

ELECTRIC HOIST

GeM Tender Enquiry for WORKSHOP EQUIPMENT for 5 X 800 MW YADADRI TPS

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Package: - WORKSHOP EQUIPMENT
GeM BID No....., Dtd.
ANNEXURE –I

Additional clauses of NIT

1. Dispatch Markings: -

Each box shall be marked with Capital Letters in “Red” indicating the PEM supply (Main Supply OR Commissioning spare) for **5 X 800 MW YADADRI TPS**. Each package delivered under the Contract shall be marked by Supplier and such marking must be distinct and in English Language (all previous irrelevant markings being carefully obliterated). Such marking shall show the description and quantity of contents, the name and address of consignee, the Gross weight and Net weight of the package, the name of the Supplier, PEM P.O. reference number, with a distinctive number of mark sufficient for purposes of identification. Besides above necessary, packing shall bear a special marking ‘TOP’, ‘BOTTOM’, ‘DO NOT TURN OVER’, ‘KEEP DRY’, ‘HANDLE WITH CARE’, etc.

IMPORTANT

- ☐ Two copies of respective standard manufacturer’s erection instruction/operation instruction manual shall be kept in each package / container for immediate reference by BHEL site and same shall be reflected in packing slip also
- ☐ The Packing list details for the consignment must be put inside the Box/Boxes.

2. Liquidated Damages: -

- a) **Main Supply:-** Purchaser reserves the right to recover from the Seller/ Contractor, as agreed liquidated damages and not by way of penalty, a sum equivalent to half ($\frac{1}{2}$) percent and applicable GST thereon, of the total main supply & commissioning spares contract price excluding GST per week or part thereof, subject to a maximum of ten(10) percent of the total main supply & commissioning Spares contract price excluding GST, if the Seller/ Contractor fails to deliver any part of the ordered goods/stores within the period stipulated in the Order/ Contract.
- b) **LD on service portion** (demonstration charges, PG test, installation check, supervision of erection / commissioning charges, engineering charges, O&M, study, calibration charges, type test, AMC, etc.) where delivery for services are defined separately in the NIT. LD shall be applicable @ $\frac{1}{2}$ percent and applicable GST thereon, of the total service portion contract value excluding GST per week or part thereof. However, total LD (main supply and services) shall be limiting to 10% of cumulative total contract value (main supply +services) excluding GST

NOTE:

- i. LR/RR date for indigenous supplies (Bill of Lading/AWB for Foreign supplies) shall be treated as the date of dispatch for levying LD. However, if receipted LR date for indigenous supply is beyond 30 days for FTL/ 45 days for PTL from the date of LR (PTL to be clearly mentioned in LR), such excess period shall be considered for LD purpose irrespective of dispatch date. Import General Manifest (IGM)/Bill of entry date (whichever is earlier), for foreign supplies, is beyond 90 days from the date of Bill of Lading/AWB, such excess period shall be considered for LD purpose irrespective of dispatch date.

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ii. In case of any amendment/ revision, LD shall be linked to the amended/ revised contract value and delivery date(s).

iii. If Order/ Contract involves two or more Units/ Sets/ Lots/ Stages, then Liquidated Damages shall be levied on order/ contract value excluding GST of the delayed Unit/ Set/ Lot/ Stage, provided delivery stipulated in the Order/ Contract is Unit/ Set/ Lot/Stage wise, however total LD amount shall be limited to 10% of total order/ amended order value excluding GST of delayed Unit/ Set/ Lot/Stage. Any subsequent lot released (not envisaged in original contract) due to increase in quantity within permissible quantity variation shall be treated as separate lot for the purpose of LD.

iv. The sum specified above is not a penalty but a genuine pre-estimate of the loss/ damage which will be suffered by purchaser on account of delay on the part of the Contractor/Seller and the said amount will be deductible without proof of actual loss or damage caused by such delay.

3. Risk & Cost Purchase

BHEL reserves the right to terminate the contract or withdraw portion of work and get it done through other agency, at the risk and cost of the contractor after due notice of a period of 14 days' by BHEL in any of the following cases:

i) If the Seller/Contractor fails to deliver the goods or materials or any instalment thereof within the period(s) fixed for such delivery or the Seller's poor progress of the supply/ services vis-à-vis delivery/execution timeline as stipulated in the Contract, backlog attributable to seller including unexecuted portion of supply does not appear to be executable within balance available period;

ii) Delivers goods or materials not of the contracted quality and failing to adhere to the contract specifications;

iii) Withdrawal from or repudiation/ abandonment of the supply/ services by Seller before completion as per contract or if the Seller refuses or is unable to supply goods or materials covered by the Order/Contract either in whole or in part or otherwise fails to perform the Order/Contract;

iv) Non-supply by the Seller within scheduled completion/delivery period as per Contract or as extended from time to time, for the reasons attributable to the Seller;

v) Termination of Contract on account of any other reason (s) attributable to Seller.

vi) Assignment, transfer, subletting of Contract without BHEL's written permission resulting in termination of Contract or part thereof by BHEL.

vii) If the Seller be an individual or a sole proprietorship Firm, in the event of the death or insanity of the Seller;

viii) If the Seller/Contractor being an individual or if a firm on a partnership thereof, shall at any time, be adjudged insolvent or shall have a receiving order for administration of his estate made against him or shall take any proceeding for composition under any Insolvency Act for the time being in force or make any assignment of the Order/Contract or enter into any arrangement or composition with his creditors or suspend payment or if the firm dissolved under the Partnership Act;

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ix) If the Seller/Contractor being a company is wound up voluntarily or by order of a Court or a Receiver, Liquidator or Manager on behalf of the debenture holders and creditors is appointed or circumstances shall have arisen which entitles the Court of debenture holder and creditors to appoint a receiver, liquidator or manager;

x) Non-compliance to any contractual condition or any other default attributable to Seller.

Such defaulting vendor/Seller shall not be eligible to participate in re-tendering conducted on account of risk purchase made due to fault of such vendor/Seller.

3.1 Risk & Cost Amount against Balance Work:

Risk & Cost amount against balance work shall be calculated as follows:

$$\text{Risk \& Cost Amount} = [(A-B) + (A \times H/100)]$$

Where,

A= Value of Balance scope of Work (*) as per rates of new contract

B= Value of Balance scope of Work (*) as per rates of old contract being paid to the contractor at the time of termination of contract i.e. inclusive of PVC & ORC, if any.

H = Overhead Factor to be taken as 5

In case (A-B) is less than 0 (zero), value of (A-B) shall be taken as 0 (zero).

3.2 Balance scope of work (in case of termination of contract):

Difference of Contract Quantities and Executed Quantities as on the date of issue of Letter for 'Termination of Contract', shall be taken as balance scope of Work for calculating risk & cost amount.

Contract quantities are the quantities as per original contract. If, Contract has been amended, quantities as per amended Contract shall be considered as Contract Quantities.

Items for which total quantities to be executed have exceeded the Contract Quantities based on drawings issued to contractor from time to time till issue of Termination letter, then for these items total Quantities as per issued drawings would be deemed to be contract quantities.

Substitute/ extra items whose rates have already been approved would form part of contract quantities for this purpose.

Substitute/ extra items which have been executed but rates have not been approved, would also form part of contract quantities for this purpose and rates of such items shall be determined in line with contractual provisions.

However, increase in quantities on account of additional scope in new tender shall not be considered for this purpose.

NOTE: In case portion of work is being withdrawn at risk & cost of contractor instead of termination of contract, contract

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quantities pertaining to portion of work withdrawn shall be considered as 'Balance scope of work' for calculating Risk & Cost amount.

3.3 LD against delay in executed work in case of Termination of Contract:

LD against delay in executed work shall be calculated in line with above LD clause, for the delay attributable to contractor. For limiting the maximum value of LD, contract value shall be taken as Executed Value of work till termination of contract.

Method for calculation of LD against delay in executed work in case of termination of contract" is given below.

i. Let the time period from scheduled date of start of work till termination of contract excluding the period of

Hold (if any) not attributable to contractor = T1

ii. Let the value of executed work till the time of termination of contract = X

iii. Let the Total Executable Value of work for which inputs/fronts were made available to contractor and were planned for execution till termination of contract = Y

iv. Delay in executed work attributable to contractor i.e. $T2 = [1 - (X/Y)] \times T1$

v. LD shall be calculated in line with LD clause (clause 16) of the Contract for the delay attributable to contractor taking "X" as Contract Value and "T2" as period of delay attributable to contractor.

3.4 Recoveries arising out of Risk & Cost and LD or any other recoveries due from Contractor

Without prejudice to the other means of recovery of such dues from the Seller recoveries from the Seller on whom risk & cost has been invoked shall be made from the following:

a) Dues available in the form of Bills payable to seller, SD, BGs against the same contract.

b) Dues payable to seller against other contracts in the same Region/Unit/ Division of BHEL.

c) Dues payable to seller against other contracts in the different Region/Unit/ division of BHEL.

In-case recoveries are not possible with any of the above available options, Legal action shall be initiated for recovery against contractor.

- 4.** For recognition of dispatch, vendor to submit following documents to BHEL by e-mail/ fax immediately on dispatch: - GST compliant invoice, LR for Indian Vendors (indicating Invoice No., no. of boxes, PTL (if applicable) etc.) / Bill of Lading or AWB for foreign vendor, Packing List (Must be indicating No. of boxes, Packing size, Gross weight and net weight of each package, Contents of the package with cross reference to BoM item code no. or item serial no. and Quantity of each item separately), Insurance Intimation to underwriter through email/fax, Dispatch Clearance.

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5. Following ATC available in GEM shall also be part of NIT: -

i. Bidder's offer is liable to be rejected if they don't upload any of the certificates / documents sought in the Bid document, ATC and Corrigendum if any.

ii. Bidders are advised to check applicable GST on their own before quoting. Buyer will not take any responsibility in this regards. GST reimbursement will be as per actuals or as per applicable rates (whichever is lower), subject to the maximum of quoted GST %.

iii. Data Sheet of the product(s) offered in the bid, are to be uploaded along with the bid documents. Buyers can match and verify the Data Sheet with the product specifications offered. In case of any unexplained mismatch of technical parameters, the bid is liable for rejection.

iv. The bidder is required to upload, along with the bid, all relevant certificates such as BIS license, type test certificate, approval certificates and other certificates as prescribed in the Product Specification given in the bid document.

v. While generating invoice in GeM portal, the seller must upload scanned copy of GST invoice and the screenshot of GST portal confirming payment of GST.

VI. Nominated Inspection Agency: On behalf of the Buyer organization, any one of the following Inspection Agency would be conducting inspection of stores before acceptance:

Pre-dispatch Inspection at Seller Premises (applicable only if pre-dispatch inspection clause has been selected in ATC): BHEL TPIA

Post Receipt Inspection at consignee site before acceptance of stores: NA

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Additional Terms and Conditions for subject Tender Enquiry to be complied by Bidders for Consideration in this tender:

- A.** Bidders to ensure that Third party/Customer issued certificates being submitted as proof of PQR qualification should have verifiable details of document/certificate issuing authority such as name & designation of Issuing Authority and its organization contact number and E-mail Id. In case the same is found not available, BHEL has the right to reject such document from evaluation.
- B.** "This item /package/system falls under the list of items defined in para 3 of ministry of finance guideline date 20.09.16 (procurement of items related to public safety, health, critical security operations and Equipment's etc.) & hence criteria of prior experience /turnover shall be same for all bidders including start up /MSME".
- C. Guarantee & Warrantee** shall be as per Cl. No. 10 of GTC on GeM for the bid. However, Guarantee & Warrantee time period shall be 18 months from the date of last supply in the contract for Main Supply.
- D. Evaluation criterion:** - Evaluation will be done on itemwise L1 (landed price to BHEL at consignee destination) basis.
Bidders to inform freight percentage for all the items as part of un-priced bid to be submitted along with their Techno-Commercial offer. Break-up of supply and services (Supervision of E & C) shall be asked after Price bid opening from L1 bidders. Further, detailed Price Break up shall be reverse calculated based on break of Supply & service portion, GST percentages and freight percentage as furnished by bidder for Order Placements.
- E. Terms of Delivery:** - Terms of delivery shall be F.O.R. dispatch station. All dispatches shall be through Road Carriers on Freight Pre-Paid basis. Road Permit/E-way Bill if required will be arranged by Supplier. However, loading & Transit insurance shall be in the scope of Seller and unloading of items at delivery point shall be in the scope of BHEL. Bidder to quote prices accordingly.
- F.** Further, w.r.t. Transit Insurance supplier has to inform the details of dispatches (such as Policy No., Consignee Name, Consignment Packing details, Project Name, Purchase Order No., LR No. & date, Invoice No. & date, Dispatch Origin & destination details etc.) to policy underwriter.
- G.** Bidder has to provide the details as per TECHNICAL PQR (attached with Specifications of product catalogue) in its offer and has to note that bids of only those bidders shall be evaluated who meet the Technical Pre-Qualifying requirements'. The terms of technical PQR shall prevail in conflict (if any).
- H.** PQR criteria uploaded with Buyer uploaded Bid Specific document shall prevail Value of Experience criteria and Past performance parameter mentioned in GeM bid.
- I.** "Due to COVID-19 pandemic condition prevailing in the country BHEL/PEM may go for Remote Inspection of Offered items if required. Vendors are requested to be equipped with the facilities/gadgets as indicated in the guidelines available at : <https://pem.bhel.com/Documents/VendorSection/Vendor/Guidelines.pdf> to take up the inspection remotely.
- J. Inspection call to be raised by bidder on BHEL CQIR portal** (details shall be shared at the of execution of order) and Inspection agency shall attend at the inspection within seven (07) days of the date on which the material is notified as being ready. In case of delay in witnessing of inspection beyond stipulated time (i.e. 7 days from the date on which the material is notified as being ready), by BHEL arising due to reasons not attributable to vendor, BHEL will extend the delivery period for such delay in carrying out inspection. If BHEL is not able to witness inspection up to 15 days then in addition to delay beyond stipulated period, extension in delivery time of 07 days for arranging fresh inspection will be given.

When the tests have been satisfactorily completed at Seller/ Contractor's works, the Inspection Agency shall issue an inspection report that effect within seven (07) days after completion of the tests, but if the tests were not

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witnessed by the Inspection Agency or his representative, the material acceptance report would be issued within seven (07) days after receipt of the test certificates by the Purchaser.

Purchaser will issue MDCC to the Seller/ Contractor within 7 days based on inspection report/ test certificates/Certificate of Conformance as applicable. In case of delay in issuance of MDCC beyond 7 days stipulated time (i.e. from the date of successful inspection report), by BHEL arising due to reasons not attributable to vendor, BHEL will extend the delivery period for such delay in issuing MDCC. If BHEL is not able to issue MDCC up to 15 days then in addition to delay beyond stipulated period, 7 days' additional time shall be given to vendor to facilitate the vendor for arranging logistics arrangements.

- K.** All Bidders shall be required to submit applicable Freight % & GST % included in their prices during clarification stage of Tender.
- L.** Total lump sum price of each machines along with all accessories and Supervision of E&C (as applicable) etc. at site (2 days, 1 visit) as per enclosed technical specification. Break up of supply and supervision of E&C prices shall be provided by L1 bidder after Price bid opening. Evaluation will be done on itemwise.
- M.** Performance Bank Guarantee: shall be as per Cl. No. 7 of GTC of GeM. Performance Security amount shall be @5% of the value of contract value. In case any benefit with respect to BG reduction is applicable at later stage, then similar benefit shall be passed onto the bidders for subject tender as well.
- N. Payment Terms:** For Supply Portion - As per clause no. 12 (i) of GTC on GeM. Supplier has to provide original+1 copy of Tax invoice, Packing List, LR/RR or AWB, CRAC, Insurance intimation, Guarantee Certificate, E-way bill (as applicable) for payment.
For Services (**Supervision of E & C**) :- As per clause no. 12 (i) of GTC on GeM. Supplier has to provide Tax invoice, CRAC for payment.
Offline payment mode shall be selected. Payment will be released within 90 days for Non MSME after submission of complete documents (45 days for Micro & Small Enterprises (MSEs), 60 days for Medium Enterprises.
- O. Bid reserved for Make in India products:** - Bidders have to note, "For this procurement, the local content to categorize a supplier as a Class I Local Supplier / Class II Local Supplier / Non Local supplier and Purchase preference to Class I local supplier, is as defined in Public Procurement (Preference to Make in India), (PPP-MII) Order 2017 dt. 16/09/2020 issued by DPIIT. In case of subsequent orders issued by the nodal ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of Part-II bids against this NIT."

Following may also pls. be noted by the bidders:

Eligibility of Suppliers : Class I Local Suppliers & Class II Local Suppliers, (as per para no. 3(b) of Public Procurement (Preference to Make in India), (PPP-MII) Order 2017 dt. 16/09/2020 issued by DPIIT and subsequent amendments).

In accordance with para 9 (a) of DPIIT's PP-MII order 2017 revision dated 04/06/2020, Class-I local suppliers" / "Class-II local suppliers" at the time of tender, bidding or solicitation shall be required to indicate percentage of local content and provide self-certification that the item offered meets the local content requirement for the

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Class-I local supplier” / “Class-II local supplier” as the case may be. They shall also give details of the location(s) at which the local value addition is made.

