

BHARAT HEAVY ELECTRICALS LIMITED
RANIPET – 632 406
QUALITY ASSURANCE for Pre-Treatment Plant for Sagardighi Project

Quality requirements are given below:

1. MQP shall be submitted (incorporating raw material check, in process inspection like NDT, Dimension inspection, final inspection, painting & packing etc relevant to the product) in attached format along with manufacturing process, drawing & data sheet from bidder for review and finalization of MQP.
2. MQP shall be submitted in one stroke for all the items covered under PT plant (For example Clarifier bridge, Sludge sump pump, Dosing system, Blower, pipes, etc)
QPs shall be submitted by the successful bidder for Electrical C&I items referred in Technical specification SPEC.NO.ROS:6323 Rev.03 dt 12.11.2021 like LT Motor, Instruments, EOH, Cable Trays & Accessories, C&I Cables, Cable glands & lugs etc., in the MQP format enclosed.
3. Already customer approved (BHEL, NTPC, State Electricity board etc.) latest MQP for similar application if available specific to vendor may be shared for reference purpose.
4. All the items shall be inspected at manufacturer works as per BHEL approved QP, Drawing, approved data sheet and relevant standard. The supplier shall inform BHEL in advance about the readiness of the goods for inspection and testing. Material test certificates / Inspection reports as per approved quality plan shall be submitted to BHEL.
5. Physical Inspection at manufacturer works applicable by BHEL/BHEL TPI as per BHEL approved vendor quality plan.
6. Packing of the items shall be as per BHEL Engineering approved packing drawing / data sheet /Specification / Packing procedure.
7. BHEL authorized representative have the right to witness the necessary inspection and testing of goods mentioned in the PO. Inspection / inspection waiver / approval by BHEL does not absolve supplier's responsibility for conformity of the specification as per the terms of PO.
8. Annexure-Q and BOI details shall be a part of the offer and shall be filled by supplier along with their sign and seal.
9. Vendor Quality Plan shall contain following inspection notes.
 - a) Latest version of standards & Specification shall be applied
 - b) Materials shall be procured in compliance to Functional Technical Specification.
 - c) Gauges and measuring instruments with valid calibration only shall be used.
 - d) BHEL /BHEL Authorized representatives shall have the right to witness the necessary inspection and testing of goods mentioned in the PO.
 - e) Inspection / Inspection waiver / approval by BHEL do not absolve Supplier's responsibility for conformity of the specification as per the terms of PO.
 - f) In case of Vendor Drawing & Datasheet, it needs approval by BHEL Engineering.
 - g) This QP shall be read along with relevant PO, BHEL drawing and approved data sheet.

Details of BOI's/ Sub Systems with respect to Main Items

Sl No.	Item/ Sub system Name	Quantity	Supplier Name	Place of Manufacturing
OEM (ORIGINAL EQUIPMENT MANUFACTURER) SEAL AND SIGN.				

List of items in this Systems (.....) required QP approval

SI No.	Item/ Sub system Name	Quantity	SI No.	Item/ Sub system Name	Quantity
01			08		
02			09		
03			10		
04			11		
05			12		
06			13		
07			14		

List of Minor items in this Systems (.....) required COC of OEM

01			08		
02			09		
03			10		
04			11		
05			12		
06			13		
07			14		

OEM (ORIGINAL EQUIPMENT MANUFACTURER) SEAL AND SIGN WITH DATE.

560829/2021/BAP-QA-BHEL

MANUFACTURER'S NAME & ADDRESS Manufacturer Logo		MANUFACTURING QUALITY PLAN Item/subsystem:			QP NO: Rev: Date: Page:		PROJECT: MAIN CONTRACTOR: M/s BHEL-RANIPET PO NO:						
SL NO 1	COMPONENT & OPERATION 2	CHARACTERISTICS 3	CLASS 4	TYPE OF CHECK 5	QUANTUM OF CHECK 6		REFERENCE DOCUMENTS 7	ACCEPTANCE NORMS 8	FORMAT OF RECORD 9 D	AGENCY 10			REMARKS 11
					M	B/C				M	B	C	

