

Request for Quotation (RFQ)

Collective No : B5D1Y38289

S.No	PR Number	Material code	Description of item	Drawing No-Var, Rev Specification,Rev	MU	Qty	Project Name
1	8000138289	TC9517350279	ROTOR FORGING	23030120133-00,01, HY19473,04	EA	1	RELIANCE UTILITIES & POWER, HAZIRA

- Delivery Terms: FOR Destination to BHEL, Hyderabad, 01-Stores - For Indian vendors
CIF -Mumbai - For Foreign vendors.
- Acceptance of the offer shall be subject to approval by BHEL and/or the End Customer.
- The vendor shall submit a Technical Offer without price on the company letterhead containing all relevant technical details, including:
 - i) Material Code
 - ii) Item Description
 - iii) Drawing Number
 - iv) Specification Number
 - v) Quantity
 - vi) Compliance to Technical Requirements
 - vii) Any other applicable technical conditions
- Vendor has to submit Instructions to Bidder (ITB) duly filled, signed and stamped on each paper, along with their technical offer.
- Vendor has to submit Annexure-I, Annexure-III & Annexure-IV duly filled, signed and stamped, along with their technical offer.
- **Technical Pre-Qualification Criteria (PQC)** along with supporting documentary evidence, shall be submitted without fail as part of the Technical Offer.
- Vendor has to submit Integrity Pact (IP) duly filled, signed and stamped along with their technical offer.
- The Quality Plan shall be submitted after placement of the Purchase Order (PO) for approval by BHEL and/or the End Customer. The approved Quality Plan shall be strictly adhered to during execution of the order.
- Relevant drawings and specifications are enclosed with this enquiry. For any further clarifications, vendors may contact through e-mail at "**mohanj@bhel.in**"
- The quoted price shall be inclusive of all applicable taxes, duties, levies, packing, forwarding, and other incidental charges, unless specifically stated otherwise.
- BHEL reserves the right to accept or reject any offer, wholly or partially, and/or cancel the tender at any stage without assigning any reason thereof.
- Delivery required in 120 days from the date of PO.

Supplier Declaration

I, _____ (Name of Supplier / Authorized Representative), hereby declare that I have read, understood, and accepted all the above-mentioned requirements, terms, and conditions, and confirm compliance while submitting our quotation.

Authorized Signatory: _____

Name: _____

Designation: _____

Company Name: _____

Signature & Company Seal

Date: _____



(Attachment to Enquiry No. XXXXXXXXXX Due on Date XX.XX.XXXX for submission by 11.00 hrs to open from 14.00 hrs.)

INSTRUCTIONS TO BIDDER (ITB)

NOTE: Bidder to confirm in affirmative by typing "YES" or "Applicable Data" in the response column. Deviations, if any shall be recorded in deviations/comments column (Separate sheet can be attached if needed). Non deviatable clauses are indicated as "NON DEVIATABLE".

Sl. No.	DETAILED TERMS & CONDITIONS	BIDDER RESPONSE (YES/NO)	DEVIATIONS / COMMENT
1	SCOPE OF SUPPLY:		
	Signed & Sealed offers are invited for the Scope of Supply of goods or services or both as detailed in the enquiry. Relevant enclosures/supporting documents / catalogue, if any shall be enclosed to the technical offer.		
2	DEFINITIONS		
A	'The Buyer' means BHEL-HPEP, Ramachandrapuram, Hyderabad-502 032 of Bharat Heavy Electricals Limited (A Govt. of India Undertaking) incorporated under the companies Act having its registered office at BHEL House, Siri fort, New Delhi-110049, India and shall be deemed to include its successors and assigns. It may also be referred to as BHEL.		
B	'The Bidder' means the persons, firm, company or organization on whom the Purchase order is placed and shall be deemed to include the bidder's successors, representatives, heirs, executors and administrator as the case may be. It may also be referred to as Contractor, supplier or bidder.		
C	'Contract' shall mean and include the Purchase order incorporating various documents viz., Notice Inviting Tender (NIT), Offer, Letter Of Intent/Acceptance (LOI/LOA), Instruction to Bidders (ITB) and Special Conditions of Contract (SCC), specifications, inspection/quality plan, schedule of prices and quantities, drawings, if any, enclosed by Bidder/ provided by the Buyer or his authorized nominee and the samples or patterns if any to be provided under the provision of the contract. In case of any inconsistency or contradiction between any of the documents, the order of precedence shall be Purchase Order, LOI/LOA followed by Minutes Of Meeting (MOM), NIT, SCC, ITB.		
D	'Parties to the contract' shall mean the bidder and the buyer as named in the main body of the Purchase Order.		
E	'Goods/Material' shall include Works and Services which are incidental or consequential to supply.		
3	GENERAL INSTRUCTIONS:		
A	Mode of submission of offer shall be as indicated in SCC		Non Deviatable
B	The quotation should be neatly typed and free from over writing/ erasures. Any correction or addition must be authenticated. The offer including annexures and brochures should be submitted in English / Hindi. All Pages of Techno Commercial Bids (Main Pages), ITB, SCC should be signed and Stamped. If there is a conflict in case of bilingual submission, the submission in English will be final. Prices shall be quoted both in figures and words. In case of any discrepancy in value, the prices quoted in words shall be considered for evaluation and establishing L1 Status. Any discount / revised offer / bids submitted by a bidder on his own shall be considered, provided it is received on or before the due date and time of offer / bid submission (Part-1). Conditional discounts shall not be considered for evaluation of tenders.		Non Deviatable
C	Incomplete offers are liable for rejection.		Non Deviatable
D	Bidders to please note that the Terms & conditions contained in this document and SCC are to be read fully before submission of quotations.		Non Deviatable
E	Bidders are advised to comply with ITB and SCC, should there be any deviations (where deviations are permitted), it shall be entered in the deviation column. BHEL reserves the right to reject such offers or load the bid suitably for evaluation.		Non Deviatable
F	Offers shall be submitted directly, only by the bidder or by their authorized representative / agent and the offer should be in line with the regulatory guidelines (i.e. A valid Agency agreement between principal bidder and agent / representative shall be attached and the agreement shall cover the scope of services rendered by Agent, Agency Commission and any other information called for as per the regulatory guidelines). OEM / Mill details shall be provided if bidder is not a manufacturer. Bid envelops shall bear the name of Bidder. In case of submission through authorized representative/agent, the name of representative/agent should also be mentioned apart from bidder name.		Non Deviatable
G	Offer received after the specified time and date of submission will be rejected. No further correspondence shall be entertained.		Non Deviatable
H	Unsolicited offers will not be considered.		Non Deviatable
4	OTHER PARTICULARS (Please indicate applicable data)		
A	Name of the Bid currency (freely tradable foreign currency for imports and Indian Rupees for indigenous purchase).		
B	Name of the Port of loading and Port of Discharge (applicable to imports).		



5	BID SUBMISSION PROCEDURE FOR CONVENTIONAL TENDER:		
A	For Single Part Bids:		
	The complete bid shall be submitted in a single sealed cover superscribing the Tender number and due date, addressed to Sr DGM/CMM, Vendor Complex, BHEL, Hyderabad and sent by appropriate mode to above address or dropped in tender box located at vendor complex on or before the specified time and date of submission of offers, preferably in the bidder's envelope. E- mail bids shall be sent to mail ID pricebid_hyd@bhel.in only as an attachment.		Non Deviatable
B.	For two-Part Bids:		
i	The offer is to be submitted in two parts viz., Techno-commercial Bid - (Part-I), with all technical specification & scope including bill of material etc., Earnest Money Deposit (EMD)(wherever applicable) and unpriced bid with all applicable Commercial Terms and Conditions, rates of agency commission, duties, taxes and other charges, Signed and Stamped ITB and SCC, <u>except the price</u>, shall be kept in a separate sealed cover, superscribing enquiry No. (Techno-Commercial Bid) and due date AND Price Bid (Part-II), containing ONLY the price (including agency commission, if any) and the applicable duties/taxes/other charges shall be kept in a separate sealed cover superscribing Enquiry no. (Price bid) & due date. Both the above covers (Part –I & II) shall be kept in a Third cover superscribing Enquiry no. & due date. Bidder can also submit offer through email. Technical offer to be submitted to mail ID technicalbid_hyd@bhel.in, and price bid to be submitted to mail ID pricebid_hyd@bhel.in only as an attachment. Interchanging the information in the mails may lead to rejection of the offer. Bidder shall have no claim on e-mail offers sent to any other e-mail ID. In case of e-mail offers, the mail subject should contain Enquiry Number, Due date and Bidder name. Bidder address including contact details shall be mentioned in the content of the mail. Without these details, the offer is liable for rejection. All techno commercial terms & conditions mutually agreed prior to price bid opening shall prevail and supersede any terms and conditions specified otherwise in price bid.		Non Deviatable
ii	The bidders whose bids are techno commercially not accepted will be informed and EMD shall be returned wherever submitted.		
iii	Bidders will be allowed to submit the impact on their quoted prices due to changes in technical scope, specifications, and commercial terms/conditions as specified in NIT which in the opinion of BHEL , warrant changes in prices.		Non Deviatable
C	Bids shall be opened on due time and date in the presence of bidders who may like to be present. Only one representative of each bidder shall be permitted to attend the bid opening. Only the price bids of bidder (in case of two part bid) whose techno commercial bids are accepted will be opened later on a specified date.		Non Deviatable
6	DELIVERY TERMS		
A	Indigenous Purchase		
	a. Terms of Delivery for dispatches to BHEL Hyderabad (HPEP) shall be FOR Destination. b. Terms of Delivery for Direct Dispatch (DD) items shall be Ex Works. i. Incase specified in SCC that insurance is in customer/BHEL scope, price quoted shall include Freight charges up to Destination. ii. Otherwise, price quoted shall include Freight and Insurance upto Destination. However, beneficiary for insurance shall be BHEL.		
B.	Imports		
	The goods shall be delivered on FCA capital airport basis in case of freight by Air and CIP basis in case of freight by Sea.		
7	Documentation for Payment		
A	Indigenous Purchase		
	Following documents shall be submitted immediately on dispatch of material to BHEL HPEP / Site a. Two numbers of Original Tax Invoice (Refer ITB clause no 11 for Tax Compliance)/ e-invoice of GST Portal if applicable) b. Packing List - clearly showing number of packages, gross weight and net weight. c. Test/Warranty/Guarantee certificates, O&M Manual (If specified in SCC) d. Insurance intimation/declaration certificate e. Pre-dispatch Inspection report /Third Party Inspection Certificates. f. Consignee copy of LR signed & stamped by Customer/Site representative for DD Items g. e-waybill h. Any other documents as specified in SCC.		Non Deviatable

B	Softcopies of the above documents shall be uploaded in SUVIDHA portal https://suvidha.bhel.in/suvidha/ or https://hpep.bhel.com/mm/main.jsp Vendor Bills tab. immediately after dispatch of the material. Upload of Documents is mandatory for material Entry. Imports i) Bidder shall inform BHEL the readiness of material along with packing details 30 days in advance from the date of delivery. For Hazardous cargo/DG cargo, supplier must provide the following documents prior to handing over shipment to freight forwarder, wherever freight is in BHEL scope: 1. Valid MSDS 2. DGD certificate with appropriate UN numbers. 3. Labelling and marking on DG cargo along with photo of packaging. 4. Self-declaration for consignment 5. Packaging Certificate as per DG Standards 6. TSA Approved Truckers details to be provided to forwarder at the time of shipment In addition to the above, supplier should ensure to comply all IATA DG regulations, if any new requirement is added in future. ii). Bidder shall also upload the soft copy of the dispatch documents consisting of BL / AWB, Invoice, delivery note, packing list, country of origin & Test certificates and other documents as specifically indicated in the SCC in PRADAN Portal (https://hpep.bhel.com/mm) within Five days from the B/L date for sea shipment and One day from AWB date for Air shipment and sent to email ids: mssea@bhel.in, msair@bhel.in, cmmfe@bhel.in. iii) AWB/BL must contain the information of BHEL GST no., and PAN no. iv) Air Shipments: Bidder shall ensure the following a) Port of discharge -- Mumbai/Chennai/Hyderabad (as indicated in SCC). b) Consignee shall be BHEL, Hyderabad. Material shall be air freighted through cargo mode only and not through Courier. c) Upon handing over the cargo to the forwarder, bidder shall ensure the acknowledgement receipt with wordings "Cargo handed over in sound condition for Air freighting". Note: Warehouse receipt will not be considered for penalty calculations. d) In case of CIF/ shipments, bidder shall also inform BHEL the information about discharge port agent details and cargo arrival information within one day from the date of Shipment. e) Following dimensions of single package may be noted. - i). Maximum dimension of the cargo(ODC) -- 125" x 88" x 63" - ii). Maximum weight of the cargo -- 3.5 MT. If any package dimension or weight exceeds the above set limits, it will be treated as Over Dimension Cargo (ODC) or Over Weight Cargo and bidder shall inform BHEL 30 days in advance to the delivery date to enable BHEL to finalize the freight forwarder. - f). If package falls under Hazardous category, bidder shall communicate BHEL 30 days in advance period with document support. v) Sea Shipments:- bidder shall ensure the following - a). Port of discharge -- Nhavaseva/Mumbai/Chennai. - b). Place of Delivery / Final Destination for CIP shipments - Nhavaseva CFS / Chennai CFS. - c). In case of FOB shipments, bidder shall handover the material to BHEL nominated forwarder and obtain the cargo receipt. - d). If the material cannot be containerized in 20 or 40 GP containers, an advance information of 30 days prior to the delivery date shall be communicated to BHEL for necessary arrangements and finalisation of freight forwarder. - e). For CIP shipments 1. In case of FCL shipments, Detention free period must be 14 days. 2. Bidder shall also inform BHEL the information about discharge port agent details and cargo arrival information within 5 days from the date of Shipment. 3. No charges for the services rendered till place of destination will be payable by BHEL. In case liner / forwarder insist for charges, not in the scope of BHEL, the same will be adjusted from bidder account. 4. In case of CIF shipments -- Bidder must select a forwarder/liner whose discharge port published tariff for THC and other services is available. Any charges over and above the published tariff will not be borne by BHEL or will be adjusted from the bidder's bill. 5. bidder must insure the cargo for 110% of material value including the freight amount. (vi). Recovery charges for non-submission of documents: - Bidder shall submit all the required documents to BHEL as prescribed in the Purchase order and NIT.		
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	If BHEL incurs any charges such as Penalty, demurrage, container detention, wharfage, storage, Ground rent etc., due to non - compliance / non - submission of documents prescribed in Purchase Order/ NIT/Letter of credit, the same shall be recovered from the bidder as under: 1. EUROPE/USA/Black Sea/ Far East/Middle East/South East sector A. For FOB Sea Consignments:- Penalty for late submission / negotiation of documents beyond 14 days shall be as under: <table><tr><th rowspan="2">Sl. no</th><th rowspan="2">Period (From Date of Bill of Lading)</th><th>Recoverable Charges</th><th colspan="2">Recoverable Charges per day per container</th></tr><tr><th>LCL per week/ Break bulk cargo per day</th><th>20FT Container</th><th>40FT Container</th></tr><tr><td>i</td><td>Upto 14th day</td><td>Nil</td><td>Nil</td><td>Nil</td></tr><tr><td>ii</td><td>15th day onward</td><td>USD 10</td><td>USD 110</td><td>USD 200</td></tr></table> B. For CIP Sea Shipments: - Bidder shall provide rates for detention charges after free period at the time of offer itself in case of engagement of 20FT Container and 40FT category. In case of late presentation of documents to the bank recovery will be effected from the Bidder as per the rates quoted by the Bidder at the time of offer in this regard. In case of Break bulk cargo and LCL, Demurrage charges shall be recovered at the rate of USD 1 per Ton per day and storage charges at the rate of USD 10 per week respectively shall be charged as late presentation charges. (vii) Description of items in invoice, packing list, BL / AWB or LR shall be same as PO item description. Bidders shall ensure that invoice shall contain PAN nos. of both bidder and BHEL along with other tax related numbers. BHEL PAN AAACB4146P and BHEL TAN HYDB00086C Any other additional documents sought by the statutory authorities, the same shall be produced by the bidder on priority basis. (viii) Bidder shall provide package details including number of packages, gross weight, net weight etc. (ix) The bidder shall provide the following documents at the time of submission of offer: a) No Business Connection in India declaration issued by the bidder as per the format specified. (or) b) (i) No Permanent Establishment in India declaration issued by the bidder as per the format specified. (ii) Tax Residence Certificate issued by the bidder's tax authorities. (iii) Form 10F, as attached in Annexure V, to be issued by the bidder. c) In case the bidder has a Business Connection in India as per Section 9 of Income Tax Act or significant economic presence in India as per rule 11 UD of IT Act or Permanent Establishment in India as per Article 5 of Double Taxation Avoidance Agreement between India and the bidder's country, the bidder shall provide a withholding tax order issued by the Indian Income Tax authority for recovery of applicable tax.	Sl. no	Period (From Date of Bill of Lading)	Recoverable Charges	Recoverable Charges per day per container		LCL per week/ Break bulk cargo per day	20FT Container	40FT Container	i	Upto 14th day	Nil	Nil	Nil	ii	15th day onward	USD 10	USD 110	USD 200		
Sl. no	Period (From Date of Bill of Lading)			Recoverable Charges	Recoverable Charges per day per container																
		LCL per week/ Break bulk cargo per day	20FT Container	40FT Container																	
i	Upto 14th day	Nil	Nil	Nil																	
ii	15th day onward	USD 10	USD 110	USD 200																	
8	Delivery Schedule																				
	The tendered goods shall be delivered within the period stipulated in NIT/ SCC as accepted. Inordinate delay/early supply are liable for rejection/Hold on payment.		Non Deviatable																		
9	Pricing Terms																				
	Quoted price shall be inclusive of Packing & Forwarding and shall remain firm and valid during the execution of PO. Offers with PVC will be rejected outright except in cases where specifically called for in the SCC.		Non Deviatable																		
10	PRICE VALIDITY :																				
	Unless otherwise specified, offer shall be valid for a period of 90 days from the date of bid opening (Technical bid /part-I in case of two part bid). However the prices quoted for spare parts of the Main equipment shall be kept valid for a period as specified in SCC.		Non Deviatable																		