Regarding verification of local content, the local supplier at the time of tender, bidding or solicitation shall be required to provide certification w.r.t minimum local content (as per enclosed annexure-IV) as per para 9 of PP-MII order revision dated 16.09.2020.

The package is non-divisible in nature.

P. This is conditional tender enquiry. Financial bid opening (Part-II) of a bidder shall be subjected to following: -

- (i) Techno-Commercial evaluation/recommendation by BHEL.
- (ii) Qualification of Technical PQR
- (iii) Offered item should mandatorily conform to PP-MII order provisions.
- (iv) Approval of vendor from end Customer (TSGENCO). shall be taken up by BHEL-PEM with customer. Bidders who are not approved from TSGENCO (end customer) should furnish the credentials as per TSGENCO (end customer) format - (Annexure -A) along with their bid.

Q. Consignee Details (for PRC - Provisional Receipt Certificate & CRAC - Consignee's Receipt cum Acceptance Certificate, as applicable) shall be as per Project Site official details.

R. The Bidder has to 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.

S. Bidders to ensure the following: -

- Ensure compliance to Ministry of Power (MoP) Order No. 11/05/2018 Coord. dt. 28/07/2020, if applicable.
- Ensure compliance of Ministry of Finance (MoF) Order (Public Procurement No. 1 & 2) F. No. 6/18/2019/PPD dt. 23/07/2020.
- to submit “Model Certificate for Tenders” as per Annexure-III of Ministry of Finance (MoF) Order (Public Procurement No. 1 & 2) F. No. 6/18/2019/PPD dt. 23/07/2020. Bidder to submit the following undertaking on their letter head duly signed from the highest competent authority at your end (i.e Owner, partner, CMD, Director etc.)

“I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I hereby certify that this bidder is not from such a country and is eligible to be considered”

Note: - This bidder is to be replaced with bidders' organizational name.

T. Delivery Period: As per attached Annexure-II. Delivery Days mentioned in GeM bid is indicative only. Delivery Days (999 days from the date of PO) mentioned in GeM bid is to be treated as currency of the contract period. However, vendor to consider Delivery period as given in Annexure-II

U. For registration in BHEL PEM- Online registration portal is operational, Non-registered Vendors who wish to apply for registration in BHEL-PEM can apply through Online Registration Portal available at www.pem.bhel.com -

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vendor section - Online Supplier Registration. All credentials and/or documents duly signed and stamped related to registration can be uploaded on the website and submit the application for registration. However, registration of suppliers is not mandatory in case of open tender.

- V.** A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. **The bidder found to have a conflict of interest shall be disqualified.** A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:
- a) They have controlling partner (s) in common; or
 - b) They receive or have received any direct or indirect subsidy/financial stake from any of them; or
 - c) They have the same legal representative/agent for purposes of this bid; or
 - d) They have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; or
 - e) Bidder participates in more than one bid in this bidding process. Participation by a bidder in more than one bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/sub-assembly/sub-assemblies from one bidding manufacturer in more than one bid; or
 - f) In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorise only one agent /dealer. There can be only one bid from the following:
 - 1. The principal manufacturer directly or through one Indian agent on his behalf; and
 - 2. Indian /foreign agent on behalf of only one principal;Or
 - g) A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid; or
 - h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidder must proactively declare such sister/common business/management units in same/similar line of business.
- W.** Total quoted price against Supervision of E & C at site (VISIT CHARGES & MANDAYS CHARGES) should not exceed 2% of the total contract value (itemwise).
- X.** Instructions to Packing List (annexure –III) and Certification reg. Local content (annexure –IV) to be complied by bidders.
- Y. Quantity Variation:** - Qty Variation shall be 0%.
- Z.** All the Buyer Added Bid Specific Additional Terms and Conditions shall supersede relevant terms & conditions of GeM GTC and shall prevail in case of conflict with any other terms & conditions of tender (if any).
- AA.** All other terms & conditions shall be as per selected Additional Terms & Conditions for subject bid from GeM library and GTC version 4.0 (Version 1.8) available on GeM Portal on enquiry floating date shall be applicable.

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An undertaking regarding Model Clauses (To be provided alongwith bid)

Refer,

PROJECT	:- 5 X 800 MW YADADRI TPS
PACKAGE	:- WORKSHOP EQUIPMENT
Primary product category on GeM	:-.....
BID No. (Through GeM)	:-, Dtd.

M/s

Reference:

TO WHOM SO IT MAY CONCERN

This is with reference to Ministry of Finance circular dated 23.07.20 reg. restriction under rule 144 (xi) of GFR.

“I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India. I hereby certify that M/s is not from such a country and is eligible to be considered against GeM enquiry no:, **Dtd.**”

Sign & Signature

Date:

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ANNEXURE -III TO INSTRUCTIONS TO PACKING LIST

For faster verification of bills, successful bidder to submit detailed Bill of Material (BOM) at the time of drawings/ documents submission after placement of PO. Each item of the BOM to be uniquely identified with item code no. or item Sl. No. Supplier to ensure that all items which will find separate mention in the packing list are covered in this detailed BOM.

Supplier to also give the following undertaking in the BOM:

“The BOM provided herewith completes the scope (in content and intent) of material supply under PO No. Dated Any additional material which may become necessary for the intended application of the supplied items/package will be supplied free of cost in most reasonable time.

Packing List must indicate:

- a) Packing size
- b) Gross weight and net weight of each package
- c) Contents of the package with cross reference to BOM item code no. / Sl. No.
- d) Quantity of each items separately.

The packing list must cover all the BOM items.

Supplier to give following undertaking in the packing list:

The Packing list provided herewith is as per BOM approved under PO No. ----

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ANNEXURE IV

Letter head of Company

Ref.....

Date.....

To,
Bharat Heavy Electricals Limited
PEM, PPEI Building, Plot No 25,
Sector 16A, Noida (U.P.) 201301

Subject: Certification regarding local content

Reference: Tender Enquiry No....., Dtd.

Name of Package: **WORKSHOP EQUIPMENT.**

Dear Sir,

We hereby certify that items offered by us of **WORKSHOP EQUIPMENT** for **5 X 800 MW YADADRI TPS**, M/s meets the requirement of minimum local content as a Class – I/ CLASS-II local supplier in line with clause of NIT (GeM NIT) and the Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017, 28.05.2018 & 29.05.2019, 04.06.20 & 16.09.20.

We hereby certify that items offered by us for **WORKSHOP EQUIPMENTS** for **5 X 800 MW YADADRI TPS** has local content of %

We further confirm that details of location at which the local value addition is made will be our registered works at

.....
...(address of the works)

Yours very truly

..... (authorized signatory of company)

..... (firm name)

authorized signatory
of company

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Primary	receipt.	the date clearance delay in Primary reduced of 05 mo
	within 30 days of issuance of	In case I

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Sl. No.	Package Code	BHEL Drawing No	Drawing Title	Primary/ Secondary	BHEL Inputs	Drg Sch for Vendors	Standard Delivery Terms for Supply Portion	Scope of Services, (if any, as per Indent) and corresponding schedule for rendering the services
1	568A	PE-V0-417-568-A002	Data sheet of machine/equipment with detailed BOM WORKSHOP EQUIPMENT	Primary		R-0 within 21 days from PO & subsequent revisions within 10 days of comments received from BHEL. BHEL shall furnish comments / approval on each submission within 18 days from receipt.	Within Five (05) months from date of CAT-1 approval of Primary drawing/documents or BHEL manufacturing clearance whichever is later. In case date of CAT-1 approval of Primary drawing/documents is later than the date of BHEL manufacturing clearance then for delay analysis, any delay in submission/re-submission of Primary drawing/documents shall be reduced from the given delivery period of 05 months.	Supervision of E&C: Vendor to depute its service engineer for Supervision of E&C within 15 days from BHEL's intimation (for deputing service engineer). For delay in deputing service engineer, LD on Supervision of E&C portion shall be applicable @ ½% of the total Supervision of E&C portion contract value (excluding element of taxes) per week or part thereof, with applicable GST. However, total LD (supply + Supervision of E&C) shall be limited to 10% of cumulative total contract value excluding taxes and freight (supply + Supervision of E&C).
		PE-V0-417-568-A001	Inspection Check List / Manufacturing Quality Plan of machine/equipment	Primary				
		PE-V0-417-568-A003	GA of machine / equipment	Primary				
		PE-V0-417-568-A004	O & M Manual	Secondary		within 30 days of issuance of MDCC	In case BHEL manufacturing clearance date is later than date of cat-1 approval of Primary drawing/documents, then for delay analysis submission/re-submission time of Primary drawing/document shall not be considered.	
		PE-V0-417-568-A006	Erection Procedure for Workshop Equipments	Secondary		2 weeks after approval of primary dwg/doc		

Notes:-

(i)	The end period specified is for completion of the deliveries. Deliveries to start progressively so as to meet the completion schedule.
(ii)	The delivery conditions specified are for contractual LD purposes, however BHEL may ask for early deliveries without any compensation thereof.
(iii)	Non-applicable drawings shall be decided during bid evaluation.
(iv)	Wherever schedule of drawings/documents submission / re-submission is stipulated in the Technical Specifications, same shall be superseded by delivery specified in NIT.
(v)	Vendor to start manufacturing activities only after obtaining specific manufacturing clearance from BHEL Purchase group.
(vi)	In case BHEL manufacturing clearance date is later than the date of Cat-1 approval of Primary drawing/documents, then the contractual delivery period will be calculated by setting off the time gap between Cat-1 approval date of Primary drawing/documents and the manufacturing clearance date, from any delay by vendor in submission/re-submission of Primary drawing/documents.

CUSTOMER/ BHEL LOGO	VENDOR CREDENTIALS SUMMARY SHEET (TO BE FILLED BY BIDDER AND SUBMITTED WITH BID)
------------------------------------	---


i.	Item/Scope					
ii.	Address of the registered office	Details of Contact Person (Name, Designation, Mobile, Email)				
iii.	Name and Address of the proposed vendor's works where item is being manufactured	Details of Contact Person: (Name, Designation, Mobile, Email)				
iv.	Annual Production Capacity for proposed item					
v.	Annual production for last 3 years for proposed item					
vi.	Details of proposed works					
1.	Year of establishment					
2.	Factory Registration Certificate	Details attached at Annexure – F2.1 (Page No....)				
3.	Overall organization Chart with Manpower Details (Design/Manufacturing/Quality etc.)	Details attached at Annexure – F2.2 (Page No....)				
4.	After sales service set up in India, in case of foreign sub-vendor(Location, Contact Person, Contact details etc.)	Applicable / Not applicable Details attached at Annexure – F2.3 (Page No....)				
5.	Sources of Raw Material/Major Bought Out Item	Details attached at Annexure – F2.4 (Page No....)				
6.	Quality Control exercised during receipt of raw material/BOI, in-process, Final Testing, packing	Details attached at Annexure – F2.5 (Page No....)				
7.	Manufacturing facilities (List of machines, special process facilities, material handling etc.)	Details attached at Annexure – F2.6 (Page No....)				
8.	Testing facilities (List of testing equipment)	Details attached at Annexure – F2.7 (Page No....)				
9.	Supply reference list including recent supplies (Preferably of reputed, well known clients to whom the vendor has supplied the material and are of quantum of item/scope at point (i) above)	Reputed client name (s)..... Details attached at Annexure – F2.8 (as per format given below) (Page No....)				
Project/ package	Customer Name	Supplied Item (Type/Rating/Model /Capacity/Size etc)	PO ref no/date	Supplied Quantity	Date of Supply	

SUGGESTED PRICE FORMAT

Sl.No	DESCRIPTION OF EQUIPMENT / ITEM	UNIT	QTY	HSN Code	UNIT RATE in Rs (Ex-Works)	TOTAL AMOUNT in Rs (Ex-Works)	FREIGHT RATE @.....% OF TOTAL	FREIGHT CHARGES	TOTAL EX-WORKS PRICE +	APPLICABLE GST RATE @.....% ON	TOTAL GST AMOUNT (INR)	TOTAL PRICE F.O.R. (INR)	No of Visit	No of Days at site (excluding travel time)	Price for Supervision of E & C at site in Rs. (Excluding taxes & duties)	TOTAL PRICE SUPERVISION OF E & C	TOTAL GST AMOUNT (INR)	TOTAL PRICE SUPERVISION OF E & C including GST	TOTAL PRICE F.O.R. (INR)	
															<div>Visit charges (travel expenses only)</div> <div>Stay charges</div>				(SUPPLY + E & C)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17				
1.0	Total lump sum firm price inclusive of all prevailing taxes, duties and other levies for SUPPLY PART & SERVICES PART, comprising of design (i.e. preparation and submission of drawing /documents including "As Built" drawings and O&M manuals), engineering, manufacture, fabrication, assembly, inspection / testing at vendor's & sub-vendor's works, painting, cutting tools and cutting tool mounting accessories (as applicable), power cable and plug for mobile equipment (as applicable), maintenance tools & tackles (as applicable), fill of lubricants & consumables till warranty period, along with spares for erection, startup and commissioning as required, initial spares (as applicable), foundation bolts, nuts, lock nuts, washers, levelling pads, forwarding, proper packing, shipment and delivery as specified, supervision of erection and comissioning at site (as applicable),training of Customer's O & M staff, demonstration testing at site, lodging, boarding etc, travelling expenses as specified for project and package specified complete with all accessories for the total scope defined as per BHEL NIT & tender technical specification, amendment & agreements till placement of order in line with drawings/ documents/ test procedures approved by BHEL/ Customer for WORKSHOP EQUIPMENT as per details in different sections / volumes of tender specification.																			
1.1	Heavy duty lathe	Nos	1										1	2						
1.2	Precision lathe	Nos	1										1	2						
1.3	Shaper	Nos	1										1	2						
1.4	Slotting machine	Nos	1										1	2						
1.5	Universal milling machine	Nos	1										1	2						
1.6	Radial drilling machine	Nos	1										1	2						
1.7	Pipe bending machine	Nos	1										Nil	Nil						
1.8	Tube bending machine	Nos	1										Nil	Nil						
1.9	Hydraulic plate shearing machine	Nos	1										1	2						
1.10	Power hacksaw	Nos	1										1	2						
1.11	Hydraulic press	Nos	1										1	2						
1.12	Cylindrical grinder	Nos	1										1	2						
1.13	Surface grinder	Nos	1										1	2						
1.14	A/C welding machine	Nos	1										Nil	Nil						
1.15	Motor Generator Set	Nos	1										Nil	Nil						
1.16	Balancing machine	Nos	1										1	2						
1.17	Tool and cutter grinder	Nos	1										1	2						
1.18	Column type drill	Nos	1										1	2						
1.19	Works Benches with vice	Nos	4										Nil	Nil						
1.20	Set of general tools	Set	2										Nil	Nil						
1.21	Set of measuring tools	Set	2										Nil	Nil						
1.22	Wheel Barrow	Nos	8										Nil	Nil						

[illegible]

BHEL-PEM-MAUX
PRE-QUALIFICATION CRITERIA

	PACKAGE: WORKSHOP PROJECT: 5X800 MW YADADRI TPS PRE-QUALIFICATION REQUIREMENT- WORKSHOP		PE-PQ-417-568-A001
			DATE 15.03.2023
			REV NO 00

1.0	<p>Supplier should have capability of manufacturing and having in-house facility for testing of at least one of the following Machines: -</p> <ul style="list-style-type: none"> ➤ Lathe Machine SOB-575 mm, DBC-1500 mm. ➤ Shaper Machine Stroke-600 mm. ➤ Slotter Stroke-300 mm ➤ Universal Milling Machine- Table Size-1000mm X225mm ➤ Radial Drilling Machine -Drilling capacity in mild steel-50 mm and radius of drilling arm-950 mm ➤ Hydraulic Plate Shearing Machine-Shearing Capacity 8 mm X 1000 mm in MS ➤ Hydraulic Press 60 MT capacity, table size-900 mm X 1000 mm ➤ Cylindrical Grinder- SOB-280 mm, DBC-400 mm ➤ Surface Grinder-250 mm wheel diameter, table size - 250 X 1000 mm ➤ Balancing Machine- Job diameter-1 meter, job weight-2 tonnes
2.0	<p>The supplier has to submit either of following supporting documents meeting above mentioned pre-qualifying requirement</p> <ul style="list-style-type: none"> a. Copy of minimum one (1) performance certificate in English from end user along with copy of related Purchase Order (PO) or letter of intent (LOI) or letter of award (LOA) or work order (WO) specifying that the product/ equipment is running successfully for one (1) year from date of commissioning meeting the minimum pre-qualifying requirement. OR b. Minimum two PO/ LOI /LOA/ WO placed with a minimum gap of six (6) months from same purchaser meeting the minimum pre-qualifying requirement. OR c. Minimum one PO/ LOI /LOA/ WO after commissioning of first order from same purchaser meeting the minimum pre-qualifying requirement. OR d. Minimum three customer's/ third party's inspection reports/ test certificates/commissioning certificates meeting the minimum pre-qualifying requirement.
3.0	Indian stockiest/ trader/ distributor/ dealer/ authorized agent/ channel partner/ Indian sales office or subsidiary of principal - with aftersales service agreement with OEM/principal are also acceptable provided OEM/principal meets the minimum pre-qualification criteria stipulated above at S.no 1.
4.0	Bidder to submit all supporting documents in English. If documents submitted by bidder are in language other than English, a self-attested English translated document should also be submitted.
5.0	Notwithstanding anything stated above, BHEL reserves the right to assess the capabilities and capacity of the bidder to perform the contract, should the circumstances warrant such assessment in the overall interest of BHEL.
6.0	Consideration of offer shall be subject to customer's approval of bidders, if applicable.
7.0	After satisfactory fulfilment of all the above criteria / requirement, offer shall be considered for further evaluation as per NIT and all the other terms of the tender.

