



**ANNEXURE-A TO SPEC: PY 51 735**  
**THERMAL OBJECTIVE SPECIFICATION BY LINE SERVICE**

**ENGINEERED PRE-FABRICATED BOLT-ON HEATING SYSTEM**  
**FOR IOCL PARADIP 525 TPD STANDBY SRU**

**This Specification covers the thermal objective to be maintained by the Engineered Bolt-on Heating System. The thermal objective is as under specified against the each service:**

**Tail Gas (pre-TGTU):**

Maintain pipe wall temperature at/above 138°C during maximum flow conditions. Potential cooling effect of heat sinks such as pipe supports, flange pairs, etc. should be considered in the design. Vendor is required to supply calculations to show compliance.

**Tail Gas Bypass (NNF):**

Maintain pipe wall temperature at/above 138°C during no flow condition. Potential cooling effect of heat sinks such as pipe supports, flange pairs, etc. should be considered in the design. Vendor is required to supply calculations to show compliance.

**Sulphur Tank/Vessel:**

Maintain sulphur process temperature at 138°C at all liquid levels, AND maintain a minimum interior wall and roof temperature at/above 125°C at all times. All attached nozzles/vents to be maintained at/above 125°C. Potential cooling effect of heat sinks such as manways, nozzles, stairs etc. should be considered in the design. Vendor is required to supply calculations to show compliance.



**ANNEXURE-E1 :: PRICE BID FORMAT (OPTION-1, CL 10.5)**  
**ENGINEERED PRE-FABRICATED BOLT-ON HEATING SYSTEM**  
**FOR IOCL PARADIP 525 TPD STANDBY SRU**

BHEL's Enquiry No & Date      <Bidder to Specify>      :  
 Bidder's Name                      <Bidder to Specify>      :  
 Bidder's Offer No & Date        <Bidder to Specify>      :  
 Bidder's Ref No & Date          <Bidder to Specify>      :

<b>I MAIN OFFER</b>				
<b>SL NO</b>	<b>ITEM DESCRIPTION</b>	<b>QTY</b>	<b>TOTAL PRICE (Rs.)</b>	<b>PRICE WEIGHTAGE FACTOR</b>
<b>A</b>	<b>MATERIAL SUPPLY</b> Design, Manufacture and Supply of Engineered Pre-fabricated Bolt-On Heating System for Piping and Equipment complete with all Accessories as per the Technical Specification PY51735 including Commissioning Spares, Special Tools & Tackles (Commissioning spares, Special tools & tackles as per manufacturer's recommendation. Bidder to furnish the list along with their offer)			
<b>A.1</b>	<b>Lot-1 Supplies: For Existing Lines</b>	1 Set	not to be quoted separately	<b>75%</b>
<b>A.2</b>	<b>Lot-2 Supplies: For New Lines</b>	1 Set	not to be quoted separately	<b>23%</b>
<b>B</b>	<b>SUPERVISION OF ERECTION &amp; COMMISSIONING AT SITE</b> Lump sum Charges for deputation of service personnel for Supervision of Erection & Commissioning of Bolt-on Heating System including training of purchaser's installation crew, for PG test of the plant and handover of the package to Client (Charges shall include all the expenses like boarding, lodging, travel, insurance, Visa fees etc.)			
<b>B.1</b>	Lump sum Charges for supervision activities as defined above, <b>for Installation of Lot-1 supplies</b> , envisaging a minimum of 2 Months deputation at site and 2 Visits to site.	Lump sum	not to be quoted separately	<b>1%</b>
<b>B.2</b>	Lump sum Charges for supervision activities as defined above, <b>for Installation of Lot-2 supplies</b> , envisaging a minimum of 2 Months deputation at site and 2 Visits to site.	Lump sum	not to be quoted separately	<b>0.75%</b>
<b>B.3</b>	Lump sum price for deputation of service personnel during PG test of the plant and handover of the package to Client	Lump sum	not to be quoted separately	<b>0.25%</b>
	<b>TOTAL LUMP SUM PRICE(A.1+A.2+B.1+B.2+B.3)</b>			<b>A+ B</b>