RAW MATERIAL INSPECTION

1	CHEMICAL COMPOSITION	MAJOR	CHEMICAL ANALYSIS	1 SAMPLE / HEAT	MTC	√	P	V	V	NO REPAIR WELDING IS PERMITTED ON CI AS CAST / PUNCHED HEAT NO SHALL BE PROVIDED FOR CORRELATION
	MECHANICAL PROPERTIES	MAJOR	TENSILE TEST	1 SAMPLE / HEAT	MTC	√	P	V	V	
	SURFACE EXAMINATION	MAJOR	VISUAL INSPECTION	100%	IR	√	P	V	V	
2	CHEMICAL COMPOSITION	MAJOR	CHEMICAL ANALYSIS	1 SAMPLE / HEAT	MTC	√	P	V	V	
	MECHANICAL PROPERTIES	MAJOR	TENSILE TEST & HARDNESS	1 SAMPLE / HEAT	MTC	√	P	V	V	
	HEAT TREATMENT (As applicable)	CRITICAL	REVIEW OF TIME-TEMP CHART	100%	HT CAHRT	√	P	V	V	
	SURFACE EXAMINATION	MAJOR	VISUAL INSPECTION	100%	IR		P	V	V	
3	CHEMICAL COMPOSITION	MAJOR	CHEMICAL ANALYSIS	1 SAMPLE / HEAT	MTC	√	P	V	V	
	MECHANICAL PROPERTIES	MAJOR	TENSILE TEST	1 SAMPLE / HEAT	MTC	√	P	V	V	

QP FORMAT

M – Manufacturer / Subcontractor, B - MAIN CONTRACTOR/ BHEL /BHEL Authorized Inspection Agency, C- Customer / Customer Authorized Inspection Agency, P - Perform, V - Verification of reports, W - Witness, TC - Test certificate, DR – Dimensional report. * Record, identified with "tick" (√) shall be submitted to customer as a QA documentation package.	Prepared by	Reviewed by	Approved by

560829/2021/BAP-QA-BHECH

MANUFACTURER'S NAME & ADDRESS Manufacturer Logo		MANUFACTURING QUALITY PLAN				PROJECT: MAIN CONTRACTOR: M/s BHEL-RANIPET PO NO:							
		Item/subsystem:		QP NO: Rev: Date: Page:									
SL NO 1	COMPONENT & OPERATION 2	CHARACTERISTICS 3	CLASS 4	TYPE OF CHECK 5	QUANTUM OF CHECK 6		REFERENCE DOCUMENT S 7	ACCEPTANCE NORMS 8	FORMAT OF RECORD 9 D	AGENCY 10			REMARKS 11
					M	B/C				M	B	C	

		SOUNDNESS	CRITICAL	VISUAL INSPECTION	100%				UT Report	√	P	V	V	FOR BAR DIA. ≥ 50 MM ONLY
4									MTC	√	P	V	V	
									MTR	√	P	V	V	

QP FORMAT

IN PROCESS INSPECTION														
5		DIMENSIONAL	MAJOR	MEASURE					IR	√	P	V	V	
		HYDROSTATIC TEST OF CASTING	CRITICAL	PRESSURE TEST	100%				IR	√	P	W	V	SEE NOTE -1
6		DIMENSIONAL	MAJOR	MEASURE					IR	√	P	V	V	
		DYNAMIC BALANCING	CRITICAL	MEASURE	100%				IR	√	P	W	V	SEE NOTE-1
7		SOUNDNESS OF CASTING	MAJOR	NDT-DPT					DPT Report	√	P	V	V	
8		DIMENSIONAL	MAJOR	VISUAL					IR	√	P	V	V	
		SOUNDNESS	CRITICAL	ULTRASONIC TEST					UT Report	√	P	W	V	FOR SHAFT DIA ≥ 50 MM ONLY (EXCEPT THREADED PORTION) SEE NOTE-1
		DP TEST ON MACHINED AREA	MAJOR	DP TEST	100%				DPT Report	√	P	V	V	
FINAL INSPECTION														

M – Manufacturer / Subcontractor, B - MAIN CONTRACTOR/ BHEL /BHEL Authorized Inspection Agency, C- Customer / Customer Authorized Inspection Agency, P - Perform, V - Verification of reports, W - Witness, TC - Test certificate, DR – Dimensional report. * Record, identified with "tick" (√) under column 'D' shall be submitted to customer as a QA documentation package.	Prepared by	Reviewed by	Approved by

560829/2021/BAP-QA-BHEL

MANUFACTURER'S NAME & ADDRESS Manufacturer Logo		MANUFACTURING QUALITY PLAN Item/subsystem:			QP NO: Rev: Date: Page:		PROJECT: MAIN CONTRACTOR: M/s BHEL-RANIPET PO NO:						
SL NO 1	COMPONENT & OPERATION 2	CHARACTERISTICS 3	CLASS 4	TYPE OF CHECK 5	QUANTUM OF CHECK 6		REFERENCE DOCUMENT S 7	ACCEPTANCE NORMS 8	FORMAT OF RECORD 9 D	AGENCY 10			REMARKS 11
					M	B/C				M	B	C	