11	Taxes & Duties (RATE TO BE INDICATED by the bidder against the space provided)	
A	Indigenous Purchase i) Only valid GST registered bidders will be considered for the tender. The GSTIN of the bidder should be clearly mentioned in the offer. ii) If bidder is exempted from GST registration under any provision of the GST Law, a declaration with due supporting documents should be furnished for considering the offer. iii) Bidder to quote the applicable taxes in the following manner: - Harmonized System of Nomenclature (HSN) of Goods - Services Accounting Code(SAC) of Services. - IGST/CGST/SGST/UTGST: Rate of Tax to be quoted as extra in % against the space provided iv) Bidders to ensure correct applicability of IGST/CGST/SGST/UTGST based on the Inter / Intra state movement of goods/services. v) In case Bidder has opted for GST Composition Scheme, the same may be stated explicitly both in their technical and price bids. An undertaking to the effect that any change in the status of the bidder will be intimated. vi) Any other taxes & duties not covered anywhere above may be indicated separately. Taxes deducted at source: - TDS as per the extant statutes shall be deducted. - In case bidder does not provide PAN details, higher rate of tax shall be deducted as per the Act. - Concessional certificates, if any, should be provided well in time for lower deduction of tax.	Non Deviatable
	Terms & Conditions to be complied 1. All invoices (incl. Credit Notes, Debit Notes) to contain BHEL HPEP GSTIN ie 36AAACB4146P1ZG. Invoices submitted should be in the format as specified under GST Law. All details as mentioned in Invoice Rules including Dealer GST registration number (GSTIN), invoice number with date of issue, quantity, rate, value, taxes with nomenclature – CGST, SGST, UGST, IGST mentioned separately, HSN Code / SAC Code etc. 2. Reimbursement of GST amount will be made only upon completion of the following: i. Bidder declaring such invoice in their GSTR-1 Return/ IFF ii. Receipt of Goods or Services and Submission of Tax invoice by BHEL iii. The tax invoice is reflected in the GSTR2B of BHEL, HPEP (buyer). Payment of GST will be made only if it is matching with data uploaded by the Bidder in GST portal. 3. In case of discrepancy in the data uploaded by the bidder in the GSTN portal vis-a-vis the tax invoice or in case of any shortages or rejection in the supply, then BHEL will not be able to avail the tax credit. The same would be available in PRADAN Portal for the bidder's information. Bidder has to rectify the data discrepancy in the GSTN portal or issue credit note or debit note (details also to be uploaded in GSTN portal) for the shortages or rejections in the supplies or additional claims for processing of such invoices. 4. In cases where invoice details have been uploaded by the bidder but failed to remit the GST amount to GST Department within stipulated time, then GST on the invoices in default will be recovered from the bidder along with the applicable interest. 5. In case GST credit is delayed/denied to BHEL due to non/delayed receipt of goods and/or tax invoice or expiry of timeline prescribed in GST law for availing such ITC, or any other reasons not attributable to BHEL, such GST amount will be recoverable from bidder along with interest levied/ leviable on BHEL. 6. GST TDS deducted as per GST Act, is uploaded in GSTN portal along GSTR7. Bidders can directly download the GST TDS Certificate from the GSTN Portal. 7. Bidders to note that Rules & Regulations pertaining to E-way bill system are to be strictly adhered to, as and when notified by Govt. authorities. 8. Vendors who fall under the E-Invoice regulations, i.e., having an annual turnover of Rs. 10 crores (Rs 5 crore w.e.f 01.08.2023) in the previous year shall issue e-invoice in line with Rule 48(4) of CGST Rules failing which GST amount will not be reimbursed to the vendor even if the other requirements are fulfilled. 9. In case the vendor is exempted by the GST department under the Rule 48(4) of CGST Rules from issuing E-invoice, a declaration as prescribed in the Notification 17/2022 - Central Tax dated 01-08-2022 shall be provided on the invoice. 10. Vendors who do not fall under the E-Invoice regulations, i.e., whose annual turnover is less than Rs. 10 crores (Rs 5 crore w.e.f 01.08.2023) in the previous year have to give an undertaking indemnifying BHEL that the vendor is not falling under the E-invoice requirement category and that in case of any breach of this E-invoicing requirement, the vendor indemnifies BHEL of any consequences that may arise due to such a breach. 11. No GST shall be levied on liquidated damages / penalty.	



B.	Foreign Purchase (Imports)		
	The offered price shall be inclusive of all the Taxes and duties as applicable in country of export / country of dispatch for the quoted price. Taxes deducted at source: a. In case of goods or services subject to Income tax in India, such tax as per the extant statute shall be recovered. b. In case bidder does not provide necessary documents for beneficial taxation (Refer clause 7-B-(ix) a-c of ITB), the TDS deduction shall be at the maximum percentage stipulated as per the provisions of Income Tax Act.		Non Deviatable
12	Payment Terms: Unless otherwise specified in SCC, following shall be the terms of Payment.		
A	Indigenous: a. Micro & Small Enterprises (MSEs) - 100% Direct EFT payment within 45 days b. Medium Enterprises - 100% Direct EFT payment within 60 days c. Non MSME Bidders - 100% direct EFT Payment within 90 Days Note A. Above due date is reckoned from the date of Receipt of material or 15 days from the date of submission of complete set of documents as per PO whichever is later. Objections, if any on the invoice, available on SUVIDHA portal need to be closed. In such instances, due date is reckoned from the closure of objections. Vendors are advised to get familiarized with the document exchange feature on SUVIDHA portal. Payment will be made for Material accepted value. B. MSEs (covered under MSME Act) need to register and renew periodically and update the same with BHEL C. The taxes that are reimbursed are limited to applicable taxes as on the Purchase Order delivery date or the amount actually paid whichever is less. D. Adherence to the above time schedule of payment is contingent upon Bidder complying with GST provisions and availment of Input Tax Credit by BHEL before the date of payment. E. In case of packaged items, 10% of supply value will be retained till completion of total supplies. F. Bidders to comply with clause 11 on GST requirements G. MSE benefits are not applicable to Traders / Wholesalers registered as MSEs. G. MSME vendors may avail the facility of invoice discounting through Trade Receivables Discounting System(TREDs) platforms like RXIL, INVOICEMART, M1XCHANGE and any other platforms onboarded from time to time.		
B	Imports: i) 100% payment (less Indian Agency Commission, if any) shall be through Wire Transfer with a credit period of 45 days - Cash Against Documents (CAD) ii) In case Bidder opts for Letter of Credit payment, the LC Usance period shall be 90 days with respective bank charges to respective accounts and loading of 0.50% iii) Indian Agency commission if payable and so specified in the Purchase order shall be paid in Indian Rupees, considering the SBI TT selling exchange rate, as on the date of payment after successful completion of the contract.		
C	Conditions for LC: a. LC validity period will be 90 days and for any extension, applicable charges will be to bidder's account. b. LC will be opened after successful completion of pre dispatch inspection prior to the scheduled / agreed delivery date. LC will be opened within 15 bank working days from the date of request.		Non Deviatable
D	Conditions for both Indigenous & Foreign Bidders: a. In case Bidders insist for lesser Credit period and BHEL accepts, a loading of 0.60% for every 15 days reduction will be applicable. b. In case PBG as required is not furnished, Payment will be released deducting the BG amount, which will be paid after expiry of warranty period against submission of supplementary claim. c. Payment does not imply in any respect whatsoever a waiver of Buyer's right to performance of the Order. Buyer is entitled to set off claimable debts against claimable liabilities with the bidder by means of a setoff Note.		Non Deviatable
E	Wherever EMD is applicable, the EMD will be paid back to unsuccessful bidders within fifteen days after award of the contract. Successful bidder's EMD will be retained till submission of Performance Bank Guarantee (PBG). Tender Fee wherever applicable is not refundable. No interest shall be payable by BHEL on earnest money or security deposit or any money due to the contractor by BHEL.		Non Deviatable

13	Penalty clause:		
	In the event of delay in supply /part-supply of goods, Penalty as detailed below is leviable a. Penalty of 0.5% per week or part there of shall be levied, limited to a max of 10% (ten percent) of delayed portion value / order value (as specified in SCC). b. Penalty applicable for delay in documentation is as per SCC. c. Date Reckoned for Penalty - Indigenous Orders with delivery terms FOR HPEP: C Note date. - Indigenous Orders (Others): Date of e-waybill. - Imports: For CIP/CIF Orders: IGM date - Imports: For FOB Orders: AWB / BL date - Imports: - For FCA Orders: - Date of acknowledgement from Freight Forwarder. - For Ex Work Orders (both air and sea): - Latest of Air Freight Request (AFR), Invoice, Packing List, Inspection date (if applicable) or any other documentary evidence confirming material readiness. d. In case of Deviation to above Penalty clause, loading applicable to the extent to which not agreed by Bidder. e. Timelines as mentioned in the Annexure 1 will be considered for reckoning delivery.		
14	Excess materials supplied beyond tolerance limit as specified in PO will not be paid and bidder may raise credit note for the excess/unaccepted material as per GST law.		Non Deviatable
15	Rejected materials , if any, shall be collected by the bidder within 90 days of such communication to the bidder. Beyond this period the bidder forfeits their right to the materials.		Non Deviatable
16	Guarantee / Warranty Period: Wherever required, and so provided in the specifications/SCC/Purchase Order, the bidder shall guarantee that the goods supplied shall comply with the specifications laid down, for materials, workmanship and performance. a. Guarantee period shall be 12 months from the date of commissioning or 18 months from the date of supply whichever is earlier. b. In case erection & commissioning is involved, guarantee period shall be 12 months from the date of commissioning. c. In case of equipment bought as a package which are intended to be incorporated in installations or systems, the guarantee period shall be 12 months from the date of commissioning of such equipment. The guarantee period shall be extended by the period during which the goods are not in compliance. If the delivery is found to be non-complaint, bidder shall replace, repair or re-execute the as requested by BHEL. If the bidder defaults on his obligations, buyer has the right to proceed to replace, repair or re-execute at the bidder's expense. A guarantee period as described above shall apply afresh to replaced, repaired or re-executed parts of a delivery. Loading for deviation: In case warranty specified in SCC is over and above the period mentioned in b & c above; loading will be 1% per annum for the deviation in warranty end period, on the contract value. Expected commissioning period is as indicated in SCC.		Non Deviatable
17	PERFORMANCE BANK GUARANTEE (PBG) (Applicable in case mentioned in SCC) In case enquiry specifically spells out PBG requirement, PBG is to be submitted by Bidder in requisite format as per Annexure VII. Further detailing on PBG as specified in SCC. The PBG shall be for the performance of the goods and shall remain binding notwithstanding such variations, alterations or extensions of item as may be made, give, conceded or agreed to between the Bidder and BHEL under these Terms and conditions or otherwise.		Non Deviatable
NOTE: Deviations (Commercial as well as Technical) from the tender specifications and conditions are generally not acceptable. However, deviation if any, shall be brought out clearly with proper justification in the offer. The deviation, if considered by BHEL, shall be loaded for comparison, while evaluating the offer. If a bidder unconditionally withdraws any deviation before price bid opening, the same shall not be loaded. Loading criteria in respect of major commercial conditions where deviations if any are accepted shall be as per clause No.18. The Bidders may specifically note the following.			

18	Evaluation and Loading Criteria: i) Evaluation Currency for this tender shall be “INR”. ii) Evaluation of prices shall be done item-wise unless otherwise specified in the SCC. iii) Evaluation shall be on the basis of delivered cost, i.e. “Total Cost to BHEL” w.r.t the finalized technical scope and commercial conditions (after considering incidence of applicable taxes and duties and loading). iv) In the course of evaluation, if more than one Bidder happens to occupy L1 status, effective L1 will be decided by soliciting discounts from the respective L1 Bidders. In case more than one Bidder happens to occupy the L1 status even after soliciting discounts, the L1 Bidder shall be decided by a toss/draw of lots, in the presence of the respective L1 Bidders or their representatives. Ranking will be done accordingly. BHEL decision in such situations shall be final and binding. INDIGENOUS a. Bidder shall ensure to indicate the applicable taxes against each line item, failing which the same will be considered as inclusive/NIL. b. Ex-works offers received (as against FOR Destination mentioned in enquiry) shall be loaded by 2% of Ex-works value. c. GST and any other charges quoted will be added to the base price. However, in case input credit is available for GST (SGST, CGST/IGST), the same shall be excluded for arriving at “Total Cost to BHEL” IMPORTS For evaluation of offers in foreign currency, exchange rate (TT selling rate of State Bank of India) as on the date of bid opening (Part-I, in case of two-part bids) shall be considered. If the relevant day happens to be a bank holiday, then the forex rate as on the previous bank (SBI) working day shall be taken. In case of foreign Bidders, the quoted CIP price shall be loaded by the following factors to arrive at “Total Cost to BHEL”: - Import duty as applicable on the date of Part-I bid opening. - Loading will be as per the table below <table><tr><td></td><td>Ex Works</td><td>FOB/F CA</td><td>CIF/C FR</td><td>CIP</td></tr><tr><td>Foreign Inland freight and insurance</td><td>2%</td><td></td><td></td><td></td></tr><tr><td>Marine freight and marine insurance</td><td>3%</td><td>3%</td><td></td><td></td></tr><tr><td>Destination Port handling charges</td><td>0.50%</td><td>0.50%</td><td>0.50%</td><td></td></tr><tr><td>clearing charges & inland freight and insurance</td><td>2%</td><td>2%</td><td>2%</td><td>2%</td></tr></table> COMMON LOADING FOR IMPORTS & INDIGENOUS that will be added for arriving the "Total Cost to BHEL" A. Loading on Deviated Penalty clause shall be 10% or to the extent to which the bidder has opted for deviation. B. Loading for payment terms as per clause 12 of ITB C. Loading for deviation in Warranty & PBG as per clause 16,17.		Ex Works	FOB/F CA	CIF/C FR	CIP	Foreign Inland freight and insurance	2%				Marine freight and marine insurance	3%	3%			Destination Port handling charges	0.50%	0.50%	0.50%		clearing charges & inland freight and insurance	2%	2%	2%	2%
	Ex Works	FOB/F CA	CIF/C FR	CIP																						
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clearing charges & inland freight and insurance	2%	2%	2%	2%																						
19	Procurement directly from the manufacturers/ suppliers shall be preferred. However, no agent shall be allowed to represent more than one manufacturer/ supplier in the same tender. Moreover, either the agent could bid on behalf of the manufacturer/ supplier or the manufacturer / supplier could bid directly but not both. In case bids are received from both from the manufacturer/ supplier and the agent, bid received from the agent shall be ignored.																									
20	RIGHT OF REJECTION /NON- PLACEMENT OF PO: BHEL reserves the right to accept or reject any or all bid/s in full or part without assigning any reason whatsoever.																									
21	INTEGRITY PACT Bidders shall have to enter into Integrity Pact with BHEL as per Annexure VI - for Tender value of rupees two crores and above and shall be signed by the authorized signatory along with the offer, failing which Bidder’s offer will be rejected.																									
22	Public Procurement																									
A	Make in India For this Procurement, the local content to categorize a bidder as a Class I local bidder / Class II local bidder / Non-Local bidder and purchase preference to Class I local bidder, is as defined in Public Procurement (Preference to Make in India) order No P-45021/2/2017-PP(BE-II) dated 04-06-2020 issued by DPIIT as amended from time to time. Proforma for self-certification for minimum local content and auditor’s certification is given in Annexure III.																									

B	Any Bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with competent authority. GOI website https://www.mea.gov.in/ to be referred for latest details of competent authority and exemptions . Proforma for self-certification for compliance is given in Annexure IV.															
C	Startups: For Start-ups duly registered with DPIIT (Copy of certificate to be provided), condition of prior turnover and prior experience in Public Procurement may be relaxed subject to meeting of Quality and Technical Specifications. Startups are exempt from paying EMD.															
23	Benefits earmarked for Purchase from Micro & Small Enterprises (MSEs) – Indigenous Purchase															
A	All Micro and Small Enterprises (MSEs) as defined in MSE Procurement Policy are exempt from Paying EMD. NSIC/UDYAM registered bidders shall submit NSIC/UDYAM Certificate along with bid documents. Any Bidder falling under MSE category shall furnish the following details & submit documentary evidence/ Govt. Certificate etc. in support of the same along with their techno-commercial offer. <table><tr><th>Type under MSE</th><th>SC/ST Owned</th><th>Women Owned</th><th>Others (excluding SC/ST & Women Owned)</th></tr><tr><td>Micro</td><td></td><td></td><td></td></tr><tr><td>Small</td><td></td><td></td><td></td></tr></table> Note: If the bidder does not furnish the above in the tender, offer shall be processed construing that the bidder is not falling under MSE category. Date to be reckoned for determining the deemed validity will be the last date of Technical bid submission. Non- submission of such document will lead to consideration of their bid, at par with other bidders and MSE status of such bidders shall be shifted to Non- MSE Category till the bidder submits these documents.				Type under MSE	SC/ST Owned	Women Owned	Others (excluding SC/ST & Women Owned)	Micro				Small			
Type under MSE	SC/ST Owned	Women Owned	Others (excluding SC/ST & Women Owned)													
Micro																
Small																
B	MSE suppliers can avail the intended benefits in respect of the procurements related to the Goods and Services only (Definition of Goods and Services as enumerated by Govt. of India vide Office Memorandum F. No. 21(8)/2011-MA dtd. 09/11/2016 office of AS & DC, MSME) and subsequent amendments & clarifications, if any. Documents NSIC/UDYAM Certificate submitted by the bidder shall be verified by BHEL for rendering the applicable benefits.															
C	If an enterprise falling under MSME category as defined in the Act, graduates to a higher category from its original category or beyond the purview of the Act, it shall continue to avail all non-tax benefits of its original category notified by the Ministry of Micro, Small and Medium Enterprise for a period of three years from the date of such graduation to the higher category.															
D	BHEL HPEP is registered with TReDS (RXIL , M1XCHANGE , InvoiceMart) platform. MSME bidders are requested to get registered with TReDS(RXIL / M1XCHANGE / InvoiceMart/ exchanges added from time to time) platform to avail the facility as per the GOI guidelines.															
24	Inspection Measuring and Test Equipment (IMTE) used by the Bidder/ Contractor or sub-contractor shall be calibrated, maintained and controlled. Calibration shall be valid and IMTE maintained in sound condition during usage.															
25	ISO-9001, ISO14001 & OHSMS 45001 shall be complied.															
26	If BHEL registered supplier is not quoting against this NIT, supplier shall send regret letter positively with valid reasons for not participating. Repeated lack of response on the part of supplier may lead to deletion of such registered supplier from BHEL's approved supplier's list as per BHEL SEARP Guidelines.															
27	<u>BREACH OF CONTRACT, REMEDIES AND TERMINATION</u> 27.1 BREACH OF CONTRACT: The following shall amount to breach of contract: i. Non-supply of material/ non-completion of work by the Supplier/Vendor within scheduled delivery/ completion period as per contract or as extended from time to time. ii. The Supplier/Vendor fails to perform as per the activity schedule and there are sufficient reasons even before expiry of the delivery/ completion period to justify that supplies shall be inordinately delayed beyond contractual delivery/ completion period. iii. The Supplier/Vendor delivers equipment/ material not of the contracted quality. iv. The Supplier/Vendor fails to replace the defective equipment/ material/ component as per guarantee clause. v. Withdrawal from or abandonment of the work by the Supplier/Vendor before completion as per contract. vi. Assignment, transfer, subletting of Contract by the Supplier/Vendor without BHEL's written permission resulting in termination of Contract or part thereof by BHEL. vii. Non-compliance to any contractual condition or any other default attributable to Supplier/Vendor. viii. Any other reason(s) attributable to Vendor towards failure of performance of contract. In case of breach of contract, BHEL shall have the right to terminate the Purchase Order/ Contract either in whole or in part thereof without any compensation to the Supplier/Vendor. ix. Any of the declarations furnished by the contractor at the time of bidding and/ or entering into the contract for supply are found untruthful and such declarations were of a nature that could have resulted in non-award of contract to the contractor or could expose BHEL and/ or Owner to adverse consequences, financial or otherwise. x. Supplier/Vendor is convicted of any offence involving corrupt business practices, antinational activities or any such offence that compromises the business ethics of BHEL, in violation of the Integrity Pact entered into with BHEL has the potential to harm the overall business of BHEL/ Owner. Note- Once BHEL considers that a breach of contract has occurred on the part of Supplier/Vendor, BHEL shall notify the Supplier/Vendor by way of notice in this regard. Contractor shall be given an opportunity to rectify the reasons causing the breach of contract within a period of 14 days. In case the contractor fails to remedy the breach, as mentioned in the notice, to the satisfaction of BHEL, BHEL shall have the right to take recourse to any of the remedial actions available to it under the relevant provisions of contract															

	27.2 Remedies in case of Breach of Contract.: i. Wherein the period as stipulated in the notice issued under clause 27.1 has expired and Supplier/Vendor has failed to remedy the breach, BHEL will have the right to terminate the contract on the ground of "Breach of Contract" without any further notice to contractor. ii. Upon termination of contract, BHEL shall be entitled to recover an amount equivalent to 10% of the Contract Value for the damages on account of breach of contract committed by the Supplier/Vendor. This amount shall be recovered by way of encashing the security instruments like performance bank guarantee etc available with BHEL against the said contract. In case the value of the security instruments available is less than 10% of the contract value, the balance amount shall be recovered from other financial remedies (i.e. available bills of the Supplier/Vendor, retention amount, from the money due to the Supplier/Vendor etc. with BHEL) or the other legal remedies shall be pursued. iii. Wherever the value of security instruments like performance bank guarantee available with BHEL against the said contract is 10% of the contract value or more, such security instruments to the extent of 10% contract value will be encashed. In case no security instruments are available or the value of the security instruments available is less than 10% of the contract value, the 10% of the contract value or the balance amount, as the case may be, will be recovered in all or any of the following manners: iv. In case the amount recovered under sub clause (a) above is not sufficient to fulfil the amount recoverable then; a demand notice to deposit the balance amount within 30 days shall be issued to Supplier/Vendor. v. If Supplier/Vendor fails to deposit the balance amount within the period as prescribed in demand notice, following action shall be taken for recovery of the balance amount: a). from dues available in the form of Bills payable to defaulted Supplier/Vendor against the same contract. b). If it is not possible to recover the dues available from the same contract or dues are insufficient to meet the recoverable amount, balance amount shall be recovered from any money(s) payable to Supplier/Vendor under any contract with other Units of BHEL including recovery from security deposits or any other deposit available in the form of security instruments of any kind against Security deposit or EMD. vi. In-case recoveries are not possible with any of the above available options, Legal action shall be initiated for recovery against defaulted supplier/Vendor. vii. It is an agreed term of contract that this amount shall be a genuine pre-estimate of damages that BHEL would incur in completion of balance contractual obligation of the contract through any other agency and BHEL will not be required to furnish any other evidence to the Supplier/Vendor for the purpose of estimation of damages. viii. In addition to the above, imposition of liquidated damages, debarment, termination, de-scoping, short-closure, etc., shall be applied as per provisions of the contract. ix. Non-performance of contract attracts penal provisions in line with BHEL guidelines for Suspension of Business Dealings (SBD). Note: 1) The defaulting Supplier/Vendor shall not be eligible for participation in any of the future enquiries floated by BHEL to complete the balance work. The defaulting contractor shall mean and include: (a) In case defaulted Supplier/Vendor is the Sole Proprietorship Firm, any Sole Proprietorship Firm owned by same Sole Proprietor. (b) In case defaulted Supplier/Vendor is The Partnership Firm, any firm comprising of same partners/ some of the same partners; or sole proprietorship firm owned by any partner(s) as a sole proprietor.
28	Any other terms and conditions of the bidder attached / referred against the tender enquiry will not be considered.
29	All drawings, patterns and tools supplied by BHEL or made at BHEL's expense are BHEL's property. These cannot be used or referred to any other party and must be used only in the execution of BHEL's orders.
30	Any amount payable by the bidder under any of the conditions of this contract shall be liable to be adjusted against any amount payable to the bidder under any other work / contract awarded by BHEL HPEP or any other BHEL Units. This is without prejudice to any other action as may be deemed fit by BHEL.
31	The bids of the bidders who are on the banned list and also the bids of the bidders, who engage the services of the banned firms, will be rejected. The list of firms banned by BHEL is available on BHEL web site: www.bhel.com
32	Ordering and confirmation of order The bidder shall send the order acceptance within one week from the date of LOI/Purchase order or such other period as specified/agreed by the Buyer. Buyer reserves the right to revoke the order placed if the order confirmation differs from the original order placed. Buyer shall be legally bound, only if agreed for any deviation explicitly in writing. The acceptance of deliverables or supplies by Buyer as well as payments made in this regard shall not imply acceptance of any deviations. The Purchase order will be deemed to have been accepted if no communication to the contrary is received within one week (or the time limit as specified /agreed by the Buyer) from the date of P.O. Buyer, is at liberty to send signed P.O. through electronic media such as e-mail and the receipt of which shall be treated as receipt of order.
33	Execution The whole contract is to be executed in the most workman like manner, substantial and approved as per the contracted terms.
34	Progress Report The bidder shall render such report as to the progress of work and in such form as may be called for by the Buyer from time to time. The submission and acceptance of such reports shall not prejudice the rights of the buyer in any manner. Bidder shall communicate to BHEL immediately, the change of address, ownership, contact person(s), the mobile numbers and e-mail of the dealing person concerned. Milestones shall be periodically updated by bidder through PRADAN Portal (https://hpep.bhel.com/mm/). Non updation will adversely affect service rating of bidder performance.

35	Non-disclosure Obligations
	Drawings, technical documents or other technical information received by one party shall not without the consent of the other party, be used for any other purpose than that for which they were provided. They may not, without the consent of the submitting party, otherwise be used or copied, reproduced, transmitted or communicated to third parties. All information and data contained in general product documentation, whether in electronic or any other form, are confidential and binding only to the extent that they are by reference expressly included in the contract. The bidder shall, as per agreed date/s but not later than the date of delivery, provide free of charge any information and/or drawings which are necessary to permit the Buyer to erect, commission, operate and maintain the product. Such information and drawings shall be supplied as specified in technical specification. All intellectual properties, including designs, drawings and product information etc. exchanged during the formation and execution of the contract shall continue to be the property of the submitting party. The bidder shall provide Buyer with all information pertaining to the delivery in so far as it could be of importance to Buyer. The bidder shall not reveal confidential information to its own employees not involved with the tender/contract and its execution and delivery or to third parties, unless Buyer has agreed to this in writing beforehand. The bidder shall not be entitled to use the Buyer's name in advertisements and other commercial publications including website without prior written permission from Buyer. In the event of violation of the confidentiality as agreed, BHEL will take legal action as deemed fit. Non-disclosure agreement to be entered as per Annexure- II wherever applicable.
36	Inspection and Testing
A	The goods and stores shall be manufactured by approved quality system and each part/component may be inspected and tested by the Buyer prior to shipment and shall comply with relevant requirements. Buyer has the right to inspect at any stage during manufacture/ delivery.
B	Buyer or his authorized representative shall be entitled at all reasonable times during execution to inspect, examine and test at the bidder's premises the material and workmanship of all stores to be supplied under the contract, and if the part of the stores are being manufactured at other premises, the bidder shall obtain for buyer or his authorized representative permission to inspect, examine and test as if the said stores are being manufactured at the bidder's premises. Such inspection, examination and testing, if made shall not release the bidder from any obligation under the contract. For indigenous bidders all costs related to first inspection request shall be borne by the buyer and the cost of subsequent inspections due to non-readiness of material/rework/ rejections shall be borne by the bidder. In case of imports all inspection charges including third party inspections if any shall be borne by the bidder. The cost of inspection staff/third party specified by the Buyer shall be borne by bidder unless otherwise specifically agreed. If the contract provides for tests on the premises of the bidder or any of his sub-contractor/s, bidder shall be responsible to provide such assistance, labor, materials, electricity, fuels, stores, apparatus, instruments as may be required and as may be reasonably demanded to carry out such tests efficiently. Cost of any type test or such other special tests shall be borne by the bidder unless otherwise specifically agreed in the contract. The Bidder shall give the authorized representative of the buyer reasonable notice in writing of the date on and the place at which any stores will be ready for inspection/ testing as provided in the Contract. Annexure – I, may strictly be complied with or the time lines. Any delay in submission of the documents by the bidder will not alter the delivery date.
37	Quality and Condition of the Deliverables
	The bidder shall be responsible for compliance with applicable technical, safety, quality, environmental requirements and other regulations in relation to products, packaging and raw and ancillary materials.
38	Packaging and Dispatch
	The bidder shall package the deliverables safely and carefully and pack them suitably in all respects considering the peculiarity of the material for normal safe transport by sea/air/rail/road to its destination suitably protected against loss, damage, corrosion in transit and the effect of tropical salt laden atmosphere. The packages shall be provided with fixtures/hooks and sling marks as may be required for easy and safe handling by mechanical means. Special packaging conditions/ environmental conditions as defined in the NIT shall be fully complied. Each package must be marked with consignee name, address, P.O. number, Package Number, gross weight & net weight, dimensions (L x B x H) and bidder's name. The packing shall allow for easy removal and checking of goods on receipt and comply with carrier's conditions of packing or established trade practices. Packing list for goods inside each package with P.O. item No. & quantity must also be fixed securely outside the box to indicate the contents. If any consignment needs special handling instruction, the same shall be clearly marked with standard symbols/instructions. Hazardous material should be notified as such and their packing, transportation and other protection must conform to relevant regulations.
39	Contract variations; Increase or decrease in the scope of supply
	Buyer may vary the contracted scope during execution due to exigencies of project requirement. If the bidder is of the opinion that the variation has an effect on the agreed price or delivery period, Buyer shall be informed of this immediately in writing along with technical details, and in the event of additional work, submit a quotation with regards to the price and period involved, as well as the effect this additional work will have on the other work to be performed by the bidder. Wherever unit rates are available in the contract, the same shall be applied to such additional work. The bidder shall not perform additional work before buyer has issued written instructions/amendment to the purchase order to that effect. The work which the bidder should have or could have anticipated in terms of delivering the service (s) and functionality (ies) as described in this agreement should be executed by the bidder without any price implication. In case of no change in the scope / technical specifications, bidder shall endeavor to keep the material ready and intimate the same to BHEL within the contractual delivery date, failing which, the delay if any will be attributed to supplier, and any upward price variation thereof for delivery at a later date is not admissible.
40	Rejected/Short shipments/ warranty/guarantee replacements
	In case of any short shipment during initial supply which is subsequently dispatched by the bidder or any guarantee / warranty replacements shall be dispatched on "DDP-Delivered duty paid BHEL stores" basis for imported items and "FOR-BHEL Stores/designated destination" basis for indigenous items.

41	Export Administration Regulations
	If a delivery includes such technology and / or supply that is subjected to the export regulations the bidder shall obtain due permissions, approvals, license etc.
42	Force Majeure
	The bidder shall not be considered in default if delay occurs due to causes beyond their control such as Acts of God, Natural calamities, Fire, Frost, Flood, Civil War, civil commotion, riot, Government Restrictions. Only those causes that have duration of more than seven days shall be considered cause of force majeure. Notification to this effect duly certified by local chamber of commerce/statutory authorities with supporting documents shall be given by the bidder to BHEL by registered letter/courier service immediately without loss of time. In the event of delay due to such causes the delivery schedule shall be extended for a length of time equal to the period of Force Majeure or at the option of BHEL the order may be cancelled. Such cancellation would be without any liability whatsoever on the part of BHEL. In the event of such cancellation the bidder shall refund any amount advanced or paid to the bidder by BHEL and deliver back any material issued to him by BHEL and release facilities, if any provided by BHEL.
43	Non-waiver of Defaults
	If any individual provision of the contract is invalid, the other provisions shall not be affected.
44	Settlement of Disputes
	Except as otherwise specifically provided in the contract, all disputes concerning questions of the facts arising under the contract, shall be decided by the Buyer, subject to written appeal by the bidder to the buyer, whose decision shall be final. Any disputes of differences shall to the extent possible be settled amicably between the parties thereto, failing which the disputed issues shall be settled through arbitration The bidder shall continue to perform the contract, pending settlement of disputes(s).
45	Conciliation clause
	CONCILIATION CLAUSE FOR CONDUCTING CONCILIATION PROCEEDINGS UNDER THE BHEL CONCILIATION SCHEME, 2018: The Parties agree that if at any time (whether before, during or after the arbitral or judicial proceedings), any Disputes (which term shall mean and include any dispute, difference, question or disagreement arising in connection with construction, meaning, operation, effect, interpretation or breach of the agreement, contract or the Memorandum of Understanding, penalty deduction, time extension), which the Parties are unable to settle mutually, arise inter-se the Parties, the same may, be referred by either party to Conciliation to be conducted through Independent Experts Committee to be appointed by competent authority of BHEL from the BHEL Panel of Conciliators. The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as provided in Procedure in http://www.bhel.com/index.php/story_details?story=2454 . The Procedure together with its Formats will be treated as if the same is part and parcel hereof and shall be as effectual as if set out herein in this ITB
46	ARBITRATION
	46.1 Except as provided elsewhere in this Contract, in case Parties are unable to reach amicable settlement (whether by Conciliation to be conducted as provided in Clause 45 herein above or otherwise) in respect of any dispute or difference; arising out of the formation, breach, termination, validity or execution of the Contract; or, the respective rights and liabilities of the Parties; or, in relation to interpretation of any provision of the Contract; or, in any manner touching upon the Contract (hereinafter referred to as the 'Dispute'), then, either Party may, refer the disputes to IAMC (International Arbitration and Mediation Centre, Hyderabad) and such dispute to be adjudicated by Sole Arbitrator appointed in accordance with the IAMC Rules. 46.2 A party willing to commence arbitration proceeding shall invoke Arbitration Clause by giving notice to the other party in terms of section 21 of the Arbitration & Conciliation Act, 1996 (hereinafter referred to as the 'Notice') before referring the matter to IAMC. The Notice shall be addressed to the Head of the Unit, BHEL, executing the Contract and shall contain the particulars of all claims to be referred to arbitration with sufficient detail and shall also indicate the monetary amount of such claim including interest, if any. 46.3 After expiry of 30 days from the date of receipt of aforesaid notice, the party invoking the Arbitration shall submit that dispute to IAMC and that dispute shall be adjudicated in accordance with their respective Arbitration Rules. The matter shall be adjudicated by a Sole Arbitrator who shall necessarily be a Retd Judge having considerable experience in commercial matters to be appointed/nominated by the respective institution. The cost/expenses pertaining to the said Arbitration shall also be governed in accordance with the Rules of the respective Arbitral Institution. The decision of the party invoking the Arbitration for reference of dispute to a specific Arbitral institution for adjudication of that dispute shall be final and binding on both the parties and shall not be subject to any change thereafter. The institution once selected at the time of invocation of dispute shall remain unchanged. 46.4 The fee and expenses shall be borne by the parties as per the Arbitral Institutional rules. 46.5 The Arbitration proceedings shall be in English language and the seat and venue of Arbitration shall be Hyderabad. 46.6 Subject to the above, the provisions of Arbitration & Conciliation Act 1996 and any amendment thereof shall be applicable. All matters relating to this Contract and arising out of invocation of Arbitration clause are subject to the exclusive jurisdiction of the Court(s) situated at Hyderabad. 46.7 Notwithstanding any reference to the Designated Engineer or Conciliation or Arbitration herein, a. the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree. Settlement of Dispute clause cannot be invoked by the Contractor, if the Contract has been mutually closed or 'No Demand Certificate' has been furnished by the Contractor or any Settlement Agreement has been signed between the Employer and the Contractor. 46.8 It is agreed that Mechanism of resolution of disputes through arbitration shall be available only in the cases where the

	value of the dispute is less than Rs. 10 Crores. 46.9 In case the disputed amount Claim, Counter claim including interest is Rs. 10 crores and above, the parties shall be within their rights to take recourse to remedies other than Arbitration, as may be available to them under the applicable laws after prior intimation to the other party. Subject to the aforesaid conditions, provisions of the Arbitration and Conciliation Act, 1996 and any statutory modifications or re-enactment thereof as amended from time to time, shall apply to the arbitration proceedings under this clause. 46.10 In case, multiple arbitrations are invoked (whether sub-judice or arbitral award passed) by any party to under this contract, then the cumulative value of claims (including interest claimed or awarded) in all such arbitrations shall be taken in account while arriving at the total claim in dispute for the subject contract for the purpose of clause 46.9. Disputes having cumulative value of less than 10 crores shall be resolved through arbitration and any additional dispute shall be adjudicated by the court of competent jurisdiction. In the event of any dispute or difference relating to the interpretation and application of the provisions of commercial contract(s) between Central Public Sector Enterprises (CPSEs)/ Port Trusts inter se and also between CPSEs and Government Departments/Organizations (excluding disputes concerning Railways, Income Tax, Customs & Excise Departments), such dispute or difference shall be taken up by either party for resolution through AMRCD (Administrative Mechanism for Resolution of CPSEs Disputes) as mentioned in DPE OM No. 05/0003/2019-FTS-10937 dated 14-12-2022 as amended from time to time.		
47	Applicable Laws and jurisdiction of Courts		
	This contract shall be governed by the Law for the time being in force in the Republic of India. Subject to clause 46 of this contract, the Civil Court having original Civil Jurisdiction at Hyderabad, shall alone have exclusive jurisdiction in regard to all matters in respect of the Contract.”		
48	BHEL-Fraud prevention policy shall be adhered to.		
	The Bidder along with its associate/ Collaborators/ Sub-contractors/ sub-bidders/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention policy displayed on BHEL Website http://www.bhel.com and shall immediately bring to the notice of BHEL management about any fraud or suspected fraud as soon as it comes to their notice. List of nodal officers is hosted on BHEL Hyderabad website https://hpep.bhel.com/.		
49	Suspected Cartel Formation		
	The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case , the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies / guidelines .		
50	Treatment of cases regarding conflict of interest: The bidder notes that a conflict of interest would said to have occurred in the tender process and execution of the resultant contract, in case of any of the following situations: i) If its personnel have a close personal, financial, or business relationship with any personnel of BHEL who are directly or indirectly related to the procurement or execution process of the contract, which can affect the decision of BHEL directly or indirectly; ii) The bidder (or his allied firm) provided services for the need assessment/procurement planning of the Tender process in which it is participating; iii) Procurement of goods directly from the manufacturers/ suppliers shall be preferred. However, if the OEM/ Principal insists on engaging the services of an agent, such agent shall not be allowed to represent more than one manufacturer/ supplier in the same tender. Moreover, either the agent could bid on behalf of the manufacturer/ supplier or the manufacturer/ supplier could bid directly but not both. In case bids are received from both the manufacturer/supplier and the agent, bid received from the agent shall be ignored. However, this shall not debar more than one Authorized distributor (with/ or without the OEM) from quoting equipment manufactured by an Original Equipment Manufacturer (OEM) in procurements under a Proprietary Article Certificate. iv) A bidder participates in more than one bid in this tender process. Participation in any capacity by a Bidder (including the participation of a Bidder as a partner/ JV member or sub-contractor in another bid or vice-versa) in more than one bid shall result in the disqualification of all bids in which he is a party. However, this does not limit the participation of an entity as a subcontractor in more than one bid if he is not bidding independently in his own name or as a member of a JV. The Bidder declares that they have read and understood the above aspects, and the bidder confirms that such conflict of interest does not exist and undertakes that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s), in this regard. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case, the Bidder is found having indulged in above activities, the same will be considered as a violation of the tender conditions, and suitable action shall be taken by BHEL as per extant policies/guidelines.		
51	Escalation Matrix		
	Details	Name	Contact Number
	Authorised representative		
	Technical In-charge		
	Finance and Taxation		
	Escalation for above		



52	Grievance Redressal Mechanism
	To promote transparency and ensure fair treatment of all bidders, a structured Grievance Redressal Mechanism is in place to address any concerns or issues arising during the tendering process or in subsequent business dealings with the company. Suppliers/Contractors are requested to follow the below escalation process for grievance resolution: 1. First Level: Any grievance should initially be addressed to the designated Dealing Officer, whose contact details are provided in the Notice Inviting Tender (NIT)/Contract. 2. Second Level: If the issue remains unresolved, it may be escalated by lodging a formal grievance through the SUVIDHA Portal: https://suvidha.bhel.in/suvidha/. Responses will be provided in accordance with the defined escalation matrix.”

Note: Purchase officer has to fill Annexure-I while sending enquiry

Annexure-I				
Major Activity timelines shall be considered for indigenous purchases				
S No	Activity	Agency	Timeline	Acceptance / Remarks
1	PO acknowledgement	Vendor	04 days from the date of receipt of PO	
2	First submission of Drawings, Data sheets and QP Rev-00	Vendor	15 days from receipt of PO	
3	commented / approved drawings / data sheets and QP to vendor	BHEL/Customer	07 days from the receipt of Rev-00 submission.	
4	Subsequent submission of revised drawings / data sheets and QP	Vendor	07 days from the receipt of commented drawings / data sheets and QP	
5	Subsequent Approved /commented Drawings and QP to vendor	BHEL/Customer	07 days from the date of receipt of revised drawings / data sheets and QAP.	
6	Raising of Inspection Call	Vendor	07 days before the proposing inspection date. (BHEL will provide approved QP before raising inspection call)	
7	Inspection completion	BHEL Third party inspection agency / Customer	07 days from inspection call date.	
8	Despatch Instructions	BHEL	07 days from the date of receipt of final approved inspection report to BHEL.	
9	Receipt of Material at BHEL stores/ site	Vendor	15 days from Despatch instructions	

Absence of this annexure in NIT will entail non processing of delivery extension cases in case of delay in supplies of goods owing to reason attributable to BHEL.

Vendor's Signature

Annexure - III

Proforma for self-certification by Supplier for minimum local content on their letter head for tender value less than Rs 10 Crore

"We _____ (Name of Manufacturer) undertake that we meet the mandatory minimum Local Content (LC) requirement i.e. _____ (to be filled as notified in the policy) for claiming Purchase Preference linked with Local Contents under the Govt. policy against tender no. _____."

Auditor's certification with respect to minimum local content on the letter head of Statutory Auditor for tender value above Rs.10 crore

"We _____ the statutory auditor of M/s _____ (name of the bidder) hereby certify that M/s _____ (name of manufacturer) meet the mandatory Local Content requirements of the Goods and/or Services i.e. _____ (to be filled as notified in the policy) quoted vide offer No. _____ dated _____ against BHEL's tender No. _____ by M/s _____ (Name of the bidder)."



ANNEXURE IV

Proforma for self-certification by Supplier for Compliance to below Clause

Clause: Any Bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with competent authority. <https://www.mea.gov.in/> to be referred for latest details of competent authority and exemptions.

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and I certify that M/s _____ **(Name of firm)**

(Tick the Appropriate)

☐ **Is not from such a country**

☐ **Is from such a country and has been duly registered with the Competent**

authority. (If, Yes Please enclose the Approval obtained from Competent Authority)

I hereby certify M/s _____ **(Name of firm)** fulfills all requirements in this regard and is eligible to be considered (where applicable, valid registration by the competent authority shall be attached)

Sd/-
Authorized Signatory with Stamp



This is a mandatory document to be filled and attached to your technical bid for evaluation
(Otherwise your bid will be disqualified)

Special Contractual Conditions to the enquiry Ref : _____, Dt: _____.

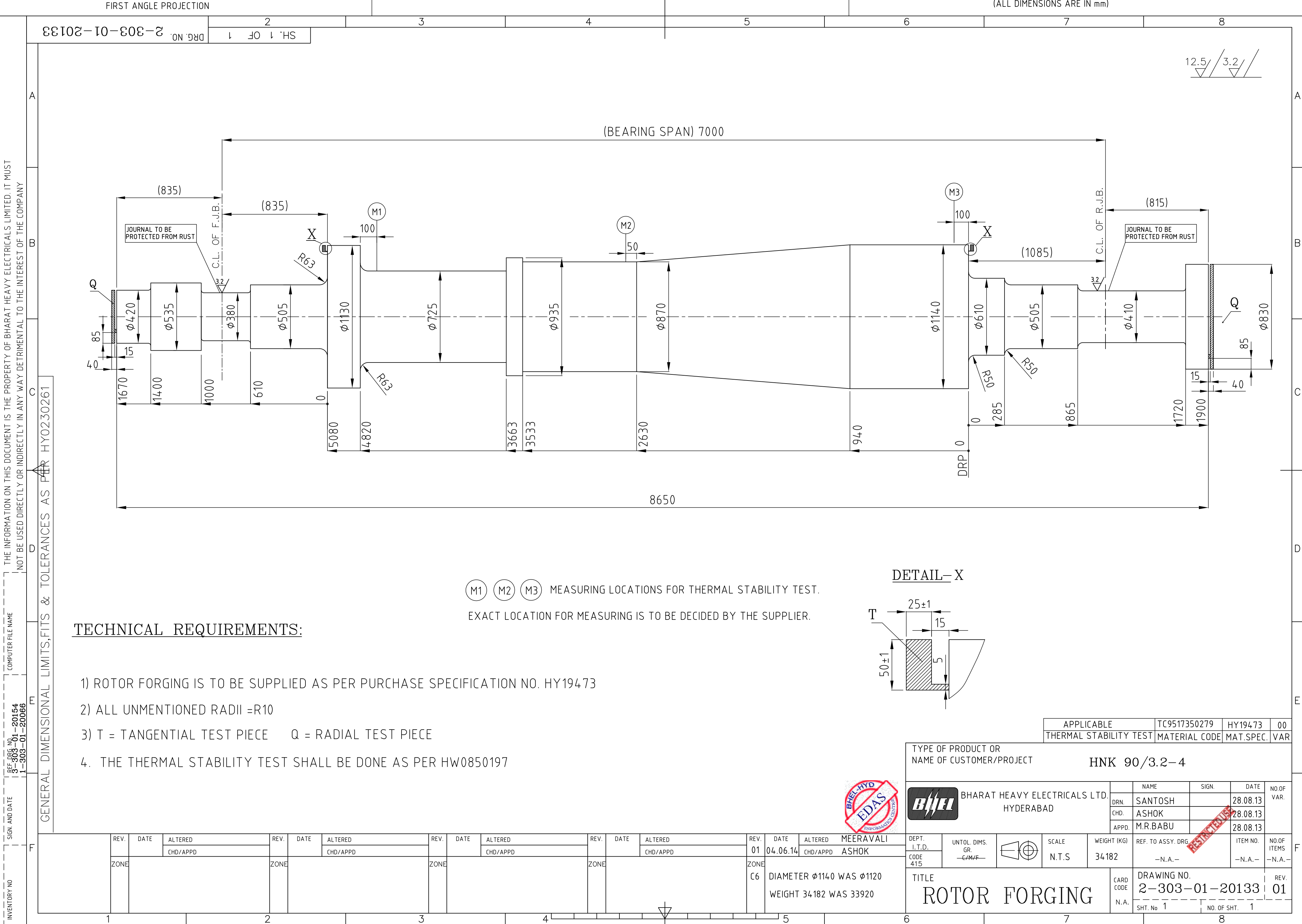
Sl. No.	BHEL Standard Terms & Conditions	Supplier confirmation	Comments / Remarks
1	Packing, Forwarding, Freight & Insurance Packing & forwarded charges shall be included in Quoted Price. Freight & Insurance to be included in the quoted price.		
2.	Guarantee: As specified in the BHEL specifications and ITB enclosed to this enquiry.		
3.	Third Party Inspection (For indigenous vendors Only): In addition to the Manufacturers Inspection and any other statutory inspection agency as specified in Enquiry/Specs or ITB, the material shall be offered for pre-inspection of BHEL's Third Party Inspection Agency. The fees for TPI will be paid by BHEL. Vendor shall send inspection request to inspection agency at least 15 days in advance to the readiness of material for inspection to maintain the mutually agreed delivery schedules. The item shall be inspected by one of the following agencies:- i) BHEL ii) TPI		
4.	Terms of Delivery: (For Indigenous vendors only) The items are to be quoted on FOR DESTINATION basis. Destination : BHEL, RC Puram, 502032		
5.	Delivery period: For items to be delivered at BHEL RC Puram, Required delivery in 180 days from the date of PO.		
6.	BHEL SPECIFICATIONS: Vendor shall confirm total compliance to BHEL specifications mentioned against each item of the enquiry. Deviations if any shall be brought out in their technical offer. Otherwise, it will be presumed that offered items will be in compliance to specs mentioned in the enquiry.		
7.	Offers of the bidders with unsatisfactory past performance will be rejected.		

8.	Confirmation to BHEL ITB		
9.	Penalty clause: In the event of delay in supply /part-supply of goods, Penalty as detailed below is leviable a. Penalty of 0.5% per week or part there of shall be levied, limited to a max of 10% (ten percent) of order value. b. Penalty applicable for delay in documentation. c. Date Reckoned for Penalty: C Note date. d. In case of Deviation to above Penalty clause, loading applicable to the extent to which not agreed by Bidder. e. Timelines as mentioned in the Annexure 1 will be considered for reckoning delivery. Penalty amount so determined along with applicable GST (for Indigenous orders) thereon shall be recovered. Imposition, recovery or settlement of this penalty shall not affect BHEL's right to performance, compensation and termination of the order.		
10.	In the event and to the extent of any inconsistency between two or more documents which form part of this enquiry, those documents will be interpreted in the following order of priority: i. Enquiry ii. SCC iii. ITB iv. Vendor quotation		

SIGNATURE

DATE

SEAL



PRE-QUALIFYING CRITERIA FOR PROCUREMENT OF ST ROTOR FORGING:

Enquiry No.