Prepared by

Reviewed by

Approved by

**TELANGANA STATE POWER GENERATION CORPORATION LTD
TELANGANA (INDIA)**

5 X 800 MW TSGENCO YADADRI TPS NALGONDA, TELANGANA

**TECHNICAL SPECIFICATION
FOR
WORKSHOP EQUIPMENT**

SPECIFICATION NO.: PE-TS-417-568-A001



**BHARAT HEAVY ELECTRICALS LIMITED
(A Govt. of India Undertaking)
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, U.P
INDIA**



TITLE: 5X800 MW TSGENCO YADADRI TPS

TECHNICAL SPECIFICATION FOR
WORKSHOP EQUIPMENT

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SECTION – I

SPECIFIC TECHNICAL REQUIREMENTS

SUB-SECTION IA – Specific Technical Requirement (Mechanical)

SUB-SECTION IB – Specific Technical Requirement (Electrical)



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1.0 SCOPE OF ENQUIRY/ INTENT OF SPECIFICATION

- 1.1 This specification includes, but not limited to SUPPLY PART comprising of design (i.e. preparation and submission of drawing /documents including "As Built" drawings and O&M manuals), engineering, manufacture, fabrication, assembly, inspection / testing at vendor's & sub-vendor's works, painting, maintenance tools & tackles (as applicable), fill of lubricants & consumables, along with spares for erection, start up and commissioning as required, initial spares (as applicable), foundation bolts, nuts, lock nuts, washers, levelling pads, forwarding, packing, shipment and delivery (at site, as per NIT conditions) and Supervision of Erection and Commissioning (as per applicable item), training of Customer's O & M staff, demonstration testing at site, lodging, boarding etc, travelling expenses for specified items of Workshop Equipments package for **5X800 MW YADADRI TPS** specified as above complete with all accessories for the total scope defined as per BHEL NIT & tender technical specification, amendment & agreements till placement of order.
- 1.2 The contractor shall be responsible for providing all material, equipment & services, which are required to fulfil the intent of ensuring operability, maintainability, reliability and complete safety of the complete work covered under this specification, irrespective of whether it has been specifically listed herein or not. Omission of specific reference to any component / accessory necessary for proper performance of the equipment shall not relieve the vendor from the responsibility of providing such facilities to complete the supply of **WORKSHOP EQUIPMENTS**.
- 1.3 It is not the intent to specify herein all the details of design and manufacture. However, the equipment shall conform in all respects to high standards of design, engineering and workmanship and shall be capable of performing the required duties in a manner acceptable to purchaser who will interpret the meaning of drawings and specifications and shall be entitled to reject any work or material which in his judgement is not in full accordance herewith.
- 1.4 The extent of supply under the contract includes all items shown in the drawings, notwithstanding the fact that such items may have been omitted from the specification or schedules. Similarly, the extent of supply also includes all items mentioned in the specification and /or schedules, notwithstanding the fact that such items may have been omitted in the drawing.
- 1.5 The general term and conditions, instructions to tenderer and other attachment referred to elsewhere are made part of the tender specification. The equipment materials and works covered by this specification is subject to compliance to all attachments referred to in the specification. The bidder shall be responsible for and governed by all requirements stipulated herein.
- 1.6 While all efforts have been made to make the specification requirement complete & unambiguous, it shall be bidders' responsibility to ask for missing information, ensure completeness of specification, to bring out any contradictory / conflicting requirement in different sections of the specification and within a section itself to the notice of BHEL and to seek any clarification on specification requirement in the format enclosed under Vol-III of the specification. In absence of any such clarifications, in case of any contradictory requirement,



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the more stringent requirement as per interpretation of Purchaser/Customer shall prevail and shall be complied by the bidder without any commercial implication on account of the same. Further in case of any missing information in the specification not brought out by the prospective bidders as part of pre-bid clarification, the same shall be furnished by Purchaser/ Customer as and when brought to their notice either by the bidder or by purchaser/ customer themselves. However, such requirements shall be binding on the successful bidder without any commercial & delivery implication.

- 1.7 The bidder's offer shall not carry any sections like clarification, interpretations and /or assumptions.
- 1.8 Deviations, if any, should be very clearly brought out clause by clause in the enclosed deviation schedule along with cost of withdrawal; otherwise, it will be presumed that the bidder's offer is strictly in line with NIT specification. If no cost of withdrawal is given against the deviation, it will be presumed that deviation can be withdrawn without any cost to BHEL/its customer.
- 1.9 In the event of any conflict between the requirements of two clauses of this specification documents or requirements of different codes and standards specified, more stringent requirement as per the interpretation of the owner shall apply.
- 1.10 In case all above requirements are not complied with, the offer may be considered as incomplete and would become liable for rejection.
- 1.11 Unless specified otherwise, all through the specification, the word contractor shall have same meaning as successful bidder /vendor and Customer/ Purchaser/Employer will mean BHEL and /or customer including their consultant as interpreted by BHEL in the relevant context. For details refer the relevant clause in GCC.



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1.0 **SYSTEM DESCRIPTION AND SCOPE OF WORK**

Various types of equipment / machines which are included in bidder's scope of work and required for the maintenance and repair workshop of the power station equipment are given under: -

S.N.	Machine name	Brief specification	Accessories	Qty
1	Heavy duty lathe	Swing over bed 900 mm X Distance between centres 2000 mm	Geared machine, Complete cooling equipment including pump, motor, pipings etc. 4 – jaw chuck, splash guard (rear splash guard on wheels moving on floor) and other accessories required for proper functioning of machine.	1
2	Precision lathe	Swing over bed 575 mm X Distance between centres 1500 mm	Geared machine, Work light without bulb, 3 jaw self-centering chuck of diameter 250 mm with back plate, chip tray, complete coolant equipment, splash guard, longitudinal stop and other accessories required for proper functioning of machine.	1
3	Shaper	Stroke – 36 inch	Geared machine, Electric motor, starter, automotive lubricating pump, machine lamp and other accessories required for proper functioning of machine.	1
4	Slotting machine	Stroke - 450 mm	Geared machine, Complete coolant system / equipment, lighting equipment, 3 jaw self-centering chuck with back plate (steel body) and other accessories required for proper functioning of machine.	1
5	Universal milling machine	Table - 1600 mm X 300 mm	Geared machine, Complete coolant equipment, work-light without bulb, indexing head and other accessories required for proper functioning of machine.	1
6	Radial drilling machine	Capacity drilling in steel 50 mm diameter, Radius of drilling arm: 1500 mm	Geared machine, Box table (500 mm X 500 mm X 500 mm), complete coolant equipment with pump, motor, pipings etc., work light without bulb and other accessories required for proper functioning of machine.	1
7	Pipe bending machine	Hydraulic Hand operated Size 25 mm - 150 mm NB	Accessories required for proper functioning of machine.	1
8	Tube bending machine	Hydraulic Hand operated Size 1/2" to 4" NB	Accessories required for proper functioning of machine.	1
9	Hydraulic plate	12 mm X 1000 mm in	Accessories required for proper	1



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	shearing machine	MS, 8 mm X 1000 mm in stainless steel	functioning of machine.	
10	Power hacksaw	Job diameter - 225 mm	Work light without bulb and other accessories required for proper functioning of machine.	1
11	Hydraulic press	60 MT capacity, table size - 900 mm X 1000 mm	Accessories required for proper functioning of machine.	1
12	Cylindrical grinder	Swing over bed - 280 mm X Distance between centres 400 mm	Geared machine, 3 jaw self-centering chuck with adapter and flange of diameter 150 / 160 mm, worklight without bulb, wheel balancing stand, additional standard wheel flanges with balancing blocks and other accessories required for proper functioning of machine.	1
13	Surface grinder	250 mm wheel diameter, table size - 250 X 1000 mm	Geared machine, Electro - magnetic chuck suitable for the table, complete coolant system / equipment including pump, motor, piping, reservoir etc., machine lamp, wheel balancing stand and other accessories required for proper functioning of machine.	1
14	A/C welding machine	Current range - 60 to 400 Amps.	Welding cable with electrode holder (5 metres length), Earthing cable assembly (5 metres), Protective helmet with glass, pair of hand gloves, chisel, wire brush, Ammeter - voltmeter attachment and other accessories required for proper functioning of machine.	1
15	Motor Generator Set	MG set, current range: 35 – 320 Amps	Welding cable with electrode holder (5 metres length), Earthing cable assembly (5 metres), Protective helmet with glass, pair of hand gloves, chisel, wire brush. and other accessories required for proper functioning of machine.	1
16	Balancing machine	Diameter - 1 m, job weight - 2 tonnes	Accessories required for proper functioning of machine.	1
17	Tool and cutter grinder	Swing Over bed 280 mm X Distance between tailstock 750 mm	Indexing unit, machine lamp, complete cooling system / device with tank, pump, pipings etc. universal voice	1
18	Column type drill	Drill size - 30 mm, table - 300 X 300 mm	Work-light without bulb and other accessories required for proper functioning of machine.	1
19	Works Benches with vice	Carpenter type work bench (made of wood), size –750 mm x 500 mm x 1000 mm height with	Nil	4



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		vice 150 mm at two corner and drawer		
20	Set of general tools	1) Ball pin Hammers: a) Size 500 gms - 1 no. b) Size 800 gms - 1 no. 2) Screw Drivers: - a) Plain type - 1 no. b) Cross type - 1 no. 3) Flat FILES: a) size 100 mm (10 nos) b) size 150 mm (10nos.) c)size 200 mm (10 nos.) d)size 250 mm (10nos.) e) size 100 mm (10nos.) f) Round file size 150 mm (10nos.) g) Half Round file size 200mm (10nos.) h) Half Round file size 250mm (10nos.) 4)Pipe wrenches (1 no. each): a) Size 0-3/4" b) Size 0-1½" c)Size 0-2½" 5)Pipe Cutter (1 no.) size ½" – 2"	Nil	2 set
21	Set of measuring tools	(a) Vernier caliper: 0 – 300 mm, least count - 0.02 mm, (b) Inside micrometer: 0 – 25 mm, least count 0.02 mm, (c) Dial Gauge: least count 0.01 mm, (d) V-block: size 100 mm x 45 mm x 60 mm.,	Nil	2 no. each
22	Wheel Barrow	Capacity min. 6.0 cu. ft., Double wheel (Wheel size 12"X 2" Nylon Rubber) with two handles, MOC-Mild steel		8



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3.0 PAINTING SCHEDULE

Painting of workshop equipment: Following painting specification shall be followed for above workshop equipment except item no. 7,8,14,15,20 & 21. For these machines, manufacture's standard painting specification shall be followed.

At Works

Pre-treatment: - Degreasing and surface preparation to SA 2 1/2.

Prime coat: - One (1) coat of Epoxy based polyamide cured (2) pack HB zinc phosphate primer. Dry-film thickness 75 microns per coat.

Intermediate coat: - One (1) coat of Epoxy based MIO pigmented polyamide cured paint. Dry-film thickness 50 microns per coat.

Finish coat: - Two (2) coat of Aliphatic Acrylic (2) pack glossy polyurethane paint. Dry-film thickness 30 microns per coat.

Total system: - Dry film thickness 185 microns.

Final shade of paint shall be as per manufacturer's standard only.

NOTES: -

- 1) Maintenance tools and tackles as required for the various machines, commissioning spares for various machines as applicable, first fill lubricant /coolant for each equipment is included in Bidder's scope of work.
- 2) Machines shall be supplied with the manufacturer's standard accessories & other accessories as indicated above. Bidder shall submit list of all other special accessories in their bid & furnish item wise price in the price bid.

2.0 The followings shall also be included in bidder's scope of work: -

- 2.1 Required numbers of machines in new / unused condition along with standard accessories and special accessories as listed above in the specification.
- 2.2 First fill of lubricants, oil, coolants etc. for all machines.
- 2.3 Painting of equipment shall be done by the bidder before despatch as per the attached painting schedule. Bidder shall also supply adequate quantity of loose touch up paint along with the equipment so that damage in transition, if any, can be taken care.
- 2.4 Base plates, Support plates, anchor bolts, foundation bolts and nuts, lifting lugs, eye bolts etc. if any. All commissioning spares shall be included in the scope of work of each equipment / item.
- 2.5 Terminal points for electrical shall be the power supply terminals in respective machines and power cable glands and lugs shall be in bidder's scope.



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- 2.6 The electrical equipment supplied as a part of machine shall include isolating switch for power supply isolation incorporating mechanical safety as required.
- 2.7 Commissioning spares shall be included in the scope of work of the bidder.
- 2.8 A complete unused new set of special purpose service / maintenance tools & tackles shall be supplied with each machine. The tools shall be supplied in steel tool box & shall be of the best quality & specially protected against rusting in tropical climate.
- 2.9 Five (5) metres of power cable (spare) shall be supplied along with each machine / item.
- 2.10 Supervision of Erection and Commissioning (for applicable equipment / machines).
- 2.11 Any other works not covered above but required for the safe operation of the machines.

3.0 **CODES & STANDARD**

The machines covered under the scope of work shall be new, of streamlined construction, rugged and vibration free in line with the Indian / international standard and practices.

4.0 **SERVICES BY CUSTOMER**

- 4.1 Draining arrangement of liquid coolant from source to the nearest drain.
- 4.2 Construction of Workshop building.
- 4.3 Pipe trench & cable trenches, doors / windows, rolling shutter, ramp and glass partition wall, if any.
- 4.4 Cable termination.
- 4.5 One no. EOT crane of 10 tonnes capacity.
- 4.6 Erection and commissioning of workshop machines.

5.0 **DOCUMENTS AND DATA REQUIRED TO BE SUBMITTED AFTER PLACEMENT OF LOI**

Following drawings and documents shall be submitted to BHEL for approval after the placement of LOI: -

- a) General arrangement drawing indicating overall dimensions, total weights, foundation details and bill of material for all types of machines including requirement of withdrawal space.
- b) Final details of motors (machine wise) indicating guaranteed power consumption as per BHEL's format.
- c) Manual calculation for selection of machines including authentic supporting literature (e.g. handbook / standards).
- d) Manual calculation for requirement of air / water quantity and pressure including authentic supporting literature (e.g. handbook / standards).
- e) Final filled up Data sheet "B" / Data sheet "C"



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- f) Quality assurance plan being followed for all items of each type of machine starting from raw material to final product including routine and type test being conducted at works.
- g) Write - up on working principle and special safety features envisaged for each type of machines.
- h) Final requirement of air and water indicating quantity, pressure and terminal points, if any.
- i) Painting schedule.
- j) O & M manual.
- k) List of spares (commissioning).
- l) List of Tools and Tackles.
- m) Schedule of lubricants indicating quantity, make and trade name of at-least three manufacturers.
- n) Data sheet of machines.

NOTE: -

- 1) The list of drawings and documents to be submitted after placement of order shall be forwarded to the successful bidder after award of contract.
- 2) Only manual calculation with authentic supporting literature shall be furnished (e.g. Hand book / standards / codes).
- 3) Drawings and documents not covered above but required to check safety of machines / system shall be submitted during detailed engineering stage without any commercial implication.

6.0 General requirement

- 01. All the drawings shall be prepared in Auto Cad - 2007 version or higher and required number of hardcopies and soft copies of all the drawings, documents, O & M and spare parts manuals shall be furnished to BHEL during detailed engineering stage as per Annexure – III enclosed with the NIT specification.
- 02. Inspection checklist / quality plan and recommended field quality plan for each machine and submitted to BHEL for approval after placement of order and any changes required by BHEL / CUSTOMER for the same shall be incorporated and adhered by the bidder without any commercial implications.
- 03. BHEL will require 21 days time to offer their comments on the drawings and documents being submitted by the bidder from the date of receipt.
- 04. All drawings including general arrangement, civil foundation drawing shall be furnished to BHEL during detailed engineering stage and shall include BOQ / BOM in tabular form indicating all major components including bought out items, standard as well as optional accessories which are covered under the bidder's scope of supply and their quantity, material of construction indicating its applicable code / standard, weight, make.