9	PUMP ASSEMBLY								IR	√	P	V	V	
10	PERFORMANCE TEST WITH JOB								IR	√	P	W	W	
									IR		P	W	W	
									IR		P	W	W	
									IR		P	W	W	
11	NPSHR TEST							IR	√	P	W	W		
12	PAINTING PACKING AND PRESERVATIONS							IR	√	P	V	-		

QP FORMAT

INSPECTION NOTES:

- a. Latest version of standards & Specification shall be applied.
- b. Materials shall be procured in compliance to Functional Technical specification.
- c. Gauges and measuring instruments with valid calibration only shall be used.
- d. Inspection/Inspection waiver/approval by BHEL does not absolve Supplier's responsibility for conformity of the specification as per the terms of PO.
- e. BHEL /BHEL Authorized representatives shall have the right to witness the necessary inspection and testing of goods mentioned in the PO.
- f. In case of Vendor Drawing & Datasheet, it needs approval by BHEL Engineering.
- g. This QP shall be read along with relevant PO, BHEL Specification / Approved Drawing/ Datasheet.
- h. This QP is applicable for Mandatory supply also.
- i. All other minor items, which are not cover under this QP, shall be manufactured inspected as per OEM (Original equipment Manufacturer)/BHEL standard practice and relevant standard. Relevant TC/COC will be submitted for the same.

M – Manufacturer / Subcontractor, B - MAIN CONTRACTOR/ BHEL /BHEL Authorized Inspection Agency, C- Customer / Customer Authorized Inspection Agency, P - Perform, V - Verification of reports, W - Witness, TC - Test certificate, DR – Dimensional report. * Record, identified with "tick" (√) under column 'D' shall be submitted to customer as a QA documentation package.	Prepared by	Reviewed by	Approved by

560819/2021/BAP-QA-ELEC

 Ranipet	Painting schedule for APH, ESP, FAN, FGD, Water Treatment and Gates & Damper for 1X660 MW Sagardighi TPP, Extension, Unit-5 (BHEL WO NO: R681, R4W1 & R4W2) Cust. Drg. No.:RP-MQ-445-ESP-E049 Rev 04	Doc No: PS:SAGA:R681 Rev 04 Date: 21/12/2020
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SI No	Description / PGMA	Surface preparation	Primer/ DFT in μm	Intermediate DFT	Finish DFT	Total DFT
	Water Treatment					
25	RODM Structures (WT 220, WT 225,etc)	Blast cleaning to near white metal Sa 2½ (SSPC SP10)	Epoxy resin based Zinc phosphate primer to IS 13238; 100 μm	Epoxy resin based Titanium Dioxide pigmented intermediate coat; 100 μm Δ	Epoxy based polyamide cured finish paint to IS 14209 (Latest); 75 μm Δ At Site: Aliphatic acrylic polyurethane paint to IS 13213; 25 μm Smoke grey Shade 692 of IS 5	300 μm Δ (min)
26	Tools and Equipments (WT023,WT222,WT226,etc)	Power tool cleaning SP3(SSPC) /St-3(SIS) Δ	One coats of Red oxide Zinc phosphate primer as per IS 12744 DFT 1x30 = 30 μm (min)	NIL	Two coats synthetic enamel as per IS 2932 smoke grey shade 692 of IS 5. DFT 2x30 μm = 40 μm (min) 60	90 μm (min)

