supplied in the past two years. The date of supply may also be indicated, against each client.

i) ***Bidders who are not already registered with BHEL Ranipet*** are requested to submit the filled in Supplier Registration Forms **(SRF)- Annexure-II** available in the BHEL website-ww.bhel.com and the other required documents called for in the SRF (the facilities available at the works – starting material to finished product, manufacturing quality plan, inspection & test plan to meet the specification requirements) along with the technical bid. In addition, vendors may submit an experience certificate detailing the quantity supplied spec wise year wise along with the unpriced PO copies and proof of supply along with the offer for all the tendered specifications. Technical acceptance of offer by BHEL, shall be based on the evaluation of offer and the submitted documents.

k) ***Authorization Letter:*** Such of those tenderers who wish to participate in the Tender Opening, should attach an authorization letter which shall be duly signed and stamped in original, identifying the representative to be deputed for tender opening.

Note:

(i) The materials offered, shall conform to the specification and scope attached in the tender.

(ii) In case the offered materials are not conforming to the Enquiry material Specification or such that the offered sections do not match the enquiry, such offers would not be considered for evaluation and would be rejected. Where equivalent specifications and sections are offered considering such offers will be at the sole discretion of BHEL. Wherever alternative standards / specifications are offered by Bidder, the Bidder shall provide sufficient documentary evidence to ensure equivalence to the designated standards / specifications, failing which the offer would be considered as not technically acceptable and hence shall stand rejected.

(iii) All taxes and duties payable as extra to the quoted price should be specifically stated in offers. Offer from within India shall be submitted along with CST & TIN No. / Tariff No. etc, failing which the purchaser will not be liable for payment of such taxes and duties. Our TIN NO. 33024364741, CST. NO. 1141686, BHEL ECC No. AAACB4146PXM008.

(iv) The un-priced bid is to be used to indicate relevant commercial implications without indicating price.

(v) Commercial terms are to be indicated clearly in the offer.

(vi) No changes shall be entertained once the bid is opened unless otherwise specifically agreed to in writing by BHEL.

(vii) Money values shall not be indicated anywhere in the un-priced bid.

(viii) Time required for inspection (at Supplier's works), should be clearly given in terms of numbers of working days

(ix) It is advised that all the pages and annexure to the Techno-Commercial bid should be serially numbered, including indicating the total number of pages.

Sealed envelope super-scribed Cover – II (Price bid), with Tender Number, Item Name, Tender Due Date & Name of the Supplier and Validity, containing:

Sealed Cover super scribed "Cover II –Price Bid" containing:

Price Bid (i.e. Un-priced bid but with Price duly filled-in) in conformance with the commercial terms as per Cover- I.

The Prices shall be indicated in both figures and words, clearly specifying the currency used. Differential foreign currencies may not be used in a given offer.

Wherever there is a discrepancy between the figures and the words, the value as indicated by words shall be taken as the "Price" by the Purchaser. Similarly if there is a discrepancy between the Unit Price and the Value on account of arithmetical error in the computation of the Value (Price x Quantity), only the Unit Price would be taken by the Purchaser for consideration. No corrections would be permitted after the submission of the bids. Error statements should be completely erased / struck out and fresh values given in the offer, which

should be initialled and attested by the tender submitting authority. Offers without the above may become liable for rejection.

Note

(i) The price break-up should be in line with technical specification / scope of the tender. (Cost of material, packing charges, forwarding charges, freight, insurance charges shall be shown appropriately, as applicable).

(ii) No Price Variation Clause will be entertained and No advance payment will be made by BHEL.

(iii) In case, there is a discrepancy in the term quoted in techno-commercial bid and price bid, the term as per the techno-commercial bid (Cover I) shall hold good and the commercial term quoted in the Price Bid (Cover II) shall not be considered.

(iv) In their own interest, all Tenderers are advised to double check their prices, applicable duties and taxes.

(v) The quotation should be valid at least for a period of 90 days from the date of techno-commercial bid opening.

(vi) Offers should be submitted in two sets, one original and one copy.

(vii) The offers should invariably contain Signature (ink-signed) & Office Stamp of the Supplier. Any corrections / erasures in the offers should be initialled and stamped.

(viii) Bidders should submit the prices in Indian Rupees only.

(ix) Indian Suppliers shall quote on FOR Destination basis only. Destination is BHEL, Ranipet Stores.