<b>II OPTIONAL ITEMS</b>			
<b>SL NO</b>	<b>ITEM DESCRIPTION</b>	<b>QTY</b>	<b>UNIT PRICE (Rs.)</b>
<b>C</b>	<b>SUPERVISION CHARGES FOR ERECTION &amp; COMMISSIONING AT SITE</b>		
<b>C.1</b>	Per day supervision charges of an Engineer including all other expenses like boarding, lodging, local travel, insurance etc.	1 Day	
<b>C.2</b>	Travel expenses (inclusive of all other charges like visa fee (if applicable), insurance etc) from / to vendor works to / from site per Engineer per Visit for supervision of erection & commissioning.	1 Visit	

## NOTES:

1. Bidder to quote strictly as per BHEL's NIT requirements.
2. MAIN OFFER consists of those items which will be part of main order after successful bidder is identified. OPTIONAL ITEMS consists of those items which need to be quoted by bidder but may or may not be ordered by BHEL. Bidders are instructed to provide the pricing details listed under Main offer and Optional items as per the prescribed format.
3. MAIN OFFER:
  - a. Bidder shall quote ONLY Lump sum Total Price (A+B). Individual Price not to be quoted.
  - b. Line Item Rates of the individual items shall be derived by multiplying the "Price Weightage Factor" with the Lump sum Price quoted. These rates shall be binding on the bidder till the execution of contract.
4. OPTIONAL ITEMS:

Prices to be furnished in the prescribed price bid format only for each individual item. No combined prices, common prices or any other format will be accepted and such bids are liable for rejection.
5. **Price bids shall be evaluated on overall L1 basis on the Total Lump sum Price quoted by the bidders for MAIN OFFER: Sl no I items A and B.**

However, BHEL reserves the right,

- a. To include any of the optional items in scope of supply (as per customer contract requirements) and accordingly consider the same in evaluation. Any such scope increase and change in evaluation will be intimated to vendor during technical evaluation (before price bid opening).
- b. To place PO for any of the Optional items within the contract period.

**Hence bidders need to mandatorily quote reasonable prices for all optional items considering such requirement and keep the validity of the prices till the end of contract period.**

6. Bidders to quote strictly as per the above price format. No other format is acceptable. Any tampering/ modification/ change of the above price format is not allowed and the bidder's offer is liable for rejection. Partial offers are liable for rejection.
7. The bidder shall submit a detailed Unit Rate Table, as an Annexure to the Price Bid Format in line with clause no 23 of the Specification, which shall be binding on the bidder till the execution of the Contract. These unit rates, shall be used by the Purchaser to arrive at the final purchase order price based on the finalized Core Piping Input.
8. Bidder to quote the base rates only exclusive of taxes. The Total Lumpsum price quoted shall be INCLUSIVE of Freight, Packing & Forwarding, Inspection and Testing Charges etc.
9. Reference document: BHEL Tender Specification (PY51735) & all its annexures.
10. Commissioning spares are those spares which are required at the time of commissioning and shall be recommended (as per bidder's experience) and quoted by bidder. Commissioning spares consumed over and above the recommended commissioning spares, during commissioning shall be supplied free of cost by the vendor.
11. In case the systems are being supplied from outside India, reputed Third Party Inspection agencies like Llyods or equivalent has to be considered and the charges should be included in the offer. For those bidders who are supplying from India, such third party inspection charges need not be considered and same will be arranged by BHEL/BHEL nominated inspection agency.
12. In case the systems are being supplied from outside India, for IBR Inspection, TPIAs authorized by IBR Authorities shall be engaged by Vendor. For supplies within India, IBR inspection shall be carried out by local state CIB inspector. In both the cases, the charges should be included in bidder's offer.

13. Separate Purchase Orders will be issued for scope of work of this tender as follows:
  - a) The Purchase Order for Supplies (A) will be issued by BHEL-PE&SD Hyderabad.
  - b) The Purchase Order for Supervision of E&C (B) will be issued by BHEL Erection Agency.
14. All the items included in the price bid format shall be quoted as per tender specification and pre-bid clarifications, if any. Responsibility of ensuring correctness & completeness of scope of supply as per specification requirement solely lies with bidder.
15. Unpriced price bid format along with unit rate table, indicating as "QUOTED" against each applicable item shall be submitted duly signed & stamped along with technical offer by bidder as a token of concurrence that prices are submitted in this format only. The offer shall be liable for rejection in case if un-priced price bid format is not submitted or any modification is carried out in price bid format.
- 16. Unit prices quoted by the bidder in the price bid format (unit rate table)/ finalized during price evaluation process, shall be binding on the vendor till successful execution of the order and to settle the final price of the package after taking care of the subsequent variations (if any).**
17. The percentage limitation of the variation in Price of the overall package, from the time of PO to Final Execution of the order, shall be +/- 20%, i.e., **the overall price of the Engineered Bolt-on Heating System package arrived at based on the Final Core Piping Input as per spec clause 23.7, may vary upto +/- 20% from the PO Value.** Bidder shall make a note of the same while submitting the bid.



