




TD-201 Rev No. 00		Form No.	<div><div><div>बी एच ई एल</div><div></div><div>HYDERABAD</div></div></div>		PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD		PY 56020 REV 03 Page 1 of 9							
<div>COPYRIGHT AND CONFIDENTIAL</div> <div>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>			<div>Specification for PRESSURE GAUGE</div>											
			<div>1. SCOPE</div> <div>This technical specification covers the Design, Engineering, Manufacturing, Assembly, testing at vendor works, inspection by purchaser, packing and transportation to site with necessary documentation like data sheets, statutory approvals, O&M manuals etc., as required for Pressure gauges.</div>											
			<div>2. SCOPE of SUPPLY – As per enquiry</div>											
			<div>3. Proven Track Record</div> <div>The items being offered as per specification should be operating satisfactorily in captive power plant applications / hydrocarbon industries like Refinery, Petrochemical and gas processing plants under similar process conditions for <u>at least 4000 Hours</u>. The above criteria shall be applicable to main equipment, sub- components as well as bought out items if any.</div> <div>Vendor shall submit necessary supporting documents / past users confirmation supporting to above PTR requirements along with technical offer.</div> <div>If offered instruments / equipments are supplied to BHEL PE&SD within last 5 years, above PTR clause is not applicable.</div>											
			<div>4. INSTRUCTIONS TO BIDDERS</div> <div>4.1 Bidders are advised to contact BHEL for essential technical queries in writing within one week of issue of Enquiry. Offers with incomplete information will not be considered for evaluation, and are likely to be rejected outright without any further interaction with the Bidder.</div> <div>4.2 Any technical features [over & above BHEL enquiry specification requirements] proposed by Bidder will not be given preference for the purpose of evaluation.</div> <div>4.3 In the event of any conflict between these specifications, data sheets, related standards, codes etc. the vendor shall refer the matter to the purchaser for clarifications and only after obtaining the same shall proceed with the manufacture of the items in question.</div>											
<div>5. DESIGN VARIABLES to be provided after P.O. Placement / during drawing approval:</div> <div>Following variables to be finalized during drawing approval and vendor shall comply the same without any commercial implication:</div> <table><tr><td>a)</td><td>Calibration Ranges</td><td>:</td><td colspan="2">Shall be intimated after P.O. placement</td></tr><tr><td>b)</td><td>Tag List</td><td>:</td><td colspan="2">Shall be intimated after P.O. placement</td></tr></table>					a)	Calibration Ranges	:	Shall be intimated after P.O. placement		b)	Tag List	:	Shall be intimated after P.O. placement	
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Ref. Doc	Revision :00 Refer Record of Revisions		Prepared : (Sd/-) SUJATHA		Approved : (Sd/-) KAMAL		Date : 10.02.16							

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	Enquiry No. / Date :																																		
	Name of the Bidder :																																		
	Project Name :																																		
	Item Description :																																		
	<table><thead><tr><th>S. No</th><th>Document</th><th>Supplier confirmation (Yes/No)</th><th>Remarks</th></tr></thead><tbody><tr><td>1</td><td>Technical offer complies with the specifications in Toto and there are no technical deviations</td><td></td><td></td></tr><tr><td>2</td><td>In case of deviation, vendor to confirm that these are technically not feasible deviations and same are submitted in BHEL format. In case technically feasible deviations are proposed by the bidder and subsequently withdrawn, <u>no commercial implications can be claimed by the bidder</u></td><td></td><td></td></tr><tr><td>3</td><td>All items are manufactured confirming to latest version of material grade standard and manufacturing standard mentioned in this specifications</td><td></td><td></td></tr><tr><td>4</td><td>Material packing is confirmed as per this specification</td><td></td><td></td></tr><tr><td>5</td><td>Inspection & testing requirements are complied as per individual data sheets of this specifications</td><td></td><td></td></tr><tr><td>6</td><td>Unpriced Price schedule as per BHEL price format is submitted</td><td></td><td></td></tr><tr><td>7</td><td>For addition/reduction of quantity, unit rate quoted in the present offer shall be considered during ordering and shall be valid up to execution of the contract to the extent of ± 10% of order Value.</td><td></td><td></td></tr></tbody></table>			S. No	Document	Supplier confirmation (Yes/No)	Remarks	1	Technical offer complies with the specifications in Toto and there are no technical deviations			2	In case of deviation, vendor to confirm that these are technically not feasible deviations and same are submitted in BHEL format. In case technically feasible deviations are proposed by the bidder and subsequently withdrawn, <u>no commercial implications can be claimed by the bidder</u>			3	All items are manufactured confirming to latest version of material grade standard and manufacturing standard mentioned in this specifications			4	Material packing is confirmed as per this specification			5	Inspection & testing requirements are complied as per individual data sheets of this specifications			6	Unpriced Price schedule as per BHEL price format is submitted			7	For addition/reduction of quantity, unit rate quoted in the present offer shall be considered during ordering and shall be valid up to execution of the contract to the extent of ± 10% of order Value.		
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(Bidder's Signature and stamp with date)

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<div>COPYRIGHT AND CONFIDENTIAL</div> <div>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>				<div>7. MANDATORY SPARES - Spares requirement shall be as per enquiry.</div>			
				<div>8. DOCUMENTATION</div> <div>8.1 Information to be included with offer</div> <div>Vendor shall make the offer in detail, with respect to every item of the Purchaser’s specifications. Any offer not conforming to this shall be summarily rejected.</div> <div><div>a) Bill of materials</div><div>b) Signed and stamped copy of enquiry technical specification,</div><div>c) Proven Track record and reference list (if applicable)</div><div>d) Unpriced price schedule (To be submitted compulsorily without fail)</div><div>e) Technical catalogues.(of selected models)</div><div>f) Deviation list, if any (as per “No deviation format” given in this specification).</div></div> <div>8.2 Documentation submission within 2 weeks of placement of LOI (for approval by BHEL and / or BHEL’s customer in 4 sets)</div> <div><div>a) Bill of materials with accessories</div><div>b) Data sheets of each and every instrument.</div><div>c) Detail GA drawings</div><div>d) Type tests, statutory certificates</div><div>e) Comprehensive Quality Assurance plan (QAP).</div></div> <div>8.3 Documents to be submitted during final shop testing and before equipment dispatch. (Note: submission of these documents are commercially linked)</div> <div><div>a) Complete O& M manual – all in 16 sets (14 sets to be included with item dispatch and balance to BHEL purchase department).</div><div>b) Approved Engg documents</div><div>c) Guarantee and all test certificates for review and acceptance by BHEL and / or BHEL’s Customer</div><div>2 sets of CD-ROM – containing O&M manual and Engineering documents (1 set to be included with item dispatch and balance to BHEL purchase department).</div></div>			
				<div>9. NAME PLATE</div> <div>Each equipment shall have a 316 SS nameplate attached firmly to it at a visible place furnishing the following information:</div> <div><div>a) Instrument range & Tag number.</div><div>b) Manufacturer’s name and emblem.</div><div>c) Manufacturer’s model number.</div></div>			
				<div>10. MARKING, PACKING AND DESPATCH</div> <div>10.1 The equipment shall be transported to site by the vendor in fully assembled condition.</div> <div>10.2 However, in case some of the components are likely to be damaged during transportation, the same shall be dismantled after inspection and supplied separately duly packed, same to be reassembled at site by the vendor without any commercial implications.</div> <div>10.3 Each item shall be suitably wrapped in polythene sheets, packed in wooden crates, etc properly tagged and secured before dispatch.</div> <div>10.4 The vendor shall send each consignment to site with a detailed packing list.</div> <div>10.5 <i>In case of imported/exported items, seaworthy packing shall be done as per specification no: AA0490004 (latest revision) and the type of packing applicable for flow orifice is “CQ”. This specification shall be obtained by vendor on request.</i></div> <div>10.6 If mandatory spare items are ordered, same shall be separately packed and clearly marked on the consignment as “Mandatory spares” and dispatch to site.</div> <div>10.7 <i>If mandatory spare items are ordered, same shall be sent in pre-decided lots in containers /secure boxes distinctly marked in GREEN color with boldly written "S" mark on each face of the containers /secure boxes</i></div> <div>10.8 <i>Loose vendor items sent by vendor to sites shall be quantified/numbered/tagged and not merely mentioned as ONE lot of loose items.</i></div>			
<div>Ref. Doc</div>				<div>11. INSPECTION & TESTING</div> <div>Refer enclosed TECHNICAL DATASHEETS, Clause “TEST REPORTS/CERTIFICATION” for inspection and testing requirements.</div>			

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VARIANT TABLE-1 (Dial Size- 150mm)

Var. No	Material Code	Description	Range	Dial Size	Remarks
00	PY9756020008	Solid Front PG	0 – 100 kg/cm2(g)	150 mm	
01	PY9756020016	Solid Front PG	0 – 160 kg/cm2(g)	150 mm	
02	PY9756020024	Solid Front PG	0 – 250 kg/cm2(g)	150 mm	
03	PY9756020032	Solid Front PG	0 – 400 kg/cm2(g)	150 mm	
04	PY9756020040	Pressure Gauge	0 – 4 kg/cm2(g)	150 mm	
05	PY9756020059	Pressure Gauge	0 – 6 kg/cm2(g)	150 mm	
06	PY9756020067	Pressure Gauge	0 – 10 kg/cm2(g)	150 mm	
07	PY9756020075	Pressure Gauge	0 – 16 kg/cm2(g)	150 mm	
08	PY9756020083	Pressure Gauge	0 – 25 kg/cm2(g)	150 mm	
09	PY9756020091	Pressure Gauge	0 – 40 kg/cm2(g)	150 mm	
10	PY9756020105	Pressure Gauge	0 – 60 kg/cm2(g)	150 mm	
11	PY9756020113	Pressure Gauge	0 – 800 mmWC	150 mm	Sensor type: vendor decide
12	PY9756020121	Pressure Gauge	0 – 1200 mmWC	150 mm	Sensor type: vendor decide
13	PY9756020130	Pressure Gauge	0 – 1 kg/cm2(g)	150 mm	
14	PY9756020148	Pressure Gauge	0 – 2.5 kg/cm2(g)	150 mm	
15	PY9756020156	Pressure Gauge	0 – 1000 mmWC	150 mm	Sensor type: vendor decide
16	PY9756020164	Pressure Gauge	-1 to 1.5 kg/cm2(g)	150 mm	
17	PY9756020172	Pressure Gauge	0 – 50 mmWC	150 mm	Sensor type: vendor decide
18	PY9756020180	Pressure Gauge	0 – 600 mmWC	150 mm	Sensor type: vendor decide
19	PY9756020199	Pressure Gauge	0 – 1500 mmWC	150 mm	Sensor type: vendor decide


VARIANT TABLE-2 (Dial Size- 250mm)

Var. No	Material Code	Description	Range	Dial Size	Remarks
20	PY9756020202	Solid Front PG	0 – 60 kg/cm2(g)	250 mm	
21	PY9756020210	Solid Front PG	0 – 250 kg/cm2(g)	250 mm	

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No</th><th>Material Code</th><th>Description</th><th>Material</th><th>Certification</th><th>Remarks</th></tr><tr><td>40</td><td>PY9756020407</td><td>Syphon</td><td>A 106 Gr B</td><td>IBR</td><td>Pig Tail; 1/2" PL x NPT(M), SCH 160</td></tr><tr><td>41</td><td>PY9756020415</td><td>Syphon</td><td>SS316</td><td>IBR</td><td>Pig Tail; 1/2" PL x NPT(M), SCH 160</td></tr><tr><td>42</td><td>PY9756020423</td><td>Gauge Saver</td><td>SS316</td><td></td><td></td></tr><tr><td>43</td><td>PY9756020431</td><td>Snubber</td><td>SS316</td><td></td><td></td></tr><tr><td>44</td><td>PY9756020440</td><td>Syphon</td><td>A 335 Gr P91, 2500#</td><td>IBR</td><td>Pig Tail; 1/2" PL x NPT(M), SCH 160</td></tr><tr><td>45</td><td>PY9756020458</td><td>Syphon</td><td>A 335 Gr P22, 1500#</td><td>IBR</td><td>Pig Tail; 1/2" PL x NPT(M), SCH 160</td></tr><tr><td>46</td><td>PY9756020466</td><td>2-vlv Manifold</td><td>SS 316</td><td></td><td>Pressure Class: 6000 psi</td></tr><tr><td>47</td><td>PY9756020474</td><td>2-vlv Manifold</td><td>SS 316</td><td></td><td>Pressure Class: 3000 psi</td></tr><tr><td>48</td><td></td><td>2-vlv Manifold</td><td>SS 316</td><td></td><td>Pressure Class: 9000 psi</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> <div>VARIANT TABLE-5 (Dial Size- 150mm)</div> <table><tr><th>Var. 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41	PY9756020415	Syphon	SS316	IBR	Pig Tail; 1/2" PL x NPT(M), SCH 160																																																																																																																																																																																																																		
42	PY9756020423	Gauge Saver	SS316																																																																																																																																																																																																																				
43	PY9756020431	Snubber	SS316																																																																																																																																																																																																																				
44	PY9756020440	Syphon	A 335 Gr P91, 2500#	IBR	Pig Tail; 1/2" PL x NPT(M), SCH 160																																																																																																																																																																																																																		
45	PY9756020458	Syphon	A 335 Gr P22, 1500#	IBR	Pig Tail; 1/2" PL x NPT(M), SCH 160																																																																																																																																																																																																																		
46	PY9756020466	2-vlv Manifold	SS 316		Pressure Class: 6000 psi																																																																																																																																																																																																																		
47	PY9756020474	2-vlv Manifold	SS 316		Pressure Class: 3000 psi																																																																																																																																																																																																																		
48		2-vlv Manifold	SS 316		Pressure Class: 9000 psi																																																																																																																																																																																																																		
Var. No	Material Code	Description	Range	Dial Size	Remarks																																																																																																																																																																																																																		
80	PY9756020806	Oil filled PG	0 – 2.5 kg/cm2(g)	150 mm																																																																																																																																																																																																																			
81	PY9756020814	Oil filled PG	0 – 4 kg/cm2(g)	150 mm																																																																																																																																																																																																																			
82	PY9756020822	Oil filled PG	0 – 6 kg/cm2(g)	150 mm																																																																																																																																																																																																																			
83	PY9756020830	Oil filled PG	0 – 10 kg/cm2(g)	150 mm																																																																																																																																																																																																																			
84	PY9756020849	Oil filled PG	0 – 16 kg/cm2(g)	150 mm																																																																																																																																																																																																																			
85		Oil filled PG	0 – 25 kg/cm2(g)	150 mm																																																																																																																																																																																																																			
86	PY9756020865	Oil filled PG	0 – 40 kg/cm2(g)	150 mm																																																																																																																																																																																																																			
87		Oil filled PG	0 – 60 kg/cm2(g)	150 mm	Solid front type																																																																																																																																																																																																																		
88		Oil filled PG	0 – 160 kg/cm2(g)	150 mm	Solid front type																																																																																																																																																																																																																		
89	PY9756020890	Oil filled PG	0 – 250 kg/cm2(g)	150 mm	Solid front type																																																																																																																																																																																																																		
Ref. Doc																																																																																																																																																																																																																							

<div>Form No.</div> <div>  </div> <div>HYDERABAD</div>	<div>PRODUCT STANDARD</div> <div>PROJECT ENGINEERING & SYSTEMS DIVISION</div> <div>HYDERABAD</div>		<div>PY 56020</div> <div>REV. 03</div> <div>Page 6 of 9</div>																														
	<div>DEVIATION FORMAT</div> <div> <div>Enquiry No.:</div> <div>Item:</div> <div>Name of Bidder:</div> <div>Offer Ref. No.:</div> </div> <table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Clause no. & Spec. no.</th> <th>Description as per Specification</th> <th>Deviation taken</th> <th>Nature of Deviation</th> <th>Remarks</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table> <div> <div>NOTES:</div> <ol style="list-style-type: none"> Technical offer of the bidder will be evaluated only on the basis of Deviation Schedule. Deviation Schedule constitutes this sheet (with these Notes) duly signed and stamped. Deviations, if any, shall be clearly brought out only in this format. Deviations mentioned / taken elsewhere or in any other format will be ignored. Additional sheets in the same format can be attached by the vendor, if necessary. Nature of Deviations shall only be of Design / Manufacturing constraints and non-availability of items / components / makes in market. No price implications shall be entertained for deviations withdrawn during the technical scrutiny. If any deviations are accepted by BHEL during technical scrutiny then also there will be no price implication. Hence, in no case there will be consideration of Price implications. Reasons for the deviations shall be specified in the Remarks column. If there are no deviations from the specifications, bidder still has to submit the signed copy of this format by writing "NO Deviations" on this format. If the "Deviation Schedule" is not submitted along with the offer, the bidder's offer is likely to be rejected without any further interaction with the bidder. Only the accepted deviations in conjunction with the original tender shall constitute the contract document for the award of job to the bidder <div> <div> <div>SIGNATURE OF THE BIDDER_____</div> <div>NAME_____</div> <div>DESIGNATION_____</div> <div>DATE_____</div> </div> <div>COMPANY SEAL</div> </div> </div>			Sl. No.	Clause no. & Spec. no.	Description as per Specification	Deviation taken	Nature of Deviation	Remarks																								
	Sl. No.	Clause no. & Spec. no.	Description as per Specification	Deviation taken	Nature of Deviation	Remarks																											
<div>Ref. Doc</div>																																	

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ESP-001-2A Rev.00		PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD		Std. / Doc. Number	
				PY 56020	
				Rev. No.	03
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Pressure Gauge (PG) & PG-Oil filled Technical Data Sheet						
GENERAL	1	Range & Qty.	As per enquiry and Material code			
	2	Type	Surface mount /Local Gauge			
	3	Ambient Temp Limit	0 to 65°C			
	4					
GAUGE	5	Sensor Type	Bourdon Tube			
	6	Dial Size	250MM & 150MM as per enquiry (Material code)			
	7	Accuracy	±1% of URV			
	8	Process Connection	1/2" NPT (M), Bottom entry.			
	9	Blow out Disc	Required.			
	10	Solid Front Case	Required for ranges > 60Kg/Cm2.			
	11	Over Range Protection	> 130% of full scale.			
	12	Protection	IP 65 or better			
	13	Zero & Span adjustment	External Required.			
	14	Anti-corrosive Dial	Non-Rusting Plastic, White with black figure & shall confirm to IS-3624			
	15	Micro meter Adjustment	Required for pointers.			
	16	Scale type	Concentric, Graduated units(Graduations in black on white dial)			
	17	Pointer-270° Deflection	Yes, Metal with Black Finish			
	18	Pointer Stop	Required at both end			
	19	Bezel ring	Bayonet Lock Type			
	20	Movement	Geared / Cam-roller type			
	21	Oil filled	As per enquiry and Material code			
	22					
	23					
	MATERIAL	24	Case Material	SS304		
		25	Element Material	SS316		
		26	Window Glass	Shatter Proof, toughened glass		
		27	Pointer	Alluminium.		
28		Blow out Disc	Neoprane			
29		Tag Plate	Reqd, SS 304			
30		Bezel ring	SS 304			
31		Movement	SS 316			
32		Socket Material	SS 304			
33						
ACCESSORIES	34	Syphon	As per enquiry (Not applicable)			
	35					
	36	Tag Plate	Required, 1 No per Gauge, SS304			
	37	2 way manifold	Required, 1 No per Gauge, SS316			
TEST REPORT/CERTIFICATE	38	Bill of Material (model, dim., Tag no's)	100% Witness			
	39	Spares (BOM, part no's)	100% Witness (if ordered)			
	40	Material compliance certificate	100% Review			
	41	Calibration	10% witness or min. 2 of each range			
	42	Over Protection Test	10% witness or min. 2 of each range			
	43	Accuracy Test	10% witness or min. 2 of each range			
	44	Vibration test	100% Review			
	45	Ingress Protection Test	100% Review			
	46	PMI Test (for SS & AS Materials)	100% Review			

NOTES::

- Tag list shall be furnished by BHEL after P.O. palcement
- Vendor shall submit the consolidated BOM sheet along with accessories of instruments, finalised make /models of instruments, etc for approval.

GA drawings shall be submitted for approval (if applicable)

REMARKs:

- The elastic element material shall be as follows:
 - For range ≤ 60 Kg/cm2 - AISI-316 seamless drawn stainless steel tube, argon arc welded at AISI-316 forged or wrought stain less steel tube anchorage and tube end piece.
 - For range > 60 Kg/cm2 - AISI-316 bored stainless steel.

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			Sheet	8 of 9

Remote seal - Pressure Gauge (PGD) Technical Data Sheet


GENERAL	1	Range & Qty.	As per enquiry and Material code	MATERIAL	26	Case Material	SS304
	2	Type / Std	Diaphragm Sealed / IS3624		27	Element Material	SS316
	3	Ambient Temp Limit	0 to 65°C		28	Window Glass	Shatter Proof.
	4				29	Pointer	Alluminium.
GAUGE	5	Sensing Element	Diaphragm, SS 316		30	Blow out Disc	SS 304
	6	Dial Size	150MM (6")		31	Tag Plate	Reqd, SS 304
	7	Accuracy	±1% of full scale deflection		32	Bezel ring	SS 304
	8	Process Connection	As per enquiry and Material code		33	Movement	SS 304
	9	Instrument connection	1/2" NPT(M)		34	Socket Material	SS 304
	10	Blow out Disc	Required.		35	Flange	SS 316
	11	Over Range Protection	> 130% of full scale.	ACCESSORIES	36	Tag Plate	Required, 1 No per Gauge, SS304
	12	Protection	IP 65		37	Spacer Ring	Required, SS
	13	Zero & Span adjustment	External Required.		38	Vent+Drain plugs	Required, SS, In built to Spacer
	14	Anti-corrossive Dial	Non-Rusting Plastic, White with black figure & shall confirm to IS-3624		39	Armoured Capillary	Reqd. 3 Mts, SS316L with PVC Coat
	15	Micro meter Adjustment	Required for pointers.		40	Stud Nuts+Bolts	Reqd. A194Gr2H+A193GrB7 (Min 120mm long)
	16	Scale type	Concentric, Graduated units	TEST REPORT/CERTIFICATE	41	Gasket	Reqd. Spiral Wound, SS
	17	Pointer-270 ^o Deflection	Yes,Metal with Black Finish		42	Bill of Material (model, dim., Tag no's)	100% Witness
	18	Pointer Stop	Required at both end		43	Spares (BOM, part no's)	100% Witness (if ordered)
	19	Bezel ring	Bayonet Lock Type		44	Material compliance certificate	100% Review
	20	Movement	Geared / Cam-roller type		45	Calibration	10% witness or min. 2 of each range
	21	Fill fluid	Silicon		46	Over Protection Test for 30 min.	10% witness or min. 2 of each range
	22				47	Accuracy Test	10% witness or min. 2 of each range
	23				48	Vibration test	100% Review
	24				49	Ingress Protection Test	100% Review
	25				50	PMI Test (for SS & AS Materials)	100% Review


NOTES::

- 1 This data sheet shall be used for inspection along with BOM sheet and Tag List. No further approval is required after P.O. placement
- 2 Tag list shall be furnished by BHEL after P.O. palcement
- 3 Vendor shall submit the consolidated BOM sheet along with accessories of instruments, finalised make /models of instruments, etc for approval.
- 4 Vendor shall not submit any data sheet for approval after P.O. placement.
- 5 GA drawings shall be submitted for approval (if applicable)
- 6 The dial of all gauges shall have yellow, green and red bands to indicate respectively, the lower, middle and upper one-thirds of the calibrated range. This requirement shall be revisited during detailed engineering.


REMARKS:


- (1) The elastic element material shall be as follows:
 - (a) For range ≤ 60 Kg/cm2 - AISI-316 seamless drawn stainless steel tube, argon arc welded at AISI-316 forged or wrought stain less steel tube anchorage and tube end piece.
 - (b) For range > 60 Kg/cm2 - AISI-316 bored stainless steel.

TD-106-3 Rev No. 5 Form No.	 HYDERABAD	PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD				PY 56020
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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.	RECORD OF REVISIONS					
	Rev. No.	Date	Revision Details	Revised By	Approved By	
	00	10.02.2016	Original issue	-----	Kamal (Sd/-)	
	01	30.7.2018	Variants added (other than 00, 01, 02, 03)	Sunil Gautam (Sd/-)	Kamal (Sd/-)	
	02	25.03.2019	Variants 17-19, 39, 60-61, 46-48 and table-5 are added.	Sujatha (Sd/-)	Kamal (Sd/-)	
	03	04.09.2021	Sl.No.11 Inspection and testing clause added.	T.Subrahmanyam <i>T. Subrahmanyam</i>	K.Anandbabu <i>K. Anand Babu</i>	
	Ref. Doc.					

	Bill of Material Cum Price Bid format [for Main Supply + Mandatory Spares]	Annexure - [A] of PY56020 Rev.03
	Pressure Gauge-Framework	
	<div> <div>BHEL ENQUIRY NO :</div> <div>Vendor Offer ref no:</div> </div> <div> <div>Ref. date:</div> <div>Ref. date:</div> </div> <div>NOTES ::</div>	
A	This document details the price schedule format for the enquiry. No other format will be entertained. Applicable taxes and duties shall be indicated separately in commercial offer.	
B	Duly signed & stamped un-priced price schedule format shall be submitted by vendor in the technical offer as a token of concurrence that price schedule would be submitted in this format. Any tampering / modification / additions, etc. are NOT allowed and not considered binding and is liable for rejection of the offer.	
C	Bidders shall be evaluated on overall L1 basis.	
D	For addition/reduction of quantity, unit rate quoted in the present offer shall be considered during order execution and shall be valid up to execution of the contract to the extent of + 30%, - 50% of overall order Value. These would include the cost up to engineering, installation of the item, wiring up in the panel and seamless integration with main system at works/site without any cost implications. All accessories as required for this purpose also shall be included in the Price Quoted	
E	Components/Items for addition/deletion, spares shall be identical to the main equipment.	
F	Billing will be as per BOM of actual supplied main equipment (including accessories) & spares.	
G	Unit Rates of the individual package items shall be derived by multiplying the "Unit Price Fixing Factor" with the Lumpsum Price quoted. Unit Rates of the Individual items thus arrived, shall be binding on the bidder, in case of any repeat order/Ammendment of order as per BHEL policies. Observations / Objections, if any, of the Bidder, to the "Unit Price Fixing Factor" shall be brought to the notice of BHEL, during Pre-Bid Stage. No Observations / Objections shall be entertained after the Techno-Commercial Bid is opened.	
H	Bidder to indicate "Quoted" in the column "Bidder's Confirmation" as a confirmation of their bid to the respective item.	
I	The Bid Evaluation is on Overall L1 Basis. Each and Every item of the Package shall be quoted by the bidder. Partial offers will not be considered for evaluation and the same are liable for rejection.	

<div><div>भारतीय</div><div>BHEL</div></div>		Price Bid format [for Main Supply + Mandatory Spares]				Annexure - [A] of PY56020 R03		
		Pressure Gauge-Framework						
S. No	Material Code	Item Description	Quantity [I]	Unit	Unit Rate (Rs.) [II]	TOTAL PRICE (Rs.) [I*II]	REMARKS	
[A]	MAIN SUPPLY							
1	PY9756020083	PG 0 - 25 KG/CM2(G)	76	No's				
MAIN SUPPLY Total prices (Sub-total of [A]) (Rs.) ::								
[B]	MANDATORY SPARE							
1	PY9756020083	PG 0 - 25 KG/CM2(G)	5	No's				
MANDATORY SPARES SUPPLY Total prices (Sub-total of [A]) (Rs.) ::								
Total prices for overall L1 evaluation ([A]+[B]) (Rs.) ::								

			[A] PRESSURE SWITCH-MAIN SUPPLY	Annexure - [A] of PY56020 R03
			PROJECT WISE BREAKUP	
			FRAMEWORK	
			A	
	Material Code →		PY9756020083	
	Item Description →		PG 0 - 25 KG/CM2(G)	Project Specific Requirement↓
Sl. No.	PROJECT NAME ↓	Unit		
1	NTPC TAlcher TPS (2x660 MW)	Nos	37	
2	Panchet HEP	Nos	12	
3	Kodayar HEP	Nos	4	
4	R&M Chilla	Nos	8	
5	Rahughat	Nos	2	
6	Arun-III 4x225mw	Nos	2	
7	Shapurkandi Ph 1 & 2	Nos	8	
8	Pipalkoti	Nos	2	
9	Rammam	Nos	1	
	Total Quantity	Nos	76	

	[A] PRESSURE SWITCH-MANDATORY SPARES SUPPLY			Annexure - [A] of PY56020 R03
			PROJECT WISE BREAKUP	
			FRAMEWORK	
			A	
	Material Code →		PY9756020083	
	Item Description →		PG 0 - 25 KG/CM2(G)	Project Specific Requirement ↓
Sl. No.	PROJECT NAME ↓	Unit		
1	R&M Chilla	Nos	2	
2	Arun-III 4x225mw	Nos	1	
3	Pipalkoti	Nos	1	
4	Rammam	Nos	1	
	Total Quantity	Nos	5	



भारत हेवी इलेक्ट्रिकल्स लिमिटेड

(भारत सरकार का उपक्रम)

BHARAT HEAVY ELECTRICALS LIMITED

(A Govt. of India Undertaking)


Bidder shall comply the following points.

1.0	Technical Pre-qualification Criteria
a	The bidder should have Designed, Tested & Supplied Pressure Gauges within the period not exceeding Five (5) years reckoned from bid submission date in any one of the captive power plant applications / hydrocarbon industries like Refinery, Petrochemical and gas processing plants under similar process conditions.
b	The bidder should have executed at least Two (2) jobs in last 7 years for establishment of business continuity.

2.0	Following Documents / Information to be submitted in support of Technical Pre-Qualification Criteria above
a	Bidder shall provide the following documents in support of s.no. 1.0 (a) above (1) Purchase Order details (2) Invoice/End user Approved drawings / documents which indicates Make, model, application, etc (OR) any other document which provides the above details
b	Bidder shall provide the following documents in support of s.no. 1.0 (b) above (1) Purchase Order details (2) LR copies / invoices

		STANDARD MANUFACTURING QUALITY PLAN							MQP. NO.: PESD/QA/CP/0006					
		PROJECT ENGINEERING & SYSTEMS DIVISION BHEL, RC PURAM, HYD-502032				PRODUCT: PRESSURE GAUGE			REV NO: 00		DATE: 01/09/2013			
									PAGE 1 OF 2					
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	RAW MATERIALS & BOUGHT OUT ITEMS													
1.1	PRESSURE GAUGE	MATERIAL OF CONSTRUCTION	MAJOR	MATERIAL CONFIRMITY	100%	Approved Datasheet/ Approved Drawing/ Tech. spec.	Approved Datasheet/ Approved Drawing/ Tech. spec.	MATERIAL COMPLIANCE CERTIFICATE	√	2	--	1		
2.0	FINAL INSPECTION & TESTING													
	PRESSURE GAUGE	VISUAL & MARKING CHECK	MAJOR	VISUAL	100%	Approved Datasheet/ Approved Drawing/ Tech. spec.	Approved Datasheet/ Approved Drawing/ Tech. spec.	INSPECTION REPORT	√	2	1	--		
		CALIBRATION	MAJOR	REVIEW	100%	Approved Datasheet/ Approved Drawing/ Tech. spec.	Approved Datasheet/ Approved Drawing/ Tech. spec.	CALIBRATION TEST CERTIFICATE	√	2	--	1		
		HYDRO TEST	MAJOR	REVIEW	10%	Approved Datasheet/ Approved Drawing/ Tech. spec.	Approved Datasheet/ Approved Drawing/ Tech. spec.	CALIBRATION TEST CERTIFICATE	√	2	1	--		
		WEATHER-PROOFNESS	MAJOR	TYPE TEST	--	Approved Datasheet/ Approved Drawing/ Tech. spec.	Approved Datasheet/ Approved Drawing/ Tech. spec.	IP CERTIFICATE	√	2	--	1		
		GUARANTEE PERFORMANCE	MAJOR	REVIEW	100%	Approved Datasheet/ Approved Drawing/ Tech. spec.	Approved Datasheet/ Approved Drawing/ Tech. spec.	GUARANTEE CERTIFICATE	√	2	--	1		
3.0	PRESERVATION & PACKING													


LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL / BHEL NOMINATED INSPECTION AGENCY/END USER/END USER'S REPRESENTATIVE & 2 FOR VENDOR/SUB VENDOR 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
	SIGNATURE & STAMP	BHEL QA SIGNATURE & STAMP	CUSTOMER'S SIGNATURE & STAMP (IF APPLICABLE)

		STANDARD MANUFACTURING QUALITY PLAN							MQP. NO.: PESD/QA/CP/0006				
									REV NO: 00		DATE: 01/09/2013		
		PROJECT ENGINEERING & SYSTEMS DIVISION BHEL, RC PURAM, HYD-502032					PRODUCT: PRESSURE GAUGE			PAGE 2 OF 2			
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY			REMARKS
										P	W	V	
	COMPLETE ASSEMBLY	PACKING & PRESERVATION	MAJOR	PACKING	100%	Approved Datasheet/ Approved Drawing/ Tech. spec.	Approved Datasheet/ Approved Drawing/ Tech. spec.	PACKING LIST	√	2	--	1	

Notes: -

1. This Standard MQP should be read along with specification (latest revision as per PO), approved drawings & approved datasheet, approved BOM (as applicable).
2. Approved drawing/datasheet & specification shall prevail over quality plan in case contradiction if any.
3. Any other tests/ checks indicated in specification, P.O., or drawing/data sheet & any additional checks envisaged by BHEL/Customer as part of correspondence to ensure workmanship, finish, aesthetics, etc. shall also be conducted and witnessed/verified by BHEL /TPIA /Customer as per project requirement.
4. All documents issued by statutory authorities such as CCOE, CMRI, ATEX etc., shall be submitted during inspection.
5. Only type test certificate of same design and same Material of Construction of equipment to be submitted, wherever required.
6. All the relevant test reports /certificates shall be submitted during inspection. The reviewed and certified documents by BHEL/TPIA/Customer shall be submitted to BHEL as documentation package.
7. All sub-ordered items, bought out items, electrical & instrumentation Items shall be procured from approved / agreed vendor list with BHEL/BHEL's Customer.

LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL / BHEL NOMINATED INSPECTION AGENCY/END USER/END USER'S REPRESENTATIVE & 2 FOR VENDOR/SUB VENDOR 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
	SIGNATURE & STAMP	BHEL QA SIGNATURE & STAMP	CUSTOMER'S SIGNATURE & STAMP (IF APPLICABLE)

TD-201	Rev No. 00	Form No.	<div data-bbox="248 152 381 259">  </div> <div data-bbox="517 152 1197 293"> <p align="center">PRODUCT STANDARD</p> <p align="center">PROJECT ENGINEERING & SYSTEMS DIVISION</p> <p align="center">HYDERABAD</p> </div>	<div data-bbox="1323 98 1493 129">ANNEXURE-</div> <div data-bbox="1323 255 1442 286">Page of</div>
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QUALITY ASSURANCE REQUIREMENTS


The vendor shall prepare & submit Quality Assurance Plan (QAP) for respective package /equipment in customer QAP format.


A customer standard QAP/typical QAP in customer format /BHEL format attached for respective equipment /package is a reference document for the vendor for future use by vendor for preparation and submission of QAP in customer format. **Hence, no deviation to such document is acceptable.**

Any, additional type or special tests or routine tests or acceptance test if found necessary to establish the intended quality after detailed engineering then the same shall have to be incorporated in the QAP without any commercial implication.


Customer QAP format is enclosed along with this document.

Note : Vendor shall submit QAP with in 07 days from PO receipt date.

TD-201 Rev No. 00 Form No.		<p style="text-align: center;">PRODUCT STANDARD</p> <p style="text-align: center;">PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD</p>	ANNEXURE Rev No. 00 Page 1 of 3
<p style="text-align: center;">COPYRIGHT AND CONFIDENTIAL</p> <p style="text-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 style="text-align: center;">QAP GUIDELINES & FORMAT</p> <p style="text-align: center;">(ANNEXURE)</p> <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>Note :</p> <ol style="list-style-type: none"> 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. 2. No deviation to reference document is acceptable. 	

Form No.	 HYDERABAD	<p align="center">PRODUCT STANDARD</p> <p align="center">PROJECT ENGINEERING & SYSTEMS DIVISION</p> <p align="center">HYDERABAD</p>	ANNEXURE
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<p align="center">COPYRIGHT AND CONFIDENTIAL</p> <p>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"><u>GUIDELINES TO VENDORS FOR PREPARATION OF QUALITY ASSURANCE PLAN</u></p> <ol style="list-style-type: none"> QAP shall be made in landscape mode on A4 size paper as per the format enclosed. Font size shall be minimum 10. Each page of QAP shall contain the following information. <ol style="list-style-type: none"> Vendor's name & address. Customer: BHEL, Hyderabad. Project. BHEL Product Standard Number/revision number as referred in P.O. BHEL Purchase Order Number & Date. Product as per P.O. description. QAP Number (unique and shall not repeat)/revision number/date. Page number and number of pages QAP shall contain four parts / stages as follows. <ol style="list-style-type: none"> Raw materials and bought out items. In process Control / Inspection. Final assembly, Inspection & Testing. Painting, preservation & packing. Under 'Component', indicate name of the component (say casing, rotor, pressure gauge, etc). Under 'Characteristics', indicate appropriately (say chemical analysis, mechanical properties, NDT (UT,DP etc.), hydrostatic test, calibration check etc.) Under 'Class', indicate minor, major or critical depending on the importance of characteristic. Under 'Type of check', indicate appropriately (say chemical, mechanical, UT, DP etc.) Under 'Quantum of check', indicate appropriately (say 100%, 10%, sample, per melt, per heat, all pieces etc.) Under 'Reference document' and 'Acceptance norms', appropriate National & 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 & approval by our Engineering dept. Under 'Format of record', indicate appropriately supplier's test certificate, calibration certificate, lab report, inspection report etc.
	<p>11. 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)</p>

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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>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 code1.</p> <p>12. Under 'D' please put (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 & 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 & Approved Drawings.</p> <p>15.The following operations/characteristics/check points may be included (AS APPROPRIATE)</p> <ul style="list-style-type: none"> a) Visual check b) Dimensional check c) Mechanical and Chemical properties. d) Surface preparation before painting (by chemical cleaning, sand blasting, shot blasting etc. as the case may be.) e) Painting check for shade, Dry Film Thickness (DFT), Adhesion/ peel off test etc. 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. g) Verification of test certificate for protection class for the enclosures. h) Mechanical functioning of switches. i) Continuity of earthing and provision of earth points. j) Colour coding of wiring, size, tightness & dressing of wiring. k) Review of test certificates of assembled items, raw materials, internal test reports etc. l) Witness of functional checks, which may include mechanical run & electrical run, H.V.test, IR measurement, Electrical and Mechanical tests etc. m) PQR, WPS, Welder Qualification Record, welding records (fit up, DP) etc. n) Material identification (for punch marks of serial numbers, Heat No, Melt No, Inspector's stamp etc.) o) Hydraulic Pressure Test, Pneumatic Pressure Test, Liquid Penetration Examination and other Non Destructive Tests. 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) q) All tests as per BHEL Product Standard & approved drawings including Type tests and Routine tests on individual items and on System as a whole. r) Packing and Preservation. <p>16. QAP Format enclosed.</p> <p>17. Typical Manufacturing QAP is attached.</p>	
		Ref. Doc	

VENDOR'S NAME & ADDRESS:		MANUFACTURING QUALITY PLAN							QP. NO.:				
		CUSTOMER: BHEL, HYDERABAD – 32.				BHEL P.O.NO.:			REV NO:		DATE:		
		PROJECT:				P.O.DATE:			PAGE 1 OF 1				
PRODUCT:		BHEL SPEC:				REV:							
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	RAW MATERIALS & BOUGHT OUT ITEMS												
2.0	INPROCESS INSPECTION												
3.0	FINAL INSPECTION & TESTING												
4.0	PRESERVATION & PACKING												

VENDOR TO NOTE: THIS FORMAT IS IN MICROSOFT WORD. HEADER & FOOTER SHALL BE AVAILABLE IN EACH PAGE OF QP. QP SHALL BE IN LANDSCAPE & A4 SIZE ONLY. FONT SIZE SHALL BE MIN 10. VENDOR SHALL SIGN & STAMP IN EACH PAGE OF QP. LOI REF. & DATE ARE NOT ACCEPTABLE. P.O.NO. & DATE SHALL BE INDICATED. QP NO. SHOULD BE UNIQUE AND SHALL NOT REPEAT. ALL THE TESTS / CHECKS INDICATED IN THE BHEL SPEC. SHALL BE INDICATED IN THE QP.

LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL CQS (OR BHEL NOMINATED INSPECTION AGENCY) & 2 FOR VENDOR/SUB VENDOR 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

**PROJECT ENGINEERING & SYSTEMS DIVISION****RC PURAM, HYDERABAD.****QUALITY & BUSINESS EXCELLENCE****INSPECTION / TC REVIEW FORMAT**

1	Vendor's Name:		5	Applicable BHEL Spec No:	
2	Project:		6	Approved Drawing No:	
3	PO No:		7	Approved Data Sheet No:	
4	Item Description:		8	Approved QAP No:	

OFFER LIST

S.No	BBU/ PO Sr. No.	Item Description	Total Qty as per PO/BBU	Qty. already accepted	Qty offered for TC review	Cumulative Qty	Balance Qty
A							
B							
C							
D							

TC REVIEW REQUISITION

BBU / PO Sr. No.	QAP Clause No.	Format of Record	Certificate No. & Date	Page No.	REMARKS
A. Item Description:					
B. Item Description:					
C. Item Description:					
D. Item Description:					
E. Item Description:					

SUPPLIER / VENDOR SIGNATURE WITH SEAL**BHEL/ BHEL's TPIA SIGNATURE WITH SEAL****Dt:****Dt:**



BHARAT HEAVY ELECTRICALS LIMITED
RAMACHANDRAPURAM:: HYDERABAD – 502032
PROJECT ENGINEERING & SYSTEMS DIVISION
QUALITY & BUSINESS EXCELLANCE DEPARTMENT
Format for inspection call

Ref: BHEL/PESD/QA/11

Dt: 28.07.2020

Due to unavailability of all BHEL/Customer, approved documents TPIAs visits are being wasted .To avoid this it is mandatory that vendor should arrange all the approved reference documents and then only raise the inspection call in portal. Vendor has to fill the below details and upload this documents in portal while raising the inspection call.

Sr.No	Approved Documents	Approved Documents date
	Approved QAP No with revision	
	Approved Drawing No with revision	
	Approved Data Sheet No with revision	
	Purchase specification	
	Purchase Order/BBU	

Note: While raising inspection call vendor has to take care of below points.

1. **Purchasing Unit:** Purchasing Unit should be PE & SD.
2. **Joint Inspection:** Joint inspection means that BHEL and BHEL client both are jointly attending the inspection.
3. **CQ Center:** CQ center is a TPIA nearest region, suppose inspection is in Mumbai than CQ center will be either of TUV Mumbai or BVI Mumbai.

Vendor Signature