Scope of supply:

Supply of steam turbine rotor forging shall be as per the following applicable documents.

- a) Rotor Forging as per drawing no. mentioned in the enquiry.
- b) Weight / size of rotor forging (in rough machined condition as per above Drawing No.)
- c) Material specification HY19473 Rev. 04
- d) Manufacturing and Inspection sequencing plan standard: HY 0652099, Rev. 00
- e) Supply condition as per HY19473 Rev 04 & Ordering drawing
- f) Applicable NDT standard: AA0850106, Rev. 01
- g) Mechanical test standard: ASTM A 370 or any equivalent National or International standard (latest version)
- h) Residual Stress Measurement standard: AA0850150 Rev 00
- i) Thermal Stability Test standard: AA0850151 Rev 02 or AA0850152 Rev 00
- j) QA plan Ref: BHEL/HY19473 Rev. 04 (with additional tests as per this PQC)

Pre-Qualification Criteria is as follows:

A. Manufacturing and Test Facilities:

Vendor shall have following in-house manufacturing & testing facilities for the manufacture of turbine rotor forgings, as a minimum requirement,

- a) Steel melting including refining facility.
- b) Forging press with required capacity
- c) Vertical heat treatment facility for rotor (Indicating max dia & length)
- d) Testing Facilities like Mechanical, UT, MPI, etc.

In addition to above in-house facilities, vendor shall also have the following facilities like Thermal stability facility at temperature $\geq 660^{\circ}\text{C}$, Axial core trepanning facility & Machining as per enquiry drawing and specification. (These processes can be outsourced to competent agencies and details of their facility at outsourced agencies to be submitted).

Vendor has to submit filled annexure 1 for in house manufacturing and testing facilities.

B. Manufacturing Experience:

B.1 Vendor must have supplied minimum three rotor forgings for Steam Turbines applications and is to be furnished in the format given below.

Sl.NO	Purchase order number /customer details	Material Grade	Dimension: diameter (max) & length	Delivered weight	Year of supply
1					
2					
3					

The above data is required to ascertain the steel melting and forging capability of the vendor.

Note: Evidence of the dispatched rotors of above forgings (preferably Material Test Certificate copies) shall be submitted.

B.2 Experience for supply of minimum 3 Rotor forgings for same or higher weights of **high temperature applications of Creep resistant material grades** and are suitable for Steam Turbine applications shall be furnished in the format given below:

Sl.NO	Purchase order number /customer details	Material grade	Dimension: diameter (max) & length	Delivered weight	Year of supply
1					
2					
3					

The above data is required to ascertain the Heat treatment (Vertical) capability of the vendor.

Note: Evidence of the dispatched rotors of above forgings (preferably Material Test Certificates copies) shall be submitted.

C. Vendor to confirm supply shall be as per BHEL enquiry drawing and specification and all cross-referred documents referred there in. Pointwise confirmation to BHEL specification shall be provided.

Annexure 1

Vendor to submit details of manufacturing and testing facilities as per format below:

STEEL MELTING FACILITIES:

Melting furnaces details (type, capacity etc.)	
Refining facility details (vacuum degassing, ESR, etc)	
Maximum ingot size • Diameter [mm] • Length [mm] • Weight [mm]	

FORGING FACILITY:

Press capacity in KN	
Max. forging weight in MT	
Manipulator Capacity	
Remarks:	

Heat treatment facilities

1. Availability of vertical heat treatment facility for heat treatment of rotor	
2. Maximum diameter, length and weight of shaft which can be vertically heat treated	
3. Quenching type & medium	

Testing facilities:

1. Chemical analysis , tensile testing, impact, micro-examination etc.	
2. NDT facilities- UT,MPI, boroscopic, residual stress measurement etc	

Machining facilities:

Facility for axial core trepanning 1. minimum & maximum diameter of the core which can be trepanned 2. maximum length of axial core that can be trepanned	
Surface finish of axial bore (Specify achievable value)	
Concentricity, cylindricity and parallelity to achieve drawing requirements.	

Heat stability testing facilities

Max. diameter of forging Max. length of forging Max. weight of forging Max. testing temperature	
--	--

Note: The manufacturer shall submit the above information in English with relevant evidences, duly signed and company stamped.

This document shall be provided by the manufacturer only. Documents with the sign and stamp of marketing agent's/representatives companies is not acceptable.

(Sign and seal of Manufacturer)

		TD219 Rev.00	PLANT PURCHASING SPECIFICATION HYDERABAD		HY 194 73
					REV. NO. 04
					PAGE 1 OF 7
ALLOY STEEL FORGINGS FOR STEAM TURBINE ROTORS					
GR: 30 Cr Mo Ni V 511 (Material No.1.6946)					
1.0	GENERAL:				
	This specification governs the technical requirements of steam turbine rotors forged out of steel grade 30 Cr Mo Ni V 511.				
2.0	APPLICATION:				
	Steam turbine rotors having diameters up to 1500 mm				
3.0	CONDITION OF DELIVERY:				
	The rotor forgings shall be supplied in vertically heat treated and rough machined condition.				
4.0	DIMENSIONS AND TOLERANCES:				
	The rotor forgings shall be supplied to the dimensions shown on the ordering drawing. The tolerance shall be as follows unless otherwise specified in the drawing/order.				
	Upto 500 mm : + 1 mm				
	Over 500 mm : + 2 mm				
5.0	MANUFACTURE :				
5.1	The steel shall be made from basic electric furnace and shall be subsequently refined by Vacuum Carbon Deoxidation (VCD) or Electro Slag refining (ESR) process.				
5.2	Sufficient discard from Top and Bottom shall be made from the ingot to ensure freedom from piping, segregation and other injurious defects.				
5.3	The forging process adopted shall ensure homogeneity of material throughout the section.				
5.4	It is important to maintain the actual centre of the forging, as far as possible identical with the center of the ingot.				
5.5	Press straightening, if necessary, may be performed before heat-treatment.				
5.6	The material as per this specification shall be supplied by the manufacturers who are having complete in-house steel melting, refining, hot rolling/forging/blooming/etc., heat treatment and testing facilities.				
Revisions: Modified Cl. No. 6 (Added note for permitting Cr content upto 2.00% max. for forgings of 1400-1500mm Diameter)			Issued : STANDARDS ENGINEERING & IPR COORDINATION DEPARTMENT		
Rev. No. 04	Amd. No.	Reaffirmed:	Prepared:	Approved:	Dt.of 1 st Issue
Dt. APR. 2014	Dt.	Year : 2021	MALTS. ENGG.	AGM(E&CC)	SEP . 1993

HY 194 73	PLANT PURCHASING SPECIFICATION HYDERABAD	TD219 Rev.00	
REV. NO. 04			
PAGE 2 OF 7			

5.7 CLOCKING SYMBOL :

Before heat-treatment, clocking symbols 3-6-9-12 shall be stamped on the rotor. If the symbols are transferred during manufacture, they shall be re-stamped in the same clock wise position. The clocking symbols shall be used for reference purposes in recording the position of defects, etc. The clocking symbols shall be encircled with oil paint for easy identification.

5.8 After heat-treatment, the forging shall be rough machined to the dimensions and surface finish shown on the ordering drawing.

5.9 If the manufacturer has not supplied the forgings as per the ordering drawing in the past, a new Manufacturing and Inspection Sequencing plan (MIP) in accordance to the specification HY 0652099 of BHEL Hyderabad shall be submitted for review & approved by BHEL. Same can be used till there are no changes in the manufacturing process and the facilities used for the manufacture of the forging.

6.0 CHEMICAL COMPOSITION:

The chemical composition of the material shall be as follows:

Element		C	Si	Mn	Cr*	Mo	Ni	V	P	S	Al (Total)
VCD Process	Min.	0.27	-	0.30	1.10	1.00	0.50	0.25	-	-	-
	Max.	0.31	0.10	0.80	1.40	1.20	0.75	0.35	0.007	0.007	0.008
ESR process	Min	0.27	-	0.30	1.10	1.00	0.50	0.25	-	-	-
	Max	0.31	0.20	0.80	1.40	1.20	0.75	0.35	0.007	0.005	0.010

*** Note:** For rotor forgings from 1400-1500 mm diameter, Cr content upto 2.00 % maximum is permitted.

Tramp Elements: The tramp elements shall be within following limits.

Cu = 0.12 max. ; As = 0.02 max.; Sb = 0.02 max. ; Sn = 0.015 max.

Small deviations in chemical composition are permissible only after approval from BHEL, provided that the specified properties are not impaired.

7.0 HEAT TREATMENT:

7.1 The rotor forging shall be heat treated vertically followed by oil or mist quenching. The heat treatment shall be done to obtain tempered upper bainitic structure uniformly through-out the cross section free of ferrite in the centre. The hardening temperature shall be between 940°C and 960°C but 950°C shall be the target. The tempering cycle shall be selected suitable to achieve the 0.2 % yield strength with the possible toughness and minimum residual stresses in the forging. It shall between 690 °C and 710°C.

At the option of the manufacturer, the rotor forgings may be suitably stress relieved (in vertical condition only) so as to achieve the residual stresses within the limits specified in Cl. 8.0.

Actual heat treatment cycles followed shall be reported in test certificate.

7.2 In case the required properties have not been obtained, reheat-treatment of the forging is to be carried out. The maximum number of reheat-treatment permitted is two. However, re-tempering is not considered as reheat treatment.

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			REV. NO. 04
			PAGE 3 OF 7

8.0 RESIDUAL STRESS MEASUREMENT:

8.1 The residual stress measurement shall be carried out as per BHEL Corporate Standard AA0850150. In lieu of BHEL standard AA0850150, residual stress measurement may be carried out by ‘Blind hole method’ as per ASTM E 837. However, all the other conditions of AA0850150 such as location of tests, acceptance criteria etc. remain same.

8.2 Additionally, for the rotors having barrel diameter up to 500 mm & length up to 1700 mm, Residual stress measurement by Ring cutting method is also acceptable. However, the rings shall be cut from T1 & T2 locations specified on the ordering drawing. The residual stresses shall not be more than 45 N/mm². The procedure for carrying out RSM by ring cutting method shall be submitted by the vendor for approval by BHEL Hyderabad.

9.0 SELECTON OF TEST SAMPLES:

9.1 The location of the test pieces shall be shown on the ordering drawing. The test samples shall not be removed before heat treatment of the rotor forging. However the method of removal of the test pieces is left to the discretion of the supplier.

9.2 The test samples shall be identified according to the locations specified in the ordering drawing. The test shall be carried out on the above identified samples and the balance test pieces (duly identified) shall be sent to BHEL for further testing.

10.0 MECHANICAL PROPERTIES:

10.1 The mechanical properties, when tested on the tangential or radial test pieces shall conform to the following at room temperature.

Tensile Strength N/mm² Max.	0.2% proof Stress N/mm²	% Elongation L=5d Min.	% Reduction in area Min.	Impact Strength J Min.
850	550 - 700	15	40	24

10.2 Axial core testing: If specified on the ordering drawing, axial trepanned core shall be tested in accordance with the standard AA0850155 and the following properties shall be obtained on the samples taken in radial direction.

0.2% Proof Stress : 530 N/mm² min.

Impact Strength : 55 J min. at +80° C
(Average of 3 samples)
ISO-V notch

FATT : ≤ +80° C,

T: Tangential Test piece, Q: Radial test piece.

The axial core shall be clearly marked, so that its original position can be easily identified with respect to the shaft. The stamp of the manufacturer’s authorized inspector close to the identification number shall confirm traceability of the trepanned core to the forging.

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Note: a) Tensile test shall be carried out as per IS: 1608 or any National Standard.

b) Impact test shall be carried out as per IS: 1757 ISO-V notch or any National standard. The minimum impact strength value specified above is the average of three samples at the same location. Only one value is permitted below the specified min. value, but in no case shall be lower than the 2/3 of the same. All values shall be reported in test certificate.

11.0 NON-DESTRUCTIVE TESTS:

11.1 Ultrasonic Test:

Ultrasonic test and evaluation shall be carried out as per BHEL Corporate Standard AA0850106.

11.2 Magnetic particle test:

Magnetic particle test and evaluation shall be carried out as per BHEL Corporate Standard AA0850106.

12.0 METALLOGRAPHIC TEST:

Metallographic test shall be conducted on samples taken from broken tensile test pieces. The photo micrographs at 500X shall show tempered upper bainitic structure and the photomicrograph (original) shall be submitted to BHEL along with test certificates.

13.0 THERMAL STABILITY TEST:

If specified in the ordering drawing, thermal stability shall be carried out according to BHEL Standard AA0850152.

14.0 FIRST PIECE QUALIFICATION TESTS:

Whenever the supplies are made for the first time to BHEL, the requirements of BHEL specification HY0800099 shall also be applicable in addition to this specification.

15.0 INSPECTION AT SUPPLIER’S WORKS:

BHEL representative shall have all reasonable facilities offered to him, at any time, by the supplier to satisfy himself that the material is being furnished in accordance with this specification. The representative shall have free access at all times while the work on the contract is being performed, to all parts of the manufactures works.

16.0 QUALITY PLAN:

16.1 Vendor shall follow the Quality Plan Ref. BHEL/QP/HY19473 Rev.04 attached as Annexure ‘A’ unless conditions stipulated in Cl.16.2 & 16.3 are applicable.

16.2 In case Customer / Project related additional requirements are applicable in the enquiry / tender, vendor may be asked to submit a separate QP including such requirements.

16.3 In case of new vendors or first time supplies according to drawings mentioned in BHEL enquiry, a separate QP shall be submitted for approval by BHEL.

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17.0 TEST CERTIFICATE:

17.1 Five copies of test certificates (in English) giving the following details shall be furnished.

- a) HY 19473 Rev .04
- b) BHEL Order No.
- c) Item Description and Drawing No. of the forging.
- d) Supplier's Name.
- e) Melt No. and Forge No. (Steel making & refining processes)
- f) Results of chemical analysis alongwith trace elements.
- g) Results of Mechanical Tests & FATT (if applicable)
- h) Results of residual stresses.
- i) Report of ultrasonic testing giving details of probe type and size, frequency, sensitivity, sketch showing the areas covered etc.
- j) Report of Metallographic test alongwith microphotographs (original).
- k) Actual Heat treatment charts
- l) Results of thermal stability test, if called for in the drawing/purchase order.
- m) Report magnetic particle inspection.
- n) Copy of approved MIP duly attested by BHEL Hyderabad.

17.2 The certificate shall be attested by chief of inspection/chief metallurgist of the supplier and BHEL representative.

18.0 MARKING:

The following details shall be punched clearly on one end of the forging.

- a) HY 19473 Rev.04
- b) Forging No. and Melt No.
- c) Drawing NO.
- d) Manufacturer's Stamp.
- e) BHEL Inspector's stamp
- f) Clocking symbols.
- g) Top and Bottom sides of ingot.

19.0 PACKING AND TRANSPORTATION:

Rotor forgings shall be properly protected from corrosion and damage during transit, journal portions shall be protected with anti-corrosive compound.

20.0 REJECTION AND REPLACEMENT:

In the event of any forging proving defective in machining, testing erection and operation such forging shall be rejected notwithstanding any previous acceptance. The supplier shall replace the rejected forging at his own cost.

ANNEXURE A (as per clause 16.0)									HY19473REV.04 PAGE 6 OF 7			
Vendor's Name & Address				Customer:			BHEL ENQ. NO.		QP No. BHEL/HY19473 Rev.04			
				Project:			Date:		Page: 1 of 2			
				Product:			BHEL Spec. HY19473 Rev.04					
Sl. No.	Component Operation	Characteristics	Class	Type of Check	Quantum	Reference Document	Acceptance Norms	Format of records	AGENCY			Remarks
									P	W	V	
1.	Melting	Chemical composition	Critical	Chemical	100%	Vendors standard	HY19473Rev.04	TC	2	-	1	Steel melting & refining process shall be specified in TC
2.	Forging	Forging Steps	Major	Visual	100%	-do-	BHEL approved MIP	TC	2	-	1	Overall reduction ratio shall be mentioned in TC
3.	Preliminary Heat Treatment	Time Temp. Control	Major	Measure	100%	-do-	-do-	Internal Record	2	-	1	
4.	Marking of Clocking Symbols		Major		100%	BHEL Drawing & Spec.	BHEL Drawing & Spec.		2	1	-	
5.	Quality Heat Treatment (in vertical condition)	Time Temp. Control	Major	Measure	100%	BHEL Drawing & Spec.	BHEL Drawing & Spec.	TC	2	-	1	
6.	Ultrasonic test & Magnetic particle test	Ultrasonic test & Magnetic particle test	Major	Internal Defects	Whole volume/ surface of the forging	BHEL Drawing & Spec.	BHEL Drawing & Spec.	TC	2	1	-	
7.	Residual Stress Measurement	Residual Stress Testing	Major	Internal stresses	Each rotor	BHEL Drawing & Spec.	BHEL Drawing & Spec.	TC	2	1	-	
8.	Sampling for Mechanical Testing		Major		As per drg.	BHEL Drawing & Spec.	BHEL Drawing & Spec.		2	1	-	
9.	Mechanical Testing & Metallography	Tensile test Impact test Microstructure	Major	Mechanical & Metallography	Each rotor	BHEL Drawing & Spec.	BHEL Drawing & Spec.	TC	2	1	-	
10.	Trepanning of Axial core		Major			BHEL Drawing & Spec.	BHEL Drawing & Spec.		2	-	-	If specified on the ordering drg.
11.	Axial Mechanical Test	Tensile test Impact test , FATT & Microstructure	Major	Core properties	As per drg. & BHEL Spec	BHEL Drawing & Spec.	BHEL Drawing & Spec.	TC	2	1	-	If specified on the ordering drg.