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05. All drawings of each machine including general arrangement and foundation drawings shall be furnished to BHEL during detailed engineering stage and shall include / indicate the following details for clarity w.r.t. inspection, construction, erection and maintenance etc. :-
- All drawings and documents shall bear BHEL's title block and drawing / document number. However, BHEL's drawing / document numbering scheme shall be furnished to the successful bidder after the placement of L.O.I.
 - All drawings shall indicate the list of all reference drawings including general arrangement and foundation drawings.
 - All drawings shall include / show plan, elevation, side view, cross - section, skin section, blow - up view and all major self manufactured, bought out items, standard as well as optional accessories which are covered under the bidder's scope of supply shall be labelled and included in BOQ / BOM in tabular form.
 - Specification / schedule of coolant / oil for oil cooler / lubricant / paint indicating atleast 3 trade name shall be made as a part of general arrangement drawing of each machine.
 - Extreme location of various items / assembly due to movement shall be shown in dotted lines indicating the dimensions of the same from the extreme point of idle location.
 - Location of motor (s), control panel along with dimensions shall be shown in the drawing.
 - Space required for the door opening of panel shall be shown in dotted lines with dimensions in all the general arrangement drawing.
 - Details of job feeding and withdrawal direction with arrow and its required space shall be shown in dotted lines with dimensions from some reference point like edge / centre of the machine.
 - Location of operator and required space for his movement shall be shown in the general arrangement drawing in dotted lines with dimensions from some reference point like edge / centre of the machine.
 - Requirement of withdrawal space for maintenance, if any, shall be shown in the general arrangement drawing in dotted lines with dimensions from the reference point like edge /centre of the machine.
 - Recommended clearance / maintenance space around the machine shall be shown in the general arrangement drawing in dotted lines with dimensions from the reference point like edge / centre of the machine.
 - Mounting details of each machine indicating size and required number of holes and the distances between them shall be indicated in the general arrangement drawing.
 - Distance between the mounting holes and distances of the same from some reference point like centre line of machine / edge of the machine to ensure correct construction of foundation and to know maximum space required for civil foundation and mechanical equipment.



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- n) Technical parameters of the machine shall be furnished (gearbox details, job rpm, vibration limit, noise level at a distance of 1.0 metre at a level of 1.5 metres above ground, V - belt details, details of pulley, details of all motors and hydraulics, whether the machine will be dispatched / delivered in the assembled condition or dismantled condition indicating the weight as the case may be, recommended capacity of E.O.T Crane, weight of heaviest (single) part / component of the machine, weight of machine along with accessories, job and total weight shall be furnished separately etc.) in all the general arrangement drawing and those shall be indicated in the drawing with dimensions to the extent possible. Details of electrical panel, wiring diagram, other relevant electrical and C&I details as applicable shall also be furnished.
- o) Details of cable entry for each machine shall be shown in all the 3 views (plan, elevation and side view).
- p) Hardness and type / method of hardening of various parts of each machine shall be indicated in the general arrangement drawing.
06. Manual Calculation for motor (s) sizing shall be furnished to BHEL during detailed engineering stage for approval along with the copy of authentic supporting literature e.g. Hand book, National / international Standards etc in line with the technical specification.
07. O & M manual shall be furnished to BHEL for approval during detailed engineering stage along with the general arrangement drawing.
08. Drawing / data sheet of all accessories shall be furnished to BHEL for approval during detailed engineering stage indicating brief specification.
09. Operational write-up along with safety features and interlock / control details of each machine shall be furnished to BHEL separately for approval during detailed engineering stage.
10. Separate drawing for lifting arrangement of machine during erection shall be furnished to BHEL for approval indicating dimensions and details of lifting lugs, rope etc.
11. Civil foundation drawing of each machine shall be furnished to BHEL for approval during detailed engineering stage showing / including the followings: -
- a) Scope of work by BHEL and vendor which shall be indicated with different legend or in the form of note.
- b) Weight of moving parts, its frequency and its height from floor shall be furnished.
- c) Recommended location of cable trench for feeding cable to machine shall be furnished along with the details of cable entry.
- d) Civil loads per bolt (static and dynamic) shall be furnished in tabular form considering weight of maximum size of job and worst cutting force.
12. Separate general arrangement drawing of drive arrangement shall be furnished to BHEL for approval during detailed engineering stage.



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13. Characteristic curve of motor shall be furnished to BHEL for approval during detailed engineering stage showing torque, speed, current & voltage.
14. Design of machines shall be such that no cooling water / air from external source shall be required for cooling of any part of machine. Necessary cooling arrangement, as required, shall be provided by the bidder in their machines.
15. First fill of all oil, lubricants, coolants etc. shall be included in scope of work of the bidder for each machine and shall be supplied along with the machine and **price for the same shall be taken care in the price bid, if any.**
16. Filled up sketch indicating various dimensions for the space requirements of each equipment, centre line of job feeding and its dimension from some reference point like the centre line of machine or edge of the machine, location of operator, direction of job feeding & withdrawal and details of cable entry.
17. Bidder has to depute competent designer (s) of each machine at BHEL's office during detailed engineering stage to discuss drawings and other technical documents as and when required by BHEL. However, minimum 7 days notice shall be served for the same.
18. Make of various bought items shall be as indicated in the NIT specification. Bidder will seek approval from BHEL during detailed engineering stage for those items which are not appearing in the list but required for the machine. However, Bidder shall not approach BHEL for approval of additional make of any item which is already appearing in the list.
19. Painting specification and schedule shall be provided by the bidder for each machine as indicated in the NIT specification. However, painting specification of those items / equipments which are not covered in the specification, bidder to prepare the painting specification (suitable for sea atmosphere) for each item / machine / equipment and will be submitted to BHEL / CUSTOMER for approval after placement of order and any changes required by BHEL / CUSTOMER for the same shall be incorporated and adhered by the bidder without any commercial implications. Bidder to include adequate quantity of loose touch up paint for each item / equipment / machine which is required to be supplied along with the item / equipment / machine to take care damage during transit and price for the same, if any, shall be taken care in the price bid.
20. Noise level for each machine at a horizontal distance of 1.0 metre from the edge of the machine and at a height of 1.5 metres from the ground shall be limited to 85 dba and the same shall be shown during the "PG" test.
21. Inspection checklist / MQP etc. shall be prepared by the bidder and will be submitted to BHEL / CUSTOMER for approval after placement of order and any changes required by BHEL / CUSTOMER for the same shall be incorporated and adhered by the bidder without any commercial implications. Necessary instruments / job material (steel plate / bar etc.) as required for the testing / inspection of machines shall be arranged by the bidder and shall also be included in bidder's scope of work.
22. All foundation nuts, bolts, lock nuts, washers etc. as required for fixing the machine with foundation shall be included in bidder's scope of work for each machine and the same shall be supplied along with the machine and **price for the same shall be taken care in the price bid, if any.**



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23. All necessary guards, devices, tools & other means that will effectively protect all personnel from any accidental or injury that may occur while machine is in running condition shall be in bidder's scope of work and shall be provided and shown in the drawings to be submitted during detail engineering stage.
24. Offered machines shall be suitable for the electrical conditions like voltages, frequencies, variations etc. as indicated in project information of NIT specification.
25. BHEL, will provide one (1) no. feeder per machine. Bidder to note & confirm that they will distribute the power requirement of various motors at their end only for this feeder.
26. List of maintenance tools / hand tools & tackles in terms of numbers only indicating sizes / ratings etc. in annexure form for each machine shall be submitted during detail engineering stage and the same shall be included in bidder's scope of work. Maintenance tools and tackles shall be supplied along with the tool box(es) and **price for the same shall be taken care in the final price bid, if any.**
27. List of commissioning spares in terms of numbers only indicating sizes / ratings etc. in annexure form for each machine shall be indicated in the offer and shall be supplied along with the machine. **Price for the same shall be taken care in the final price bid, if any.**
28. One (1) no. EOT Crane of capacity 10 Tonnes shall be provided by BHEL in the workshop building for maintenance of the machines. Bidder to check and confirm that the heaviest part of individual machine shall not exceed 10 Tonnes.
29. Necessary earthing studs / facilities for the machine and cables within the machine shall be provided by the bidder.
30. All machines shall be provided with DOL starter.
31. Bidder to furnish the Signed & stamped copy of quality plan for motors attached with the NIT specification during detail engineering stage.
32. Cable Glands shall be double compression tinned brass type and the cable glands shall be supplied as a part of the each machine and **price for the same shall be taken care in the price bid, if any.**
33. All cable lugs shall be heavy-duty tin-plated crimping type the cable lugs shall be supplied as a part of each machine and **price for the same shall be taken care in the price bid, if any.**
34. All technical parameters of LV motors shall comply data sheet –A for LV motors.
35. Filled up motor data sheet of motor (for each motor) and filled up electrical load data format (enclosed with the NIT specification) for each machine shall be submitted during detail engineering stage.
36. All the hand wheels shall be polished / Nickel - Chrome plated.



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37. List of standard accessories (which will be supplied free of cost along with the machine) in terms of numbers only for each machine shall be indicated in the offer and included in bidder's scope of work. **Price for the same shall be taken care in the price bid, if any.**

38. Bidder to indicate the material of construction of major parts of the machines indicating relevant IS / BS no.

7.0 **SPECIFIC REQUIREMENTS REGARDING ERECTION / TESTING & COMMISSIONING**

Field quality plan for all machines shall be prepared by the bidder during detailed engineering stage as per agreed schedule and the same shall be approved by BHEL to facilitate handling of equipment, erection & commissioning.

8.0 **BID EVALUATION CRITERIA**

The bid shall be evaluated based on the price quoted for main machine, commissioning spares, tools and tackles, manufacturer's standard accessories and special accessories as per specification and any technical loading due to non adherence to the technical specification. However, the price for recommended spares and other special / optional accessories which are not included in bidder's scope of work shall not be considered for evaluation purpose.

9.0 **CONDITION OF REJECTION**

Bid may be rejected if the data which have asked in clause No. 5.0 above is not properly filled-up and submitted along with the bid with company seal.

10.0 **INSPECTION, TESTING AND CODES**

10.1 The machine offered shall conform to the latest relevant Indian / international Codes / Standards, their electrical drives shall conform to the latest Indian Electricity Rules and shall comply for the currently applicable statutory regulations and safety codes for the locality where the equipment shall be installed.

10.2 Each machine before despatch shall be shop assembled & tested for its performance in the presence of purchaser's representative. Vendor to ensure the proper quality checks during manufacturing & assembly of machine, including identification, co-relation & verification of material test certificates for critical components like gears, shafts, spindles, sleeves etc. and radiographic tests for welds and ultrasonic tests on forging/castings to ensure defects free components and furnish test procedure, reports & test certificates on shop tests.

11.0 Drawing / document distribution schedule is attached in the NIT specification. Bidder shall follow the same during detail engineering stage.



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ANNEXURE - I

MAKES OF SUB VENDORS ITEMS OF WORKSHOP EQUIPMENT

S. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
1.	BEARINGS	SKF	-	
		FAG	-	
		TATA	-	
		NBC	-	
2.	V- BELT	FENNER	-	
		DUNLOP	-	
3.	HYDRAULIC POWER PACK	VICKERS-PERRY	-	
		REXROTH	-	
4.	PVC POWER CABLES	APAR INDUSTRIES LTD.	MUMBAI	
		CORDS CABLE INDUSTRIES LTD.	NEW DELHI	
		DIAMOND POWER INFRASTRUCTURE LTD	VADODARA	
		GOYOLENE FIBRES (INDIA) PVT.LTD	MUMBAI	
		GOVIND CABLE INDUSTRIES	KOLKATA	
		GUPTA POWER INFRASTRUCTURE LIMITED	BHUBNESWAR	
		HAVELLS INDIA LIMITED	NOIDA	
		KEI INDUSTRIES LTD.	NEW DELHI	
		KRISHNA ELECTRICAL INDUSTRIES LTD	GWALIOR	
		KEC INTERNATIONAL LIMITED	MUMBAI	
		MANSFIELD CABLES COMPANY LTD.	NOIDA	
		NICCO CORPORATION LTD.	KOLKATA	
		PARAMOUNT COMMUNICATIONS LTD.	NEW DELHI	
		POLYCAB WIRES PVT. LTD.	MUMBAI	
		RADIANT CORPORATION PRIVATE LIMITED	HYDERABAD	
		RAVIN CABLES LIMITED	MUMBAI	
		SUYOG ELECTRICALS LTD.	VADODARA	
		SRIRAM CABLES PVT. LTD.	NEW DELHI	
		SCOT INNOVATION WIRES AND CABLES PVT. LTD.	SOLAN	
		SAM CABLES & CONDUCTORS (P) LTD	UDHAM SINGH NAGAR	
5.	PVC CONTROL CABLES	THERMO CABLES LTD	HYDERABAD	
		ADVANCE CABLE TECHNOLOGIES (P) LTD	BANGALORE	
		APAR INDUSTRIES LTD., CMI LTD	MUMBAI	



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S. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		CMI LIMITED	FARIDABAD	
		CORDS CABLE INDUSTRIES LTD	NEW DELHI	
		CRYSTAL CABLE INDUSTRIES LTD	KOLKATA	
		DELTON CABLES LTD	NEW DELHI	
		DIAMOND POWER INFRASTRUCTURE LTD	VADODARA	
		ELKAY TELELINKS LTD	NEW DELHI	
		GEMSCAB INDUSTRIES LTD	NEW DELHI	
		GOVIND CABLE INDUSTRIES	KOLKATA	
		GUPTA POWER INFRASTRUCTURE LIMITED	BHUBNESWAR	
		HAVELLS INDIA LIMITED	NOIDA	
		INCOM CABLES (P) LTD	NEW DELHI	
		KEI INDUSTRIES LTD	NEW DELHI	
		KRISHNA ELECTRICAL INDUSTRIES LTD	GWALIOR	
		KEC INTERNATIONAL LIMITED	MUMBAI	
		MANSFIELD CABLES COMPANY LTD	NOIDA	
		NICCO CORPORATION LTD	KOLKATA	
		PARAMOUNT COMMUNICATIONS LTD	NEW DELHI	
		POLYCAB WIRES PVT. LTD	MUMBAI	
		RAVIN CABLES LIMITED	MUMBAI	
		SUYOG ELECTRICALS LTD	VADODARA	
		SPECIAL CABLES PVT. LTD	NEW DELHI	
		SCOT INNOVATION WIRES AND CABLES PVT. LTD	SOLAN	
		SAM CABLES & CONDUCTORS (P) LTD	UDHAM SINGH NAGAR	
		SPM POWER & TELECOM PVT. LTD	HYDERABAD	
		TORRENT CABLES LTD	AHMEDABAD	
		THERMO CABLES LTD	HYDERABAD	
		TIRUPATI PLASTOMATICS PVT. LTD	JAIPUR	
		UNIVERSAL CABLES LTD	SATNA	
6.	XLPE POWER CABLES	APAR INDUSTRIES LTD	MUMBAI	
		CORDS CABLE INDUSTRIES LTD	NEW DELHI	
		CRYSTAL CABLE INDUSTRIES LTD	KOLKATA	
		DIAMOND POWER INFRASTRUCTURE LTD	VADODARA	



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S. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		GEMSCAB INDUSTRIES LTD	NEW DELHI	
		GOVIND CABLE INDUSTRIES	KOLKATA	
		GUPTA POWER INFRASTRUCTURE LIMITED	BHUBNESWAR	
		HAVELLS INDIA LIMITED	NOIDA	
		KEI INDUSTRIES LTD	NEW DELHI	
		KRISHNA ELECTRICAL INDUSTRIES LTD	GWALIOR	
		KEC INTERNATIONAL LIMITED	MUMBAI	
		MANSFIELD CABLES COMPANY LTD	NOIDA	
		PARAMOUNT COMMUNICATIONS LTD	NEW DELHI	
		POLYCAB WIRES PVT. LTD	MUMBAI	
		RAVIN CABLES LIMITED	MUMBAI	
		SUYOG ELECTRICALS LTD	VADODARA	
		SPECIAL CABLES PVT. LTD	NEW DELHI	
		SCOT INNOVATION WIRES AND CABLES PVT. LTD	SOLAN	
		SRIRAM CABLES PVT. LTD	NEW DELHI	
		TORRENT CABLES LTD	AHMEDABAD	
		THERMO CABLES LTD	HYDERABAD	
		TIRUPATI PLASTOMATICS PVT. LTD	JAIPUR	
7.	XLPE CONTROL CABLES	APAR INDUSTRIES LTD	MUMBAI	
		CABLE CORPORATION OF INDIA LTD	MUMBAI	
		CRYSTAL CABLE INDUSTRIES LTD	KOLKATA	
		DIAMOND POWER INFRASTRUCTURE LTD	VADODARA	
		GEMSCAB INDUSTRIES LTD	NEW DELHI	
		HAVELLS INDIA LIMITED	NOIDA	
		KEI INDUSTRIES LTD	NEW DELHI	
		KRISHNA ELECTRICAL INDUSTRIES LTD	GWALIOR	
		KEC INTERNATIONAL LIMITED	MUMBAI	
		PARAMOUNT COMMUNICATIONS LTD	NEW DELHI	
		POLYCAB WIRES PVT. LTD	MUMBAI	
		RADIANT CORPORATION PRIVATE LIMITED	HYDERABAD	
		RAVIN CABLES LIMITED	MUMBAI	
		SUYOG ELECTRICALS LTD	VADODARA	
		SRIRAM CABLES PVT. LTD	NEW DELHI	
		TORRENT CABLES LTD	AHMEDABAD	



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S. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		UNIVERSAL CABLES LTD	SATNA	
8.	PUMP FOR COOLANT	PHULSONS RAJPURA / RAJAMANE INDUSTRIES PVT. LTD.	BANGLORE	
9.	LT MOTORS	SIEMENS	-	
		NGEF (up to 15KW)	-	
		CROMPTON	-	
		KIRLOSKAR	-	
		BHARAT BIJLI	-	
		ALSTOM	-	
		ABB	-	
10.	PAINT	ASIAN PAINTS (I) LTD.	-	
		BERGER PAINTS INDIA LTD	-	
		GOODLASS NEROLAC	-	
		JENSON & NICHOLSON (I)- LTD	-	
		CDC CARBOLINE (I) LTD.	-	
		SHALIMAR PAINTS LTD.	-	
		ADDISON PAINTS LTD	-	
		GRAND POLYCOAT	-	
		BOMBAY PAINTS	-	
		HEMPLE PAINTS (SINGAPORE)	-	
		JOTUN PAINTS	-	

NOTE:

1. THE SUB VENDOR LIST ABOVE IS INDICATIVE ONLY AND IS SUBJECT TO BHEL AND CUSTOMER APPROVAL DURING DETAILED ENGINEERING STAGE WITHOUT ANY COMMERCIAL & DELIVERY IMPLICATION TO BHEL.