**ANNEXURE-E1 :: PRICE BID FORMAT (OPTION-2, CL 10.5)**  
**ENGINEERED PRE-FABRICATED BOLT-ON HEATING SYSTEM**  
**FOR IOCL PARADIP 525 TPD STANDBY SRU**

BHEL's Enquiry No & Date <Bidder to Specify> :  
Bidder's Name <Bidder to Specify> :  
Bidder's Offer No & Date <Bidder to Specify> :  
Bidder's Ref No & Date <Bidder to Specify> :

I	MAIN OFFER			
SL NO	ITEM DESCRIPTION	QTY	TOTAL PRICE (Rs.)	PRICE WEIGHTAGE FACTOR
A	<b>MATERIAL SUPPLY</b> Design, Manufacture and Supply of Engineered Pre-fabricated Bolt-On Heating System for Piping and Equipment complete with all Accessories as per the Technical Specification PY51735 including Commissioning Spares, Special Tools & Tackles (Commissioning spares, Special tools & tackles as per manufacturer's recommendation. Bidder to furnish the list along with their offer)			
A.1	Lot-1 Supplies: For Existing Lines	1 Set	not to be quoted separately	75%
A.2	Lot-2 Supplies: For New Lines	1 Set	not to be quoted separately	23%
B	<b>SUPERVISION OF ERECTION &amp; COMMISSIONING AT SITE</b> Lump sum Charges for deputation of service personnel for Supervision of Erection & Commissioning of Bolt-on Heating System including training of purchaser's installation crew, for PG test of the plant and handover of the package to Client (Charges shall include all the expenses like boarding, lodging, travel, insurance, Visa fees etc.)			
B.1	Lump sum Charges for supervision activities as defined above, <b>for Installation of Lot-1 supplies</b> , envisaging a minimum of 2 Months deputation at site and 2 Visits to site.	Lump sum	not to be quoted separately	1%
B.2	Lump sum Charges for supervision activities as defined above, <b>for Installation of Lot-2 supplies</b> , envisaging a minimum of 2 Months deputation at site and 2 Visits to site.	Lump sum	not to be quoted separately	0.75%
B.3	Lump sum price for deputation of service personnel during PG test of the plant and handover of the package to Client	Lump sum	not to be quoted separately	0.25%
	<b>TOTAL LUMP SUM PRICE(A.1+A.2+B.1+B.2+B.3)</b>			<b>A+ B</b>

II	OPTIONAL ITEMS		
SL NO	ITEM DESCRIPTION	QTY	UNIT PRICE (Rs.)
C	<b>SUPERVISION CHARGES FOR ERECTION &amp; COMMISSIONING AT SITE</b>		
C.1	Per day supervision charges of an Engineer including all other expenses like boarding, lodging, local travel, insurance etc.	1 Day	
C.2	Travel expenses (inclusive of all other charges like visa fee (if applicable), insurance etc) from / to vendor works to / from site per Engineer per Visit for supervision of erection & commissioning.	1 Visit	

## NOTES:

1. Bidder to quote strictly as per BHEL's NIT requirements.
2. MAIN OFFER consists of those items which will be part of main order after successful bidder is identified. OPTIONAL ITEMS consists of those items which need to be quoted by bidder but may or may not be ordered by BHEL. Bidders are instructed to provide the pricing details listed under Main offer and Optional items as per the prescribed format.
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4. OPTIONAL ITEMS:

Prices to be furnished in the prescribed price bid format only for each individual item. No combined prices, common prices or any other format will be accepted and such bids are liable for rejection.
5. **Price bids shall be evaluated on overall L1 basis on the Total Lump sum Price quoted by the bidders for MAIN OFFER: Sl no I items A and B.**

However, BHEL reserves the right,

- a. To include any of the optional items in scope of supply (as per customer contract requirements) and accordingly consider the same in evaluation. Any such scope increase and change in evaluation will be intimated to vendor during technical evaluation (before price bid opening).
- b. To place PO for any of the Optional items within the contract period.