B] Opening of Offers

a) **Tenders shall be received up to 14:00 Hours on 03.06.2015 and be opened on the same day at 1430 Hours. Tenders received after 14 00 Hours would not be opened. The times indicated are Indian Standard Time (IST). Tenders received after 14:00 Hrs would be designated as "Late Offer" and would be returned back to the Bidder unopened.**

b) Supplier shall submit two covers (Cover-I techno-commercial bid & Cover-II price bid) in one envelope only. If one cover containing all the bids techno-commercial bid & price bid together, the **bid is liable for rejection**. The decision to accept such bids shall be the sole discretion of BHEL, which may be done by BHEL after segregating the bids so received.

c) Such of those Tenderers who wish so, may participate in the Tender Opening by deputing their representatives. The representatives would be allowed to participate in the Tender opening only on submission of a signed and stamped authorization letter issued by the Supplier. Representatives without the Authorization Letter would not be allowed to participate in the Tender Opening. Representatives who turn up after the Tender opening time / start of the Tender opening would not be allowed to participate. After tender opening

the details would not be given to such suppliers who choose to be absent at the time of Tender opening.

d) Details such as the Technical Specification, Delivery Terms, and Delivery Period and the Price details in the event of the sealed price bid opening, alone would be read out by the Tender Opening Officer. No other data will be read out.

e) In exceptional cases, at the discretion of BHEL, in the event of the named representative (named in the Tender Document) is unable to come due to unavoidable circumstances, then an alternative representative would be allowed, where the alternative representative should carry a revised original authorization certificate. Suppliers are advised to avoid such situations to avoid embarrassments on both sides and

f) If so required, BHEL reserves the right to open the Price-Bids, *'in-camera'*. Intimation to this effect would be given to the Supplier by BHEL, before the opening of the Price-Bids.

Note:

(i) Bids including all enclosures and supporting documents like catalogues, pamphlets, etc., shall be provided in ENGLISH language only.

(ii) At its option, BHEL may consider extending the due date/s for the tender openings. Sufficient notice would be given by BHEL for such extensions. Any amendments to this tender will be published in www.bhel.com only.

(iii) Specifications are the basic essence of the "Item". and all deviations shall be summarized and provided in a "Deviation Statement", listing the points and the deviation against each point, and

(iv) BHEL reserves the right to increase or decrease the tendered quantity.

(v) Offers for part quantities on item level basis are not acceptable to BHEL.no supplier shall quote for partial quantity of any given enquiry item. Such partial offer would not be considered in the enquiry for that item.

C] Evaluation of Offers

a) The price bids including the negative impact price of the technically acceptable offers alone, contained in Cover II shall be opened.

b) All bidders shall submit their offers by filling-in the format of the BHEL tender documents. Offers received in any other format are liable to be rejected. Offers are asked in BHEL's format for purpose of standardisation - to help in the offer evaluation.

c) Offer with any pre-conditions (like conditional discounts) for price are liable to be not considered / rejected. For evaluation the such conditions would be removed and only the base offer would be considered for evaluation and comparison.

d) In the event of any change in scope / quantity arising out of the discussions, offerers would be given a chance to submit their revised offer (impact). The revised offer (impact) shall contain only the price addition / deletion for such change in the scope / quantities, over and

above the original scope and price quoted. The original price quoted shall not be changed on account of the technical discussions.

e) BHEL reserves the right to reject without assigning any reasons / load any offer with factors other than already specified for such offers having deviations to BHEL Specifications, Standard Terms & Conditions at its discretion. The decision of BHEL in this regard shall be final.

f) BHEL reserves the right to reject an offer due to unsatisfactory past performance during tender finalisation / execution of a contract at any of BHEL projects / units or if unsatisfactory performance report is received from the party/s referenced by the supplier at any time during tender finalisation.

g) BHEL reserves the right to operate Purchase / Price preference to Government of India Undertakings, which shall be given as per the guide lines of Government of India given from time to time and / or relax the Terms and Conditions of the tender.

h) BHEL reserves the right to conduct negotiations on the "Price" and "Other Commercial Terms and Conditions" with the lowest ranked offerer at any time after the bid opening but before the release of the Purchase Order and

i) If so required by BHEL, Supplier may have to share their cost data / costing sheet with BHEL.

D] Execution of the Order

a) BHEL will have the option to pre-inspect the materials at Supplier's works by BHEL's own inspector or by third party agency appointed by BHEL or BHEL's end customer/s **but this does not absolve the Supplier from giving the specifications as agreed upon**.

b) The Inspection date/s given by the Supplier shall be on firm basis. For Suppliers the Notice period of Inspection shall be 10 working days.

c) Deviations, if any pointed out by the visiting Inspection team of BHEL shall be corrected and the items as per specification shall be dispatched on or before the contract delivery date.

d) The final inspection for acceptance will, however, be carried out at BHEL's works at Ranipet.

e) The contract delivery date is the date of receipt of material at BHEL-Stores for suppliers in India.

f) Travel & other local stay cost for the Inspectors sent by BHEL will be to BHEL account, but other Inspection Charges, if any shall be to the account of the Seller only.

g) The supplier shall arrange for packing suitably in all respects for normal transport by air / rail / road and Materials shall be suitably protected against damage in transit and storage.