BIDDER TO PROPOSE SUB VENDOR WITHIN 4 WEEKS OF PLACEMENT OF LOI. THEREAFTER NO REQUEST FOR ADDITIONAL SUB-VENDOR SHALL BE ENTERTAINED.
2. DEALERS ARE NOT ACCEPTABLE FOR ANY ITEM OF THE PACKAGE. BIDDER SHALL PROCURE ALL ITEMS INCLUDING PLATES, STRUCTURAL, FLANGES; COUNTER FLANGES ETC. FROM APPROVED SUB VENDOR ONLY.
3. THE INSPECTION CATEGORY WILL BE INTIMATED AFTER AWARD OF CONTRACT BY BHEL/CUSTOMER. HOWEVER, THE SAME WILL BE ADHERED BY THE BIDDER WITHOUT ANY COMMERCIAL AND DELIVERY IMPLICATION TO BHEL/ CUSTOMER.



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ANNEXURE-II

DRAWINGS, DATA / DOCUMENTS TO BE FURNISHED BY THE SUCCESSFUL BIDDER

The successful bidder shall submit the following drawings / documents during detail engineering for approval /information: _

LIST OF PRIMARY DRAWING / DOCUMENTS:

Sl. No.	BHEL DRG.NO	DRAWING TITLE	REMARKS	SUBMISSION SCHEDULE - WEEK NUMBER FROM DATE OF LOI
1.	PE-V0-417-568-A001	Inspection Check List / Manufacturing Quality Plan of machine/equipment	APPROVAL	3
2.	PE-V0-417-568-A002	Data sheet of machine/equipment with detailed BOM WORKSHOP EQUIPMENT	APPROVAL	3
3.	PE-V0-417-568-A003	GA, Foundation Detail (as required) of Machine / Equipment	APPROVAL	3

List of Secondary dwg. /doc for each machine / equipment (as applicable) after approval of basic dwg. / doc:

Sl. No.	BHEL DRG.NO	DRAWING TITLE	REMARKS	SUBMISSION SCHEDULE - WEEK NUMBER FROM DATE OF LOI
4.	PE-V0-417-568-A004	O & M Manual for EQUIPMENT	INFORMATION	2 weeks after approval of primary dwg/doc.
5.	PE-V0-417-568-A006	Erection Procedure for WORKSHOP EQUIPMENT	INFORMATION	2 weeks after approval of primary dwg/doc.

- The above drawing list is tentative and shall be finalized with the successful bidder after placement of order. Every repeat submission within 10 (ten) days. Response time by BHEL within three (3) weeks after receiving of drawing.
- Drawings shall be prepared in Auto-Cad latest edition. Required no. of hard and soft copies (editable) of the drawings shall be furnished as per requirement specified elsewhere in the specification.
- All the drawings and documents including general arrangement drawing, data sheet, calculation etc. to be furnished to the customer during detailed engineering stage shall include / indicate the following details for clarity w.r.t. Inspection, construction, erection and maintenance etc.:-
 - All drawings and documents shall indicate the list of all reference drawings including general arrangement.



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- b) All drawings shall include / show plan, elevation, side view, cross - section, skin section, blow - up view; all major self-manufactured and bought out items shall be labeled and included in BOQ / BOM in tabular form.
- c) Painting schedule shall also be made as a part of general arrangement drawing of each equipment / items indicating at least 3 trade names.
- d) All the drawings required to be furnished to customer during detailed engineering stage shall include technical parameters, details of paints and lubrication, hardness and BOQ / BOM in tabular form indicating all major components including bought out items and their quantity, material of construction indicating its applicable code / standard, weight, make etc.



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ANNEXURE - III

Drawings / documents distribution schedule

S.N.	DESCRIPTION	CUSTOMER / CONSULTANT	BHEL / Customer SITE	PEM (ENGINEERING)
1)	Drawings / documents during approval stage	10	Nil	6 – hard copy and 1 – soft copy (CD)
2)	Finally approved drawings / documents	10	9	6 – hard copy and 6 - softcopy (CD)
3)	As built drawings / documents	10	9	6 – hard copy and 6 - softcopy (CD)
4)	Approved erection / installation manual	10	9	6 – hard copy and 6 - softcopy (CD)
5)	Approved O & M manuals	10	9	6 – hard copy and 6 - softcopy (CD)

Note: The above requirement is minimum. However, exact quantities of drawings / documents requirement shall be informed to the successful bidder during detailed engineering stage for which no commercial implication shall be entertained by BHEL.

All drawings & documents shall be prepared in Autocad and submitted for review / approval in soft copies also. Catalogues shall be scanned for soft copy.

Note:- Manually prepared drawings are not acceptable.

Soft copy in CD Rom and Reproducible Tracings of all drawings / documents shall be submitted along with Final / As-Built submission.

“Bidder to note that BHEL reserve the right for drg/doc submission through web based Document Management System. Bidder would be provided access to the DMS for drg/doc approval and adequate training for the same. Detailed methodology would be finalized during the kick-off meeting. Bidder to ensure following at their end.

- Internet explorer version – Minimum Internet Explorer 7
- Internet speed – 2 mbps (Minimum preferred)
- Pop ups from our external DMS IP (124.124.36.198) should not be blocked
- Vendor's Internal proxy setting should not block DMS application's link (<http://124.124.36.198/wrenchwebaccess/login.aspx>)”



TITLE 5X800 MW TSGENCO YADADRI TPS
TECHNICAL SPECIFICATION FOR
WORKSHOP EQUIPMENT

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SECTION – IB

Specific Technical Requirement (Electrical)

**TELANGANA STATE POWER GENERATION
CORPORATION LTD
TELANGANA STATE, INDIA**

5 X 800 MW YADADRI TPS

**WORKSHOP EQUIPMENT
TECHNICAL SPECIFICATION
(ELECTRICAL PORTION)**



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT,
NOIDA, U.P., INDIA**




TITLE: **ELECTRICAL EQUIPMENT SPECIFICATION
FOR
WORKSHOP**
5X800 MW YADADRI TPS

SPECIFICATION NO.
VOLUME NO. : **II-B**
SECTION : **I**
REV NO. : **00** DATE: 15/12/2022
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I	TECHNICAL SPECIFICATION/FEATURE (MOTORS)	7
I	MOTOR DATA SHEET-A	1
I	MOTOR DATA SHEET-C	2
I	CABLE ROUTING PROGRAM WINPATH	2
II	QUALITY PLAN (FOR MOTORS BELOW 55 KW)	2
II	QUALITY PLAN (FOR MOTORS ABOVE & 55 KW)	9

The requirements mentioned in Section-I shall prevail and govern in case of conflict between the same and the corresponding requirements mentioned in the descriptive portion in Section-II.

	TECHNICAL SPECIFICATION FOR WORKSHOP EQUIPMENT 5X800 MW YADADRI TPS (ELECTRICAL PORTION)	SPECIFICATION NO. VOLUME NO. : SECTION : I REV NO. : 00 DATE: 15/12/2022 SHEET : 3 OF 31
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SPECIFIC TECHNICAL REQUIREMENTS FOR LV MOTORS (ELECTRICAL)

SECTION-I

	TECHNICAL SPECIFICATION FOR WORKSHOP EQUIPMENT 5X800 MW YADADRI TPS (ELECTRICAL PORTION)	SPECIFICATION NO. VOLUME NO. : SECTION : I REV NO. : 00 DATE: 15/12/2022 SHEET : 4 OF 31
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SPECIFIC TECHNICAL REQUIREMENTS: ELECTRICAL

1.0 EQUIPMENT & SERVICES TO BE PROVIDED BY BIDDER:


- a) Services and equipment as per "Electrical Scope between BHEL and Vendor".
- b) Any item/work either supply of equipment or erection material which have not been specifically mentioned but are necessary to complete the work for trouble free and efficient operation of the plant shall be deemed to be included within the scope of this specification. The same shall be provided by the bidder without any extra charge.
- c) Supply of mandatory spares as specified in the specifications of mechanical equipment's.
- d) Electrical load requirement for WORKSHOP EQUIPMENT
- e) All equipment shall be suitable for the power supply fault levels and other climatic conditions mentioned in the enclosed project information
- f) Bidder to furnish list of makes for each equipment at contract stage, which shall be subject to customer/BHEL approval without any commercial and delivery implications to BHEL
- g) Various drawings, data sheets as per required format, Quality plans, calculations, test reports, test certificates, operation and maintenance manuals etc. shall be furnished as specified at contract stage. All documents shall be subject to customer/BHEL approval without any commercial implication to BHEL.
- h) Motor shall meet minimum requirement of motor specification.
- i) Vendor to clearly indicate equipment locations and local routing lengths in their cable listing furnished to BHEL.
- j) Cable BOQ worked out based on routing of cable listing provided by the vendor for "both end equipment in vendor's scope" shall be binding to the vendor with +10 % margin to take care of slight variation in routing length & wastages.

2.0 EQUIPMENT & SERVICES TO BE PROVIDED BY PURCHASER FOR ELECTRICAL & TERMINAL POINTS:

Refer "Electrical Scope between BHEL and Vendor" Annexure - I.

3.0 DOCUMENTS TO BE SUBMITTED ALONG WITH BID

- 3.1 The electrical specification without any deviation from the technical/quality assurance requirements stipulated shall be deemed to be complied by the bidder in case bidder furnishes the overall compliance of package technical specification in the form of compliance certificate/No deviation certificate.
- 3.2 No technical submittal such as copies of data sheets, drawings, write-up, quality plans, type test certificates, technical literature, etc., is required during tender stage. Any such submission even if made, shall not be considered as part of offer.

	TECHNICAL SPECIFICATION FOR WORKSHOP EQUIPMENT 5X800 MW YADADRI TPS (ELECTRICAL PORTION)	SPECIFICATION NO. VOLUME NO. : SECTION : I REV NO. : 00 DATE: 15/12/2022 SHEET : 5 OF 31
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4.0 List of enclosures :

- a) Electrical scope between BHEL & vendor (Annexure –I)
- b) Technical specification for motors.
- c) Datasheets for motors.
- d) Electrical Load data format (Annexure –II)
- e) BHEL cable listing format (Annexure –III)
- f) Quality plan for motors.

STANDARD ELECTRICAL SCOPE BETWEEN BHEL AND VENDOR (FOR EPC PROJECTS)

PACKAGE : WORKSHOP EQUIPMENT

SCOPE OF VENDOR: SUPPLY

PROJECT : 5X800MW YADADRI TPS





S.NO	DETAILS	SCOPE SUPPLY	SCOPE E&C	REMARKS
1	415V MCC	BHEL	BHEL	240 V AC (supply feeder)/415 V AC (3 PHASE 4 WIRE) supply shall be provided by BHEL based on load data provided by vendor at contract stage for all equipment supplied by vendor as part of contract. Any other voltage level (AC/DC) required will be derived by the vendor.
2	Power cables	BHEL	BHEL	Cable size shall be derived by BHEL based on Electrical load data & shall be informed to vendor at contract stage. Vendor shall provide lugs & glands accordingly.
3	Any other/special type of cable like control, screened control, compensating, co-axial, prefab, MICC, fibre Optic cables etc.	Vendor	BHEL	
4	Cabling material (Cable trays, accessories ,cable tray supporting system, conduits etc.)	BHEL	BHEL	
5	Cable glands ,lugs, and bimetallic strip for equipment supplied by Vendor	Vendor	BHEL	1. Double compression Ni-Cr plated brass cable glands 2. Solder less crimping type heavy duty tinned copper lugs for power and control cables.
6	Motors alongwith fixing accessories	Vendor	-	Makes shall be subject to customer/ BHEL approval at contract stage.
7	Mandatory spares	Vendor	-	Vendor to quote as per specification.
8	Recommended O & M spares	Vendor	-	As per specification


NOTES:

1. Make of all electrical equipment/ items supplied shall be reputed make & shall be subject to approval of BHEL/customer after award of contract without any commercial implication.
2. All QPs shall be subject to approval of BHEL/customer after award of contract without any commercial implication.
3. Any other Equipment/material/service required for completeness of system based on system offered by the vendor(to ensure trouble free & efficient operation of the system).
4. Cable Schedules
5. Electrical Equipment & Cable tray layout

TECHNICAL SPECIFICATION

BASIC TECHNICAL FEATURES FOR LT MOTORS (FOR BHEL-PEM SCOPE PACKAGES)

	CUSTOMER TELANGANA STATE POWER GENERATION CORPORATION LTD TELANGANA, INDIA 5 x 800 MW YADADRI TPS, NALGONDA				
	ENGINEER TATA CONSULTING ENGINEERS LTD BANGLORE INDIA				
	DESIGNER BHARAT HEAVY ELECTRICALS LTD POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA				
COPY RIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED it must not be used directly or indirectly in any way detrimental to the interest of the company.		DEPT CODE	NAME	MRG	DATE
		DRN	HC	S.D.	07.12.17
		DESN	HC	S.D.	07.11.17
		CHD	AS	S.D.	07.12.17
		APPD	PD	S.D.	07.12.17
TITLE BASIC TECHNICAL FEATURES FOR LT MOTORS					
		DEVT	SCALE	DRAWING NO.	
		SIGN		PE-DC-417-565-E003	
				SHEET	REV. 02

	5 x 800 MW YADRADRI TPS BASIC TECHNICAL FEATURES FOR LT MOTORS (FOR BHEL-PEM SCOPE PACKAGES)	Doc. No.	PE-DC-417-565-E003
		Rev. No.	02
		Dated	16-08-2018
		Page	10 OF 31

- 1.0 This document covers the basic technical features of low tension (LT) squirrel cage induction AC motors employed for driving auxiliaries of BHEL-PEM scope packages in **5 x 800 MW YADRADRI TPS**.

2.0 CODES AND STANDARDS

All motors shall conform to the latest applicable standards as listed below;

- 1) Three phase induction motors: IS: 12615, IEC: 60034
- 2) Single phase AC motors: IS: 996, IEC: 60034
- 3) Crane duty motors: IS: 3177, IEC: 60034
- 4) Energy Efficient motors: IS 12615 or IEC: 60034-30 with Efficiency class IE3

3.0 DESIGN REQUIREMENTS

3.1 Service Conditions

The motors will be installed in hot, humid and tropical atmosphere highly polluted at places with coal dust and/or fly ash. For motor installed outdoor and exposed to direct sunrays, the effect of solar heat shall be considered in the determination of the design ambient temperature.

The design ambient temperature shall be 50 deg C.

3.2 Supply system and rated voltage of motors

KW rating	Supply system	Rated voltage of motor
Upto 0.2 kW	240V/415 V	240V/415 V
Above 0.2 kW & up to 175kW	415 V	415 V

3.2.1 Supply voltage & variations shall be as follows:-

Voltage variation (AC Supply): (+/-) 10%
Frequency variation : (+) 3% to (-) 5%
Combined V & F variation : 10% (sum of absolute values)

During starting of large motor, the voltage may drop to 80% of the rated voltage for a period of 60 seconds. All electrical equipment while running shall successfully ride over such period without affecting system performance.


3.2.2 Motors shall be capable of running continuously at rated output for each of the conditions specified.

3.3 Motor Rating

All motors shall be rated for continuous duty. They shall also be suitable for long period of inactivity. LT motor rating at 50 degree C shall have at least 15% margin over the input power requirement of the driven equipment at rated duty point unless stated otherwise in driven equipment specification. The motor characteristics shall match the requirements of the driven equipment so that adequate starting, accelerating, pull up, break down and full load torques are available for the intended service.

3.4 Starting Requirements

3.4.1 Motor shall start smoothly and rapidly. Motor characteristics such as speed, starting torque, break away torque and starting time shall be properly co-ordinated with the requirements of driven equipment. The

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accelerating torque at any speed with the minimum starting voltage shall be at least 10% higher than that of the driven equipment.

- 3.4.2 Motors shall be capable of starting and accelerating the load with direct on line starting without exceeding acceptable winding temperature.

The limiting value of voltage at rated frequency under which a motor will successfully start and accelerate to rated speed with load shall be taken to be a constant value of 85 (eighty five) percent rated voltage.

