




TD-201 Rev No. 00	Form No.		PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD	ANNEXURE Rev No. 00 Page 1 of 3
<div><div><div>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.</div></div><div><div><div><h2>QAP GUIDELINES & FORMAT</h2><h1>(ANNEXURE-19)</h1><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.</div></div></div></div>				

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<p style="text-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. Please refer 'Agency' in QAP format. Under P: Perform, W: Witness, V: Verify Indicate against each characteristic 1: (BHEL CQS/Nominated inspection agency), OR 			
Ref. Doc			

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<p align="center">COPYRIGHT AND CONFIDENTIAL</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>2: (Vendor / Sub vendor)</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 & 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(s) is /are attached.</p>		
				Ref. Doc

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

LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL/BHEL NOMINATED TPIA & 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

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				P.O. DATE:		REV:							
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1.0 RAW MATERIALS & BOUGHT OUT ITEMS													
1.1	Steels, Structures	Chemical & Mechanical Properties	Major	Chem., Mech. Analysis	One per Lot/Batch /Heat	BHEL Specification/ Approved Datasheet/ Approved Drawing		OEM certificates	✓	2	2	1, 3	
1.2	Pipes	Chemical & Mechanical Properties	Major	Chem., Mech. Analysis	One per Lot/Batch /Heat			OEM certificates	✓	2	2	1, 3	
1.21		Hydro Test	Major	Hydro Test	100%				✓	2	2	1, 3	
1.3	Pipe Fittings	Chemical & Mechanical Properties	Major	Chem., Mech. Analysis	One per Lot/Batch /Heat			OEM certificates	✓	2	2	1, 3	
1.31		NDE #	Major	MPI/LPT	20%				✓	2	2	1, 3	# Refer Note:1
1.4	Flanges	Chemical & Mechanical Properties	Major	Chem., Mech. Analysis	One per Lot/Batch /Heat			OEM certificates	✓	2	2	1, 3	
1.41		Rating, Type etc.	Major	Visual	100%				✓	2	2	1, 3	
1.5	Plates and Dish ends	Chemical & Mechanical Properties	Major	Chem., Mech. Analysis	One per Lot/Batch /Heat			OEM certificates	✓	2	2	1, 3	
1.51		UT if thickness >=16mm, Heat treatment for cold formed dish ends	Major	UT and HT as required	100%			IR/ OEM certificates	✓	2	2	1, 3	
1.6	Valves	Chemical & Mechanical Properties	Major	Chem., Mech. Analysis	One per Lot/Batch /Heat			OEM certificates	✓	2	2	1, 3	

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				P.O. DATE:							P		W		V	
				BHEL SPEC:							D					
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1.61		NDE, Hydro Test, Fire Safe certificate, etc. #	Major	Hydro, NDE	As per BHEL Spec/ Datasheet		BHEL Specification/ Approved Datasheet/ Approved Drawing	✓	2	2	1, 3	# as applicable				
1.7		Chemical & Mechanical Properties	Major	Chem., Mech. Analysis	One per Lot/Batch /Heat			✓	2	2	1, 3					
1.71	Control Valves	Seat Leakage test, Hydro test, Cv test, Actuator pneumatic test, Functional test, Completeness#	Major	TC Review	100%			✓	2	2	1, 3	# as applicable				
1.8	Safety Relief Valve	Chemical & Mechanical Properties	Major	Chem., Mech. Analysis	One per Lot/Batch /Heat			✓	2	2	1, 3					
1.81		Hydro Test, Set Pressure Test	Major	Testing	100%			✓	2	2	1, 3					
1.9		Chemical & Mechanical Properties, Calibration	Major	Chem., Mech. Analysis	One per Lot/Batch /Heat, 100%			✓	2	2	1, 3					
1.91	Instruments	Hydro test(as applicable), Type Test(Weather Proof & Hazardous area certification etc.)#	Major	Hydro, Type Test	100%			✓	2	2	1, 3	# as applicable				
1.10	Junction Box	Chemical & Mechanical Properties	Major	Chem., Mech. Analysis	One per Lot/Batch /Heat			✓	2	2	1, 3					