Annexure Q		
	Indent No:	Enquiry no:
Sl.No	BHEL / Customer Requirements	## Specific confirmations by the manufacturer (Acceptable/Not acceptable)
	Quality Plan Requirement: (If SQP is not given & Vendor QP applicable)	
	(i) MQP (Manufacturing Quality Plan) shall be submitted in attached format for BHEL/Customer review & approval. Our SQP/Typical MQP/ MQP Format is attached for guidance & use.	
	(ii) MQP shall invariably cover w.r.t Inward inspection including on Raw material Procurement, In process and Final inspection in elaborated way/details.	
	(iii) Bidder shall also to give specific confirmation that on need basis, their competent officials shall visit to BHEL / customer for finalization of Quality plan including test procedure/methodology during preaward / post award approval / detailed engineering in the event of an order.	
	(iv) No deviation on BHEL/Customer approved MQP/ SQP (In case BHEL SQP is provided) is acceptable.	
1	(v) Bidder shall agree to submit all cross referred documents other than codes/standards to BHEL/Customer/Consultant.	
	Important Notes shall be included in MQP : (a) Latest revision of Standard s & Specification shall apply. Only International Standards are applicable. (b) Materials shall be procured in compliance to Functional Technical Specification. (c) Inspection shall be in compliance with Approved Quality Control Procedure for the Product. (d) NDT shall be carried out by Qualified Personnel with compliance to Approved NDT Procedures and Acceptance Norms, as per ASME standard. (e) Gauges and measuring Instruments, with valid calibration only shall be used. (f) Cleaning and Painting of products shall be carried out as per Approved Packing Schedule. (g) Finished Products shall be packed to comply with Approved Packing Schedule. (h) Welding shall be carried out by Qualified Personnel with compliance to Approved NDT Procedures and Acceptance Norms, as per ASME standard.	
2	Domestic / Inland Inspection will be carried out by BHEL/BHEL appointed Third Party Inspection Agency (TPIA) / Customer/Customer Appointed Inspection Agency/Consultant. This is applicable for all Stage inspection and Final Inspection identified as "W" - Witness or "CHP" - Customer Hold Point as per customer approved Quality Plan/ Technical specification / Approved Drawing/ Approved Data sheet / Scheme / PID / PFD / SLD (Process Instrumentation Diagram / Process Flow Diagram / Single Line Diagram) etc. (as applicable).	
3	Inspection Agency for Foreign Bidders and also for Indian Bidder but importing from Foreign Sources: (1) Any one of the following Third Party Inspection Agency (TPIA) shall be appointed by the bidder and same shall be furnished by the bidder in techno commercial bid itself. (2) The details of TPIA with contact details like Name of the official, Phone no, Email id shall also to be submitted during pre/post award. However cost for such inspection agency shall be borne by the bidder only. Inspection charges for such inspection agency shall be indicated separately so that if BHEL/Customer is undertaking the inspection by on their own , then these charges are non claimable by the bidder. List of TPIA 1.M/s Bureau Veritas 2.M/s TUV-Nord 3.M/s TUV-SUD 4.M/s TUV Rheinland 5.M/s Lloyds Register 6.M/s SGS 7.M/s Germanischer Lloyds 8.M/s QUEST 9.M/s Certification Engineers International 10.M/s Intertek 11.M/s IR Class Systems and Solutions 12.M/s DNV 13. M/s Fichtner 14. M/s ABS Inspection Services	