- 3.4.3 Continuous duty LT motors up to 175 KW Output rating (at 50 deg. C ambient temperature), shall be Premium efficiency (IE3) as per IEC: 60034-30/ IS: 12615 and the locked rotor current of motors shall as per IS 12615.
However, as per system requirement drives rated in the range of 160-210 KW may be considered in either 415V or 3.3 KV

- 3.4.4 Pump motor subject to reverse rotation shall be designed to withstand the stresses encountered when starting with shaft rotating at 125% rated speed in reverse direction. The motors shall be designed to withstand 120% of rated speed for 2 minutes without any mechanical damage.

- 3.4.5 The following frequency of starts shall apply


- Three cold starts in succession with the motor being initially at a temperature not exceeding the ambient temperature.
- Two hot starts in succession with the motor being initially at a temperature not exceeding the rated load temperature.
- Three equally spread starts in an hour the motor being initially at a temperature not exceeding the rated load operating temperature (not to be repeated in the second successive hour)

- 3.4.6 Locked motor withstand time of hot motors at 110% rated voltage shall be as follows:

- For motors with starting time upto 20 sec.
- at least 3 sec. more than starting time.
- For motor with starting time above 20 secs but not exceeding 45 secs.
- at least 5.0 sec. more than starting time.
- For motors with starting time above 45 secs.
- at least 10%. more than starting time.

The starting time of the motor referred above is at minimum permissible voltage. Wherever the above requirements are not complied with, speed switches of approved make & type shall be provided to bypass the locked rotor protection for a pre-selected time during starting of motors. The speed switches shall have one NO & one NC contacts having maximum interrupting capacity of 5 Amps at 240V AC and 0.25 amps at 220 V DC.

Hot thermal withstand curve shall have a margin of at least 10% over the full load current of the motor to permit relay setting utilising motor rated capacity.

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3.5 Running Requirements

- 3.5.1 Motor shall run continuously at rated output over the entire range of voltage and frequency variations as given above.
- 3.5.2 The motor shall be capable of operating satisfactorily at full load for 5 minutes without injurious heating with 75% rated voltage at motor terminals.
- 3.5.3 The motor shall be designed to withstand momentary overload of 60% of full load torque for 15 second without any damage.

3.6 Stress during bus Transfer

- 3.6.1 The motor may be subjected to sudden application of 150% rated voltage during bus transfer, due to the phase difference between the incoming voltage and motor residual voltage.
- 3.6.2 The motor shall be designed to withstand any torsional and/or high current stresses, which may result, without experiencing any deterioration in the normal life and performance characteristics.

4.0 SPECIFIC REQUIREMENTS

4.1 Enclosure

All motor enclosures for outdoor, semi-outdoor & indoor application shall conform to the degree of protection IP-55 unless otherwise specified. Motor for outdoor or semi-outdoor service shall be of weather-proof construction with canopy. For hazardous area approved type of increased safety enclosure shall be furnished.

4.2 Cooling

- 4.2.1 The motor shall be self-ventilated type, either totally enclosed fan cooled IC 411(TEFC), totally enclosed tube ventilated IC 511(TETV) or closed air circuit air- cooled IC 611(CACA).

4.3 Winding and Insulation

All insulated winding shall be of copper. All motors shall have class F insulation but limited to class B temperature rise. Windings shall be impregnated to make them non-hygroscopic and oil resistant.


Tropical Protection

All motors shall have fungus protection involving special treatment of insulation and metal against fungus, insects and corrosion.

All fittings and hardware shall be corrosion resistant.

4.4 Bearings

- 4.4.1 Motor shall be provided with antifriction bearings, unless sleeve bearings are required by the motor application. Bearings shall be rated for minimum service life of 40,000Hrs.
- 4.4.2 Vertical shaft motors shall be provided with thrust and guide bearings. Thrust bearing of tilting pad type is preferred.

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- 4.4.3 Bearings shall be provided with seals to prevent leakage of lubricant or entrance of foreign matters like dirt, water etc. into the bearing area.
- 4.4.4 Sleeve bearings shall be split type, ring oiled, with permanently aligned, close running shaft sleeves.
- 4.4.5 Grease lubricated bearings shall be pre-lubricated and shall have provisions for in-service positive lubrication with drains to guard against over lubrication. LT motors 15kW and above shall be provided with external greasing arrangement.
- 4.4.6 Oiled bearing shall have an integral self-cooled oil reservoir with oil ring inspection ports, oil sight glass with oil level marked for standstill and running conditions and oil fill and drain plugs.
- 4.4.7 Forced lubricated or water cooled bearing shall be used as per requirement.
- 4.4.8 Lubricant shall not deteriorate under all service conditions. The lubricant shall be limited to normally available types with IOC equivalent.
- 4.4.9 Bearings shall be insulated as required to prevent shaft current and resultant bearing damage.

4.5 Noise & Vibration

- 4.5.1 For 415V motors, maximum double amplitude vibrations upto 1500 rpm shall be 40 microns and 15 microns upto 3000 rpm.
- 4.5.2 The noise level shall not exceed 85db (A) at 1.5 meters from the motor.

4.6 Motor Terminal Box

- 4.6.1 Motor terminal box shall be detachable type and located in accordance with Indian Standards clearing the motor base- plate/ foundation
- 4.6.2 Terminal box shall be capable of being turned 360 deg in steps of 90 Deg. for LT motors unless otherwise approved.
- 4.6.3 The terminal box shall be split type with removable cover with access to connections and shall have the same degree of protection as motor.
- 4.6.4 The terminal box shall have sufficient space inside for termination/connection of XLPE insulated armoured aluminium cables.
- 4.6.5 Terminals shall be stud or lead wire type, substantially constructed and thoroughly insulated from the frame.
- 4.6.6 The terminals shall be clearly identified by phase markings, with corresponding direction of rotation marked on the non-driving end of the motor.
- 4.6.7 The terminal box shall be capable of withstanding maximum system fault current for a duration of 0.25 sec.
- 4.6.8 Motor terminal box shall be furnished with suitable cable lugs and double compression brass glands to match with cable used.
- 4.6.9 The gland plate for single core cable shall be non-magnetic type. A suitable cable adopter box shall be provided if the cable size does not allow the direct termination in the main TB.

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4.6.10 Minimum clearances to be provided between phase to phase and phase to earth shall be as under-

Voltage Rating of Motor Minimum Ph-Ph & Ph-Earth clearance

0.415 kV : 25 mm

Note: In case it is not possible to maintain these clearances, the live parts shall be totally insulated from earth and other Phases. Adequate clearances shall be provided for cable connections.

4.7 Grounding

The frame of each motor shall be provided with two separate and distinct grounding pads complete with tapped hole, GI bolts and washer.

The cable terminal box shall have a separate grounding pad.

4.8 Rating Plate

In addition to the minimum information required by IS, the following information shall be shown on motor rating plate:

- Temperature rise in Deg.C under rated condition and method of measurement.
- Degree of protection.
- Bearing identification no. and Type of lubrication, Quantity and frequency/ time interval
- Location of insulated bearings.

5.0 ACCESSORIES

5.1 SPACE HEATERS

Motor of rating 30 kW and above shall be provided with space heaters, suitably located for easy removal or replacement. The space heater shall be rated 240 V, 1 Phase, 50Hz and sized to maintain the motor internal temperature above dew point when the motor is idle. The minimum cable size for space heater shall be 2.5 sq.mm copper cable.

5.2 DELETED

5.3 INDICATOR/ SWITCH

5.3.1 Dial type local indicator with alarm contacts shall be provided for the following:

Hot and cold air temperature of the closed air circuit for CACA motor.


5.3.2 Alarm switch contact rating shall be minimum 2.0 A at 220V D.C. and 10A at 240V A.C.

5.4 ACCESSORY TERMINAL BOX

5.4.1 All accessory equipment such as space heater, temperature detector, current transformers etc., shall be wired to and terminated in terminal boxes, separate from and independent of motor (power) terminal box.

5.4.2 Accessory terminal box shall be complete with double compression brass glands and pressure type terminals to suit owner's cable connections.

DRAIN PLUG

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Motor shall have drain plugs so located that they will drain the water, resulting from the condensation or other causes from all pockets of the motor casing.

5.5 LIFTING PROVISIONS

Motor weighing 25 Kg. or more shall be provided with eyebolt or other adequate provision of lifting.

5.6 DOWEL PINS

The motor shall be designed to permit easy access for drilling holes through motor feet or mounting flange for installation of dowel pins after assembling the motor and driven equipment.

7.0 PAINTING

Colour scheme for motors shall be shade 631 of IS-5.

8.0 TESTING

8.1 Type Tests

For LT Motors, type test reports for type tests as per IS: 12615/ IEC: 60034 conducted on equipment similar to those proposed to be supplied shall be submitted. The type Test should have been conducted within last 5 years from enquiry date.

8.2 Routine Tests

All motors shall be subjected to routine tests as per IS: 12615/ IEC: 60034 in the presence of customer or customer representative.

9.0 Variable Frequency Drive motor details:

- i) The motor shall be suitable for operation with a solid-state power supply consisting of an adjustable frequency inverter for speed control.
- ii) The motor shall be suitable for the current waveforms produced by the power supply including the harmonics generated by the drive.
- iii) The Motor shall be designed to operate continuously at any speed over the range 20-100 % of rated speed.
- iv) The permitted voltage variation should take into account the steady state voltage drop across the AC drive and all other system components upstream of the motor.
- v) Motors required to be transferred to DOL, by-pass mode shall be rated for specified variations in system line voltage and frequency. Starting current of motor in DOL, bypass mode shall be limited to value in motor specifications.
- vi) The motor shall be constructed to withstand torque pulsations resulting from harmonics generated by the solid-state power supply.
- vii) The motor insulation shall be designed to accept the applied voltage waveform, within the Vpeak and dv/dt limits as per IEC-61800-4.
- viii) The drive manufacturer shall be solely responsible for proper selection of the motor for the given load application and the output characteristics of the drive.

	TITLE	SPECIFICATION NO.	
		VOLUME	II B
		SECTION	I
		REV NO. 00	DATE 15/12/2022
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	LV MOTORS		
	<u>DATA SHEET-A</u>		
1.0	Design ambient temperature	:	50 °C
2.0	Maximum acceptable kW rating of LV motor	:	≤175KW
3.0	Installation (Indoors/ Outdoors)	:	As required
4.0	Degree Of Protection (Indoor/Outdoor)	:	IP55
5.0	Type of Cooling	:	TEFC/CACA/TETV
6.0	Details of supply system		
	a) Rated voltage (with variation)	:	415V ± 10%
	b) Rated frequency (with variation)	:	50 Hz (Variation: +3% TO -5%)
	c) Combined voltage & freq. variation	:	10%
	d) System fault level at rated voltage	:	50 kA for 1 sec
	e) Short time rating for terminal boxes		
	o 110kW & Above (Breaker controlled)	:	50 kA for 0.25 sec
	o Below 110kW (SFU+ Contactor controlled)	:	50 KA for 0.25 sec.
	f) LV System grounding	:	Solidly
7.0	Class of insulation	:	Class 'F', with temp rise limited to class B.
8.0	Minimum voltage for starting (As percentage of rated voltage)	:	80% of rated voltage
9.0	Power cables data	:	Shall be given during Detailed engg.
10.0	Earth Conductor Size & Material	:	Shall be given during Detailed engg.
11.0	Space heater supply	:	240 V, 1Φ , 50 Hz
12.0	Rating up to which Single phase motor	:	Acceptable below 0.20 kW
13.0	Tests	:	As per Customer motor spec. (enclosed)
14.0	Energy efficient/ Flame proof motor	:	As per Customer spec. requirement
<ul style="list-style-type: none"> Also detail spec. for Motors to be referred as enclosed with spec. 			

	TITLE	SPECIFICATION NO.
		VOLUME
		SECTION I
		REV NO. 00 DATE
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S. No.	Description	Data to be filled by successful bidder
A.	General	
1	Manufacturer & country of origin	
2	Motor type	
3	Type of starting	
4	Name of the equipment driven by motor & Quantity	
5	Maximum Power requirement of driven equipment	
6	Rated speed of Driven Equipment	
7	Design ambient temperature	
B.	Design and Performance Data	
1	Frame size & type designation	
2	Type of duty	
3	Rated Voltage	
4	Permissible variation for	
5	a) Voltage	
6	b) Frequency	
7	c) Combined voltage & frequency	
8	Rated output at design ambient temp (by resistance method)	
9	Synchronous speed & Rated slip	
10	Minimum permissible starting voltage	
11	Starting time in sec with mechanism coupled	
12	a) At rated voltage	
13	b) At min starting voltage	
14	Locked rotor current as percentage of FLC (including IS tolerance)	
15	Torque	
	a) Starting	
	b) Maximum	
16	Permissible temp rise at rated output over ambient temp & method	
17	Noise level at 1.0 m (dB)	
18	Amplitude of vibration	
19	Efficiency & P.F. at rated voltage & frequency	
	a) At 100% load	
	c) At 75% load	

NAME OF VENDOR			SEAL	REV.	
NAME	SIGNATURE	DATE			

	TITLE	SPECIFICATION NO.
		VOLUME
		SECTION I
		REV NO.00 DATE
		SHEET 18 OF 31

S. No.	Description	Data to be filled by successful bidder
	e) At starting	
C.	Constructional Features	
1	Method of connection of motor driven equipment	
2	Applicable Standard	
3	DOP of Enclosure	
4	Method of cooling	
5	Class of insulation	
6	Main terminal box	
	a) Type	
	b) Power Cable details (Conductor, size, armour/unarmour)	
	c) Cable Gland & lugs details (Size, type & material)	
	d) Permissible Fault level (kArms & duration in sec)	
7	Space heater details (Voltage & watts)	
8	Flame proof motor details (if applicable)	
	a) Enclosure	
	b) suitability for hazardous area	
	i) Zone	O / I / II
	ii) Group	IIA / IIB / IIC
9	No. of Stator winding	
10	Winding connection	
11	Kind of rotor winding	
12	Kind of bearings	
13	Direction of rotation when viewed from NDE	
14	Paint Shade & type	
15	Net weight of motor	
16	Outline mounting drawing No (To be enclosed as annexure)	
D.	Characteristic curves/ drawings (To be enclosed for motors of rating $\geq 55KW$)	
	a) Torque speed characteristic	
	b) Thermal withstand characteristic	
	c) Current vs time	
	d) Speed vs time	

NAME OF VENDOR			SEAL	REV.	
NAME	SIGNATURE	DATE			

Explanatory notes for filling up cable list for routing through WinPath, the cable routing program (developed by Corporate R&D) being used in PEM.

1. For the purpose of clarity, it may please be noted that the information given in regard to the cables to be routed through WinPath as per the system elaborated below is called "Cable List", while the term "Cable Schedule" applies to the cable list with routing information added after routing has been carried out.
2. The cable list shall be entered as an MS Excel file in the format as per enclosed template EXT_CAB_SCH_FORMAT.XLS. No blank lines, special characters, header, footer, lines, etc. shall be introduced in the file. No changes shall be made in the title line (first line) of the template.
3. The field properties shall be as under:
 - a. UNITCABLENO: A/N, up to sixteen (16) characters; each cable shall have its own unique, unduplicated cable number. In case this rule is violated, the cable cannot be taken up for routing.
 - b. FROM: A/N, up to sixty (60) characters; the "From" end equipment/ device description and location to be specified here. Information in excess of 60 characters will be truncated after 60 characters.
 - c. TO: A/N, up to sixty (60) characters; the "To" end equipment/ device description and location to be specified here. Information in excess of 60 characters will be truncated after 60 characters.
 - d. PURPOSE: A/N, up to sixty (60) characters; the purpose (i.e. power cable/ indication/ measurement, etc.) to be specified here. Information in excess of 60 characters will be truncated after 60 characters.
 - e. REMARKS: A/N, up to forty (40) characters; Any information pertinent to routing to be specified here (e.g., cable number of the cable redundant to the cable number being entered). Information in excess of 40 characters will be truncated after 40 characters.
 - f. CABLESIZE: A/N, 7 characters exactly as per the codes indicated below shall be specified here. The program cannot route cables described in any other way/ format.
 - g. PATHCABLENO: Field reserved for utilization by the program. User shall not enter any information here.
4. One list shall be prepared for each system/ equipment (i.e., separate and unique cable lists shall be prepared for each system).
5. The cables shall be described as per the scheme listed below:

A	NN	A	NNN
Cable	No. of cores	Cable code	Cable size
Voltage	(e.g. 01,03,3H, 07)	(See C below)	(e.g. 035,185,2.5, 0.5)
Code (see B below)			

(A) **SYSTEM VOLTAGE CODES:**

(ac) A = 11KV, B = 6.6KV, C = 3.3KV, D = 415V, E = 240V, F = 110V

(dc) G = 220V, H = 110V, J = 48V, K = +24V, L = -24V

(B) **CABLE VOLTAGE CODES:**

A = 11KV (Power cables)

Explanatory notes for filling up cable list for routing through WinPath, the cable routing program (developed by Corporate R&D) being used in PEM.