ANNEXURE A (as per clause 16.0)									HY19473 REV.04 PAGE 7 OF 7			
Vendor's Name & Address				Customer:			BHEL ENQ. NO.		QP No. BHEL/HY19473 Rev.04			
				Project:			Date:		Page: 2 of 2			
				Product:			BHEL Spec. HY19473 Rev.04					
Sl. No.	Component Operation	Characteristics	Class	Type of Check	Quantum	Reference Document	Acceptance Norms	Format of Records	AGENCY			Remarks
									P	W	V	
12.	Thermal stability test	Dimensions	Major	Heat stability of rotor	Each rotor as per drg.	BHEL Drawing & Spec.	BHEL Drawing & Spec.	TC	2	-	1	If specified on the ordering drg.
13.	Boroscopic & MPI of Axial Bore	Boroscopic & Magnetic particle test	Major	Boroscopic & MPI	100%	BHEL Drawing & Spec.	BHEL Drawing & Spec.	TC	2	1	-	If axial bore test specified on the drg.
14.	Plugging of Axial Bore			Visual check	Each rotor	BHEL Drawing & spec.	BHEL Drawing & Spec.		2	-	-	If axial bore test specified on the drg.
15.	Finish Machining	Dimensions	Major	Measure	100%	Drawing	Drawing	TC	2	1	-	
16.	Completeness of documents, test certificates, HT charts etc.		Major	Verification	Each rotor	BHEL Drawing & spec.	BHEL Drawing & Spec.	Endorsement by TPIA on all documents	2	-	1	
17.	Marking preservation & Packing	Marking Preservation & packing	Major	Visual check	100%	BHEL drawing & spec.	BHEL drawing & spec.		2	-	1	

Legend: P Perform ;W Witness ;V Verification ; Indicate 1 for BHEL or BHEL nominated inspection agency & 2 for vendor / sub vendor as appropriate against each component / characteristic under P, W & V columns.

Signature of the supplier with Company Stamp
(To be submitted along with the technical offer)



CORPORATE STANDARD

AA 085 0106

Rev. No. 01

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Non Destructive Examination of Turbine & Generator Shafts

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DGM/ MTE, HEEP , Haridwar.

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**1 General****1.1 Scope of Application**

This test procedure is applicable for the manual ultrasonic examination and surface crack examination (MT) of free forgings for turbine and generator shafts by the supplier. It may also be used up to the preparation of a specific test instruction for automated UT-Examination for such examinations.

It determines the conditions for UT-examination of forging items after machining in as simple as possible contour condition with body surfaces parallel to the axis. The last heat treatment, which determines the mechanical properties must already have been done. If a retempering is needed, then it must be tested by UT for minimum all recordable indications to 100%. All surface examinations must be repeated. The user must first create an equipment-specific procedure before the test equipment is qualified by both the user and BHEL. The test procedure must be approved by BHEL.

1.2 Purpose of Examination

The purpose of examination is to check as much as possible of the volume of the shaft under consideration of geometry and labour consumption for flaws resulting from the manufacturing process. It is aimed at finding flaws through to the core area of the shaft with highest detection sensitivity (see para 9 "recording- and decision criteria"). Furthermore cross-section transitions and the axial boring of the shafts are to be checked for surface crack examination (MT).

1.3 Certificate of Examiners

The forgings have to be tested by experienced and level II certified NDT-personnel (UT/MT) according to EN 473 or ASNT SNT-TC-1A. A current list of certified NDT-personnel according to the required certification shall be sent to BHEL.

2 Applicable Standards

SEP 1923, EN 12223, EN 27963, EN 10204, EN 10 228-1, EN 12668-1

3 Preparation of Forging

The examination surface of the forging shall be according to order drawing ($R_a < 20 \mu m$), in order to get a coupling of probes on the shaft which is as perfect as possible.

4 Testing of UT Equipment**4.1 UT-Instrument**

UT instrument deployed for this examination shall be in accordance with the relevant standards and rules (DIN 54 126). They shall be of impulse-echo type and with the aid of a gain controller, adjustable in decibel (dB), measurements of echo relationship shall be rendered possible with ≤ 1 dB accuracy. In the working range of the applied equipment sensitivity the amplifier shall have no threshold and shall show no saturation. The testing ranges shall overlap, whereby the time base shall be linear adjustable with an accuracy of $< 2\%$ of testing range.



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A regular inspection and maintenance of the instruments at least once a year must be proved.

4.2 Probes

The testing probes will generally be used with straight-longitudinal waves (e.g. B2S, B4S, B5S, SEB4H0) and angle-transversal waves (e.g. WB4 5-2N, and WB70-2N), therefore the selection of probes conforms to the geometrical conditions of the shaft.

In the application of the probes it must be taken into consideration that probes shall be adapted to the contour of the surface of the shaft in sound direction or small probes shall be used. This is always the case, when the curvature of the surface of the shaft is $R \leq A^2 / 4$. Therefore A is the length of the coupling area of the probe in bend direction.

4.3 Check of Testing Equipment

For equipment calibration and for control of equipment function and probes calibration blocks 1 and 2 according to EN 12223 and EN 27963 or other calibration blocks shall be available.

4.4 Calibration of Testing Instrument

The calibration of the time base range shall be done with the aid of calibration blocks according to EN 12223 or EN 27963 respectively or on the test piece, where at least two reference echo's with known sound paths shall be used.

4.5 Couplant

The couplant shall wet the surface of the shaft enough to ensure a perfect coupling on the test surface. The applied couplant must not cause any corrosive damage.

5 Test Planning

The identification number must be stamped on the face of the shaft end according to the order drawing. The marking field must be placed in the original position of the shaft after any subsequent machining. In the delivery condition of the shaft the marking shall be framed with oil paint. The correctness of the identification shall be certified by the responsible factory quality representative by hard stamping of his sign in the identification area.

Before inspection, the inspector must use the relevant drawings of the shaft to find out the position of the axial bore holes which will be drilled later, as well as the geometrical contour, dimensions etc. In addition, the inside area / volume of the area for the axial bore holes must be checked by UT before drilling. The order drawing gives a reference base groove area for axial 0-point to be used during ultrasonic testing. The reference point is the position on the face of the shaft end as shown in the drawing. There must be a stamp field on the face of the shaft before the test start. However, at this point of test, the groove should not have been machined. After machining the groove area on the shaft, the marking field must be transferred to the identical circumferential position. In addition, if a reference bore needs to be drilled according to the drawing, then it must be transferred as a reference point in the identical circumferential position. The excess length during the ultrasonic test must also be tested.

Indications from detection limit in the bore hole volume must be recorded.



It should be possible to turn the shaft during the examination. In case of recordable indications, the shaft must be rotatable.

6 Execution of Examination

6.1 Scope of Examination

Sound directions (according to SEP 1923) have to be applied as follows:

A5 Sound attenuation measurement according to SEP 1923 in radial direction over the whole length of the shaft, therefore the axial distance between two measurement points should not be more than 1000 mm. In the case of the attenuation measurement, irregularities which require further investigations can occur. For example, can probe- and/or material dependent attenuation values be identical and/or lower with the higher frequency (e.g. 5 MHz) as with the lower frequency (e.g. 4 MHz). In such cases possibly further investigations of the frequency spectrums of the probes must be carried out. Narrow-band probes whose center frequency fits as close to the nominal frequency should be used. This should if possible be engaged by a probe particular frequency analysis. The Specimen number of the used probes is to be recorded in the UT record.

A3 Examination of the total surface of the shaft in radial direction with the probe B2S. Exceptionally the probe B4S with the 4 MHz - frequency may be used, when spurious echo's (phantom echo's) or insufficient detection sensitivity limit (> 1 mm FBH) occurs by using the probe B2S.

A4 Examination in axial direction from all face areas and sections with the probes B2S and B4S. The maximum beam path for the detection sensitivity limit of 3,0 mm FBH (flat bottom hole) in the direction A4 is to be reported.

A7 Examination of the total circumferential surface of the shaft in both circumference direction (cw and ccw) with angles of incidence of 7° , 14° and 21° for the probe B2S. In case of spurious echo's (phantom echo's), the probe B4S with corresponding angles of incidence of 3.5° , 7° , 10.5° , 14° , 17.5° , 21° and 24.5° is to be taken into consideration for this circumferential direction (A7). From experience it is known that with the application of B2S-probe spurious echo's occur only by the angles of incidence of 0° to 14° .

A7 Examination of the total circumferential surface of the shaft in both circumference direction with an angle of incidence of 45° (WB45-2 N).

A8 Examination of the body in near-surface range up to a depth of about 150 mm (for generator shafts up to 250mm depth because of the coil slots) in axial direction with an angle of incidence of 70° (WB70-2N).

A9 Examination of body in near- surface range up to a depth of about 150 mm in radial direction with the probe SEB4H0° in case the detection sensitivity limit in the volume range near the back wall echo will not be ≤ 1 mm FBH when tested in radial direction (A3).

The prescribed directions of incidence are presented in **Figure 1**.

The above mentioned sound directions are valid for shafts with parallel surfaces in axial direction only.



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Examination of cross-section transitions:

The cross-section transitions in the meaning of this procedure are areas where the diameters differ at quality heat treatment $\geq 200\text{mm}$.

All cross-section transitions are to be tested to 100% from the accessible surface in radial-axial direction (A8) with angles of incidence of 70° (WB7 0-2N) according to **figure 2**. It is sufficient to test the volume up to the middle of the shaft from one side only. There is no need of this examination, if the detection limit is verified $\leq 3\text{ mm FBH}$ from the axial direction (A4) for the corresponding crossing.

6.2 Speed of Testing

For visual screen monitoring the testing speed shall not exceed 100 mm/s .

7 Special Features due to the Applied Examination Technique

7.1 Plexiglas-Adapter- Wedges

For acoustic incidence of longitudinal waves in radial-tangential sound direction according to the above mentioned angles plexiglas adapter-wedges may be used. The resulting occurrence of loss of sound energy may reduce the detection sensitivity limit. To minimize losses and disturbing spurious echo's it is taken care that the thickness of plexiglas-adapter- wedges between transducer and testing surface shall be as small as possible.

According to experience loss of sound energy of 4 dB arises by plexiglas-adapter- wedges with 5 mm thickness and 0° -angle of incidence. It is important that all other used plexiglas-adapter wedges shall have the same thickness.

8 Description of Indications

Indications from defects inside the material must be characterized by their echo height and shape, by their dynamic characteristics and if necessary by their frequency dependence. Furthermore, indications in connection with back wall echo drop $\geq 3\text{ dB}$ are to be recorded as well as the detection sensitivity limit for the largest sound path.

8.1 Flaw Echo Height

The evaluation of indications on the basis of their echo amplitude will be done according to the AVG (DGS)-method, whereby the equivalent reflector size should be recorded as equivalent flat bottom hole (FBH) in mm.

8.2 Flaw Echo Shape

The indications are characterized according to the following echo shapes:

single echo (in German <u>E</u> inzele <u>e</u> cho)	EE
many single echo's (in German <u>v</u> iele <u>E</u> inzele <u>e</u> chos)	VE
group echo resolvable (in German <u>G</u> ruppene <u>e</u> cho <u>a</u> uflösbar)	GA
group echo not resolvable (in German <u>G</u> ruppene <u>e</u> cho <u>n</u> icht auflösbar)	GN
<u>r</u> ing <u>z</u> one	RZ
<u>g</u> ross (structural indications)	GR



The max. FBH-size in an area of group indications (GA's and GN's) must be always determined by using the max. echo peak.

The screen patterns of the relevant echo shapes are shown in **Table 3**.

8.3 Dynamic Characteristic, Extension of Indications

The determination of the extent of single indications has to be done according to the half amplitude method. The sound field characteristics of the probes are to be taken into consideration. In the event that during the determination of the half amplitude extension of the flaw a change in the beam path is detected, the existence of a flaw with a plane angular orientation has to be assumed and recorded.

If the existence of angular or eccentric oriented flaws is suspected, the echo amplitude is to be recorded after optimising the angles of incidence. The following shall be taken into account:

- The reflectivity of an indication in case of radial/ tangential direction from 0° | 21° (A3, A7) according to table 1 goes through a maximum, no additional examinations are necessary.
- If an increase goes in reflectivity of the indication in radial/ tangential direction from 0° , 21° (A3, A7), according to table 1, is noted, then additional examinations with sound angles 28° and 35° shall be performed independent of the recordability of the indication.
- If recordable indications from direction A7 45° (cw/ccw) in the "long sound path" are detected, they must be tested and recorded additionally in "short sound path" with the probes VS 60 or VS 70 and if necessary with MWB60 or MWB70. The choice of the above probes is dependent on the depth of indications.

8.4 Dependence of Frequency

By means of changing the test frequency within the range of 2 | 4 MHz reflection positions can provide portions with differing sound reflection amplitudes. This dependence of frequency is to be recorded, if the FBH-values of the same individual flaw which have been determined with different frequencies deviate for 50% and more from each other. The recording should happen only in case the decision limit has been passed over by the indication.

8.5 Back Wall Echo drop ≥ 3 dB

The back wall echo drop is to be measured in the area of recordable indications of the shaft.

8.6 Limit of the Flaw Detection Sensitivity

The minimum detectable size is the value of the smallest detectable circular disk reflector (FBH) under consideration of a signal/noise ratio of 6 dB. The minimum detectable size is to be determined for all applied probes and sound directions and to be recorded in FBH together with the corresponding details, e.g. probe, sound direction, sound path, etc.

For areas with quality level 1a a detection limit of 0.5 mm FBH is to be aimed for and for the remaining areas a detection limit of 1.0 mm FBH.

9 Recording- and Decision Criteria's

Recordable are:

- Indications according to table 2



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Decision limits are:

- Indications according to table 2
- Transgression of the attenuation values
 - 2 MHz : 2 dB/m
 - 4 MHz : 6 dB/m
 - 5 MHz : 10 dB/m
- Indications from flaw areas, which will be exposed after final machining of the shaft
- In case of recordable indications in the area of the later bore hole, a special permission for drilling is required
- detection limit exceeds 1.5 mm FBH in direction A3 and A7 with the probes B2S or B4S and WB45-N2
- detection limit exceeds 1.0 mm FBH in direction A9 and A7 with the probe SEB4H0° and in direction A8 with the probe WB70-N2

With transgression of the above-mentioned features, a deviation report is to be prepared.

10 Surface Crack Examination of the cross-section transitions

The areas of the cross-section transitions (areas with diameter differences ≥ 200 mm at the heat treatment) are subjected additionally to a surface crack examination (MT) in dependence EN 10228-1 in the **delivery condition**. A yoke magnet with alternating current is to be used for magnetization. The surface roughness must correspond to $R_a < 20 \mu\text{m}$. For the recording limit and admissibility criteria, quality class 3 is to be used (see EN 10 228-1, table 2).

11 Surface-Crack-Examination of the Axial Hole Bore

The axial boring is subjected to a surface crack examination (MT) to preferably in length direction in the delivery condition. The surface roughness must correspond to $R_a < 6.3 \mu\text{m}$. For the recording limits and admissibility criteria, quality class 4 is to be used (see EN 10228-1, table 2). An Eddy current examination (ET) can also be carried out alternatively. For this the manufacturer must make out a test instruction and submit it to the purchaser for confirmation.

12 Reporting

Following the examinations an inspection and testing certificate 3.1 B according to EN 10204 is to be drawn up. The MT must be documented in accordance with EN 10 228-1. The UT report must contain the following information for the purpose of repeatability of the examination:

- a) Details about the examined object
 - identification data (ident-No., material, heat-No., etc.)
 - surface condition
 - step of the production flow when the examination happened
- b) Details about the examination technique
 - examination instruction
 - scope of examination
 - instrument

- probes
- frequency
- couplant
- kind of calibration
- values of correction
- c) Results of the examination
 - limit of the flaw detection sensitivity
 - sound attenuation values in dB/m
 - recorded indications

The indications to be recorded are to be described by sufficient information concerning their position, location, size and/or depth extension etc. and are to be described in a dimensioned sketch of the shaft, the sectional view or a handling of the surface true to size to register. Here, minimum entries must be made in accordance with the indication list (enclosure 1). While filling out the table, the following is to be considered:

- The position specifications of the table are probe positions.
- Volume positions are always entered in degrees.
- Indication types EE+VE of extension and/or GA, GN and RZ are always indication areas. Here, it is necessary for the axial and volume positions and also for the beam path to register the from-, to - and maximum values. In the case of EE+VE without extension (punctual), the maximum values information is sufficient.
- In the column "FBH", the replacement reflector size of indication is indicated. Here, the information is sufficient up to the first place after the comma.
- Back wall drop ≥ 3 dB is entered in the column "BEA".
- In the columns "Angle of incidence" both, the angle as well as the direction referring to the reference point, is to be specified. The following information e.g. must be made like this:

Probe-No. Acc. to SEP 1923	Angle of incidence (degree)		Remarks
	axial	tangential	
A3	0	0	T = direction TS G = direction GS Possible combination
A7	0	7cw	
A7	0	7ccw	
A7	0	14cw	
A7	0	14ccw	
A8	70T	0	
A8	70G	0	
A7/A8	7T	7cw	

GS = generator side and therefore always output end. The information of the output end is always given in the order drawing (BZ).

- In the column "probe", the trade name of the used probe registered e.g. becomes B2S, WB45-N2, SEB4H0° and so on.
- The column "file name" can be used if the dates to indications are saved electronically.



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- At the column "inspection areas", the following insertions e.g. are reasonable:
 - coupling TS or GS
 - journal TS or GS
 - Body
- In the column "remark" e.g., references of additional indication representations in other enclosures are reasonable.
- d) General
 - date of examination, location of examination
 - name of examiner (during the application by several examiners, it must be followable which test section was tested by which examiner)

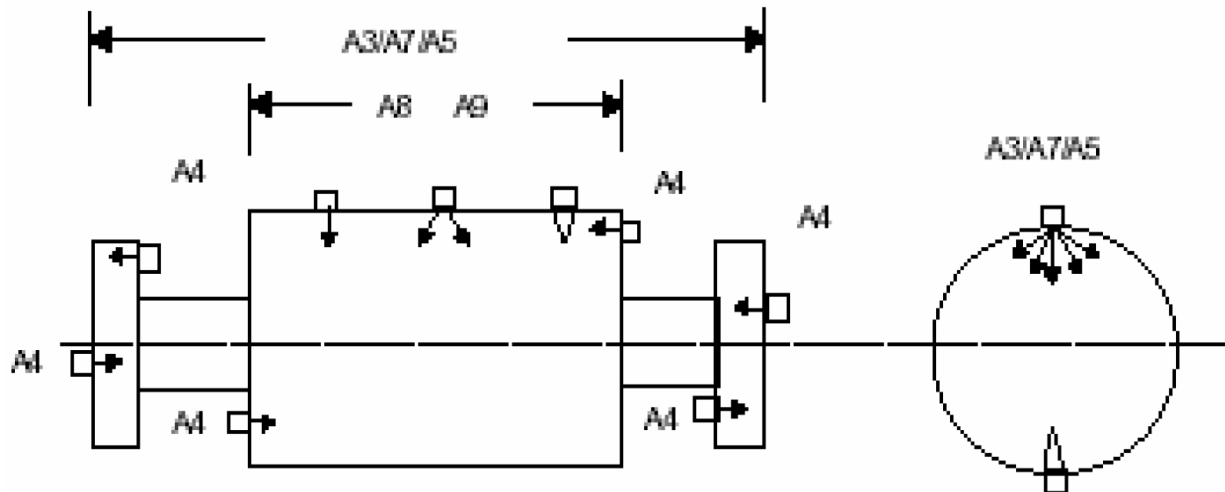


Figure 1 : Direction of incidence

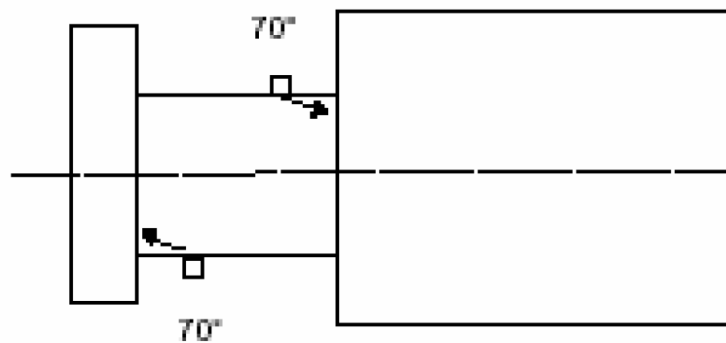


Figure 2 : Examination of the transitions of the cross section



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Table-1 : Scope of inspection

Test-No.	testing area	sound direction
A3	100% surface area of journal and body	radial with the probe B2S (B4S)
A4	100% front face of body and front face of clutch	axial with the probe B2S and B4S
A5	sound attenuation measurement per 1000 mm	radial with the probe B2S, B4S and B5S
A7	100% surface area of body and journal	2 circumferential directions in case of probe B2S with $\alpha = 7714721^\circ$ in case of probe B4S with $\alpha = 3.577710.5714717.5721724.5^\circ$ in case of probe WB45-N2 with $\alpha = 45^\circ$
A8	100% surface area of body	2 axial directions with the probe WB70-2N, $\alpha = 70^\circ$ up to a depth of about 150 mm (for generator shafts upto a depth of 250mm) additionally cross section transitions with probe WB70-2N, $\alpha = 70^\circ$ when acc. to point 6 required
A9	100% surface area of body up to a depth of about 150 mm	radial with the probe SEB4 when acc. to point 6 required



Table 2: Recording / decision limit

testing area		EE/VE without extension		EE/VE with extension GA, GN, RZ		backwall echo drop [dB]	maximum actual reflector length EE/VE	Maximum areas length (axial or radial) GA, GN
		recording limit mm FBH	decision limit mm FBH	recording limit mm FBH	decision limit mm FBH			
body area 0-150 mm ⁴⁾		1	2	all indications	1	3	10 mm ¹⁾	10 mm ¹⁾
Center area ≤40% shaft diameter		2	4	1	2	3	10 mm ¹⁾	X ¹⁾²⁾³⁾
Rest area	1%-Cr-steel	2	4	1	2	3	10 mm ¹⁾	X ¹⁾²⁾³⁾
	2%-10% steel	2	4	1	2.5	3	10 mm ¹⁾	X ¹⁾²⁾³⁾
	2%-10% Ni-steel	3	6	2	3	3	10 mm ¹⁾	X ¹⁾²⁾³⁾

1) The sound field properties of probe are to be taken in to consideration

2) Total radial extension: 40% of shaft diameter at the indication area

3) It is to be considered, whether indications occur with extension > beam diameter within the area of clustered indications. The decision limit of the real reflector length applies to such indications.

4) For generator shafts applies 0-250mm because of the coil slots

Table 3: Standard shaft materials

	Material identification
1% -Cr-steel	30CrMoNiV 511
2%-Cr-steel	23CrMoNiWV 88
10%-Cr-steel	X12CrMoWVNbN 1011 X12CrMoWVNbN 1011(B)
Ni-steel	26NiCrMoV 115 26NiCrMoV 145 26NiCrMoV 1010



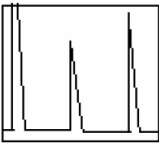
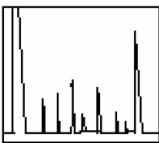
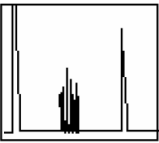
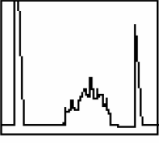
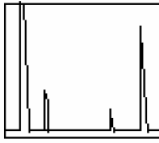
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Table 4: Echo shapes in the application of ultrasonic testing of shafts

Screen picture	Echo shape	Symbol
	single echo	EE
	many single echos ¹⁾	VE
	group echos resolvable ₂₎	GA
	group echos not resolvable ₂₎	GN
	ringzone	RZ

- 1) An echo shape is to be classified as VE, if the depth distance between the single echos is more than 5% of shaft-diameter on the test location.
- 2) Group echos are considered resolvable, if the distance between the peak of the lagerst echo and the base of the adjoining echo is > 18 dB. This classifecation is applicable for 500 mm the time-base range only.

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Annexure 2

Company

Certificate acc. To EN 10 204- 3.1B

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Ultrasonic - Report

Ident-No.

Specifications

Item

Material

Drawing No:

Order-No.

Heat-No.

Type of probe	Scanning direction	Calibr. probe	distance	Calibr. Sensitivity (dB)	Detectable Limit (mm FBH)	Sound Path (mm)	Correction Values (dB)	Test Sensitivity (dB)	Remarks
---------------	--------------------	---------------	----------	--------------------------	---------------------------	-----------------	------------------------	-----------------------	---------

 ϕ mm[illegible] ϕ mm[illegible]



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Residual Stress Measurement on Turbine and Generator shafts

1. Residual Stress Condition

In the Course of heat treatment processes of turbine and generator shafts compressive residual stresses are induced in near surface areas. They are matched by tensile residual stresses in the interior. As turbine and generator shafts always undergo operational tensile stress, the residual stresses remaining after the heat treatment process are unfavorable. Therefore try to reduce residual Stresses as far as possible.

BHEL delivery specifications do not define the cooling down rates from tempering temperature conditions. Instead of this it has been specified that the compressive residual stresses must not exceed 60 N/mm² at any place on the surface. This has to be proved by Residual Stress Measurements performed by the manufacturer.

2. Residual Stress measurements

- 2.1 Residual Stress measurements are to be performed by the ring-core-method. To assure a conforming assessment of the results by the manufacturer and BHEL, the residual Stresses have to be calculated for the depth region from 2 to 4 mm using following formulas:

$$\sigma^{\tan} = \frac{\varepsilon^{\tan}(2\text{mm}) - \varepsilon^{\tan}(4\text{mm})}{2.36} + \frac{\varepsilon^{\text{ax}}(2\text{mm}) - \varepsilon^{\text{ax}}(4\text{mm})}{11.2}$$

$$\sigma^{\text{ax}} = \frac{\varepsilon^{\text{ax}}(2\text{mm}) - \varepsilon^{\text{ax}}(4\text{mm})}{2.36} + \frac{\varepsilon^{\tan}(2\text{mm}) - \varepsilon^{\tan}(4\text{mm})}{11.2}$$

These formulas are valid for 26NiCrMoV 145 and ring core of 14 mm in diameter. Stresses (σ) are given in N/mm², strains (ε) in $\mu\text{m/m}$.

- 2.2 Stress measurements have to be performed after the last tempering treatment on the contour as tempered. The appropriate location of the three measuring Points are marked in annex 1 and 2. Measurements have to be performed at the Points specified, being offset by 120° on circumference.

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- 2.3 If measurements are to be performed on the contour as delivered, contact BHEL in any case to ensure that the cutting allowance available will suffice. Should the occasion arise, certain locations can be specified by BHEL.
- 2.4 Repeat the Stress measurements, if re-heat treatment or re-tempering is required.
- 2.5 In case, the relevant Stress condition cannot be determined unambiguously, BHEL reserves the right to define additional measuring Points.
- 2.6 An immediate and close exchange of experience regarding the measured values between manufacturer and BHEL is necessary.



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Annexure-1

Customer

Drawing no.

Order no.

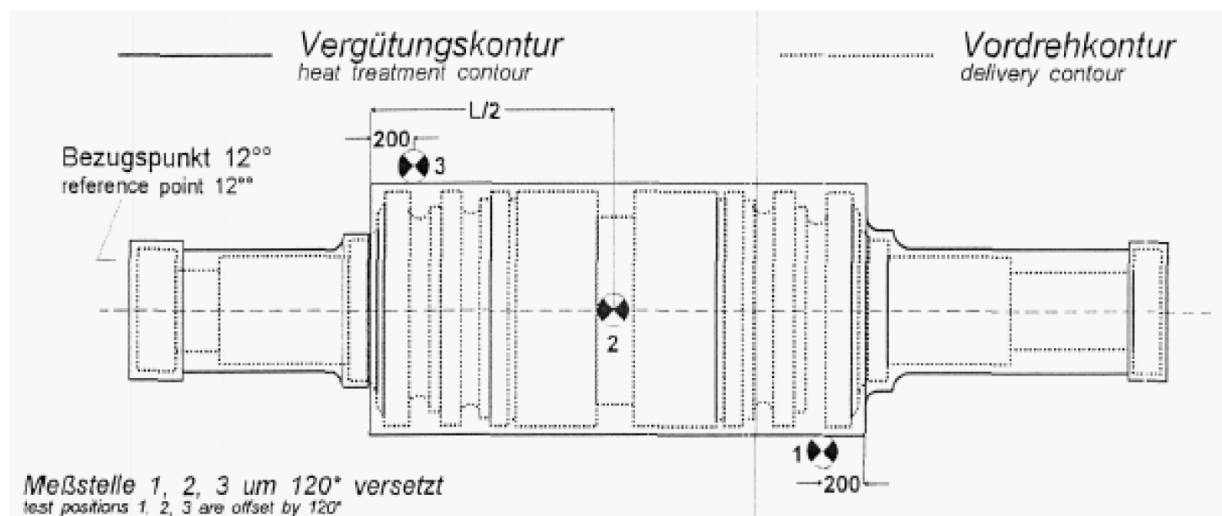
Identification no:

Subject

Material:

Heat treatment

Residual stress measurement
Test method: ring-core-method



	Heat treatment contour			Delivery contour			
Test position	1	2	3	1	2	3	
Reference point specification							Time pos.
σ_{tg}							N/mm ²
σ_{ax}							N/mm ²

Date

Company
Dept.



Annexure-2

Customer

Drawing no.

Order no.

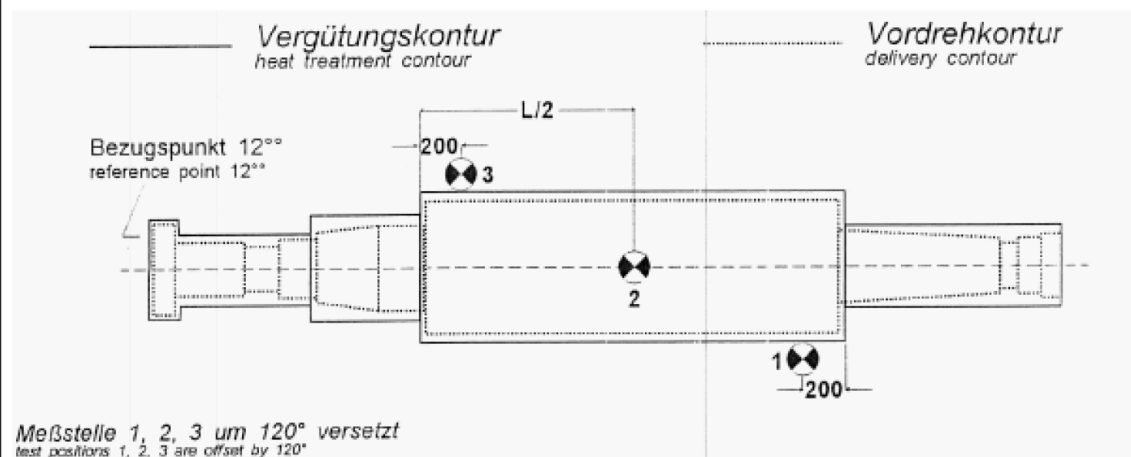
Identification no:

Subject

Material:

Heat treatment

Residual stress measurement
Test method: ring-core-method



	Heat treatment contour			Delivery contour			
Test position	1	2	3	1	2	3	
Reference point							Time pos.
specification							N/mm ²
σ_{tg}							N/mm ²
σ_{ax}							N/mm ²

Date

Company
Dept.



CORPORATE STANDARD

AA 085 01 51

Rev. No. 02

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THERMAL STABILITY TESTING OF TURBINE ROTORS

1.0 GENERAL:

This specification details the procedure that shall be followed in the thermal stability testing of turbine rotors at Supplier's Works. Changes from this procedure or sub-contracting of the thermal stability test by the supplier shall only be carried out with the written approval of BHEL. The name of the proposed sub-contractor shall be submitted at the tendering stage.

This specification is intended primarily for forging suppliers however any "in works" thermal stability testing must meet the procedural and acceptance standard requirements of this specification.

2.0 SUMMARY OF PROCEDURE :

1. Condition of Rotor for Test
2. Rotor Set-Up and Alignment
3. Eccentricity Indicators
4. Temperature Measurement
5. Heating
6. Soaking Temperature
7. Test Cycle
8. Acceptance standard
9. Retest
10. Inspection
11. Documentation and Release
12. Rejection

3.0 CONDITION OF ROTOR FOR TEST:

- 3.1 The thermal stability test shall be carried out after final heat treatment after the rotor forging has been machined as detailed on the drawing. Surplus test material shall be removed from the end wheels but shall be retained until the rotor forging has been finally accepted on completion of testing. Surplus material may be left on the shaft ends to facilitate the test.
- 3.2 The journals and eccentricity indicator bands shall be smooth Machined or ground, concentric with the axis of rotation to a tolerance of 0.025 mm. "Journals" refers to the bearing areas selected for the test which are not necessarily related to the bearing centres indicated on the forging drawing.