h) Indian suppliers shall dispatch on free delivery (door-delivery) at BHEL stores basis only. Unloading the materials at BHEL Stores would be to the account of BHEL only.

i) In the event of any short supply, it shall be the responsibility of the supplier to deliver such short supplied/ missing items on Free-of-Cost basis at BHEL stores).

j) Materials shall be dispatched only after getting the dispatch clearance of BHEL (Dispatch clearance would either be faxed / e-mailed as a scanned document / couriered.) and

k) Payment terms: The acceptable mode is "100% direct with in 90 days of receipt and acceptance of materials at BHEL for Indigenous Non MSE Suppliers and 100% direct with in 45 days of receipt and acceptance of materials at BHEL for Indigenous MSE Suppliers (MSE suppliers shall submit the Notarised MSE certificate and CA certificate) along with offer. Payment to suppliers would be through Electronic Fund Transfer (EFT). The EFT form which is a part of the tender document has to be filled in and submitted by the Indian bidder along with the techno-commercial offer in Cover-I. No other payment terms are acceptable.

l) Any incidence of tax like Income tax, Service Tax and any other similar tax / duties /levies imposed by the Government of India, or the State Government, where the BHEL Unit is located, deductible at Source, during the tenure of the Order shall be deducted by BHEL and necessary certification of the deduction (Tax deduction at Source) would be given.

n) The Guarantee period shall start from the "Date of Dispatch" and shall be submitted in BHEL-Format only.

E] Liquidated Damages Clause:

BHEL will levy penalty as Liquidated Damages (LD), for delay in delivery. The damages shall be at the rate of ½% per week or part thereof subject to a maximum of **10%.** Delivery for purpose of L.D, will date of receipt of materials at stores. Supplier shall deduct the applicable LD from the first payment when raising the claim for the same. The applicable LD if any would be communicated by BHEL along with the dispatch clearance. The LD would apply on the undelivered portion only. In case of reasons attributable to BHEL for the delay in delivery (for e.g. delay in arranging the pre-inspection) then the delivery time would be reset to the extent of the time delay attributable to BHEL, with waiver of the LD. Delivery being the essence of BHEL's contract requirements, In the event that a Supplier does not accept the LD condition above, the offer would be loaded to the extent of the shortfall with respect to upper limit .

F] Force Majeure

If at any time during the currency of this contract, the performance in whole or in part, by either party of any obligations under this contract shall be prevented or delayed by reason, of any war, hostilities, acts of the public enemy, civil commotion, sabotage, fires, explosions, epidemics, quarantine, restrictions or acts of GOD (hereinafter referred to as events), then provided notice of happening of any such events is given by either party to other within ten days from the date of occurrence thereof, neither party shall reason of such events be entitled to terminate this contract nor shall either party have any such non performance and delay is resumed as soon as practicable after such events has come to an end or ceased to exist. If the performance in whole or part of any obligation under this contract is prevented or delayed by reason or any such event claims for extension of time shall be granted for period considered reasonable by the purchaser subject to prompt notification by the seller to the purchaser of

the particulars of the events and supply to the purchaser if required of any supporting evidence. Any waiver of time in respect of partial installment shall not be deemed to be a waiver of time in respect of remaining deliveries.

G] Cancellation of Order:

In the event of non-performance of the contract by the Supplier, BHEL reserves the right to cancel the order with issue of a written notice. BHEL would provide a curing period of 30 days, for the Supplier to rectify the situation. If the Supplier fails to rectify the reason/s that led to the issue of cancellation notice by BHEL, then the cancellation order would be issued automatically by BHEL, without further recourse to the Seller. BHEL will not pay any cancellation charges or any other charges / damages to the Supplier, arising out such cancellation. In the event of the non-performance of the supply contract, by the Supplier, the rights of BHEL include, in addition to canceling the order, to take alternate purchase action at the cost and risk of the supplier. The additional expenditure to be incurred by BHEL in such alternate purchase would be to the account of the supplier. (Risk Purchase). This remedy would be in addition to the invoking of the CEBG on grounds of failure of the Supplier in executing the Contract and any other legal remedies."

H) Quantity Split:

Special Terms and Conditions

01) BHEL reserves the right to increase or decrease the tender quantity.

02) Lowest prices received against BHEL tenders need not be the technicallyacceptable L1. Price and BHEL reserves the right not to consider the same.

03)BHEL reserves the right to negotiate or re-float the tender opened if L1 price is not the lowest acceptable price to inter- alia other reasons.

04)BHEL reserves the right to negotiate the L1 rates.

Quantity Split:

5 a) BHEL reserves the right to split the tendered quantity as follows: 70:30 (70% for the original L1and 30% for the next higher bidders who accepts to supply the goods and quantity at the same rates, commercial terms and conditions as that of the L1)

5 b) The quantity split is considered on the grounds of:

(1) Higher quantity
(2) Higher tender value
(3) Capacity limitation of the suppliers.
(4) Delivery requirement of BHEL
(5) One or a combination of above or all of the above.