B = 6.6KV (Power cables)
 C = 3.3KV (Power cables)
 D = 1.1KV (LV & DC system power & control cables)
 E = 0.6KV (0.5 sq. mm. Control cables)

(C) CABLE CODES

PVC Copper

A = Armoured FRLS	B = Armoured Non-FRLS
C = unarmoured FRLS	D = Unarmoured Non-FRLS

PVC Aluminium

E = Armoured FRLS	F = Armoured Non-FRLS
G = unarmoured FRLS	H = Unarmoured Non-FRLS

XLPE Copper

J = Armoured FRLS	K = Armoured Non-FRLS
L = unarmoured FRLS	M = Unarmoured Non-FRLS

XLPE Aluminium


N = Armoured FRLS	P = Armoured Non-FRLS
Q = unarmoured FRLS	R = Unarmoured Non-FRLS

S = FIRE SURVIVAL CABLES
 T = TOUGH RUBBER SHEATH
 U = OVERALL SCREENED
 V = PAIRED OVERALL SCREENED
 W = PAIRED INDIVIDUAL SCREENED
 Y = COMPENSATING CABLES
 I = PRE-FABRICATED CABLES
 Z = JELLY FILLED CABLES

6. Once a cable list has been given to PEM for routing, any subsequent changes required in the cable list (which may be in the form of addition of cables, deletion of cables, change of type or size of cable, etc.) must be informed as specific changes (as a separate file MS Excel of the same format as the original file) to the cable list given earlier if the cable list has been routed and cable schedule generated. The routing status of the cable list shall be got confirmed from PEM by the agency that has prepared the cable list before the changes are intimated. In case PEM confirms that the cable list in question has not been taken up for routing, and the revised cable list is acceptable, the same may be sent. Since cable routing through the program involves adding each cable list to the project cable schedule database, the original cable schedule shall not be furnished to PEM with revisions incorporated within.

QUALITY PLAN FOR MOTORS BELOW 55 KW (LV)

SHEET 21 OF 31

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO :	DATE:
		CUSTOMER :		QP NO.: PE-QP-999-Q-006, REV-02	DATE: 17.04.2020
		PROJECT:		PO NO.:	DATE:
		ITEM: AC ELECT. MOTORS UPTO 55KW (LV (415V))	SYSTEM:	SECTION: II	SHEET 1 of 2

S. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
1	2	3	4	5	6		7	8	9	*	**		
					M	C/ N				D	M	C	N
1.0	ASSEMBLY	1.WORKMANSHIP	MA	VISUAL	100%	-	MFG. SPEC.	MFG. SPEC.	LOG BOOK		P	-	-
		2.DIMENSIONS	MA	VISUAL	100%	-	MFG. DRG./ MFG. SPEC.	MFG. DRG./ MFG. SPEC.	LOG BOOK		P	-	-
		3.CORRECTNESS COMPLETENESS TERMINATIONS/ MARKING/ COLOUR CODE	MA	VISUAL	100%	-	MFG.SPEC./	MFG.SPEC.	LOG BOOK		P	-	-
2.0	PAINTING	1.SHADE	MA	VISUAL	SAMPLE	-	MFG. SPEC/ APPROVED DATASHEET	MFG. SPEC/ APPROVED DATASHEET	LOG BOOK	✓	P	V	-
3.0	TESTS	1.ROUTINE TEST INCLUDING SPECIAL TEST	MA	VISUAL	100%	-	IS-325 / IS-12615/ APPROVED DATA SHEET	IS-325 / IS-12615/ APPROVED DATA SHEET	TEST/ INSPN. REPORT	✓	P	V	-
		2.OVERALL DIMENSIONS & ORIENTATION	MA	MEASUREMENT & VISUAL	100%	-	APPROVED DRG/ DATA SHEET	APPROVED DRG/ DATA SHEET	TEST/ INSPN. REPORT	✓	P	V	-


BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:		HEMA KHUSHWAHA	Checked by:		KUNAL GANDHI
Reviewed by:		PRAVEEN DUTTA	Reviewed by:		RITESH KUMAR JAISWAL

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

FOR CUSTOMER REVIEW & APPROVAL			
Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

QUALITY PLAN FOR MOTORS BELOW 55 KW (LV)

SHEET 22 OF 31

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO :	DATE:
		CUSTOMER :		QP NO.: PE-QP-999-Q-006, REV-02	DATE: 17.04.2020
		PROJECT:		PO NO.:	DATE:
		ITEM: AC ELECT. MOTORS UPTO 55KW (LV (415V))	SYSTEM:	SECTION: II	SHEET 2 of 2

		3.NAMEPLATE DETAILS	MA	VISUAL	100%	-	IS-325 / IS-12615 / APPROVED DATA SHEET	SAME AS COL. 7	TEST/ INSPN. REPORT	✓	P	V	-	
4.0	PACKING	SURFACE FINISH & COMPLETENESS	MA	VISUAL	100%	100%	AS PER MFG. STANDARD / (#)	AS PER MFG. STANDARD / (#).	INSPC. REPORT	✓	P	W	-	(#) REFER NOTE-8

NOTES:

1. Routine tests on 100% motors shall be done by the vendor. However, BHEL/ Customer shall witness routine tests on random samples. The sampling plan shall be mutually agreed upon.
2. For exhaust/ventilation fan motors of rating up to 1.5 KW, only routine test certificates shall be furnished for scrutiny.
3. In case test certificates for these tests on similar type, size and design of motor from independent laboratory are available, the same is valid for 5 years.
4. BHEL reserves the right to perform repeat test, if required.
5. After packing and prior to issue MDCC, photographs of items to be despatched shall be sent to BHEL for review.
6. In case of any changes in QP commented by customer at contract stage, same shall be carried out by bidder without any implication to BHEL/ Customer.
7. Project specific QP to be developed based on customer requirement.
8. For export job, BHEL technical specification for seaworthy packing to be followed.
9. Packing shall be suitable for storage at site in tropical climate conditions.
10. Latest revision/ year of issue of all the standards (IS/ ASME/ IEC etc.) indicated in QP shall be referred.

LEGENDS:

*RECORDS, IDENTIFIED WITH "TICK"(✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION,

** M: SUPPLIER/ MANUFACTURER/ SUB-SUPPLIER, B: MAIN SUPPLIER/ BHEL/ THIRD PARTY INSPECTION AGENCY, C: CUSTOMER,


P: PERFORM, W: WITNESS, V: VERIFICATION, AS APPROPRIATE

MA: MAJOR, MI: MINOR, CR: CRITICAL

D: DOCUMENTATION

BHEL						BIDDER/ SUPPLIER		FOR CUSTOMER REVIEW & APPROVAL			
ENGINEERING			QUALITY			Sign & Date		Doc No:			
	Sign & Date	Name		Sign & Date	Name	Seal			Sign & Date	Name	Seal
Prepared by:		HEMA KHUSHWAHA	Checked by:		KUNAL GANDHI			Reviewed by:			
Reviewed by:		PRAVEEN DUTTA	Reviewed by:		RITESH KUMAR JAISWAL			Approved by:			

QUALITY PLAN FOR MOTORS 55 KW & ABOVE

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO.		DATE: 17.04.2020
		CUSTOMER :		QP NO.: PE-QP-895-Q-007, REV-04		
		PROJECT:		PO NO.:		
		ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV (415V))		SYSTEM:		
		SECTION: II		SHEET 1 OF 9		

Sl No.	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance NORMS	FORMAT OF RECORD	AGENCY			
1	2	3	4	5	6		7	8	9	10	11	12	
					M	CN				D	M	C	N
1.0	RAW MATERIAL & BOUGHT OUT CONTROL												
1.1	SHEET STEEL PLATES, SECTION EYEBOLTS	1.SURFACE CONDN	MA	VISUAL	100%	-		FREE FROM BUNKS, CRACKS, WAVINESS ETC	LOG BOOK		P	-	-
		2.DIMENSIONS	MA	MEASUREMENT	SAMPLE	-	MANUFACTURER'S DRG./SPEC	MANUFACTURER'S DRG./SPEC	LOG BOOK		P	-	-
		3.PROOF LOAD TEST (EYE BOLT)	MA	MECH TEST	SAMPLE	-	MANUFACTURER'S DRG./SPEC	MANUFACTURER'S DRG./SPEC	TEST REPORT		PV	-	-
1.2	HARDWARES	1.SURFACE CONDN	MA	VISUAL	100%	-		FREE FROM CRACKS, UN-EVENNESS ETC.	TEST REPORT		P	-	-
		2.PROPERTY CLASS	MA	VISUAL	SAMPLES	-	MANUFACTURER'S DRG./SPEC	MANUFACTURER'S DRG./SPEC	TC		PV	-	-
1.3	CASTING	1.SURFACE CONDN	MA	VISUAL	100%	-	MANUFACTURER'S DRG./SPEC	FREE FROM CRACKS, BLOW HOLES ETC.	LOG BOOK		PV	-	-
		2.CHEM. & PHY. PROP.	MA	CHEM & MECH TEST	1. HEAT NO.	-	MANUFACTURER'S DRG./SPEC	MANUFACTURER'S DRG./SPEC	TC		PV	-	-
		3.DIMENSIONS	MA	MEASUREMENT	100%	-	MANUFACTURER'S DRG.	MANUFACTURER'S DRG.	LOG BOOK		PV	-	-
1.4	PAINT & VARNISH	1.MAKE, SHADE, SHELF LIFE & TYPE	MA	VISUAL	100% CONTINUOUS	-	MANUFACTURER'S DRG./SPEC	MANUFACTURER'S DRG./SPEC	LOG BOOK		PV	-	-


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Reviewed by:		PRAVEEN DUTTA	Reviewed by:		R K JAISWAL

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

FOR CUSTOMER REVIEW & APPROVAL			
Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

QUALITY PLAN FOR MOTORS 55 KW & ABOVE

SHEET 24 OF 31

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO.		DATE: 17.04.2020
		CUSTOMER :		QP NO.: PE-QP-899-Q-007, REV-04		
		PROJECT:		PO NO.:		
		ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV (415V))		SYSTEM:		
				SECTION: E		SHEET 2 OF 9


Sl No.	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance NORMS	FORMAT OF RECORD		AGENCY			
1	2	3	4	5	6		7	8	9	10				
					M	CN					D	M	C	N
1.5	SHAFT (FORGED OR ROLLED)	1. SURFACE COND.	MA	VISUAL	100%	-	-	FREE FROM VISUAL DEFECTS	LOG BOOK		P	-	-	VENDOR'S APPROVAL IDENTIFICATION SHALL BE MAINTAINED
		2. CHEM. & PHYSICAL PROPERTIES	MA	CHEM. & PHYSICAL TESTS	1/HEAT NO OR HEAT TREATMENT BATCH NO	-	MANUFACTURER'S DRG./ SPEC.	MANUFACTURER'S DRG./ STD.	TC		PV	-	-	
		3. DIMENSIONS	MA	MEASUREMENT	100%	-	MANUFACTURER'S DRG./ SPEC.	MANUFACTURER'S DRG.	LOG BOOK		PV	-	-	
		4. INTERNAL FLAWS	CR	ULTRASONIC TEST	100%	-	ASTM A388	MANUFACTURER'S STD.	INSPECTION REPORT	✓	PV	V	-	FOR DIA OF 55 MM & ABOVE
1.6	SPACE HEATERS, CONNECTORS, TERMINAL BLOCKS, CABLES, CABLE LUGS, CARBON BRUSH TEMP. DETECTORS, RTD, ETD'S	1. MAKE & RATING	MA	VISUAL	100%	-	MANUFACTURER'S DRG./ STD.	MANUFACTURER'S DRG./ STD.	INSPECTION REPORT		PV	-	-	
		2. PHYSICAL COND.	MA	VISUAL	100%	-	MANUFACTURER'S DRG./ STD.	NO PHYS. DAMAGE, NO ELECTRICAL DISCONTINUITY	INSPECTION REPORT		PV	-	-	
		3. DIMENSIONS (WHEREVER APPLICABLE)	MA	MEASUREMENT	SAMPLE	-	MANUFACTURER'S DRG./ STD.	MANUFACTURER'S DRG./ STD.	INSPECTION REPORT		PV	-	-	
		4. PERFORMANCE/ CALIBRATION	MA	TEST	100%	-	MANUFACTURER'S DRG./ STD.	MANUFACTURER'S DRG./ STD.	TEST REPORT		PV	-	-	

BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
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Reviewed by:		PRAVEEN DUTTA	Reviewed by:		R K JAISWAL

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

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Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

QUALITY PLAN FOR MOTORS 55 KW & ABOVE

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO.		DATE: 17.04.2020 SHEET 3 OF 3
		CUSTOMER :		GP NO.: PE-QP-999-G-067, REV-04		
		PROJECT:		PO NO.:		
		ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV (415V))	SYSTEM:	SECTION: B		

Sl No.	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance NORMS	FORMAT OF RECORD		AGENCY			
1	2	3	4	5	6		7	8	9	10	11			
					M	CN					D	M	C	N
1.7	OTHER INSULATING MATERIALS LIKE SLEEVES, BINDINGS CORDS, PAPERS, PRESS BOARDS ETC.	1. SURFACE COND. ETC.	MA	VISUAL	100%	-	-	NO VISUAL DEFECTS	TEST REPORT		PV	-	-	
		2. DIMENSION/BORE DIA, WALL THICKNESS, BDV AS RECEIVED, BDV AFTER FOLDING AT 180°	MA	TEST	SAMPLE	-	MANUFACTURER'S STD.	MANUFACTURER'S STD.	LOG BOOK AND OR SUPPLIER'S TC		PV	-	-	
1.8	SHEET STAMPING (PUNCHED)	1. SURFACE COND.	MA	VISUAL	100%	-	-	NO VISUAL DEFECTS (FREE FROM BURRS)	LOG BOOK		P	-	-	
		2. DIMENSIONS INCLUDING BURR HEIGHT	MA	MEASUREMENT	SAMPLE	-	MANUFACTURER'S DRG.	MANUFACTURER'S DRG.	LOG BOOK		PV	-	-	
		3. ACCEPTANCE TESTS	MA	ELECT. & MECH TESTS	SAMPLE	-	MANUFACTURER'S DRG./ STD.	MANUFACTURER'S DRG./ STD.	TC		PV	-	-	
1.9	CONDUCTORS	1. SURFACE FINISH	MA	VISUAL	100%	-	-	FREE FROM VISUAL DEFECTS	LOG BOOK		PV	-	-	
		2. ELECT. PROP. & MECH. PROP.	MA	ELECT. & MECH. TEST	SAMPLES	-	MANUFACTURER'S DRG./ SPEC	MANUFACTURER'S / SPEC	TC & VENDOR'S TEST REPORTS		PV	-	-	


BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:		HEMA KHUSHWAHA	Checked by:		KUNAL GANDHI
Reviewed by:		PRAVEEN DUTTA	Reviewed by:		R K JAISWAL

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

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Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

QUALITY PLAN FOR MOTORS 55 KW & ABOVE

SHEET 26 OF 31

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO.	DATE: 17.04.2020
		CUSTOMER :		QP NO.: PE-QP-885-Q-007, REV-04	
		PROJECT:		PO NO.:	
		ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV (415V))	SYSTEM:	SECTION: II	

Sl No.	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance NORMS	FORMAT OF RECORD		AGENCY			
1	2	3	4	5	6		7	8	9	10	11			
					M	C/N				D	M	C	N	
1.10	BEARINGS	3.DIMENSIONS	MA	MEASUREMENT	SAMPLES	-	MANUFACTURER'S DRG./ SPEC.	MANUFACTURER'S / SPEC.	LOG BOOK		PV	-	-	
		1.MAKE & TYPE	MA	VISUAL	100%	-	MANUFACTURER'S DRG./ APPROVED DATASHEET	MANUFACTURER'S DRG./ APPROVED DATASHEET	LOG BOOK		PV	-	-	
		2.DIMENSIONS	MA	MEASUREMENT	SAMPLE	-	APPROVED DATASHEET	APPROVED DATASHEET/ BEARING MANUF'S CATALOGUES	LOG BOOK		PV	-	-	
1.11	SLIP RING (WHEREVER APPLICABLE)	3.SURFACE FINISH	MA	VISUAL	100%	-	-	FREE FROM VISUAL DEFECTS	LOG BOOK		PV	-	-	
		1.SURFACE COND.	MA	VISUAL	100%	-	-	FREE FROM VISUAL DEFECTS	LOG BOOK		P	-	-	
		2.DIMENSIONS	MA	MEASUREMENT	SAMPLE	-	MANUFACTURER'S DRG	MANUFACTURER'S DRG	LOG BOOK		P	-	-	
		3.TEMP WITH-STAND CAPACITY	MA	ELECT TEST	SAMPLE	-	MANUFACTURER'S STD./ APPROVED DATASHEET	MANUFACTURER'S STD./ APPROVED DATASHEET	LOG BOOK		PV	-	-	
1.12	OIL SEALS & GASKETS	4.HYR	MA	DO-	100%	-	MANUFACTURER'S STD./ APPROVED DATASHEET	MANUFACTURER'S STD./ APPROVED DATASHEET	LOG BOOK		PV	-	-	
		1.MATERIAL OF GASKET	MA	VISUAL	100%	-	MANUFACTURER'S DRG/SPECS	MANUFACTURER'S DRG./ SPECS.	LOG BOOK		P	-	-	
		2.SURFACE COND.	MA	VISUAL	100%	-	-	FREE FROM VISUAL DEFECTS	LOG BOOK		P	-	-	
		3.DIMENSIONS	MA	MEASUREMENT	SAMPLE	-	MANUFACTURER'S DRG	MANUFACTURER'S DRG	LOG BOOK		P	-	-	


BHEL					
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	Sign & Date	Name		Sign & Date	Name
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Reviewed by:		PRAVEEN DUTTA	Reviewed by:		R K JAISWAL

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

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QUALITY PLAN FOR MOTORS 55 KW & ABOVE

SHEET 27 OF 31

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO.		DATE: 17.04.2020
		CUSTOMER :		QP NO.: PE-QP-899-G-507, REV-04		
		PROJECT:		PO NO.:		
		ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV (415V))	SYSTEM:	SECTION: II	SHEET: 5 OF 9	

Sl No.	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance NORMS	FORMAT OF RECORD		AGENCY			
1	2	3	4	5	6		7	8	9	10	11			
					M	CN				D	M	C	N	
2.0	IN PROCESS													
2.1	STATOR FRAME WELDING (IN CASE OF FABRICATED STATOR)	1 WORKMANSHIP & CLEANNESS	MA	VISUAL	100%	-	MANUFACTURER'S DRG	GOOD FRESH	LOG BOOK		PAW	-	-	
		2 DIMENSIONS	MA	MEASUREMENT	100%	-	MANUFACTURER'S DRG	MANUFACTURER'S DRG	LOG BOOK		P	-	-	
2.2	MACHINING	1 FINISH	MA	VISUAL	100%	-	-DO-	GOOD FRESH	LOG BOOK		P	-	-	
		2 DIMENSIONS	MA	MEASUREMENT	100%	-	MANUFACTURER'S DRG	MANUFACTURER'S DRG	LOG BOOK		P	-	-	
		3 SHAFT SURFACE FLOWS	MA	PT	100%	-	MANUFACTURER'S STD./ASTM E185	MANUFACTURER'S STD./APPROVED DATASHEET	LOG BOOK	✓	P	V	-	
2.3	PAINTING	1 SURFACE PREPARATION	MA	VISUAL	100%	-	MANUFACTURER'S STD./APPROVED DATASHEET	MANUFACTURER'S STD./APPROVED DATASHEET	LOG BOOK		P	-	-	
		2 PAINT THICKNESS (BOTH PRIMER & FINISH COAT)	MA	MEASUREMENT BY ELCO METER	SAMPLE	-	MANUFACTURER'S STD./APPROVED DATASHEET	MANUFACTURER'S STD./APPROVED DATASHEET	LOG BOOK		P	-	-	
		3 SHADE	MA	VISUAL	SAMPLE	-	MANUFACTURER'S STD./APPROVED DATASHEET	MANUFACTURER'S STD./APPROVED DATASHEET	LOG BOOK		P	-	-	
		4 ADHESION	MA	CROSS CUTTING & TAPE TEST	SAMPLE	-	MANUFACTURER'S STD./APPROVED DATASHEET	MANUFACTURER'S STD./APPROVED DATASHEET	LOG BOOK		P	-	-	


BHEL					
ENGINEERING			QUALITY		
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Reviewed by:		PRAVEEN DUTTA	Reviewed by:		R K JAISWAL

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

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Approved by:			

QUALITY PLAN FOR MOTORS 55 KW & ABOVE

SHEET 28 OF 31

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO.	DATE: 17.04.2020
		CUSTOMER :		QP NO.: PE-QP-995-Q-007, REV-04	
		PROJECT:		PO NO.:	
		ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV (415V))	SYSTEM:	SECTION: II	

Sl No.	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance NORMS	FORMAT OF RECORD		AGENCY			
1	2	3	4	5	6		7	8	9	10				
					M	CN					M	C	N	
2.4	SHEET STACKING	1.COMPLETENESS	MA	MEASUREMENT	SAMPLE	-	MANUFACTURER'S STD.	MANUFACTURER'S STD.	LOG BOOK		P	-	-	
		2.COMPRESSION & TIGHTENING	MA	MEASUREMENT	100%	-	MANUFACTURER'S STD.	MANUFACTURER'S STD.	LOG BOOK		P	-	-	
2.5	WINDING	1.COMPLETENESS	CR	VISUAL	100%	-	MANUFACTURER'S STD./APPROVED DATASHEET	MANUFACTURER'S STD./APPROVED DATASHEET	LOG BOOK		P	-	-	
		2.CLEANLINESS	CR	VISUAL	100%	-	MANUFACTURER'S STD./APPROVED DATASHEET	MANUFACTURER'S STD./APPROVED DATASHEET	LOG BOOK		P	-	-	
		3.R-HV-R	CR	ELECT. TEST	100%	-	IS-325/IS-12615/IEC-60034 PART-1	IS-325/IS-12615/IEC-60034 PART-1	TEST/INSP. REPORT	✓	P	V	-	
		4.RESISTANCE	CR	ELECT. TEST	100%	-	IS-325/IS-12615/IEC-60034 PART-1	IS-325/IS-12615/IEC-60034 PART-1	TEST/INSP. REPORT	✓	P	V	-	
		5.INTERTURN INSULATION	CR	ELECT. TEST	100%	-	IS-325/IS-12615/IEC-60034 PART-1	IS-325/IS-12615/IEC-60034 PART-1	TEST/INSP. REPORT		P	-	-	
2.6	IMPREGNATION	1.VISCOSITY	MA	PHY. TEST	AT STARTING	-	MANUFACTURER'S STANDARD	MANUFACTURER'S STANDARD	LOG BOOK		P	-	-	
		2.TEMP. PRESSURE VACUUM	MA	PROCESS CHECK	CONTINUOUS	-	MANUFACTURER'S STANDARD	MANUFACTURER'S STANDARD	LOG BOOK		P	-	-	
		3.NO. OF DIPS	MA	PROCESS CHECK	CONTINUOUS	-	MANUFACTURER'S STANDARD	MANUFACTURER'S STANDARD	LOG BOOK	✓	P	V	-	THREE DIPS TO BE GIVEN


BHEL					
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BIDDER/ SUPPLIER	
Sign & Date	
Seal	

FOR CUSTOMER REVIEW & APPROVAL			
Doc No:			
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Approved by:			

QUALITY PLAN FOR MOTORS 55 KW & ABOVE

SHEET 29 OF 31

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO.	DATE: 17.04.2020
		CUSTOMER :		QP NO.: PE-QP-995-Q-007, REV-04	
		PROJECT:		PO NO.:	
		ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV (415V))	SYSTEM:	SECTION: II	

Sl No.	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance NORMS	FORMAT OF RECORD	AGENCY			
1	2	3	4	5	6		7	8	9	10	11	12	13
					M	C/N				D	M	C	N
2.7	COMPLETE STATOR ASSEMBLY	4.DURATION 1.COMPACTNESS & CLEANLINESS	MA MA	PROCESS CHECK VISUAL	CONTINUOUS 100%	- -	MANUFACTURER'S STANDARD MANUFACTURER'S STANDARD	MANUFACTURER'S STANDARD MANUFACTURER'S STANDARD	LOG BOOK LOG BOOK	✓ -	P P	V -	- -
2.8	BRAZING/COMPRESSION JOINT	1.COMPLETENESS 2.SOUNDNESS	CR CR	VISUAL MALLETT TEST & UT	100% 100%	- -	MANUFACTURER'S STANDARD MANUFACTURER'S STANDARD	MANUFACTURER'S STANDARD MANUFACTURER'S STANDARD	LOG BOOK TESTING SPEC. REPORT	- ✓	P P	- V	- -
2.9	COMPLETE ROTOR ASSEMBLY	3.HV 1.RESIDUAL UNBALANCE	MA CR	ELECT. TEST DYN. BALANCE	100% 100%	- -	MANUFACTURER'S STANDARD MANUFACTURER'S SPEC./ ISO 1940	MANUFACTURER'S STANDARD MANUFACTURER'S DWG.	TESTING SPEC. REPORT LOG BOOK	✓ -	P P	V -	- -
2.10	ASSEMBLY	2.SOUNDNESS OF DIE CASTING 1.ALIGNMENT 2.WORKMANSHIP 3.AXIAL PLAY 4.DIMENSIONS 5.CORRECTNESS, COMPLETENESS, TERNATIONS, MARKING/ COLOUR CODE 6. RTD, STD & SPACE HEATER MOUNTING.	CR MA MA MA MA MA MA	ELECT. (GROWLER TEST) MEAS. VISUAL MEAS. MEAS. VISUAL VISUAL	100% 100% 100% 100% 100% 100%	- - - - - -	MANUFACTURER'S SPEC. MANUFACTURER'S SPEC. MANUFACTURER'S SPEC. MANUFACTURER'S SPEC. MANUFACTURER'S SPEC. MANUFACTURER'S SPEC.	MANUFACTURER'S SPEC. MANUFACTURER'S SPEC. MANUFACTURER'S SPEC. MANUFACTURER'S SPEC. MANUFACTURER'S SPEC. MANUFACTURER'S SPEC.	LOG BOOK LOG BOOK LOG BOOK LOG BOOK LOG BOOK LOG BOOK	- ✓ - - - ✓	P P P P P P	- V - - - V	- - - - - -


BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:		HEMA KHUSHWAHA	Checked by:		KUNAL GANDHI
Reviewed by:		PRAVEEN DUTTA	Reviewed by:		R K JAISWAL

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

FOR CUSTOMER REVIEW & APPROVAL			
Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

QUALITY PLAN FOR MOTORS 55 KW & ABOVE

SHEET 30 OF 31

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO.		DATE: 17.04.2020
		CUSTOMER :		QP NO.: PE-QP-666-G-607, REV-04		
		PROJECT:		PO NO.:		
		ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV (415V))	SYSTEM:	SECTION: II	SHEET 30 OF 31	

Sl No.	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance NORMS	FORMAT OF RECORD		AGENCY			
1	2	3	4	5	6		7	8	9	10	11			
					M	CN					D	M	C	N
3.0	TESTS	1. TYPE TESTS INCLUDING SPECIAL TESTS	MA	ELECT TEST	1/TYPE/SIZE	1/TYPE/SIZE	IS-325/IS-12615/APPROVED DATASHEET	IS-325/IS-12615/APPROVED DATASHEET	TEST REPORT	✓	P	W	-	* NOTE - 1
		2. ROUTINE TESTS INCLUDING SPECIAL TEST	MA	ELECT TEST	100%	-	IS-325/IS-12615/APPROVED DATASHEET	IS-325/IS-12615/APPROVED DATASHEET	TEST REPORT	✓	P	✓	-	* NOTE - 2
		3. VIBRATION & NOISE LEVEL	MA	ELECT TEST	100%	-	IS-12075 / IEC 60034-14 & IS-12065	IS-12075 / IEC 60034-14 & IS-12065	TEST REPORT	✓	P	✓	-	* NOTE - 2
		4. OVERALL DIMENSIONS AND ORIENTATION	MA	MEASUREMENT & VISUAL	100%	100%	APPROVED DRG/DATA SHEET	APPROVED DRG/DATA SHEET	TEST/INSP. REPORT	✓	P	W	-	
		5. DEGREE OF PROTECTION	MA	ELECT. & MECH. TEST	1/TYPE/ SIZE	-	IEC 60034-5/IS-12615	APPROVED DATASHEET	TC	✓	P	V	-	TC FROM AN INDEPENDENT LABORATORY, REFER NOTE-3
		6. MEASUREMENT OF RESISTANCE OF RTD & STD	MA	ELECT. & MECH. TEST	100%	-	IS-325/IS-12615/IEC-60034 PART-1/IS-12602	IS-325/IS-12615/IEC-60034 PART-1/IS-12602	TC	✓	P	✓	-	* NOTE - 2
		7. MEASUREMENT OF RESISTANCE, IR OF SPACE HEATER	MA	ELECT. & MECH. TEST	100%	-	IS-325/IS-12615/IEC-60034 PART-1	IS-325/IS-12615/IEC-60034 PART-1	TC	✓	P	✓	-	* NOTE - 2
		8. NAME PLATE DETAILS	MA	VISUAL	100%	-	IS-325/IS-12615 & DATA SHEET	IS-325/IS-12615 & DATA SHEET	TEST/INSP. REPORT	✓	P	✓	-	* NOTE - 2
		9. EXPLOSION FLAME PROOF NESS (IF SPECIFIED)	MA	EXPLOSION FLAME PROOF TEST	1/TYPE	-	IS-2148 / IEC 60079-1	IS-2148 / IEC 60079-1	TC	✓	P	V	-	TC FROM AN INDEPENDENT LABORATORY, REFER NOTE-3
		10. PAINT SHADE, THICKNESS & FINISH	MA	VISUAL & MEASUREMENT BY ELKOMETER	SAMPLE	SAMPLE	APPROVED DATASHEET	APPROVED DATASHEET	TC	✓	P	WS	-	SAMPLING PLAN TO BE DECIDED BY INSPECTION AGENCY * NOTE - 2


BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:		HEMA KHUSHWAHA	Checked by:		KUNAL GANDHI
Reviewed by:		PRAVEEN DUTTA	Reviewed by:		R K JAISWAL

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

FOR CUSTOMER REVIEW & APPROVAL			
Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

QUALITY PLAN FOR MOTORS 55 KW & ABOVE

SHEET 31 OF 31

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO.		DATE: 17.04.2020
		CUSTOMER :		QP NO.: PE-QP-985-G-887, REV-04		
		PROJECT:		PO NO.:		
		ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV (415V))	SYSTEM:	SECTION: II	SHEET 31 OF 31	

Sl No.	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance NORMS	FORMAT OF RECORD		AGENCY		
1	2	3	4	5	6		7	8	9	10	11		
					M	CN							
4.0	PACKING	SURFACE FINISH & COMPLETENESS	MA	VISUAL	100%	100%	AS PER MANUFACT. STANDARD / (B)	AS PER MANUFACT. STANDARD / (E)	INSPC. REPORT	✓	P	W	(B) REFER NOTE-8

NOTES:

1. DEPENDING UPON THE SIZE AND CRITICALLY, WITNESSING BY BHEL SHALL BE DECIDED.
2. ROUTINE TESTS ON 100% MOTORS SHALL BE DONE BY THE VENDOR. HOWEVER, BHEL/CUSTOMER SHALL WITNESS ROUTINE TESTS ON RANDOM SAMPLES. THE SAMPLING PLAN SHALL BE MUTUALLY AGREED UPON.
3. IN CASE TEST CERTIFICATES FOR THESE TESTS ON SIMILAR TYPE, SIZE AND DESIGN OF MOTOR FROM INDEPENDENT LABORATORY ARE AVAILABLE, THE SAME IS VALID FOR 5 YEARS.
4. BHEL RESERVES THE RIGHT TO PERFORM REPEAT TEST, IF REQUIRED.
5. AFTER PACKING AND PRIOR TO ISSUE MOC, PHOTOGRAPHS OF ITEMS TO BE DESPATCHED SHALL BE SENT TO BHEL PURCHASE GROUP FOR REVIEW.
6. IN CASE, ANY CHANGES IN QP COMMENTED BY CUSTOMER AT CONTRACT STAGE SHALL BE CARRIED OUT BY BIDDER WITHOUT ANY IMPLICATION TO BHEL/ CUSTOMER.
7. PROJECT SPECIFIC QP TO BE DEVELOPED BASED ON CUSTOMER REQUIREMENT.
8. FOR EXPORT JOB, BHEL TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING TO BE FOLLOWED.
9. PACKING SHALL BE SUITABLE FOR STORAGE AT SITE IN TROPICAL CLIMATE CONDITIONS.
10. LATEST REVISION/ YEAR OF ISSUE OF ALL THE STANDARDS (IS/ ASME/ IEC ETC.) INDICATED IN QP SHALL BE REFERRED.

LEGENDS:

*RECORDS, IDENTIFIED WITH "TICK"(✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.
 ** M: SUPPLIER/ MANUFACTURER/ SUB-SUPPLIER, B: MAIN SUPPLIER/ BHEL/ THIRD PARTY INSPECTION AGENCY, C: CUSTOMER.
 P: PERFORM, W: WITNESS, V: VERIFICATION, AS APPROPRIATE.
 MA: MAJOR, MI: MINOR, CR: CRITICAL.
 D: DOCUMENT

BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:		HEMA KHUSHWAHA	Checked by:		KUNAL GANDHI
Reviewed by:		PRAVEEN DUTTA	Reviewed by:		R K JAISWAL

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

FOR CUSTOMER REVIEW & APPROVAL			
Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			



TITLE 5X800 MW TSGENCO YADADRI TPS

TECHNICAL SPECIFICATION FOR
WORKSHOP EQUIPMENT

SPECIFICATION NO. PE – TS - 417 - 568 – A001

SECTION I

SUB SECTION IA

REV 0

SHEET OF

SECTION-III

DOCUMENTS TO BE SUBMITTED ALONG WITH BID

SUB-SECTION IIIA – Documents Furnished along with offer

SUB-SECTION IIIB – