




Confirmation Sheet (Deaerator)


Ref.no.: HEE-DEA-CONFIRM-1


S.No	Description	270 MW	500 MW	600 MW
01.	Storage Tank sections	3	3	3
02.	Deaerator Heater	1	1	1
03.	Spool piece	4 nos. (2 sizes) Dia. 457-2 nos. Dia. 610- 2nos.	4 nos. of dia. 914	4 nos. of dia. 914
04.	Backing rings	8 nos. (2 sizes) Dia. 426- 4 nos. Dia. 579- 4 nos.	8 nos. dia. 880	8 nos. dia. 880
05.	Bottom plates for saddles	3 nos.	3 nos.	3 nos.
06.	Heater supports	2 nos.	2 nos.	2 nos.
07.	SS plates for Sliding supports	4 nos.	4 nos.	4 nos.
08.	Orifice assembly	3 nos.	4 nos.	4 nos.
09.	Loose items other than those mentioned in Sl. no. 03 to 07 for Storage tank eg : Isolation valves, impulse piping, Counter flanges, gaskets, fasteners	As per BOM	As per BOM	As per BOM
10.	Loose items other than those mentioned in Sl. no. 08 for Heatereg Isolation valves, impulse piping, Counter flanges, gaskets, fasteners	As per BOM	As per BOM	As per BOM
11.	Standpipes	2 nos.	2 nos.	2 nos.
12.	Loose items for Standpipes eg: elbows, connecting piping, Isolation valves, Counter flanges, gaskets, fasteners	As per BOM	As per BOM	As per BOM
13.	Platform Base plates & other loose items	As per BOM	As per BOM	As per BOM


TD-106-1 Rev-5	Form No.		PRODUCT STANDARD HEAT EXCHANGERS HYDERABAD		No: HE 5 1474
					REV. NO. 01
					Page 1 of 8
<h1>SPECIFICATION</h1> <h2>FOR</h2> <h1>DEAERATORS</h1>					
Ref.Doc.			Prepared: UMESH MENON	Approved: TSN BHARGAV	Date : 02.02.2011


TD-106-1 Rev-5	Form No.		PRODUCT STANDARD HEAT EXCHANGERS HYDERABAD		No: HE 5 1474												
					REV. NO. 01												
					Page 2 of 8												
Ref.Doc.		<p>1.0 <u>Scope:</u></p> <p>This specification covers supply of Deaerator in complete assembled condition as per the materials specified and documents enclosed with technical enquiry, the details of which are as follows. In other words, Vendors to supply Deaerators with their own materials as per BHEL design (Refer Sl. no.5.0 for list of drgs./ documents applicable). Loose items required to be supplied along with main equipments shall be packed in crates</p> <p>2.0 <u>Scope of Assemblies to be supplied:</u></p> <table border="1"> <tr> <th>Sl. No.</th> <th>Sub assembly</th> </tr> <tr> <td>1.</td> <td>Deaerator Storage tank: In one or more than one piece depending on the length as indicated in the drg.</td> </tr> <tr> <td>2.</td> <td>Deaerator Heater in one assembly</td> </tr> <tr> <td>3.</td> <td>Loose items such as Heater supports, Spool pieces, Backing rings, Bottom plates for Saddles, SS plates, Foundation bolts (if included in BOM for vendor) , Orifice assembly, impulse piping, isolation valves, Counter flanges, Elbows and Fasteners</td> </tr> <tr> <td>4.</td> <td>Stand pipes along with loose items</td> </tr> <tr> <td>5.</td> <td>Platform materials as per BOM and Platform assembly drg.</td> </tr> </table> <p>3.0 <u>Scope of work:</u></p> <ul style="list-style-type: none"> i) Procurement of all materials such as Plates, Pipes, Angles, Channels, Fasteners, ANSI Flanges, Gaskets, Couplings, Plugs. Only Spray Valves, Trays and Name Plate will be given as free issue materials by BHEL. ii) Manufacturing. iii) Inspection, NDT & Testing. iv) Painting v) Preservation & Packaging vi) Packing of loose items and Platform materials in crates for dispatch to site. Vendor to forward list of items in each crate to site as well as to BHEL. 				Sl. No.	Sub assembly	1.	Deaerator Storage tank: In one or more than one piece depending on the length as indicated in the drg.	2.	Deaerator Heater in one assembly	3.	Loose items such as Heater supports, Spool pieces, Backing rings, Bottom plates for Saddles, SS plates, Foundation bolts (if included in BOM for vendor) , Orifice assembly, impulse piping, isolation valves, Counter flanges, Elbows and Fasteners	4.	Stand pipes along with loose items	5.	Platform materials as per BOM and Platform assembly drg.
		Sl. No.	Sub assembly														
1.	Deaerator Storage tank: In one or more than one piece depending on the length as indicated in the drg.																
2.	Deaerator Heater in one assembly																
3.	Loose items such as Heater supports, Spool pieces, Backing rings, Bottom plates for Saddles, SS plates, Foundation bolts (if included in BOM for vendor) , Orifice assembly, impulse piping, isolation valves, Counter flanges, Elbows and Fasteners																
4.	Stand pipes along with loose items																
5.	Platform materials as per BOM and Platform assembly drg.																
	Prepared:	Approved:	Date :														
	UMESH MENON	TSN BHARGAV	02.02.2011														


TD-106-1 Rev-5	Form No.		PRODUCT STANDARD HEAT EXCHANGERS HYDERABAD		No: HE 5 1474																												
					REV. NO. 01																												
					Page 3 of 8																												
<p>4.0 <u>List of applicable standards:</u></p> <p><u>Non BHEL standards</u></p> <ul style="list-style-type: none"> • ASME Sec II Part A (Latest edition and addenda) • ASME Sec VIII Div 1. (Latest edition and addenda) • ANSI B16.5 for pipes flanges, flanged fittings. (Latest edition) • ASME Sec IX for welding standards. (Latest edition and addenda) • ANSI B36.1 for Pipes(Latest edition) • Heat exchange Institute (HEI) Standard for Deaerator (Latest edition and addenda (If indicated as design code in the assly. drg.)) <p><u>BHEL standards:</u></p> <ul style="list-style-type: none"> i. Standard for Unspecified tolerances- HE71036 R02 ii. Hydro test standard- HY0852061 R02 iii. Dished Ends & Spherical Dishes: HE51370 R00. <p>5.0 <u>List of applicable Drawings/ Documents:</u></p> <table border="1"> <thead> <tr> <th>S.No.</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Manufacturing drgs. as per drawing list</td> </tr> <tr> <td>2.</td> <td>Bill of Material</td> </tr> <tr> <td>3.</td> <td>Drawings for forming of Dished Ends & Spherical Dishes</td> </tr> <tr> <td>4.</td> <td>List of Vendors for Dished Ends & Spherical Dishes</td> </tr> </tbody> </table> <p>6.0 <u>Materials specification:</u></p> <table border="1"> <thead> <tr> <th>Material</th> <th>Standard</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>CS Plates</td> <td>BQ to SA 516 Gr. 70 with S1, S5 and S8.</td> <td>For pressure parts (Shell, Dished ends, Spherical dishes, Support pads and RF Pads)</td> </tr> <tr> <td>SS Plates</td> <td>SA240 TP304</td> <td>Orifice plate, Water box, Tray enclosure, Impingement plate etc.</td> </tr> <tr> <td>CS Pipes</td> <td>SA106 Gr.B</td> <td>Nozzle pipes, Stand Pipes</td> </tr> <tr> <td>SS Pipes</td> <td>SA312 TP321</td> <td>Disperser pipe, Vent pipe etc.</td> </tr> <tr> <td>CS Couplings</td> <td>SA350 LF2/ SA105</td> <td>Stubs for Pressure gauge/ Transmitter/ Temperature gauge/ Sampling & Dosing conn, Stand Pipe Couplings</td> </tr> </tbody> </table>						S.No.	Description	1.	Manufacturing drgs. as per drawing list	2.	Bill of Material	3.	Drawings for forming of Dished Ends & Spherical Dishes	4.	List of Vendors for Dished Ends & Spherical Dishes	Material	Standard	Remarks	CS Plates	BQ to SA 516 Gr. 70 with S1, S5 and S8.	For pressure parts (Shell, Dished ends, Spherical dishes, Support pads and RF Pads)	SS Plates	SA240 TP304	Orifice plate, Water box, Tray enclosure, Impingement plate etc.	CS Pipes	SA106 Gr.B	Nozzle pipes, Stand Pipes	SS Pipes	SA312 TP321	Disperser pipe, Vent pipe etc.	CS Couplings	SA350 LF2/ SA105	Stubs for Pressure gauge/ Transmitter/ Temperature gauge/ Sampling & Dosing conn, Stand Pipe Couplings
S.No.	Description																																
1.	Manufacturing drgs. as per drawing list																																
2.	Bill of Material																																
3.	Drawings for forming of Dished Ends & Spherical Dishes																																
4.	List of Vendors for Dished Ends & Spherical Dishes																																
Material	Standard	Remarks																															
CS Plates	BQ to SA 516 Gr. 70 with S1, S5 and S8.	For pressure parts (Shell, Dished ends, Spherical dishes, Support pads and RF Pads)																															
SS Plates	SA240 TP304	Orifice plate, Water box, Tray enclosure, Impingement plate etc.																															
CS Pipes	SA106 Gr.B	Nozzle pipes, Stand Pipes																															
SS Pipes	SA312 TP321	Disperser pipe, Vent pipe etc.																															
CS Couplings	SA350 LF2/ SA105	Stubs for Pressure gauge/ Transmitter/ Temperature gauge/ Sampling & Dosing conn, Stand Pipe Couplings																															
Ref.Doc.		Prepared:	Approved:	Date :																													
		UMESH MENON	TSN BHARGAV	02.02.2011																													

