

TD-201 Rev No. 00 Form No.		PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD	ANNEXURE
			Rev No. 00
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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. QAP GUIDELINES & FORMAT (ANNEXURE – III) The QAP format and guidelines for filling up the format shall be used by vendor for preparation and submission of QAP after order placement. Note : 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.			

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<u>GUIDELINES TO VENDORS FOR PREPARATION OF QUALITY ASSURANCE PLAN</u> - 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. - 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. - 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 2: (Vendor / Sub vendor)			
Ref. Doc			

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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.		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. 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. 13. Vendor's signature & stamp should be available on each page of QAP. 14. Vendor should read the BHEL Product Standard thoroughly and QAP should be made only inline and relevant to the Specification & Approved Drawings. 15. The following operations/characteristics/check points may be included (AS APPROPRIATE) 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) For loose items test certificate or COC is required. s) Packing and Preservation. 16. QAP Format enclosed. 17. Typical Manufacturing QAP is attached.		
				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
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

VENDOR'S NAME & ADDRESS:			TYPICAL MANUFACTURING QUALITY PLAN								MQP. NO.:			
			CUSTOMER: BHEL, HYDERABAD PROJECT: RDA Raipur PRODUCT: Outdoor type 11 kV CT, PT Metering Cubical				BHEL PO No: PO DATE: BHEL SPEC: PY55291REV:00				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			REMARKS	
										P	W	V		

1	Current Transformer	Raw materials: i) Insulator, ii) Epoxy resin, iii) Copper conductor, iv) Kraft Paper v) CRGO cores	Major	Mechanical & Electrical	100%	BHEL Spec/ Appd drg /data sheet	BHEL Spec/ Appd drg /data sheet	MTC/ Internal test reports	√	2	-	1, 3	
		BOM Verification, Make, Model, Type & Rating	Major	Physical	100%	BHEL Spec/ Appd drg /data sheet	BHEL Spec/ Appd drg /data sheet	IR	√	2	1, 3	-	
		Routine Test as per IS 2705: i) Verification of terminal marking & polarity ii) HV power frequency withstand test on primary winding & secondary winding iii) Over voltage inter-turn test iv) Determination of errors as per requirement of accuracy class v) Partial discharge test (IS:11322)	Major	Physical	100%	As per IS2705 /IEC standards BHEL Spec	As per IS2705 /IEC standards BHEL Spec	IR	√	2	1, 3	-	
		All Type tests as per IS-2705	Major	Physical	Sample	BHEL Spec/ Appd drg /data sheet	BHEL Spec/ Appd drg /data sheet	Type test report	√	2	-	1, 3	

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VENDOR'S NAME & ADDRESS:			TYPICAL MANUFACTURING QUALITY PLAN							MQP. NO.:					
			CUSTOMER: BHEL, HYDERABAD PROJECT: RDA Raipur PRODUCT: Outdoor type 11 kV CT, PT Metering Cubical				BHEL PO No: PO DATE: BHEL SPEC: PY55291			REV:00		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			REMARKS		
										P	W	V			
2	Potential Transformer	Raw materials: i) Insulator, ii) Epoxy resin, iii) Copper conductor, iv) Kraft Paper v) CRGO cores	Major	Physical	100%	BHEL Spec/ Appd drg /data sheet	BHEL Spec/ Appd drg /data sheet	MTC/ Internal test reports	√	2	-	1, 3			
		Make, Model, Type, & Rating, BOM check, Test Certificate	Major	Physical	100%	BHEL Spec/ Appd drg /data sheet	BHEL Spec/ Appd drg /data sheet	IR	√	2	1, 3	-			
		Routine Test as per IS 3156: i) Verification of terminal marking & polarity ii) HV power frequency withstand test on primary winding & secondary winding iv) Determination of errors as per requirement of accuracy class v) Partial discharge test (IS:11322)	Major	Physical	100%	As per IS 3156/IEC standards BHEL Spec	As per IS 3156 /IEC standards BHEL Spec	IR	√	2	1, 3	-			
		All Type tests as per IS-3156	Major	Physical	Sample	BHEL Spec/ Appd drg /data sheet	BHEL Spec/ Appd drg /data sheet	Type test report	√	2	-	1, 3			