**Hence bidders need to mandatorily quote reasonable prices for all optional items considering such requirement and keep the validity of the prices till the end of contract period.**

6. Bidders to quote strictly as per the above price format. No other format is acceptable. Any tampering/ modification/ change of the above price format is not allowed and the bidder's offer is liable for rejection. Partial offers are liable for rejection.
7. The bidder shall submit a detailed Unit Rate Table, as an Annexure to the Price Bid Format in line with clause no 23 of the Specification, which shall be binding on the bidder till the execution of the Contract. These unit rates, shall be used by the Purchaser to arrive at the final purchase order price based on the finalized Core Piping Input.
8. Bidder to quote the base rates only exclusive of taxes. The Total Lumpsum price quoted shall be INCLUSIVE of Freight, Packing & Forwarding, Inspection and Testing Charges etc.
9. Reference document: BHEL Tender Specification (PY51735) & all its annexures.
10. Commissioning spares are those spares which are required at the time of commissioning and shall be recommended (as per bidder's experience) and quoted by bidder. Commissioning spares consumed over and above the recommended commissioning spares, during commissioning shall be supplied free of cost by the vendor.
11. In case the systems are being supplied from outside India, reputed Third Party Inspection agencies like Llyods or equivalent has to be considered and the charges should be included in the offer. For those bidders who are supplying from India, such third party inspection charges need not be considered and same will be arranged by BHEL/BHEL nominated inspection agency.
12. In case the systems are being supplied from outside India, for IBR Inspection, TPIAs authorized by IBR Authorities shall be engaged by Vendor. For supplies within India, IBR inspection shall be carried out by local state CIB inspector. In both the cases, the charges should be included in bidder's offer.

13. Separate Purchase Orders will be issued for scope of work of this tender as follows:
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14. All the items included in the price bid format shall be quoted as per tender specification and pre-bid clarifications, if any. Responsibility of ensuring correctness & completeness of scope of supply as per specification requirement solely lies with bidder.
15. Unpriced price bid format along with unit rate table, indicating as "QUOTED" against each applicable item shall be submitted duly signed & stamped along with technical offer by bidder as a token of concurrence that prices are submitted in this format only. The offer shall be liable for rejection in case if un-priced price bid format is not submitted or any modification is carried out in price bid format.
- 16. Unit prices quoted by the bidder in the price bid format (unit rate table)/ finalized during price evaluation process, shall be binding on the vendor till successful execution of the order and to settle the final price of the package after taking care of the subsequent variations (if any).**
17. The percentage limitation of the variation in Price of the overall package, from the time of PO to Final Execution of the order, shall be +/- 20%, i.e., **the overall price of the Engineered Bolt-on Heating System package arrived at based on the Final Core Piping Input as per spec clause 23.7, may vary upto +/- 20% from the PO Value.** Bidder shall make a note of the same while submitting the bid.



**ANNEXURE-F TO SPEC: PY 51 735**  
**CHECKLIST FORMAT**

**ENGINEERED PRE-FABRICATED BOLT-ON HEATING SYSTEM**  
**FOR IOCL PARADIP 525 TPD STANDBY SRU**

**CHECKLIST OF DOCUMENTATION**

<b>Sl. No.</b>	<b>Description</b>	<b>Note-1</b>
1.	Enquiry Specification (Stamped & Signed)	
2.	Annexure-A: Thermal Objective Specification (Stamped & Signed)	
3.	Annexure-B: Core Piping Input (Stamped & Signed)	
4.	Annexure-C: Engineering Design Basis for Piping Design (Stamped & Signed)	
5.	Annexure-D: Environmental Design Basis (Stamped & Signed)	
6.	Annexure-E: Price Bid Format (Stamped & Signed)	
7.	Annexure-F: Checklist Format (Stamped & Signed)	
8.	Annexure-G: Format for Deviation Schedule (Stamped & Signed)	
9.	Annexure-H: Format for Pre-bid Queries (Stamped & Signed)	
10.	Annexure-I: Format for Manufacturing Quality Assurance Plan (Stamped & Signed)	
11.	Bidder qualification documentation (Detailed Annexure to qualification requirement to be submitted )	
12.	Scope of Supply (Material supply Details) including Terminal point details.	
13.	Scope of Supply (Service Related)	
14.	OEM reference authorization (For other than CSI vendor)	
15.	Proof testing data (Clause 8.3)	
16.	Engineering report summarizing the proposed thermal design and Steam parameters.	
17.	Summary of site report for LOT-1 supplies	
18.	Site Erection Personnel qualification requirement	
19.	Non-Disclosure Agreement & Confidentiality Agreement (Stamped & Signed)	
20.	Unit Rate Table	
21.	Proforma Packing List	
22.	Shortest Manufacturing Time	
23.	P & I Diagram	
24.	Required Electric power & other Utility List at site	
25.	Weight of each supply consignment/container	