TD-106-1 Rev-5	Form No.		PRODUCT STANDARD HEAT EXCHANGERS HYDERABAD		No: HE 5 1474																																																		
					REV. NO. 01																																																		
					Page 4 of 8																																																		
<table border="1"> <tr> <td>SS Couplings</td> <td>SA182 F304</td> <td>Stubs for Vent conn.</td> </tr> <tr> <td>Plugs</td> <td>SA105</td> <td>For Couplings</td> </tr> <tr> <td>CS Fasteners</td> <td>SA193 B7/ SA194 2H</td> <td>For fixing impingement plate and Foundation Bolts</td> </tr> <tr> <td>SS Fasteners</td> <td>SA193 B8/ SA194 Gr.8</td> <td>For Water box, Tray assly. etc.</td> </tr> <tr> <td>Gasket</td> <td>Non Asbestos MSW</td> <td>For Flange conn.</td> </tr> <tr> <td>SS Valve</td> <td>SA351 Gr.CF8</td> <td>For Orifice assly.</td> </tr> <tr> <td>CS Flange</td> <td>SA105</td> <td>Nozzle Flange</td> </tr> <tr> <td>SS Flange</td> <td>SA182 F310</td> <td>For Orifice assly.</td> </tr> <tr> <td>SS Angle/ Split cotter pin/ Hold down rod</td> <td>SS304</td> <td>For Tray assly.</td> </tr> <tr> <td>Angles, Channels, Beams</td> <td>IS226</td> <td>For Tray assly. & Initial Heating pipe support and Platform</td> </tr> <tr> <td>Bar Grating</td> <td>IS2062 Gr.B</td> <td>Galvanized</td> </tr> <tr> <td>U-Clamps with nuts</td> <td>IS226/ Nuts as per IS1364</td> <td>Galvanized</td> </tr> <tr> <td>CS rounds & Pin</td> <td>IS1570 (for rounds), IS6688 (for pin)</td> <td>Manhole conn.</td> </tr> <tr> <td>.Elbows - CS</td> <td>SA234 WPB</td> <td>Stand Pipe, over flow</td> </tr> <tr> <td>Chequered Plate</td> <td>IS3502</td> <td>For Platform</td> </tr> <tr> <td>MS Tube</td> <td>IS1239PT1</td> <td>For Platform</td> </tr> <tr> <td>Washer</td> <td>IS2016</td> <td></td> </tr> </table> <p>7.0 <u>Materials for Non-pressure parts:</u></p> <p>Whenever CS is mentioned on the drawing, it shall be IS2062 Gr. B for plates. Any non-pressure part welded to pressure part shall be same as the pressure part material.</p>	SS Couplings	SA182 F304	Stubs for Vent conn.	Plugs	SA105	For Couplings	CS Fasteners	SA193 B7/ SA194 2H	For fixing impingement plate and Foundation Bolts	SS Fasteners	SA193 B8/ SA194 Gr.8	For Water box, Tray assly. etc.	Gasket	Non Asbestos MSW	For Flange conn.	SS Valve	SA351 Gr.CF8	For Orifice assly.	CS Flange	SA105	Nozzle Flange	SS Flange	SA182 F310	For Orifice assly.	SS Angle/ Split cotter pin/ Hold down rod	SS304	For Tray assly.	Angles, Channels, Beams	IS226	For Tray assly. & Initial Heating pipe support and Platform	Bar Grating	IS2062 Gr.B	Galvanized	U-Clamps with nuts	IS226/ Nuts as per IS1364	Galvanized	CS rounds & Pin	IS1570 (for rounds), IS6688 (for pin)	Manhole conn.	.Elbows - CS	SA234 WPB	Stand Pipe, over flow	Chequered Plate	IS3502	For Platform	MS Tube	IS1239PT1	For Platform	Washer	IS2016					
	SS Couplings	SA182 F304	Stubs for Vent conn.																																																				
	Plugs	SA105	For Couplings																																																				
	CS Fasteners	SA193 B7/ SA194 2H	For fixing impingement plate and Foundation Bolts																																																				
	SS Fasteners	SA193 B8/ SA194 Gr.8	For Water box, Tray assly. etc.																																																				
	Gasket	Non Asbestos MSW	For Flange conn.																																																				
	SS Valve	SA351 Gr.CF8	For Orifice assly.																																																				
	CS Flange	SA105	Nozzle Flange																																																				
	SS Flange	SA182 F310	For Orifice assly.																																																				
	SS Angle/ Split cotter pin/ Hold down rod	SS304	For Tray assly.																																																				
	Angles, Channels, Beams	IS226	For Tray assly. & Initial Heating pipe support and Platform																																																				
	Bar Grating	IS2062 Gr.B	Galvanized																																																				
	U-Clamps with nuts	IS226/ Nuts as per IS1364	Galvanized																																																				
	CS rounds & Pin	IS1570 (for rounds), IS6688 (for pin)	Manhole conn.																																																				
	.Elbows - CS	SA234 WPB	Stand Pipe, over flow																																																				
	Chequered Plate	IS3502	For Platform																																																				
	MS Tube	IS1239PT1	For Platform																																																				
Washer	IS2016																																																						
Ref.Doc.		Prepared: UMESH MENON	Approved: TSN BHARGAV	Date : 02.02.2011																																																			

TD-106-1 Rev-5	Form No.		PRODUCT STANDARD HEAT EXCHANGERS HYDERABAD		No: HE 5 1474
					REV. NO. 01
					Page 5 of 8
<p>8.0 <u>Inspection:</u></p> <p>a) Access to Quality Control Inspector / Customer / BHEL representative shall be provided by the vendor / for all process quality control activities as well as for monitoring progress of job as per agreed delivery schedule. Regular feedback from vendor shall be communicated to BHEL about the progress of individual job. Inspection call shall be communicated well in advance to accommodate travel time for reaching vendor works using all modes of available communication like fax, email, telephone etc. to sub-contract department and/or inspection agency.</p> <p>b) The raw materials for manufacture shall be as per the list of applicable national / international standards. Vendor shall procure raw materials from approved list of vendors, which shall be indicated, by the vendor at the time of bidding. Chemical composition of plates shall be as per the specification. Vendor to follow the Quality Plan (QP) furnished by BHEL (The relevant QP for inspection stages by Customer will be forwarded to Vendor after placement of PO)</p> <p>9.0 <u>Hydrostatic Test:</u></p> <p>a) Hydrostatic testing of Storage Tank (if applicable at works) and Heater shall be done separately. (Reference document shall be BHEL QP)</p> <p>b) Water for Hydro test shall be salt free and shall not contain chlorides more than 40 ppm.</p> <p>10.0 <u>Rejection & Replacement:</u></p> <p>In the event of any material proving defective in the course of further inspection / hydro testing at erection site / BHEL works, the same shall be rejected not withstanding any previous acceptance. The supplier shall replace the material at their own cost and the rejected material shall be returned to the vendor after all the commercial conditions are satisfied.</p> <p>11.0 <u>Data Folder:</u></p> <p>Fabricator shall supply 5 bound copies of data folders containing the following information:</p> <p>a) As built dimensional report.</p> <p>b) Certified material test report, showing location, heat numbers, chemical analysis and physical properties of all materials used in the fabrication of the Deaerator. Test certificates of materials supplied by BHEL (if any) will be passed on to the fabricator for completion.</p> <p>c) Welding & testing Plan.</p>					
Ref.Doc.		Prepared: UMESH MENON	Approved: TSN BHARGAV	Date : 02.02.2011	

TD-106-1 Rev-5	Form No.		PRODUCT STANDARD HEAT EXCHANGERS HYDERABAD		No: HE 5 1474
					REV. NO. 01
					Page 6 of 8
<p>d) Reports of tests made on welded test plates, if any such tests are made.</p> <p>e) Hydrostatic and other test reports.</p> <p>f) Engraving of Name Plate.</p> <p>g) Records of radiographic examination.</p> <p>h) Photostat copy of approving agency's certificate, if any.</p> <p>i) Any other documentation as required.</p> <p>11. <u>Guarantee Period:</u></p> <p>The fabricator shall, at his own expenses make necessary repairs and/or replacements without delay if any defects due to inferior materials or workmanship develop under operating conditions within 12 months from the date of commissioning or 18 months from the date of dispatch whichever is earlier.</p> <p><u>Important notes :</u></p> <p><u>General</u></p> <p>*Inspection by (BHEL QC/ Lloyds/ BHEL appointed TPI/ Customer/ Customer appointed Consultant- Reference document: BHEL Quality Plan (QP))</p> <p>a) Adhere strictly to the notes/remarks/instructions mentioned on the individual, sub-assy. and main assy. drgs.</p> <p>b) All materials of the equipment shall confirm to Part lists and attestation by '*'. Review of records by Customer if required</p> <p>c) The complete equipment shall be manufactured as per ASME Sec.VIII, Div.1- & HEI Standards (if indicated in drg)</p> <p>d) Welder's qualification shall be done as per ASME Sec. IX. Only approved welders by Lloyds shall be employed on the job.</p> <p>e) Welding procedure approval by BHEL QC and Lloyds.</p> <p>i) Check for the identification of all welds (weld No. shall be punched for correlation with welder) inspection by QC and Lloyds.</p> <p>ii) Qualified painters shall only be used on the job.</p> <p>iii) Root run of all L - seams and C- seams of shells and fabricated Nozzles shall be back gouged and examined by P.T and inspected by '*' as per QP.</p> <p>f) MT & PT Test shall be carried out on nozzle to head welds and nozzle to shell welds. Inspection by '*'.</p> <p>g) For weld details follow latest revision of drg. no. 2-163-10-00014</p> <p>h) Use spiders for removing ovality for fit up and during welding of C - seams of shell segments.</p> <p>i) Prior to rolling of shell plates, remove the mill scales by shot/grit blast.</p> <p>j) Inside edges of all projected nozzles shall be round off.</p>					
Ref.Doc		Prepared:	Approved:	Date :	
		UMESH MENON	TSN BHARGAV	02.02.2011	