NOTE : The journals and eccentricity indicator bands shall not be machined after test, but shall be preserved and mechanical damage so that check measurements may be taken after receipt as BHEL's Works.

Revisions :

Revised as per Cl. 33.2.0 of MRC – FCF+HTM

APPROVED :

INTERPLANT MATERIAL
STANDARDIZATION COMMITTEE – MRC (FCF+HTM)

Rev. No. 02

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November, 1977



- 3.3 Three eccentricity indicator bands shall be prepared, one situated at the middle and the others approximately equidistant between the middle and the journals.

On rotor forgings less than 2.5 metres drawing length, two eccentricity indicator bands may be used both situated as near as possible to the mid-position between the journals.

The eccentricity indicator bands may be positioned either on the shaft surface between the wheels or on the outside diameter of the wheels.

4.0 ROTOR SET-UP AND ALIGNMENT:

- 4.1 The rotor shall be mounted on bearings or rollers positioned as far apart as possible to permit the maximum length of furnace. Under no circumstances shall any wheel be outside the furnace and the minimum length inside the furnace shall be that which is subject to heating during service.
- 4.2 The rotor shall be connected to a non-restrictive drive to give rotation at approximately 2 revolutions per minute.
- 4.3 The rotor shall be aligned so that the maximum out of truth at the Journals is 0.025 mm measured on a dial clock.
- 4.4 The rotor shall be thoroughly cleaned and degreased, With the exception of the eccentricity indicator bands, a suitable coating shall be applied to ensure uniform emissivity.
- 4.5 The end face of the rotor shaft shall be permanently stamped with the clocking symbol 0, 3, 6 and 9 with an angular displacement of 90° in accordance with the material specification.
- 4.6 A flashing light indicator operated by a contact on the faceplate of the test rig or some other suitable timing arrangement shall be used to signify the instant at which each of the clocking symbols 0, 3, 6 and 9 (Clause 4.5) is in line with the surface contact of the eccentricity measuring device.

5.0 ECCENTRICITY INDICATORS:

- 5.1 Eccentricity indicators shall be positioned so that they are in contact with the prepared eccentricity bands whenever readings are taken. An eccentricity indicator shall also be positioned in contact with the journal band at the driving end.
- 5.2 The dial clocks for measuring eccentricity shall be not more than mm per revolution and capable of being read to 0.005 mm. The dial clock shall be marked so that when mounted on the indicator positive deflection of the rotor gives a positive reading on the clock.

6.0 TEMPERATURE TREATMENT:

- 6.1 There shall be not less than three surface thermocouples and in the case of bored rotors at least one bore thermocouple. Surface thermocouples shall be disposed so as to record the temperature of the rotor in each zone of the furnace. The thermocouples shall be constructed so that they are shielded from direct radiation and conduction so that they record accurately the surface temperature of the rotor. The bore thermocouple shall be positioned so that it corresponds to the mid-furnace length position.
- 6.2 Temperature shall be automatically recorded on a multi-point recorder.

7.0 HEATING :

- 7.1 The rotor shall be heated as uniformly as possible by gas, hot air or radiant electrical heaters and the burners or elements so disposed as to avoid local overheating.
- 7.2 The maximum rate of heating to the soaking temperature shall not exceed 50°C per hour.



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8.0 SOAKING TEMPERATURE:

Unless otherwise specified the soaking temperature shall be as follows:

Creep resistant Cr Mo V rotors

650°C ± 10°C

Ni Cr Mo V rotors
Carbon steel rotors



20°C below the stress
relieving temperature ± 10°C

9.0 THERMAL TEST CYCLE:

- 9.1 The rotor eccentricity shall be measured and recorded as detailed in Annexure 1.
- 9.2 Rotate the rotor at ambient temperature until 3 successive sets of readings taken at 30 minute intervals are consistent within 0.0125 mm measured deflection.
- 9.3 Heat the rotor to the soaking temperature at a rate not exceeding 50°C per hour. The soaking period starts when the bore temperature is within the specified soaking temperature range or in the absence of a bore when constant expansion has been attained. Under no circumstances shall the temperature of any thermocouple exceed the specified soaking temperature range.
- 9.4 The rotor shall be held at the soaking temperature for a minimum period of 6 hours. During the last 3 hours of the soaking period the change in measured deflection shall not exceed 0.0125 mm and the soaking period shall be extended beyond 6 hours if necessary to meet this requirement.
- Measurement Deflection = 2 x deflection of axis
- 9.5 The rotor shall be cooled in the closed furnace until the maximum temperature throughout the rotor is 200°C. Rotation shall be continued until final eccentricity readings at room temperature have been obtained. The maximum rate of cooling shall not exceed 50°C per hour.

10.0 ACCEPTANCE TEST:

- 10.1 **Transients (Type A)** : Measured deflections shall not exceed 0.075mm.
- 10.2 **Stress relief (Type B)** : Measured deflections shall not exceed 0.050mm.
- 10.3 **Bi-metalling (Type C)** : Measured deflections, final hot to final cold movement shall not exceed 0.050mm. See also clause 11.3.

11.0 RETEST:

- 11.1 If a Type A deflection exceeds the acceptance limit at the end of the test, the Type B and Type C deflections being acceptable, the rotor shall be re-heated at the same rate as the previous test to a temperature 100°C above the temperature at which maximum deflection occurred, or to the soaking temperature, whichever is the lower, when the acceptance standard covering Type A deflections shall again apply. A further soaking period is unnecessary. An acceptable transient deflection demonstrates that surface oxidation has eradicated the variable emissivity which caused the deflection.
- 11.2 If a Type B deflection exceeds the acceptance limit at the end of the test the rotor shall be retested but the soaking time may be reduced to 4 hours minimum but with the requirements of clause 9.4 still applying and the temperature of soak may be reduced by 10°C.



If the measured deflection (2 x deflection of axis) exceeds 0.20 mm the eccentricity indicator bands shall be re-machined to comply with clause 3.2

- 11.3 If Type C deflection exceeds the acceptance limit, the BHEL shall be informed. With BHEL's approval a further test may be carried out at the maximum operating steam temperature. The measured deflection (2 x deflection of axis) shall in this case not exceed 0.025 mm.

12.0 INSPECTION:

BHEL's representative shall have all reasonable facilities afforded by forging supplier or approved sub-contractor to inspect the thermal stability testing facilities before or during testing and to satisfy himself that testing has been strictly in accordance with this specification.

13.0 DOCUMENTATION AND RELEASE:

13.1 Documents:

Each thermal stability test shall be covered by the following documentation.

13.1.1 Temperature/Time Diagram

A temperature/time diagram showing all rotor surface temperature readings.

13.1.2 Eccentricity/Time Diagram

An eccentricity/time diagram for each eccentricity indicator. The readings of all the eccentricity measuring positions shall be plotted on the diagram.

13.1.3 Polar Diagram

A polar diagram for each eccentricity indicator constructed as detailed in Annexure 1.

13.1.4 Location of Indicators and Thermocouples

A record of the location of the eccentricity indicators, the surface and where applicable, bore thermocouple positions.

13.1.5 Record Test Reading

All readings recorded during the thermal stability test shall be retained by the supplier or approved sub-contractor and shall be available for examination by BHEL or its representative on request.

13.1.6 Identification

The following particulars shall be written on each of the above documents

BHEL's Reference

Order Number

Material Specification

Serial Number (PF)

Supplier's References

Supplier and where applicable approved sub-contractor's name

Forging Number

13.2 Release Procedure

As evidence of a satisfactory thermal stability test and before the rotor can be released 2 copies of completed documentation as described in clause 13.1 shall be sent to BHEL. The formal release for shipping of the rotor forging will indicate approval of these results.

14.0 REJECTION:

Where any part of the thermal stability test is found to be not in accordance with this specification, BHEL reserves the right to reject the records and call for a complete retest.



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ANNEXURE - I

1. Eccentricity readings shall be recorded at minimum frequencies of 30 minute intervals throughout the heating and soaking periods. Readings may be taken at less frequent intervals during cooling but shall be not less than one set every two hours.
2. The eccentricity readings shall be taken at the 0, 3 and 9 positions (clause 4.5) during at least 2 consecutive revolutions of the rotor. If consecutive readings are not consistent, as would be the case in the event of faulty or sticking indicating equipment or readings are considered unreliable for any other reason, action shall be taken immediately to obtain valid consistent readings.
3. An eccentricity / time graph shall be produced from each eccentricity indicator based on points plotted at the specified intervals.
4. A polar diagram for each eccentricity indicator shall be constructed as follows:
 - 4.1 Co-ordinates of the eccentricity shall be obtained by subtracting the reading at position 6 from that at 0 and the reading at position 9 from that at 3. The eccentricity at any time of measurement shall be represented therefore by the point (0-6, 3-9) on the polar diagram plot.
 - 4.2 At least four points shall be plotted taken from readings at stages-initial cold (a) start of soak (c) end of soak (d) final cold (e) significant intermediate deflections (b) shall also be included as illustrated in the diagram.

Stage	Clock readings at rotor position				Co-ordinates	
	0	3	6	9	0 - 6	3 - 9
(a) Initial cold	0.005	0.005	0	0	+ 0.005	+ 0.005
(b) Maximum transient (i.e. Type A)	0.105	0.005	0	0.100	+ 0.105	- 0.095
(c) Start of soak	0.075	0.100	0.050	0.025	+ 0.025	+ 0.075
(d) End of soak	0.150	0.200	0.125	0.075	+ 0.025	+ 0.125
(e) Final cold	0.040	0.085	0.025	- 0.020	+ 0.015	+ 0.105



TD-213
Rev.00

REAFFIRMATION NOTIFICATION

HY 065 20 99, Rev No. 00

TITLE

MANUFACTURING AND INSPECTION SEQUENCE PLAN (MIP) FOR FORGINGS

This standard is reviewed and reaffirmed.

REF
IOM REF.
HY/R&DEC/SEIPR/SM/2021/SG;
Dated 27/01/2021

APPROVED BY
S N THAMKE
AGM / R&D and EC

ISSUED BY
STANDARDS
ENGINEERING

DATE
09/07/2021

CUM Sr.No.
R 2738

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MANUFACTURING AND INSPECTION SEQUENCE PLAN (MIP) FOR FORGINGS

1.0 SCOPE OF APPLICATION:

This specification describes about "Manufacturing and Inspection Sequence Plan (MIP) for open die forgings which shall be submitted by the supplier and sent to BHEL for approval before starting the manufacturing.

2.0 GENERAL REQUIREMENTS:

2.1 For each forging a manufacturing and inspection sequence plan (MIP) shall be prepared. By the supplier for its approval by BHEL before starting the manufacturing.

2.2 A new MIP shall also be submitted for forging

- when the supplier intends to change the existing / BHEL approved manufacturing or in testing / inspection method.
- for every new purchase order of the forging.

2.3 Each MIP for a specific forging shall contain forging drawing reference, supplier identification no., material grade & specification, purchase order reference and other required details.

2.4 Basis for the MIP is the applicable purchase specification, ordering drawing, test specification of BHEL as well as special quality assurance requirements given in the purchase order. All the information given in MIP by the supplier shall be fixed also in the internal working instructions of the manufacturer, which have to be used for the manufacturing and inspection process.

2.5 MIP shall be submitted to BHEL well before starting manufacturing for approval by BHEL. By approving the MIP, BHEL does not take any responsibility for processes or manufacturing details of the supplier.

Revisions :			Issued : STANDARDS ENGINEERING DEPARTMENT		
Rev.No.	Rev.Date	Revised	Prepared M.ATLS ENGG.	Approved DGM / TS	Dt.of 1st Issue OCT. 2003
00					

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2.6 BHEL has to be informed in writing about the manufacturing steps to be performed by sub-suppliers. The supplier has to ensure, that all the quality assurance requirements agreed with BHEL in MIP, shall be applied to the sub- suppliers also.

2.7 Deviations during manufacturing from the agreed procedures mentioned in the MIP have to be submitted to BHEL in writing for approval along with justifications.

2.8 BHEL or its representatives (3rd party inspection agency) may witness manufacturing and /or testing besides the acceptance inspections which are mentioned in the Purchase Specifications.

3.0 CONTENTS OF MIP:

At least following information shall be given in detail in MIP along with the reference documents, copy of which shall be enclosed with MIP.

3.1 Melting, Steel Treatment, Ingot Pouring

- Ladle analysis
- Melting Process
- Ladle treatment
- Method of de-oxidation / Degassing
- Secondary Refining
- Method of ingot pouring
- Number and weight of melts in the ingot
- Pouring temperature
- Ingot weight and average diameter
- L / D ratio

3.2 Forging Process

- Power of the press
- Forging weight
- % Top discard
- % Bottom Discard
- Number of forging in the ingot
- Confirmation of final forging contour as per drawing
- Detailed forging sequence with sketch of forging dimensions and data of forging heats
- Special forging procedures are to be reported
- Total forging ratio



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3.3 Preliminary Heat Treatment: HT cycle sketch to be submitted

- Type of heat-treatment furnaces
- Heating rate
- Holding temperature and holding time
- Cooling rate
- Cooling medium
- Number of cycles
- Method of temperature measurement
- HT cycle sketch

3.4 Internal Tests and Inspections before Quality Heat Treatment

3.5 Quality Heat Treatment:

- HT cycle sketch to be submitted
- Sketch of heat treatment contour of forging including ingot position and test piece locations
- Type of heat treatment furnaces
- Heat treatment position: vertical and horizontal
- Heating rate
- Holding temperature and holding time
- Cooling rate
- Cooling medium
- Method of cooling, quenching or spraying
- Temperature in the forging core
- Method of temperature measurement

3.6 Tests and Inspection after Heat Treatment:

- Mechanical tests: with details of test piece location and sizes (preferably with sketches), Test method
- Residual stress measurement (position of test and method of measurement, if applicable).
- Surface condition after machining for non destructive examination
- Surface crack inspection with details of test with details of inspection procedure
- Any other special tests (e.g.axial core test etc.)
- Ultrasonic test with details of test procedure preferably with sketch

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- Dimensional check
- Acceptance norms of all tests and inspections along with reference documents
- TC review, Acceptance tests and inspection by BHEL / 3rd party

3.7 Heat Stability Test (If required as per technical purchase specification or ordering drawing)

- Position of bearing and measuring areas (with sketches)
- Method of heating
- Test procedure in detail
- Anti rust coating on surface
- Acceptance norms along with reference documents

3.8 Test Certificates to be submitted as per technical purchase specification

3.9 Marking, Preservation and Despatch

4.0 CROSS REFERRED STANDARDS:

- Nil -

INTEGRITY PACT

Between

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi - 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for _____

_____. The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint Independent External Monitor(s), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1- Commitments of the Principal

1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

1.1.3 The Principal will exclude from the process all known prejudiced persons.

1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions:

Section 2 - Commitments of the Bidder(s)/ Contractor(s)

- 2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.
- 2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
- 2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
- 2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
- 2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
- 2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- 2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and will await their decision in the matter.

Section 3 - Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 4 - Compensation for Damages

- 4.1 If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent Earnest Money Deposit/ Bid Security.
- 4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to

demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee, whichever is higher.

Section 5 - Previous Transgression

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- 5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section 6 - Equal treatment of all Bidders/ Contractors / Sub-contractors

- 6.1 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors. In case of sub-contracting, the Principal contractor shall be responsible for the adoption of IP by his sub-contractors and shall continue to remain responsible for any default by his sub-contractors.
- 6.2 The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

Section 7 - Criminal Charges against violating Bidders/ Contractors /Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 - Independent External Monitor(s)

- 8.1 The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.
- 8.2 The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality in line with Non- disclosure agreement.
- 8.4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

- 8.5 The role of IEMs is advisory, would not be legally binding and it is restricted to resolving issues raised by an intending bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.
- 8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process, the matter should be examined by the full panel of IEMs jointly as far as possible, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.
- 8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to CMD, BHEL, at the earliest. They may also send their report directly to the CVO and the Commission, in case of suspicion of serious irregularities requiring legal/ administrative action. IEMs will tender their advice on the complaints within 10 days as far as possible.
- 8.8 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.
- 8.9 IEM should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the organization should be looked into by the CVO of the concerned organisation.
- 8.10 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code/ Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
- 8.11 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.
- 8.12 The word 'Monitor' would include both singular and plural.

Section 9 - Pact Duration

- 9.1 This Pact shall be operative from the date IP is signed by both the parties till the final completion of contract for successful bidder and for all other bidders 6 months after the contract has been awarded. Issues like warranty / guarantee etc. should be outside the purview of IEMs.
- 9.2 If any claim is made/ lodged during currency of IP, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 - Other Provisions

- 10.1 This agreement is subject to Indian Laws and jurisdiction shall be registered office of the Principal, i.e. New Delhi.

- 10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.
- 10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
- 10.4 Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 10.5 Only those bidders / contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.

For & On behalf of the Principal

(Office Seal)

Place-----

Date-----

Witness:_____

(Name & Address) _____

For & On behalf of the Bidder/

Contractor

(Office Seal)

Witness:_____

(Name & Address) _____