26.	Spare List (Recommended)	
27.	Start-up & Commissioning Spares	
28.	Test Arrangement & Test procedure	
29.	Hoist/Crane requirement	
30.	Catalogue	
31.	Overall space and headroom requirement with details of handling during Erection, operation & maintenance.	
32.	Erection, Operation & Maintenance manual.	
33.	Procedure for shop / site performance tests.	
34.	Time schedule for delivery.	
35.	Bill of material for LOT-1&LOT-2 supplies separately.	
36.	Make of all bought out items.	
37.	Training program and schedule for BHEL/ Customer/ Consultant personnel	
38.	Maintenance schedules	

Note:

- 1. Tick to confirm the documents are submitted along with proposal.**
- 2. The Bidder shall submit all documents, drawings, diagrams and all such information, which are necessary to fully understand the offer for techno - commercial evaluation as listed herein.**
- 3. The Bidder to check and submit the signed copy of the above listed Documents for checking the completeness of their offer.**



**ANNEXURE-G TO SPEC: PY 51 735**  
**FORMAT FOR DEVIATION SCHEDULE**

**ENGINEERED PRE-FABRICATED BOLT-ON HEATING SYSTEM**  
**FOR IOCL PARADIP 525 TPD STANDBY SRU**

Sl No	Page No	Clause No	Description of Deviation

Note:

1. In case, the Bidder considers deviations essential (after exhausting all possible efforts), the same shall be In this format.
2. Any deviation, not listed under this section, even if reflected in any other portion of the proposal, shall not be considered applicable.
3. No deviation or exception shall be permitted without the written approval of the purchaser
4. Enlarge the table to incorporate items.




**ANNEXURE-H TO SPEC: PY 51 735  
FORMAT FOR PRE-BID QUERIES**


**ENGINEERED PRE-FABRICATED BOLT-ON HEATING SYSTEM  
FOR IOCL PARADIP 525 TPD STANDBY SRU**


Sl No	Page No	Clause No	Specification Requirement	Bidder Query

Note:

1. The Bidder to raise the Query In this format only.
2. No other deviation whatsoever , except for those which have been specifically agreed by purchaser as a part of pre-bid clarification shall be considered at a later stage during execution of the contract.
3. Enlarge the table to incorporate items.

TD-201 Rev No. 00 Form No.		<b>PRODUCT STANDARD</b> PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD	ANNEXURE
			Rev No. 00
			Page 1 of 3
<b>COPYRIGHT AND CONFIDENTIAL</b> 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.	<div>QAP GUIDELINES &amp; FORMAT</div> <div>(ANNEXURE )</div> <p>The QAP format and guidelines for filling up the format shall be used by vendor for preparation and submission of QAP after order placement.</p> <p><b>Note:</b></p> <ol style="list-style-type: none"><li>1. Typical /Indicative /Standard QAP(s) for equipment /package attached is reference document and to use by successful bidder in future for preparation and submission of QAP for BHEL /CUSTOMER approval.</li><li>2. No deviation to reference document is acceptable.</li></ol>		