560819/2021/BAP-QA-ELEC SI.No	BHEL / Customer Requirements	## Specific confirmations by the manufacturer (Acceptable/Not acceptable)
4	Stage Inspection during manufacturing Process : Stage Inspection during manufacturing shall be carried out as per approved quality plan and all necessary documents shall be provided for review, verification and clearance for further processing. This inspection call shall be given well in advance (at least 2 weeks before) to TPI/Bidder's own inspection agency to avoid delay in the manufacturing processes.	
5	Inspection before despatch for domestic supplier : Inspection before despatch at supplier's works shall be carried out by BHEL appointed Inspection agency (as in SI no. 2). Inspection shall be done as per approved Quality plan/ Technical specification/ Approved Drawing/ Approved Data sheet .	
6	Inspection at Foreign Source/Supplier: (a) As in sl no: 3. shall be ensured without fail (b) No material / items shall be despatched without getting the written communication from BHEL / Customer inspection carried out by Bidder appointed Third Party Inspection Agency (As per SI no.3) / Customer/Customer Appointed Inspection Agency/Consultant. This is applicable for all Stage inspection and Final Inspection identified as "W" - Witness or "CHP" - Customer Hold Point as per customer approved Quality Plan/ Technical specification / Approved Drawing/ Approved Data sheet / Scheme / PID / PFD / SLD (Process Instrumentation Diagram / Process Flow Diagram / Single Line Diagram) etc. (As applicable). Inspection before despatch for Foreign supplier : Inspection before despatch at supplier's works shall be carried out by bidder appointed inspection agencies having international presence at vendors and or vendor's sub vendor works. Inspection shall be done as per approved Quality plan/ Technical specification/ Approved Drawing/ Approved Data sheet by TPIA mentioned in SI no: 03 at supplier's cost.	
7	Painting shall be done strictly as per BHEL/Customer approved painting schedule / scheme only. Paint Thickness / Paint shade shall be ensured as per BHEL / Customer approved painting schedule / specification / data sheet etc. No deviation is acceptable unless otherwise accepted by BHEL/Customer in writing. Any conflict if any among BHEL / Customer approved painting schedule / Spec / data sheet etc. shall be brought to the notice of BHEL well in advance before proceeding including the BOI being procured for assy / skid like motors etc.	
8	Specific conformation for document package in the event of an order (2 Hard copies & soft copy in PDF file) is to be given containing the following with proper linkages (i) Index Sheet (ii) MQP/RQP/Endorsement Sheet (As applicable) (iii) TCs identified by BHEL/ Customer for record for "CHP" / "W" and Verification portion ("V") as given in approved QP. (iv) Final inspection report + TC including Chemical + Mechanical + HT + NDT etc. (v) Third party Inspection report + TC (vi) Customer CHP/ MDCC (vii) Type test / Performance Test reports conducted (viii) Type test / Performance Test approval/ clearance obtained from BHEL/Customer (ix) BOM with As Build Drgs with actual make / rating used with BHEL/customer approved drawings.	
9	Packing / Seaworthy Packing shall be as per BHEL Packing schedule / approved drg / sketch. This shall be ensured to take care transit / handling / transshipment in Road / Sea / Air. Photographs are to be submitted for BHEL review before despatching the material as per contract conditions.	
10	Outsourcing of test facilities: Bidder shall ensure all the testing facilities in house. However If any of the test facilities are not available with successful bidder, then bidder shall ensure the same at NABL accredited third party lab / Govt / Govt Lab for major testing such as NDT, Electrical & Mechanical testing.	
11	Important Note: No deviation on the above requirement 01 to 10 is acceptable with respect to Quality Requirement and those offers not meeting these specific customer requirement is liable for rejection and hence the bidder shall submit all the required documentary evidences in the offer itself.	
12	## Necessarily to be filled up by the bidder at the time of offer itself otherwise the offer may not be considered w.r.t Quality Requirement being customer specific requirement.	

VENDOR SIGN AND STAMP:

Vendor Name & Address:



Ref :INSP:CHK:001/ REV 00
DT:10/08/2020

Inspection document Check List

Inspection documents to be submitted after inspection of the items for getting dispatch clearance. Vendor shall provide documents to the BHEL/BHEL TPIA inspector during inspection and TPIA shall sign all the documents.

The document dossier shall contain following.

SL no.	Documents
1	Unpriced PO COPY.
2	Latest approved specification, datasheet, drawing, P&ID, test procedures, approved painting schedule, Packing etc.
3	Approved QAP.
4	CQIR Report (Disposal code should be Accepted all the offered QTY)
5	<p>As per approved QAP all the inspection documents to be submitted.</p> <p>Indexing of the reports as per QAP and each page wise numbered and correlated to QAP. If more than one test in each page, against each test the clause number of QAP to be mentioned.</p> <p>Inspection clause shall be mentioned against each test.</p> <p>1. Raw Material Test Certificates (NABL approved Lab TC/Manufacturer TC like Mechanical properties, Chemical Properties, UT etc. as per approved QAP.</p>

K. Kovarthan

கி. கோவர்தான்
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பரிசீலனை இயக்குநர் / Sr. Engineer
கualitasas Divisi / Quality Department
பி.என்.டி. / BHEL R&P RANIPET-3

	<p>2. In process Inspection Reports like Hydro test, Dimension Report, MPI,UT ,Balancing etc. as per approved QAP.</p> <p>3. Final Inspection Reports like Shop Assembly with testing reports, Hydro test/Leak / Pressure test reports, Type test Reports, WPS/PQR/WPQ Reports, PT/RT/UT/MT Reports etc. as per approved QAP.</p> <p>4. Final Inspection like packing and surface preparation & Painting/Metal finishing reports. (Sea worthy packing / Special Packing requirement).</p>
6	Relevant pages of standard shall be attached with report.
7	Calibration reports of the instruments used to be signed by TPI after verification.
8	Above said documents are should be in single .pdf file with not more than 10MB (if more than 10MB can be split into multiple files)
9	Hard copy of the same to be submitted along with material dispatch.

Kovarthanan

K KOVARTHANAN

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 क. कोवर्धनन / K. KOVARTHANAN
 वरिष्ठ इंजीनियर / Sr. Engineer
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DM/QC PROC
BHEL RANIPET