5 c) In no case the highest quoted bidder (H1) would be given the opportunity of the quantity split. Similarly, if there are only two bidders, quantity split will not be generally considered. However in exceptional circumstances, BHEL may still resort to quantity split between the two bidders, to meet their requirements.

5 d) It is understood that Bidders participating in this tender have agreed to this condition. Mere stipulation of the quantity split condition in the tender does not guarantee that BHEL will split the order. BHEL reserves the right to place orders on respective L1 only without resorting to the quantity split, even if the quantity split provision is made available in the tender.

5 e) The quantity split ratio is only indicative and BHEL has the right to modify the same depending on the quantities requirement of their customer projects. Such modifications would be within the range of ±10% of the indicated split ratio.

5 f) The L1 prices and their agreed commercial terms and conditions would be counter-offered to the next higher bidders in the order of their ranking and the quantity split would be given to the bidders who accept it in –toto on the basis of their ranking in the price bid.

5 g) If none of the other bidders accept the counter-offer viz the Price, Quantity, commercial terms and conditions, then the entire quantity of the tender would be ordered with the original L1 only without any further recourse by BHEL.

5 i) The decision that the quantity split would not be operated would generally be intimated to the technically successful bidders before the price bid opening. However in exceptional circumstances, BHEL may resort to ordering only on the respective L1, without the quantity split, even after the price bid is opened. The decision of BHEL in this would be final and would be binding on all the bidders.

Note:
In the event of non-operation of Quantity split , Suppliers are expected to pass on the volume / quantity discounts, as applicable to BHEL.
Counter offer: Will be made matching the lowest landed cost to BHEL(L1)

K] Others

a) In case of any contradiction in the terms and conditions given here and elsewhere in the other documents of the tender, it shall be the responsibility of the tenderer to get it clarified from BHEL. The officer authorized to provide such clarifications is Sr.Manager / ESP Purchase e-mail: tvgopal@bhelrpt.co.in (or) biswajit@bhelrpt.co.in .

b) Alterations to the conditions of the Tender can be done only by the authorized officer, at any time before the date and time of tender opening. Such changes, if any, would be communicated in writing and / or hosted in the web-page.

c) The laws governing this transaction shall be the laws in India.

d) In the event of an order, Supplier shall agree to settlement of disputes or differences, if any, by way of arbitration, in accordance with the “Rule of Arbitration” of the Indian Council of Arbitration.

ESP Purchase, Materials Management,
Bharat Heavy Electricals Limited,
Boiler Auxiliaries Plant, Ranipet - 632 406, **INDIA.**
(A Government of India Undertaking)

ACCEPTANCE FOR ELECTRONIC FUND TRANSFER / RTGS TRANSFER

01	**NAME & ADDRESS OF THE SUPPLIER / VENDOR**	
02	**VENDOR CODE** (as in WORK ORDER)	
03	**Details of Bank Account:**	
A)	**NAME & ADDRESS OF THE BANK** (WITH PIN CODE)	
B)	**BANK TELEPHONE NUMBER** (WITH STD CODE)	
C)	**BANK BRANCH CODE:**	
D)	**MICR CODE**	
E)	**ACCOUNT NUMBER**	
F)	**TYPE OF ACCOUNT**	CURRENT / OD / CASH CREDIT
G)	**VENDOR NAME AS PER BANK RECORDS**	
H)	**BANK BRANCH RTGS IFSC CODE**	
I)	**BANK BRANCH NEFT IFSC CODE**	
J)	**VENDOR'S EMAIL ID** (give two ids)	
K)	**NAME OF AUTHORISED SIGNATORY**	

CERTIFICATE

I / We hereby agree to receive the payments due from BHARAT HEAVY ELECTRICALS LIMITED, RANIPET by the National Electronic Funds Transfer and/or RTGS Transfer mode by credit to my / our above mentioned Bank Account. I / We also agree that payments made to the above mentioned Account is a valid discharge of the liability of Bharat Heavy Electricals Limited, Ranipet. I / we also agree to bear the applicable Bank Charges for the above mode of transfer.

AUTHORISED SIGNATORY OF VENDOR WITH SEAL

Banker's Certification

We confirm that we are enabled for receiving RTGS and NEFT credits and we further confirm that the account number of _____ (name of account holder), the signature of the authorized signatory and the MICR and IFSC codes of our Branch mentioned above are correct.

PLACE:

DATE:

_____
(Manager / Officer's
Signature Under Bank stamp)

Note: This EFT Form is to be submitted duly filled in manually in all fields and duly signed by Authorised Signatory and certified by Banker.