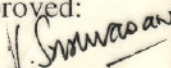
TD-106-1 Rev-5	Form No.		PRODUCT STANDARD HEAT EXCHANGERS HYDERABAD		No: HE 5 1474
					REV. NO. 01
					Page 7 of 8
Ref.Doc.		<p>k) Before flame cutting of nozzle holes, assemble Spiders at open ends and Stiffening rings inside the shells to restrict distortion.</p> <p>l) <u>Match marking of inter connecting nozzles:</u> Down comers and Equalizers nozzles of Storage tank shall exactly match with corresponding nozzles on Heater .Before closing these nozzles with end covers, a Trial assembly of storage tank to Heater shall be carried out. (Fixture shall be made by Vendor so that the location of Down comer and Equalizer can be transferred to the other tank for making openings so as to avoid any misalignment at site during erection)</p> <p>m) <u>Match marking of Storage Tank sections:</u> Trial assembly of all Storage Tank sections shall be carried out and match mark in presence of QC, Lloyds and Customer (if required)</p> <p><u>Checks for Deaerator Heater</u></p> <p>a) For detailed assly. of Trays, refer Tray assly. & Tray assly. details</p> <p>b) Spray valves and Tray plates shall be stored properly at vendor's works, before assly. with Heater</p> <p>c) Spray valves are to be assembled prior to the assembly of Trays.</p> <p>d) Check for welding of stoppers to hold down rods and assly. of hold down angles with cleats.</p> <p>e) Check to ensure welding of double lock nuts for spray valves, hold down rods and nut pos. with cleats and hold down angle.</p> <p>f) Check to ensure fixing of split pin thro' the top lock nut and stem of the spray valve before assembly of spray valve.</p> <p>g) Check to ensure positioning of split pin at the bottom of hold down rod.</p> <p>h) Painting scheme: Shall be as per assly. drg. Note: - Qualified painters shall only to be engaged on the job.</p> <p>i) Cleaning, painting & packing for dispatch including blanking of all openings inspection by BHEL QC & Lloyds.</p> <p>j) Ensure that all openings are blanked while dispatch to prevent ingress of foreign matter and to avoid damage to the terminating flange faces. All exposed machined parts shall be coated with suitable protective.</p> <p>k) Check for preservation of weld edge preparation.</p>			
		Prepared: UMESH MENON	Approved: TSN BHARGAV	Date : 02.02.2011	


TD-106-3 Rev-5	Form No.		PRODUCT STANDARD HEAT EXCHANGERS HYDERABAD	No : HE 5 1474
				REV. NO. 01
				Page 8 of 8

Rev. no.	Date	Revision details	Revised by	Approved by
00	02.02.2011	First issue	UM	TSNB
01	17.02.2011	PWHT removed	UM	TSNB

List of Vendors for Dished ends

S.No.	Vendor details
01.	ICEM- Mumbai
02.	Metal Engineers, Balanagar Hyderabad
03.	Dynamic dish, Jeedimetla, Hyderabad
04.	Hyderabad Metchem Hyderabad
05.	Satya Fabricators Hyderabad

TD-106-2 Rev-5	Form No.		<h1 style="text-align: center;">PRODUCT STANDARD</h1> <h2 style="text-align: center;">HEAT EXCHANGERS</h2> <h3 style="text-align: center;">HYDERABAD</h3>		No: HE 51370 REV. NO. 00 PAGE 1 OF 3
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company		<h3 style="text-align: center;"><u>SPECIFICATION FOR DISHED ENDS</u></h3> <p>1.0 Material: The material shall confirm to SA 516 gr. 70 (As per ASME Section II Part A, year of edition and addenda, as per Drawing/ Enquiry/ P.O). The plate shall meet the requirements of S1, S5 and S8 of supplementary requirements of ASME.</p> <p>2.0 Code of Construction: The code of construction shall be ASME section VIII division 1, year of edition and addenda as per drawing/ Enquiry/ P.O.)</p> <p>3.0 The dished ends up to a diameter of 1600 mm shall be pressed from a single plate by cold-forming/hot-forming/spinning. In case of spinning method is adopted, the central hole shall be plugged and radiographed 100%.</p> <p>4.0 For dished ends above 1600 mm, a weld joint is permitted and the butt weld shall be fully radiographed before forming. MPI/DPT shall be carried out on weld edge preparation, back chip area and weld. Qualified welders using approved procedures, as per the requirements of ASME Section IX, latest edition shall carry out the welding. Production test coupon for weld shall be prepared and tested as per the requirements of section IX of ASME.</p> <p>5.0 Tolerance: As per code of construction (para 2.0 above)</p> <p>6.0 When dished ends are ordered in pairs for a single shell, it is essential that the diameters of the two dished ends are matched within 3 mm and are clearly marked for identification to ensure proper alignment in further fabrication at BHEL.</p> <p>7.0 Thickness: The thickness specified is minimum thickness, which shall be ensured, after forming, throughout the surface of the dished ends including the knuckle portion. Minimum thickness shall be measured all over the area after removal of scales.</p> <p>8.0 Heat Treatment: Cold formed dished ends shall be normalized. Hot-formed dished ends shall be normalized, irrespective of the forming of the dished ends in normalizing range. Normalizing charts duly certified by the inspecting agency should be submitted. Dished end mechanical properties shall be proved on the test coupons, after the coupon is subjected to same heat treatment as the dished ends including the final normalization.</p> <p>9.0 In case the dished ends with butt welded joint in the blank, the following additional test shall be carried out;</p> <ol style="list-style-type: none"> The butt weld shall be 100 % radiographed after forming Both inside and outside surface of weld seam shall be MT examined after normalization 			
		Ref.Doc	Revision: Refer to record of revision	Prepared:  B. Srinivas	Approved:  V.Srinivasan

TD-106-2 Rev-5	Form No.		PRODUCT STANDARD HEAT EXCHANGERS HYDERABAD	No: HE 51370
				REV. NO. 00
				PAGE 2 OF 3
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company		<p>PT/MT shall be carried out on the entire surface of the dished ends after forming. If required, as drawing/ Enquiry. /P.O., UT shall be carried out on the entire surface of the formed dished end, as per requirement of SA 435 of ASME code. Acceptance standard shall be as per SA 435.</p> <p>10.0 Dished ends shall be protected against corrosion by a temporary coat of rust preventive.</p> <p>11.0 Three lifting lugs at 120 deg apart, of suitable sizes of the same material as dished ends shall be provided for handling. Qualified welders using approved procedures, followed by PT examination shall carry out the welding.</p> <p>12.0 Inspection: The inspection shall be as follows</p> <ol style="list-style-type: none"> 1. For HP Heater Dished ends : By DOB and LRIS and certification in IBR form III C. 2. For others : By LRIS <p>The scope of inspection shall be as per the approved quality assurance plans (HY/ HE/ 016/ DE).</p> <p>13.0 The following test certificates/ information shall be furnished by supplier duly attested by the inspection agency.</p> <ol style="list-style-type: none"> a. Mill test certificate of raw material & test coupon (if material is not free issue) b. Process of manufacture. c. Minimum thickness achieved. d. Normalizing charts e. As built dimensions of the dished ends. f. Mechanical test results. g. Radiography results(if applicable) h. UST results (if applicable) i. PT & MT examination report. j. IBR form IIIC (if applicable) <p>15. IDENTIFICATION :- The following identifications shall be hard punched.</p> <ol style="list-style-type: none"> 1. Suppliers Monogram. 2. Dish number 3. Material Specification 4. Heat & Plate Number 5. P.O Number 6. Inspection Agency/ Personnel stamp <p>The above punching shall be done outside 50 mm below the peripheral edge.</p>		
Ref.Doc.				

Copyright and Confidential

The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company

Plates

PMD No.	Item	Vendor code	Vendor Name
E.PL.004	SS PLATES / SHEETS / SHIMS	A11929	STEEL AUTHORITY OF INDIA LTD
		H00856	JSL LIMITED
		S72073	ACERINOX S.A.,
		F80003	OUTOKUMPU STAINLESS OY
		SI00001	ACRONI D.O.O
		BE00001	INDUSTEEL,
		KR00002	POSCO STEEL SERVICES & SALES CO. LTD.
E.PL.005	B.Q.PLATES(SIZE UPTO 45 MM THICKNESS)	A11929	STEEL AUTHORITY OF INDIA LTD
		T10050	JINDAL STEEL & POWER LTD.
		KA00016	JSW STEEL LIMITED
E.PL.006	B.Q.PLATES(SIZE ABOVE 45 MMTHICKNESS)	U80960	CORUS UK LTD.,
		S80003	DUFERCO S.A.,
		G91407	SALZGITTER MANNESMANN INTERNATIONAL
		F90163	DILLING-GTS VENTES,
		T10050	JINDAL STEEL & POWER LTD.
		CH00001	EAST METALS S.A
		BE00001	INDUSTEEL,
		KR00002	POSCO STEEL SERVICES & SALES CO. LTD.

Pipes

PMD No.	Item	Vendor code	Vendor Name
E.PT.003	STAINLESS STEEL TUBES &PIPES OD UPTO AND INCLUDING 168.3	A11988	M/S. NUCLEAR FUEL COMPLEX
		M14688	REMI EDELSTAHL TUBULARS LIMITED
		S90071	AB SANDVIK MATERIALS TECHNOLOGY,
		S72022	TUBACEX TUBOS INDIXIDABLES S.A.

		S70015	IGAWARA INDUSTRIAL SERVICE AND TRAD
		M20071	SANDVIK ASIA LIMITED
		M10104	HEAVY METAL & TUBES LIMITED,
		G91881	TPS TECHNITUBE ROHRENWERKE
		J90097	SUMITOMO CORPORATION
		K70003	SAMSUN CORPORATION,
		M10063	PRAKASH STEELAGE LTD.,
		J90001	NIKKO BOEKI KAISHA LTD.
		G01459	RATNAMANI METALS & TUBES LTD.,
		K70007	IL SHIN STEEL INTERNATIONAL CO.
		AP00073	LINKWELL SEAMLESS TUBES (P) LTD.
		GJ00006	MODERN TUBE INDUSTRIES LTD
		GJ00007	KRYSTAL STEEL MFG. PVT. LTD.
		GJ00011	CHANDAN STEEL LIMITED
		CN00010	ZHEJIANG HI-TECH METALS CO. LTD.
E.PT.011	CARBON STEEL (SEAMLESS) TUBES / PIPES OD ABOVE 114.3 MM AND BELOW 219.1 MM	C90151	VALCOVNY TRUB CHOMUTOV A. S
		S72049	TUBOS REUNIDOS,S.A,
		M20047	ISMT LIMITED.,
		I90302	TENARIS GLOBAL SERVICES S.A.
		M01152	MAHARASHTRA SEAMLESS LTD.,
		M01160	JINDAL SAW LIMITED,
		M10104	HEAVY METAL & TUBES LIMITED,

		J90097	SUMITOMO CORPORATION
		F90112	VALLOUREC & MANNESMANN TUBES.,
		U70047	TRANSWORLD FZC
		AE00001	KIRTANLAL INTERNATIONAL DMCC
		AE00002	VENUS INTERNATIONAL FZE (YANGZHOU CHENGDE STEEL PIPE CO. LTD.)
		U60001	INTERPIPE,
E.PT.012	CARBON STEEL(SEAMLESS) TUBE / PIPES OD FROM 219.1MM UPTO AND INCLUDING 273.1MM	C90151	VALCOVNY TRUB CHOMUTOV A. S
		J90097	SUMITOMO CORPORATION
		M01152	MAHARASHTRA SEAMLESS LTD.,
		M01160	JINDAL SAW LIMITED,
		S70615	PRODUCTOS TUBULARES S.A.,
		M20047	ISMT LIMITED.,
		I90302	TENARIS GLOBAL SERVICES S.A.
		F90112	VALLOUREC & MANNESMANN TUBES.,
		U70047	TRANSWORLD FZC
		AE00001	KIRTANLAL INTERNATIONAL DMCC
		AE00002	VENUS INTERNATIONAL FZE (YANGZHOU CHENGDE STEEL PIPE CO. LTD.)

E.PT.013	CARBON STEEL (SEAMLESS) TUBES / PIPES OD ABOVE 273.1MM UPTO AND INCLUDING 355.6MM	C90151	VALCOVNY TRUB CHOMUTOV A. S
		J90097	SUMITOMO CORPORATION
		M01152	MAHARASHTRA SEAMLESS LTD.,
		S70615	PRODUCTOS TUBULARES S.A.,
		I90302	TENARIS GLOBAL SERVICES S.A.
		F90112	VALLOUREC & MANNESMANN TUBES.,
		U70047	TRANSWORLD FZC
		AE00001	KIRTANLAL INTERNATIONAL DMCC
		AE00002	VENUS INTERNATIONAL FZE (YANGZHOU CHENGDE STEEL PIPE CO. LTD.)
E.PT.014	CARBON STEEL (SEAMLESS) TUBE /PIPES OD ABOVE 355.6MM	C90151	VALCOVNY TRUB CHOMUTOV A. S
		I90302	TENARIS GLOBAL SERVICES S.A.
		S70615	PRODUCTOS TUBULARES S.A.,
		J90097	SUMITOMO CORPORATION
		F90112	VALLOUREC & MANNESMANN TUBES.,
		U70047	TRANSWORLD FZC
		AE00001	KIRTANLAL INTERNATIONAL DMCC
		AE00002	VENUS INTERNATIONAL FZE (YANGZHOU CHENGDE STEEL PIPE CO. LTD.)

E.PT.015	STAINLESS STEEL TUBES & PIPES OD ABOVE 168.3MM UPTO AND BELOW 273.1MM	M14688	REMI EDELSTAHL TUBULARS LIMITED
		S70615	PRODUCTOS TUBULARES S.A.,
		S90071	AB SANDVIK MATERIALS TECHNOLOGY,
		S72022	TUBACEX TUBOS INOXIDABLES S.A.
		S70015	IGAWARA INDUSTRIAL SERVICE AND TRADE
		J90097	SUMITOMO CORPORATION
		G01459	RATNAMANI METALS & TUBES LTD.,
		J90001	NIKKO BOEKI KAISHA LTD.
		G91881	TPS TECHNITUBE ROHRENWERKE
		CN00010	ZHEJIANG HI-TECH METALS CO. LTD.
E.PT.016	STAINLESS STEEL TUBES & PIPES OD 273.1MM AND ABOVE	J90001	NIKKO BOEKI KAISHA LTD.
		J90097	SUMITOMO CORPORATION
		S70615	PRODUCTOS TUBULARES S.A.,
		S70015	IGAWARA INDUSTRIAL SERVICE AND TRADE
		G91881	TPS TECHNITUBE ROHRENWERKE

Structural

PMD No.	Item	Vendor code	Vendor Name
E.ST.003	STRUCTURAL STEEL (BEAMS, ANGLES & CHANNELS)	A11929	STEEL AUTHORITY OF INDIA LTD
		M40492	M/S. VANDANA ISPAT LIMITED
		T10050	JINDAL STEEL & POWER LIMITED

		A48711	RASHTRIYA ISPAT NIGAM LTD,
		A60202	STEEL AUTHORITY OF INDIA LTD
		CG00001	NANDAN STEELS & POWER LTD.
		AP00098	BEEKAY STRUCTURAL STEELS

SS Angles

PMD No.	Item	Vendor code	Vendor Name
E.ST.006	S.S. ANGLES	A11929	STEEL AUTHORITY OF INDIA LTD
		AP00048	MANIDHARI STAINLESS WIRE PVT. LTD.
		DL00004	AMBICA STEELS LIMITED
		GJ00011	CHANDAN STEEL LIMITED

Flanges

PMD No.	Item	Vendor code	Vendor Name
ST.FL.001	FLANGES (CARBON STEEL) UPTO 6 INCHES	A10415	PRESHZINGER ENGINEERING
		M10177	SHREE GANESH FORGINGS LTD
		U00150	KISAAN STEELS (PVT) LTD.,
		T10113	MOD FORGE PVT. LTD
		A49888	EVERGREEN MACHINERY & TOOLS
		D01374	J.K.FORGINGS,
		D00122	THE PUNJAB STEEL WORKS,
		U00021	ALKA FORGINGS
		A30184	FLASH FORGE PVT LTD
ST.FL.003	FLANGES (STAINLESS STEEL)-UPTO 6 INCHES	A10415	PRESHZINGER ENGINEERING
		D00122	THE PUNJAB STEEL WORKS,
		U00150	KISAAN STEELS (PVT) LTD.,

		M10177	SHREE GANESH FORGINGS LTD
		D01374	J.K.FORGINGS,
		A49888	EVERGREEN MACHINERY & TOOLS
		A30184	FLASH FORGE PVT LTD
		GJ00011	CHANDAN STEEL LIMITED
ST.FL.004	FLANGES (CARBON STEEL) FOR> 6" UPTO 12"	A10415	PRESHZINGER ENGINEERING
		A49888	EVERGREEN MACHINERY & TOOLS
		D00122	THE PUNJAB STEEL
		U00150	KISAAN STEELS P. LTD
		D00106	GOLDEN IRON & STEEL
		U00029	CHAUDHRY HAMMER
		U01378	GHAZIABAD ISPAT UDYOG
		D01374	J.K. FORGINGS
		M10177	SREE GANESH FORGINGS
		A30184	FLASH FORGE PVT LTD
D.FO.003	STANDARD FLANGE	D00106	GOLDEN IRON & STEEL WKS.
		D00122	THE PUNJAB STEEL WORKS,
		U00029	CHAUDHRY HAMMER WORKS (P) LTD.
		U00150	KISAAN STEELS (PVT) LTD.,
		U01378	GHAZIABAD ISPAT UDYOG LTD.,
		D01374	J.K.FORGINGS,

Fasteners




ST.SW.001	STUD WITH TWO NUTS	A00030	JAI FASTENERS (P) LIMITED
		M33208	PRESIDENT ENGINEERING WORKS

		T10060	SREE PAVITHRA INDUSTRIES,
		T10113	MOD FORGE PVT. LTD
		T10030	STUD INDIA
		M10016	BOLTMASER (INDIA)PVT.LTD.
		H00020	LPS BOSSARD PVT. LTD.
		K50243	NAGABUSHANAM INDUSTRIES
		A15029	ATLAS FASTENERS
		P00370	MORNING STAR INDUSTRIES
		PB00002	UDEHRA FASTENERS LTD.
		GJ00005	RATNESH METAL INDUSTRIES PVT. LTD.
		MH00021	MEGA ENGINEERING PVT. LTD.
		P00004	PIONEER NUTS AND BOLTS PVT. LTD.
ST.FS.004	FASTENERS (STUDS) and SS Fasteners	A00030	JAI FASTENERS (P) LIMITED
		M33208	PRESIDENT ENGINEERING WORKS
		T10113	MOD FORGE PVT. LTD
		T10060	SREE PAVITHRA INDUSTRIES,
		M10016	BOLTMASER (INDIA)PVT.LTD.
		A15029	ATLAS FASTENERS
		K50057	CANARA AUTO PRODUCTS
		K50138	AMBIKA ENTERPRISES,
		H00020	LPS BOSSARD PVT. LTD.
		A10388	UNIQUE ENGINEERING ENTPS P LTD
		P00370	MORNING STAR INDUSTRIES
		PB00002	UDEHRA FASTENERS LTD.

		GJ00005	RATNESH METAL INDUSTRIES PVT. LTD.
		MH00021	MEGA ENGINEERING PVT. LTD.
		P00004	PIONEER NUTS AND BOLTS PVT. LTD.
		KA00015	SRI RAMANUJA INDUSTRIAL SERVICES
		P00002	PANKAJ INTERNATIONAL
ST.FS.005	FASTENERS (NUTS) & ss fasteners	A00030	JAI FASTENERS (P) LIMITED
		H00020	LPS BOSSARD PVT. LTD.
		K50057	CANARA AUTO PRODUCTS
		M33208	PRESIDENT ENGINEERING WORKS
		T10113	MOD FORGE PVT. LTD
		T10143	SUNDRAM FASTENERS LTD.
		T10060	SREE PAVITHRA INDUSTRIES,
		M10016	BOLTMASTER (INDIA)PVT.LTD.
		A10388	UNIQUE ENGINEERING ENTPS P LTD
		A15029	ATLAS FASTENERS
		P00370	MORNING STAR INDUSTRIES
		PB00002	UDEHRA FASTENERS LTD.
		GJ00005	RATNESH METAL INDUSTRIES PVT. LTD.
		MH00021	MEGA ENGINEERING PVT. LTD.
		P00004	PIONEER NUTS AND BOLTS PVT. LTD.
		KA00015	SRI RAMANUJA INDUSTRIAL SERVICES

		P00002	PANKAJ INTERNATIONAL
ST.FS.006	FASTENERS (WASHERS)	A00030	JAI FASTENERS (P) LIMITED
		T10113	MOD FORGE PVT. LTD
		M33208	PRESIDENT ENGINEERING WORKS
		A15029	ATLAS FASTENERS
		H00020	LPS BOSSARD PVT. LTD.
		A10388	UNIQUE ENGINEERING ENTPS P LTD
		PB00002	UDEHRA FASTENERS LTD.
		P00004	PIONEER NUTS AND BOLTS PVT. LTD.
		P00002	PANKAJ INTERNATIONAL