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VENDOR'S NAME & ADDRESS:		TYPICAL MANUFACTURING QUALITY PLAN							MQP. NO.:				
		CUSTOMER: BHEL, HYDERABAD PROJECT: RDA Raipur PRODUCT: Outdoor type 11 kV CT, PT Metering Cubical				BHEL PO No: PO DATE: BHEL SPEC: PY55291			REV:00		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			REMARKS
										P	W	V	
3	Metering Cubical with bus bar & equipment	Bought out items: HT cables, cable box, fuse, MCB, panel etc	Major	Mechanical & Electrical	100%	BHEL Spec/ Appd drg /data sheet	BHEL Spec/ Appd drg /data sheet	MTC/ Internal test reports	√	2	-	1, 3	
		IP certificate for metering panel	Major	Physical	Sample	BHEL Spec/ Appd drg /data sheet	BHEL Spec/ Appd drg /data sheet	IP-55	√	2	-	1, 3	
		Make, Model, Type, & Rating, BOM verification	Major	Physical	100%	BHEL Spec/ Appd drg /data sheet	BHEL Spec/ Appd drg /data sheet	IR	√	2	1, 3	-	
		Visual check-Dimensional, component verification, polarity check	Major	Physical	100%	As per IS /IEC standards BHEL Spec	As per IS /IEC standards BHEL Spec	IR	√	2	1, 3	-	
		Visual check-Electrical wiring: routing, ferruling, tightness	M	Physical	100%	BHEL Spec/ Appd drg /data sheet	BHEL Spec/ Appd drg /data sheet	IR	√	2	1, 3	-	

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VENDOR'S NAME & ADDRESS:		TYPICAL MANUFACTURING QUALITY PLAN							MQP. NO.:				
		CUSTOMER: BHEL, HYDERABAD PROJECT: RDA Raipur PRODUCT: Outdoor type 11 kV CT, PT Metering Cubical				BHEL PO No: PO DATE: BHEL SPEC: PY55291			REV:00			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			REMARKS
										P	W	V	
		TYPE TEST*: For complete unit following type test reports shall be furnished: i) Temperature rise test on complete unit at rated current of cubicle (IS 3427) ii) Power frequency withstand test for 11 kV cubicle (IS 2071) iii) Impulse wave withstand test (IS 2071) iv) IP-55 protection test (IS 12063/IEC60529) v) short time current withstand test (IS 3427)	Major	Physical	Sample	BHEL Spec/ Appd drg /data sheet	BHEL Spec/ Appd drg /data sheet	Type test report	√	2	-	1, 3	*In case type test reports are not available with supplier the same shall be conducted by vendor on cubicle with higher CT ratio at free of cost.
		Functional test on completely assembled unit as per BHEL Specification*	Major	Physical	1 Sample	BHEL Spec/ Appd drg /data sheet	BHEL Spec/ Appd drg /data sheet	IR	√	2	1, 3	-	* as required
4	Calibration certificate	All instruments used in Inspection & testing	Major	Physical	100%	As per IS /IEC standards BHEL Spec	As per IS /IEC standards BHEL Spec	IR	√	2	-	1, 3	-do-
5	Painting	As per BHEL Spec/ Appd drg /data sheet	Major	Physical	100%	BHEL Spec/ Appd drg /data sheet	BHEL Spec/ Appd drg /data sheet	IR	√	2	-	1, 3	-do-
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		CUSTOMER: BHEL, HYDERABAD PROJECT: RDA Raipur PRODUCT: Outdoor type 11 kV CT, PT Metering Cubical				BHEL PO No: PO DATE: BHEL SPEC: PY55291			REV:00		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
6	PACKING	Proper packing	Major	Visual	100%	BHEL Spec	BHEL Spec	Report/ Packing list	√	2		1	*In case of exporting/ importing, packing shall be as per BHEL export packing spec

Notes:-

1. This MQP should be read along with specification (latest revision as per PO), approved drawings & approved datasheet.
2. Approved Drawing/datasheet shall prevail over quality plan for contradiction if any.
3. Any project/customer specific requirements which shall be notified have to be fulfilled by the vendor at the time of execution of order.
4. All test certificates/type test reports reviewed and certified by TPI/BHEL shall be submitted to BHEL as documentation package.

Abbreviations:-

MTC – Material Test certificate
IBR – Indian Boiler Regulations
DFT – Dry Film Thickness
PMI – Positive Material Identification
IR – Inspection Record

AS – Alloy Steel
SS – Stainless Steel
TC – Test Certificate
IS – Indian Standards

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