	Form No.	 HYDERABAD	<p align="center"><b>PRODUCT STANDARD</b></p> <p align="center">PROJECT ENGINEERING &amp; SYSTEMS DIVISION HYDERABAD</p>	ANNEXURE
		Rev No. 00		
		Page 2 of 3		
<p align="center"><b>COPYRIGHT AND CONFIDENTIAL</b></p> <p align="center">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>		<p align="center"><b><u>GUIDELINES TO VENDORS FOR PREPARATION OF QUALITY ASSURANCE PLAN</u></b></p> <ol style="list-style-type: none"> <li>QAP shall be made in landscape mode on A4 size paper as per the format enclosed. Font size shall be minimum 10.</li> <li>Each page of QAP shall contain the following information.           <ol style="list-style-type: none"> <li>Vendor's name &amp; address.</li> <li>Customer: BHEL, Hyderabad.</li> <li>Project.</li> <li>BHEL Product Standard Number/revision number as referred in P.O.</li> <li>BHEL Purchase Order Number &amp; Date.</li> <li>Product as per P.O. description.</li> <li>QAP Number (unique and shall not repeat)/revision number/date.</li> <li>Page number and number of pages</li> </ol> </li> <li>QAP shall contain four parts / stages as follows.           <ol style="list-style-type: none"> <li>Raw materials and bought out items.</li> <li>In process Control / Inspection.</li> <li>Final assembly, Inspection &amp; Testing.</li> <li>Painting, preservation &amp; packing.</li> </ol> </li> <li>Under 'Component', indicate name of the component (say casing, rotor, pressure gauge, etc).</li> <li>Under 'Characteristics', indicate appropriately (say chemical analysis, mechanical properties, NDT (UT, DP etc.), hydrostatic test, calibration check etc.)</li> <li>Under 'Class', indicate minor, major or critical depending on the importance of characteristic.</li> <li>Under 'Type of check', indicate appropriately (say chemical, mechanical, UT, DP etc.)</li> <li>Under 'Quantum of check', indicate appropriately (say 100%, 10%, sample, per melt, per heat, all pieces etc.)</li> <li>Under 'Reference document' and 'Acceptance norms', appropriate National &amp; International standards, BHEL standards, approved drawing references etc. should be indicated. It is not correct to mention as "Vendor's internal standards or Vendor's standard practice etc.". If vendors' internal standards are referred, same shall be in line with BHEL Spec. indicated in the P.O. These may require review &amp; approval by our Engineering dept.</li> <li>Under 'Format of record', indicate appropriately supplier's test certificate, calibration certificate, lab report, inspection report etc.</li> </ol>		
		Ref. Doc		<ol style="list-style-type: none"> <li>Please refer 'Agency' in QAP format. Under P: Perform, W: Witness, V: Verify Indicate against each characteristic 1: (BHEL CQS/Nominated inspection agency), OR 2: (Vendor / Sub vendor)</li> </ol>

	Form No.	 HYDERABAD	<p align="center"><b>PRODUCT STANDARD</b></p> <p align="center">PROJECT ENGINEERING &amp; SYSTEMS DIVISION HYDERABAD</p>	ANNEXURE
		Rev No. 00		
		Page 3 of 3		
<p align="center"><b>COPYRIGHT AND CONFIDENTIAL</b></p> <p align="center">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>		<p>Note: Performing agency is normally vendor or his sub vendor (Legend 2). Where witness points are indicated in specification, P.O., Drawing etc., for such operations, Under Witness (W) column use 1. Under 'Verify' column, use code 1.</p> <p>12. Under 'D' please put ( <input type="checkbox"/> Tick) against each characteristic where vendor proposes to submit test certificate/report etc. OR as required as per BHEL Specification.</p> <p>13. Vendor's signature &amp; stamp should be available on each page of QAP.</p> <p>14. Vendor should read the BHEL Product Standard thoroughly and QAP should be made only inline and relevant to the Specification &amp; Approved Drawings.</p> <p>15. The following operations/characteristics/check points may be included (AS APPROPRIATE)</p> <ul style="list-style-type: none"> <li>a) Visual check</li> <li>b) Dimensional check</li> <li>c) Mechanical and Chemical properties.</li> <li>d) Surface preparation before painting (by chemical cleaning, sand blasting, shot blasting etc. as the case may be.)</li> <li>e) Painting check for shade, Dry Film Thickness (DFT), Adhesion/ peel off test etc.</li> <li>f) Check for correctness for all components mounted as per General Arrangement Drawing, Bill of Materials (BOM), etc. for range, rating, make, color, size, location as per GA, quantity, label description including tag nos., annunciator facia, loose components, accessories, spares etc.</li> <li>g) Verification of test certificate for protection class for the enclosures.</li> <li>h) Mechanical functioning of switches.</li> <li>i) Continuity of earthing and provision of earth points.</li> <li>j) Colour coding of wiring, size, tightness &amp; dressing of wiring.</li> <li>k) Review of test certificates of assembled items, raw materials, internal test reports etc.</li> <li>l) Witness of functional checks, which may include mechanical run &amp; electrical run, H.V.test, IR measurement, Electrical and Mechanical tests etc.</li> <li>m) PQR, WPS, Welder Qualification Record, welding records (fit up, DP) etc.</li> <li>n) Material identification (for punch marks of serial numbers, Heat No, Melt No, Inspector's stamp etc.)</li> <li>o) Hydraulic Pressure Test, Pneumatic Pressure Test, Liquid Penetration Examination and other Non-Destructive Tests.</li> <li>p) Tests on Galvanised items (Visual, Hammer Test, Knife Test, Thickness, Pierce Test (Copper sulphate test), Hydrogen evaluation test, Stripping test (for Mass of Zinc coating)</li> <li>q) All tests as per BHEL Product Standard &amp; approved drawings including Type tests and Routine tests on individual items and on System as a whole.</li> <li>r) Packing and Preservation.</li> </ul> <p>16. <b>QAP Format enclosed.</b></p> <p>17. <b>Typical Manufacturing QAP(s) is /are attached.</b></p>		
				Ref. Doc

VENDOR'S NAME & ADDRESS:		<b>MANUFACTURING QUALITY PLAN</b>							QP. NO.:				
		CUSTOMER: BHEL, HYDERABAD – 32.				BHEL P.O.NO.:			REV NO:		DATE:		
		PROJECT:				P.O. DATE:							
		PRODUCT:				BHEL SPEC:			REV:			PAGE 1 OF 4	
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY			REMARKS
										P	W	V	
1.0	<b>RAW MATERIALS &amp; BOUGHT OUT ITEMS</b>												
2.0	<b>INPROCESS INSPECTION</b>												
3.0	<b>FINAL INSPECTION &amp; TESTING</b>												
4.0	<b>PRESERVATION &amp; PACKING</b>												

LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE <b>1 FOR BHEL/BHEL NOMINATED TPIA &amp; 2 FOR VENDOR/SUB VENDOR</b> AS APPROPRIATE AGAINST EACH COMPONENT /CHARACTERISTIC UNDER P, W & V COLUMNS. * FOR ITEMS MARKED ✓ (TICK) IN COLUMN 'D', TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.	PREPARED BY	APPROVED BY	APPROVED BY
	VENDOR'S SIGNATURE & STAMP	BHEL QA SIGNATURE & STAMP	CUSTOMER'S SIGNATURE & STAMP

# TYPICAL MANUFACTURING QUALITY PLAN

I = INSPECT      R = REVIEW      SW = Spot Witness      W = WITNESS      H = HOLD							
	ACTIVITY	Reference Document(s)	Acceptance Criteria	VERIFY DOCUMENT	Intervention		
					CSI	Client	Comments
1	Prepare Shop Sketches	CSI Standards Customer Drwgs/Data Sheets	Per CSI	Shop Drawings	I	R	
2	Pre-Fab Inspection Meeting	Customer Specifications	N/A	Meeting notes and ITP	R	W	
3	Procedure Submittals	Customer Specifications	Applicable Code	VR Schedule	R	R	Submitted per Vendor Requirements Schedule
4	Material Verification	Material Purchase Order	ASME Sect II Part A	Mill Test Reports	R	R	
5	Weld Procedure(s)	CSI Standard WPS ASME Section IX	Article II	WPS/PQR WPAL	R	R	
6	Welder Qualification	ASME Section IX	Article III	WPQ (QW-484)	R	R	On file for review
7	Final Weld Inspection	ASME Section VIII Div 1	UW-35 UW-36	As-Built Drawings	I	R	
8	Final Dimensional Inspection	CSI Standard Details	1/4" for all linear dimensions	As-Built Drawings	I	R	
9	Pneumatic Pressure Testing	CSI-BHS-01	No Leaks Permitted	Test Document	I	R	100% testing per QC-PTP-01
10	Final Documentation	Vendor Data Requirements	N/A	Manufacturer's Data Book	R	R	Submitted per Vendor Requirements Schedule

<b>Hold</b>	An activity that requires the attendance of the Client or assigned designee before it can be preformed.
<b>Inspect</b>	An activity preformed as required by Code and/or contractual requirements
<b>Review</b>	Activity documentation to be submitted for review by the Client or assigned designee
<b>Spot Witness</b>	An activity that may proceed without witness or formal notification. Activity may be randomly witnessed by the Client or designee as long as the process is not interrupted.
<b>Witness</b>	An activity that requires formal notification and can only be preformed without attendance of the Client or designee if a waiver is provided.