Vendor	Name	City	PostalCode	Street	Street 2	Street 3	Telephone 1	Fax Number	E-Mail Address
CN00010	ZHEJIANG HI-TECH METALS CO. LTD.	ZHEJIANG	111111	ZHENXI TOWN, HUZHOU 313012			86 572 7362198	86 572 3622558	samxu@jiuli.com
AP00098	BEEKAY STRUCTURAL STEELS	VISAKAPATNAM	530012	AUTONAGAR		PLOT NO. 19-21 & 24-26, BLOCK-E	0891-6539029,9830093993	0891-2708237	structural@beekaysteel.com
AP00073	LINK WELL SEAMLESS TUBES (P) LTD.	SECUNDERABAD	500009	TAWAIPURA, TARBUND		LINKWELL HOUSE, GROUND FLOOR, 2-3-76	040-27897077	040-27814121	shr@linkwellseamless tubes.com
AP00048	MANIDHARI STAINLESS WIRE PVT. LTD.	HYDERABAD	500055	137, I.D.A, PHASE-V, JEEDIMETLA			040-23091478	040-23195734	info@manidhariwire.com
A60202	STEEL AUTHORITY OF INDIA LTD	SECUNDERABAD	127714	4TH FLOOR, 4TH FLOOR,SOMASUNDARAM S	IISCO STEEL PLANT	3-1-277/1/4, PVS MANSION,			liscohyd@yahoo.com
A49888	EVERGREEN MACHINERY & TOOLS STORES	SECUNDERABAD	500003	5-1-454, RANIGUNI		POST BOX NO.1628,			evergreenmachinery@yahoo.co.in
A48711	RASHTRIYA ISPAT NIGAM LTD,		103311	KHANU BHA KHANU BHAVAN / NMDC BUI	VISAKHAPATNAM STEEL PLANT,	DOOR NO:10-3-311/A,			rinlhyd@ap.nic.in
A30184	FLASH FORGE PVT LTD	VISAKHAPATNAM	530012	F-33, D BLOCK,	AUTONAGAR,		08913292232,9848149317	8912768281	sales@flashforge.co.in
A30184	FLASH FORGE PVT LTD	VISAKHAPATNAM	530012	F-33, D BLOCK,	AUTONAGAR,		08913292232,9848149317	8912768281	salesmumbai@flashforge.co.in
A11929	STEEL AUTHORITY OF INDIA LTD	HYDERABAD	500004	TARAMANDAL SAIFABAD		5-9-13 9TH FLOOR			bmsec@sail_steel.com
A10415	PRESHZINGER ENGINEERING	HYDERABAD	500055	IDA JEEDIMETLA	PLOT NO. 84/A	PHASE-1 SHAPUR NAGAR	040-55440384	040-23713008	pecplks_hyd53@rediffmail.com
GJ00011	CHANDAN STEEL LIMITED	UMBERGAON	396171	DIST. VALSAD	PLOT # 35 & 36, 102/2 GIDC		91 260 2562066	91 260 2562287	flanges@chandansteel.net
GJ00007	KRYSTAL STEEL MANUFACTURING	VADODARA	391775	P.O. MANIUSAR, TALUKA SAVLI		PLOT NO. KV-2, G.I.D.C. SAVLI	02667-264777	02667-264778	works@krystalsteel.co.in
GJ00006	MODERN TUBE INDUSTRIES	VADODARA	391243	VILLAGE: RAMANGAMD, POR		SURVEY NO. 873, NEAR: POR GIDC	0265-2831810	0265-2831811	herbert.mtil@gmail.com
G01459	RATNAMANI METALS & TUBES LTD.,		111111	ANKUR ROAD ANKUR ROAD, NARANPURA, A	17,RAJMUGAT SOCIETY,	NARANPURA CHAR RASTA,			info@ratnamani.com
H00856	JSL STAINLESS LIMITED	HISAR	125005		REG.OFFICE:P.O.BOX.NO.6,	DELHI ROAD,			jsl_puneetgrover@gmail.com
KA00016	JSW STEEL LIMITED	DIST. BELLARY	583275	P.O. VIJAYANAGAR			08395-250120	08395-250138	balachandra.mouli@jsw.in
M40492	M/S. VANDANA ISPAT LIMITED	RAIPUR.	492001		VANDANA BUILDING	M.G. ROAD	0771-2535244	0771-2233023	vandanaloha@yahoo.co.in
M20071	SANDVIK ASIA LIMITED	PUNE	411012	MAHARASHTRA	MUMBAI-PUNE ROAD	DAPODI, PUNE- 411012			sanika.kulkarni@sandvik.com
M14688	REMI EDELSTAHL TUBULARS LIMITED	MUMBAI	400063	GOREGAON EAST,		11, CAMA INDUSTRIAL ESTATE,	022-40589888	022-26852335	deepaksoni@remigroup.com
M10177	SHREE GANESH FORGINGS LTD	NAVI MUMBAI	400705		C-3/C, TTC INSUATRIAL AREA	THANE BELAPUR ROAD			shreeganeshforgings@vsnl.com
M10104	HEAVY METAL & TUBES LIMITED.		111111	MUMBAI - 400 004. MAHARASHTRA	12, 'SKM HOUSE',	6TH KHETWADI,			hitesh@heavytubes.com
M10063	PRAKASH STEELAGE LTD.,	MUMBAI	400026		701, MAHALAXMI CHAMBERS	BHULABHAI DESAI ROAD	022-66134500	022-23526576	marketing@prakashsteelage.com
M01152	MAHARASHTRA SEAMLESS LTD.,		402126	DIST. RAIGADH	PIPE NAGAR, VILLAGE SUKELI	N.H.17, B.K.G.ROAD, TALUKA-ROHA	02194-238511	02194-238513	jindal_d@vsnl.net.in
T10113	MOD FORGE PVT. LTD	CHENNAI	600058	AMBATTUR INDL. ESTATE,	103, SIDCO AIEMA TOWER,	1ST MAIN ROAD,	044-26253236	044-26257986	chennai@mod-forge.com
T10050	JINDAL STEEL & POWER LIMITED	CHENNAI	600018	TEYNAPET	4C, CENTURY PLAZA	560-562, ANNA SALAI			jsplichennai@vsnl.net
U01378	GHAZIABAD ISPAT UDYOG LTD.,	GHAZIABAD	201009	SITE NO.1	C/89, INDUSTRIAL AREA,	BULANDSHAHR ROAD,	0120 2866189	0120-2866188	giultd@yahoo.co.in
U01378	GHAZIABAD ISPAT UDYOG LTD.,	GHAZIABAD	201009	SITE NO.1	C/89, INDUSTRIAL AREA,	BULANDSHAHR ROAD,	0120 2866189	0120-2866188	sharmaak27@rediffmail.com
U00150	KISAAN STEELS (PVT) LTD.,	GHAZIABAD	201001	P.O. BOX NO 71	B-12 INDUSTRIAL AREA,	BULANDSHAHR ROAD,	0120-2700938	0120-4175942	ksp_l_nitin@yahoo.com
U00150	KISAAN STEELS (PVT) LTD.,	GHAZIABAD	201001	P.O. BOX NO 71	B-12 INDUSTRIAL AREA,	BULANDSHAHR ROAD,	0120-2700938	0120-4175942	accounts@kisaansteels.com
U00029	CHAUDHRY HAMMER WORKS (P) LTD.		201001	GHAZIABAD - , (UP) INDIA.	NEAR HAPUR ROAD FLY OVER	P.O. BOX 20,			chaudhry.works@gems.vsr
U00021	ALKA FORGINGS	GHAZIABAD	201009	GHAZIABAD, GHAZIABAD, U.P.	C-20, BULANDSHAR ROAD	INDUSTRIAL AREA	0120-2700831,9873439011	0120-2702529	alka_forgings@rediffmail.com
DL00004	AMBICA STEELS LIMITED	NEW DELHI	110052	C54/1 WAZIRPUR INDL. AREA			011-47034400	011-47034450	info@ambicasteels.com
D01374	J.K.FORGINGS,	NEW DELHI.	110064		B-83, MAYAPURI INDUSTRIAL AREA	PHASE-1,	011-28114484	011-28115161	jkforgings@sify.com
D00122	THE PUNJAB STEEL WORKS,	NEW DELHI	110064	MAYAPURI INDUSTRIAL AREA		B-38,	011-28115960	011-28116333	pswforge@yahoo.com
D00106	GOLDEN IRON & STEEL WKS.	NEW DELHI.	110015		7/19, INDUSTRIAL AREA,	KIRTHINAGAR,	011-25932126	011-25195342	giswgold@del3.vsnl.net.in
CG00001	NANDAN STEELS & POWER LTD.	RAIPUR	492001	MAIN ROAD, SAMTA COLONY		GROUND FLOOR, 199'C	0771-4078000	0771-4078040	raipur_nandan@yahoo.com
KR00002	POSCO STEEL SERVICES &	KYEONGZSANGBUK-DO	790-360	POHANG-SI	MILL-POSCO	1, GOEDONG-DONG, NAM-GU	82 54 2200114	82 54 220 6000	webmaster@posco.com
AE00001	KIRTANLAL INTERNATIONAL DMCC		103921	P.O. BOX- 103921, DUBAI	504, BIN HENDI TOWER-1	AL-MANKHOOL ROAD	971-4-3543411	971-4-3543381	admin@kirtanlalinternational.com
AE00002	VENUS INTERNATIONAL FZE,	DUBAI,	1111111	P.O.BOX-103976,		PLOT # 352-971, BLOCK-5,		-3557677	hemendra@venusfze.com
BE00001	INDUSTEEL BELGIUM	CHARLEROI	0	RUE DE CHATELET 266			32 71 441905	32 71 441714	etienne.francois@arcelormittal.com
CH00001	EAST METALS S.A.		6900	VIA MAGGIO 1C, 6900 LUGANO				41912607760	diego.zanuso@eastmetals.biz
F90112	VALLOUREC & MANNESMANN TUBES.,		12345	BOULOGNE-B BOULOGNE-BILLANCOURT, FR	V&M FRANCE,DIRECTION COMMERC-	IALE,130,RUE DE SILLY,92100			dindmag@md4.vsnl.net.in
G91407	SALZGITTER MANNESMANN INTERNATIONAL		12345	GERMANY.	SCHWANNSTRASSE 12,	D-40476, DUSSELDORF,			scc_mum@satyam.net.in
G91881	TPS TECHNITUBE ROHRENWERKE	GERMANY.	11111		JULIUS-SAXLER-STR. 7,	DE-54550 DAUN	49 65927120	49 65921305	service@tpsd.de
I90302	TENARIS GLOBAL SERVICES S.A.		12345	URUGUAY	LA CUMPARSITA 1373, PISO 6,	11200, MONTEVIDEO,			imoc@vsnl.com
J90001	NIKKO BOEKI KAISHA LTD.		1234567	TOKYO 103-0012, JAPANTOKYO 103-	TOWA, 3-15, NIHONBASHI -	HARIDOME-CHO,1-CHOME,CHUO-KU			mdl_mdi@sify.com
K70007	IL SHIN STEEL INTERNATIONAL CO.		123-567	SEOJEONG-DONG PYEONGTAEK-CI, GYEONG	ROOM NO.603, 6TH FLOOR	GYEONGSUNG B/D, 841-1			overseas@ilshinsteel.co.kr
S70015	IGAWARA INDUSTRIAL SERVICE AND TRAD		123456	SINGAPORE SINGAPORE - 609 601.	LTD., 2 JURONG EAST STREET 21,	# 05-04, IMM BUILDING,			kumar@igawara.com.sg
S70615	PRODUCTOS TUBULARES S.A.,		123456	(VIZCAYA), (VIZCAYA), SPAIN	CARRETERA GALINDO A UGARTE S/M	48510, VALLEDE TRAPAGA,			commercial.tubos@productostubulers.com
S72022	TUBACEX TUBOS INOXIDABLES S.A.		123456	S P A I N .	P.O.BOX - 22,	01400 LLODIO,			grnaoc@hd1.vsnl.net.in
S72049	TUBOS REUNIDOS.S.A.		123456	SPAIN	BARRIO SAGARRIABAI N.2A,	01470 AMURRIO-ALAVA			trade@bom5.vsnl.net.in
S72073	ACERINOX S.A.,		123456	S P A I N .	SANTIAGO DE COMPOSTELA 100 ,	28035 - MADRID,			acuetopa@acxgroup.com
S80003	DUFERCO S.A.,		1234	SWITZERLAND.	VIA BAGUTTI 9,	CH 6900, LUGANO,			jacques.schramm@duferco.com
S90071	AB SANDVIK MATERIALS TECHNOLOGY,		111 11	SWEDEN.	SE - 811 81 ,	SANDVIKEN ,			genny.dcuze@sandvik.com
SI00001	ACRONI d.o.o.		4270	JESENICE	CESTA BORISA KIDRICA 44		38645841000	38645841111	bostjan.blazic@acroni.si
U60001	INTERPIPE,		49600	DNEPROPETROVSK,		1-A, PISARZHEVSKOGO STR. 49600	3.80562E+11	3.80562E+11	denys.poptsov@interpipe.biz
U70047	TRANSWORLD FZC		1234	BLOCK AL ESBIO, BUR DUBAI U.A.E	104, RABAB & LAYLA	PLOT NO 3, 316-0119 (P-60/4)			trivedi@transworldfzc.com
U80960	CORUS UK LTD.,	ENGLAND	123456789	ALDWARKE LANE, ROTHERHAM	CORUS ENGINEERING STEELS OR	WIRE ROD & BAR PO BOX 50	44 2077174444	44 2077174455	feedback@corusgroup.com
AE00001	KIRTANLAL INTERNATIONAL DMCC		103921	P.O. BOX- 103921, DUBAI	504, BIN HENDI TOWER-1	AL-MANKHOOL ROAD	971-4-3543411	971-4-3543381	admin@kirtanlalinternational.com
AE00002	VENUS INTERNATIONAL FZE,	DUBAI,	1111111	P.O.BOX-103976,		PLOT # 352-971, BLOCK-5,		-3557677	hemendra@venusfze.com
BE00001	INDUSTEEL BELGIUM	CHARLEROI	0	RUE DE CHATELET 266			32 71 441905	32 71 441714	etienne.francois@arcelormittal.com
CH00001	EAST METALS S.A.		6900	VIA MAGGIO 1C, 6900 LUGANO				41912607760	diego.zanuso@eastmetals.biz
F90112	VALLOUREC & MANNESMANN TUBES,		12345	BOULOGNE-B BOULOGNE-BILLANCOURT, FR	V&M FRANCE,DIRECTION COMMERC-	IALE,130,RUE DE SILLY,92100			dindmag@md4.vsnl.net.in
G91407	SALZGITTER MANNESMANN INTERNATIONAL		12345	GERMANY.	SCHWANNSTRASSE 12,	D-40476, DUSSELDORF,			scc_mum@satyam.net.in
G91881	TPS TECHNITUBE ROHRENWERKE	GERMANY.	11111		JULIUS-SAXLER-STR. 7,	DE-54550 DAUN	49 65927120	49 65921305	service@tpsd.de
I90302	TENARIS GLOBAL SERVICES S.A.		12345	URUGUAY	LA CUMPARSITA 1373, PISO 6,	11200, MONTEVIDEO,			imoc@vsnl.com
J90001	NIKKO BOEKI KAISHA LTD.		1234567	TOKYO 103-0012, JAPANTOKYO 103-	TOWA, 3-15, NIHONBASHI -	HARIDOME-CHO,1-CHOME,CHUO-KU			mdl_mdi@sify.com
K70007	IL SHIN STEEL INTERNATIONAL CO.		123-567	SEOJEONG-DONG PYEONGTAEK-CI, GYEONG	ROOM NO.603, 6TH FLOOR	GYEONGSUNG B/D, 841-1			overseas@ilshinsteel.co.kr
S70015	IGAWARA INDUSTRIAL SERVICE AND TRAD		123456	SINGAPORE SINGAPORE - 609 601.	LTD., 2 JURONG EAST STREET 21,	# 05-04, IMM BUILDING,			kumar@igawara.com.sg
S70615	PRODUCTOS TUBULARES S.A.,		123456	(VIZCAYA), (VIZCAYA), SPAIN	CARRETERA GALINDO A UGARTE S/M	48510, VALLEDE TRAPAGA,			commercial.tubos@productostubulers.com
S72022	TUBACEX TUBOS INOXIDABLES S.A.		123456	S P A I N .	P.O.BOX - 22,	01400 LLODIO,			grnaoc@hd1.vsnl.net.in
S72049	TUBOS REUNIDOS.S.A.		123456	SPAIN	BARRIO SAGARRIABAI N.2A,	01470 AMURRIO-ALAVA			trade@bom5.vsnl.net.in
S72073	ACERINOX S.A.,		123456	S P A I N .	SANTIAGO DE COMPOSTELA 100 ,	28035 - MADRID,			acuetopa@acxgroup.com
S80003	DUFERCO S.A.,		1234	SWITZERLAND.	VIA BAGUTTI 9,	CH 6900, LUGANO,			jacques.schramm@duferco.com
S90071	AB SANDVIK MATERIALS TECHNOLOGY,		111 11	SWEDEN.	SE - 811 81 ,	SANDVIKEN ,			genny.dcuze@sandvik.com
SI00001	ACRONI d.o.o.		4270	JESENICE	CESTA BORISA KIDRICA 44		38645841000	38645841111	bostjan.blazic@acroni.si
U60001	INTERPIPE,		49600	DNEPROPETROVSK,		1-A, PISARZHEVSKOGO STR. 49600	3.80562E+11	3.80562E+11	denys.poptsov@interpipe.biz
U70047	TRANSWORLD FZC		1234	BLOCK AL ESBIO, BUR DUBAI U.A.E	104, RABAB & LAYLA	PLOT NO.3, 316-0119 (P-60/4)			trivedi@transworldfzc.com
U80960	CORUS UK LTD.,	ENGLAND	123456789	ALDWARKE LANE, ROTHERHAM	CORUS ENGINEERING STEELS OR	WIRE ROD & BAR PO BOX 50	44 2077174444	44 2077174455	feedback@corusgroup.com

		BHEL HYDERABAD-32		VENDOR STANDARD QUALITY PLAN				QP No. : HY/QA/VSQP/01 Rev. No.: 00 DATE : 18.02.2011 PAGE : Page 1 of 8					
				ITEM: DEAERATOR HEADER & STORAGE TANK									
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY			REMARKS
										S	M	C	
1.0	MATERIAL												
1.1	At Suppliers works												
1.1.1	Shell Plates & Plates for Dished Ends	a. Chemical composition	Critical	Chemical	As per Spec	SA 516 GR.70	SA 516 GR.70	Supplier's TC	√	P	V	V	With the supplementary requirements S1,S5,S8 C=0.25Max.
		b. Mechanical properties	„	Mechanical	As per Spec	SA 516 GR.70	SA 516 GR.70	Supplier's TC	√	P	V	V	
		c. UT Examination as per Drg	„	NDE	100%	SA 435	SA 435	„	√	P	V	V	
		d. Dimensional examination	Major	Measrt	„	PO/Spec	PO/spec	„	√	P	V	V	
		e. Surface Examination	Major	Visual	100%	No pitting	No pitting	Insp. Record	√	P	W	W	
		f. Verification of Material with Spec & TC	„	Visual	„	„	„	„	√	P	V	V	Verification of Mill TCs at the time of induction.
1.1.2	Pipes	a. Verification & correlation of material with Mill TCs and transfer of attestation Dimensional & surface examination	Major	Visual	100%	SA 106 GRB	SA 106 GRB	Supplier's TCS and Insp. Record	√	P	V	V	Hydro test or UT/ eddy current & flattening test at subvendors works of vendor.
1.1.3	Flanges	a. Verification & correlation of material with TC and transfer of attestation Dimensional & surface examination	Major	Visual	100%	SA105	SA105	Supplier's TCS and Insp. Record	√	P	V	V	UT on all accessible areas for thickness >25mm shall be carried out
Drg No. : As per BHEL PO			BHEL Spec. No.: As per BHEL PO			PREPARED BY:  AMIT KARAMCHANDANI ENGINEER/QA			APPROVED BY:  Y C VENKATESWARA RAO DGM / QA				
Legend: *D- Documents marked (✓) to be included by Supplier in Documentation Package. S - Sub Vendor P - Perform M -Vendor / Manufacturer W - Witness C -Customer (BHEL) / Inspection Agency V - Verify													





**BHEL
HYDERABAD-32**

VENDOR STANDARD QUALITY PLAN

ITEM: DEAERATOR HEADER & STORAGE TANK

QP No. : HY/QA/VSQP/01
Rev. No.: 00
DATE : 18.02.2011
PAGE : Page 2 of 8

SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY			REMARKS
										S	M	C	
1.1.4	Plates for pads	a. Verification & correlation of material with Mill TCs and transfer of attestation Dimensional & surface examination	Major	Visual	100%	SA516 GR.70	SA516 GR.70	Supplier's TCS and Insp. Record	√	P	V	V	
1.1.5	Tray Assemblies												
	At Supplier's works	a. Chemical composition.	Critical	Chemical	As per Spec.	SA240TP430	SA240TP430	Supplier's TC	√	P	V	V	
		b. Mech. Properties	“	Mechanical	As per Spec.	SA240TP430	SA240TP430	Supplier's TC	√	P	V	V	
		c. Visual examination for any surface defects of tray after stamping.	Major	Visual	100%	No cracks and dents	No cracks and dents	Supplier's TC	√	P	V	V	
		d. PT examination of Tray plates	“	NDE	100%	ASME SEC V article 6	ASME SEC VIII appendix 8	Supplier's TC	√	P	V	V	
		e. Dimensional conformity of Tray stack	“	Measrt.	100%	Drawing	Drawing	Supplier's TC	√	P	V	V	
		f. Verification of Material with Spec & TC	„	Visual	100%	Drawing	Drawing	Supplier's TC	√	P	V	V	Verification of Mill TCs at the time of induction.
1.1.6	Spray Valves												
1.1.6.1	At Supplier's works	a. Verification of material TC for compliance with Specification and PO	Major	Visual & Measrt	100%	As per Spec & PO	As per Spec & PO	-	√	P	V	V	CHP Review of Original Mill TCs at the time of induction
1.1.7	Shell Dished Ends (formed with single Plate or Butt welded plates)												
1..1.7.1	At supplier's works	a. Verification & correlation	Major	Visual	100%	SA 516 GR.70/	SA 516 GR.70	Supplier's TC	√	P	V	V	with the
Drg No. : As per BHEL PO			BHEL Spec. No.: As per BHEL PO				PREPARED BY:  AMIT KARAMCHANDANI ENGINEER/QA			APPROVED BY:  Y C VENKATESWARA RAO DGM / OA			
Legend: *D- Documents marked (✓) to be included by Supplier in Documentation Package. S - Sub Vendor M -Vendor / Manufacturer C -Customer (BHEL) / Inspection Agency P - Perform W - Witness V - Verify													



**BHEL
HYDERABAD-32**

VENDOR STANDARD QUALITY PLAN

ITEM: DEAERATOR HEADER & STORAGE TANK

QP No. : HY/QA/VSQP/01
Rev. No.: 00
DATE : 18.02.2011
PAGE : Page 4 of 8

SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY			REMARKS
										S	M	C	
		marks and check for dimensional marking											
		b. Dimensional conformity	„	Visual	„	Drawing	Drawing	Insp. Record	√		P	W	
		c. Surface exam of plates after rolling and edge preparation	„	„	„	ASME Sec VIII Div.I	ASME Sec.VIII Div.I	Insp. Record	√		P	W	
		d. PT of Weld edge preparation	Major	Visual	100%	ASME Sec.V ART.6	ASME Sec.VIII Appx.8	Insp. Record	√		P	W	
		e. Verification of approved WPS,PQR & Welders Qualification records	„	„	„	As per Sec.IX	As per Sec.IX	-	√		P	V	CHP (Review of Record)
		f. Fit up of L & C seams including shell to Dished ends	„	Measrt	„	Drg & ASME Sec.VIII Div.I	Drg & ASME Sec.VIII Div.I	Insp. Record	√		P	W	Ensure use of stiffener rings to avoid distortion
		g. PT after back chip	„	NDE	„	ASME Sec.V ART.6	ASME Sec.VIII Appx.8	Insp. Record	√		P	V	
		h. Check for the identification of all welds (weld No. punched for correlation with welder)	„	Visual	„	-	-	„	√		P	V	
		i. RT of welds	Critical	NDE	100%	ASME Sec.V Art.2	ASME Sec.VIII DIV.1 UW 51	Insp. Record	√		P	V	Review of RT films
		j. PT exam. of L & C seams of the outer shell welds	Major	„	„	ASME Sec.V ART.6	ASME Sec.VIII Appx.8	Insp. Record	√		P	W	
		k. Visual exam. of all welds	„	Visual	„	ASME Sec.VIII Div.1	ASME Sec.VIII Div.1	-	√		P	V	
		l. Dimensional conformity including ovality	„	Measrt	„	ASME Sec .VIII Div.1 & Drg	ASME Sec.VIII Div.1 & Drg	Insp. Record	√		P	W	
2.2	Nozzle Fabrication	a. Transfer of identification	Major	Visual	100%	TC	TC	I Insp. Record	√		P	W	

Drg No. : As per BHEL PO

BHEL Spec. No.: As per BHEL PO

PREPARED BY:

APPROVED BY:

Legend: *D- Documents marked (✓) to be included by Supplier in Documentation Package.

S - Sub Vendor

P - Perform

M -Vendor / Manufacturer


W - Witness



C -Customer (BHEL) / Inspection Agency

V - Verify

**AMIT KARAMCHANDANI
ENGINEER/QA**

**Y C VENKATESWARA RAO
DGM / QA**

		BHEL HYDERABAD-32		VENDOR STANDARD QUALITY PLAN					QP No. : HY/QA/VSQP/01 Rev. No.: 00 DATE : 18.02.2011 PAGE : Page 5 of 8				
				ITEM: DEAERATOR HEADER & STORAGE TANK									
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY			REMARKS
										S	M	C	
	with Plate Material	marks											
		b. Fit up of ‘L’ seams	„	Measrt	„	Drawing	Drawing	I Insp. Record	√		P	W	
		c. PT after back chip	„	NDE	„	ASME Sec.V Art .6	ASME Sec.VIII Div.I Appx.8	I Insp. Record	√		P	W	
		d. RT of the above weld	Critical	NDE	100%	ASME Sec.V Art.2	ASME Sec.VIII Div.I UW 51	I Insp. Record	√		P	V	Review of RT films
		e. Dimensional conformity	Major	Measrt	„	Drawing	Drawing	-	√		P	V	
2.3	Welding of Nozzles with Shell	a. Check for markings of nozzle openings prior to cutting	Major	Visual	100%	Drawing	Drawing	-	√		P	W	
		b. Transfer of identification marks on nozzles	Major	Visual	100%	TC	TC	Insp. Record	√		P	W	
		c. Check for Dimn conformity of Nozzle welds, visual and dimensional exam of weld	„	Measrt	„	Drawing	Drawing	Insp. Record	√		P	W	
		d. Fit up of Flange to pipe	„	„	„	„	„	„	√		P	W	
		e. Branches to shell fit up	„	„	„	„	„	„	√		P	W	
		f. MT exam of nozzle to shell welds	„	NDE	„	ASME Sec.V Art.7	ASME Sec.VIII Appx.6	„	√		P	W	
		g. PT of weld edge preparation>40mm	„	NDE	„	ASME Sec.V Art.6	ASME Sec.VIII Appx.8	„	√		P	W	
		g. Dimensional & visual exam of nozzles	„	Measrt	100%	Drawing	Drawing	Insp. Record	√		P	W	
		h. Soap Sol test of RF pads	„	Measrt.	„	HE71022/01	HE71022/01	Insp. Record	√		P	W	
2.4	Saddle fabrication & internal support & Tray enclosures	a. Fit up of pads to shell	Major	Measrt	100%	Drawing	Drawing	Insp. Record	√		P	W	
		b. Fit up of saddle to the shell	Major	Measrt	100%	Drawing	Drawing	Insp. Record	√		P	W	



Drg No. : As per BHEL PO	BHEL Spec. No.: As per BHEL PO	PREPARED BY:	APPROVED BY:
Legend: *D- Documents marked (✓) to be included by Supplier in Documentation Package. S - Sub Vendor M -Vendor / Manufacturer C -Customer (BHEL) / Inspection Agency		 AMIT KARAMCHANDANI ENGINEER/QA	 Y C VENKATESWARA RAO DGM / QA
P - Perform W - Witness V - Verify			


	BHEL HYDERABAD-32	VENDOR STANDARD QUALITY PLAN	QP No. : HY/QA/VSQP/01 Rev. No.: 00 DATE : 18.02.2011 PAGE : Page 7 of 8
		ITEM: DEAERATOR HEADER & STORAGE TANK	

SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	S	M	C	REMARKS
						Rev03 & Drg	Rev03 & Drg						
3.0	PREDESPATCH INSPN												
		a. Dimensional insp. Of Header & storage Tank	Major	Visual	100%	Drg	Drg	As built Drg	√		P	W	
		b. Match marking of storage tank sections for site assembly	„	Visual & Measrt	-	Drawing & procedure	Drawing & procedure	Insp. Record	√		P	W	
		c. Check for completeness verification of test / inspection records and certification of H & FST	Critical	Visual	100%	QP, Tech.spec. drg & data sheet	QP, Tech.spec. drg & data sheet	Manufacture's TC	√		P	V	
		d. Check for cleanliness after sand/shot blasting of internal/external surfaces of FST & external of header	Major	Visual	100%	HE-71023	HE-71023	Insp. Record	√		P	W	
		e. Cleaning, Painting & packing for despatch including blanking of all openings	„	„	„	„	„	„	√		P	W	
		f. Check for preservation of weld edge preparation	Major	Visual	100%	HE-71023	HE-71023	“	√		P	W	
		g. Check for identification on markings assemblies & loose items prior to transport	„	„	„	-	-	-	√		P	W	

GENERAL NOTES:

1. Identification and traceability of BHEL supplied materials (SEE SPECIAL NOTES 1)
2. Identification and calibration of Welding equipments, Measuring instruments and gauges
3. Availability of electrode baking, holding and portable ovens
4. Approval of WPS, PQR and WPQ by BHEL/BHEL nominated inspection agency

Drg No. : As per BHEL PO	BHEL Spec. No.: As per BHEL PO	PREPARED BY:	APPROVED BY:
Legend: *D- Documents marked (✓) to be included by Supplier in Documentation Package. S - Sub Vendor M - Vendor / Manufacturer C - Customer (BHEL) / Inspection Agency		 AMIT KARAMCHANDANI ENGINEER/QA	 Y C VENKATESWARA RAO DGM / QA

		BHEL HYDERABAD-32		VENDOR STANDARD QUALITY PLAN					QP No. : HY/QA/VSQP/01 Rev. No.: 00 DATE : 18.02.2011 PAGE : Page 8 of 8				
				ITEM: DEAERATOR HEADER & STORAGE TANK									
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY			REMARKS
										S	M	C	



5. Sourcing and usage of Electrodes and Welding wires from BHEL approved vendors
6. Availability of qualified QC personnel
7. Availability of NDT qualified personnel and procedures
8. Inspection of outsourced activities by vendor
9. Punching of welder nos. near weld jobs and RT ref. Nos. on weld joints
10. Availability of Technology process or work instructions to carry out job
11. Maintenance of welders log book

SPECIAL NOTES:

1. Material supply scope is as indicated in the BHEL PO or BHEL Sub contract Order and materials shall be as per BHEL approved drg./datasheet.
2. Vendor to refer BHEL customer approved project specific quality plan for identification of stages of inspection by BHEL customer/consultant.

INSTRUCTIONS FOR ASSEMBLY :

1. Closing dished end shall be assembled only after assembly of spray valves and tray assemblies
2. Spray valves are to be assembled prior to assembly of trays.
3. Vendor to ensure welding of stoppers for hold down rods and assembly of hold down angles with cleats.
4. Vendor to ensure tack welding of double lock nuts for spray valve fixing to valve plate.
5. Vendor to ensure availability of split pin through the top lock nut and stem of the spray valve before assembly of spray valve.
6. Vendor to ensure positioning of split pin at the bottom of hold down rod during tray assembly

Drg No. : As per BHEL PO	BHEL Spec. No.: As per BHEL PO	PREPARED BY:	APPROVED BY:
Legend: *D- Documents marked (✓) to be included by Supplier in Documentation Package. S - Sub Vendor M -Vendor / Manufacturer C -Customer (BHEL) / Inspection Agency		 AMIT KARAMCHANDANI ENGINEER/QA	 Y C VENKATESWARA RAO DGM / QA