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SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	*	D	P	W	V	REMARKS		
1.10.1		Type Tests (Weather Proof & Hazardous area certification etc.)	Major	Type Test	100%	BHEL Specification/ Approved Datasheet/ Approved Drawing			✓	2	2	2	1, 3			
1.11	Strainer	Chemical & Mechanical Properties, Rating, Hydro Test	Major	Chem., Mech. Analysis, Hydro test	One per Lot/Batch /Heat, 100%			OEM certificates	✓	2	2	2	1, 3			
1.12	Filter Elements	Chemical & Mechanical Properties, Degree of filtration	Major	Chem., Mech. Analysis, Testing	One per Lot/Batch /Heat			OEM certificates	✓	2	2	2	1, 3			
1.13	Cable & Cable Gland	Chemical & Mechanical Properties, Routine test, Type test	Major	Chem., Mech. Analysis	One per Lot/Batch /Heat			OEM certificates/ Statutory Approvals	✓	2	2	2	1, 3			
1.14	Local Gauge Board	Chemical Analysis, Routine tests, Weather proof protection	Major	Chem. Analysis, Routine test, IP Cert.	100%			MTC and type test certificates	✓	2	2	2	1, 3			
1.15	Heater Element, Baffle Plate, Terminal box	Chemical & Mechanical Properties, Type test (IP, Ex-proof)	Major	Visual	100%			OEM certificates/ Statutory Approvals	✓	2	2	2	1, 3			
1.16	Gaskets , Fasteners, Lugs, cable trays	Chemical & Mechanical Properties	Major	Visual	100%			OEM certificates	✓	2	2	2	1, 3			

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1.17	Instruments Tubing, Ferrule, Bite coupling and Fitting	Chemical & Mechanical Properties	Major	Chem., Mech. Analysis	100%	BHEL Specification/ Approved Datasheet/ Approved Drawing		OEM certificates	✓	2	2	1, 3	Components as applicable
2.0 INPROCESS INSPECTIONS													
2.1	For SS & AS Material	PMI	Major	PMI Check	Random	BHEL Specification/ Approved Datasheet/ Approved Drawing		TC	✓	2	1	3	
2.2	Fabrication of vessels and piping	WPS, PQR, WQR	Major	Doc. Verification	100%			WPS, PQR, WQR	-	2	-	1, 3	
2.21		Fit up of shell, shell to disc ends, shell to nozzle, nozzle to flange etc.	Major	Doc. Verification	100%			Log book/register /IR	✓	2	2	1, 3	
2.3		Radiography	Major	RT	As per BHEL Spec			NDE	✓	2	-	1, 3	
2.31	Liquid penetrant	Major	LPT				Reports, IR	✓	2	1	3		
2.4	Vessels and Piping	Thickness check	Major	Thickness check	Random			TC/IR	✓	2	1	3	
2.5	Reinforcement pads	Soap solution test	Major	Testing	100%			TC	✓	2	1	3	
2.51	Hydro test of vessels and piping	Hydro Test	Major	Hydro Test	100%			TC	✓	2	1	3	
2.6	Skid Assembly	Visual, Dimension, Alignment and Orientation	Major	Visual, Measurement	100%		IR	-	2	2	-		

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3.0 FINAL INSPECTION & TESTING															
A SCRUBBER & FILTER SEPERATOR															
3.1	Skid Assembly	Visual, Process check w.r.t P&ID, Dimensions, Alignment, BOM check	Major	Visual, Measurement	100%	BHEL Specification/ Approved Datasheet/ Approved Drawing/ Approved FAT		IR	✓	2	1	3	-		
3.2		Hydro test of assembled skid #	Critical	Hydro Test	100%				✓	2	1	3	-	# incase pneumatic test is not feasible.	
3.3		Pneumatic leak test of assembled skid	Major	Pneumatic testing	100%				✓	2	1	3	-		
3.4		Spares (if any)	Minor	Visual and BOM check	100%				✓	2	1	3	-		
4.0 PRESERVATION & PACKING															
4.1		Surface preparation, Painting (Shade, DFT) # Marking	Major	Visual, Measurement	Random	BHEL Specification/ Approved Datasheet/ Approved Drawing		TC	✓	2	1	-	#as applicable		
4.2		Packing#	Major	Visual	Random				✓	2	2	1	# Sea worthy packing in case of Export orders		

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				BHEL SPEC:									
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Notes: -

1. MPI/LPT Should be carried on Knuckle of Reducers, Outer bend portion of Elbows and Neck portion of Tees.
 - a) CS & AS (>=2") Material – MPI
 - b) SS Material (>=2") – LPT.
2. This typical MQP should be read along with specification (Latest revision as per PO), approved drawings & approved datasheet.
3. Drawing/datasheet shall prevail over quality plan for contradiction if any.
4. All type test reports submitted shall not be older than 5 yrs. from the date of purchase order.
5. Any project/customer specific requirements which shall be notified have to be fulfilled by the vendor at the time of execution of order.
6. The applicability of above items/products depends on scope of supply. Same to be considered accordingly during inspections.
7. IGC test for austenitic stainless steels as per ASTM A 262 practice E.

Abbreviations: -

MTC	-	Material Test certificate	WPS	-	Welding Procedure Specification
PQR	-	Procedure Qualification Record	MPI	-	Magnetic Particle Inspection
WPQ	-	Welder Performance Qualification	LPT	-	Liquid Penetrant Test
NDE	-	Non Destructive Examination	TC	-	Test Certificate
PMI	-	Positive Material Identification	CS	-	Carbon Steel
SS	-	Stainless Steel	DFT	-	Dry Film Thickness
IR	-	Inspection Report			

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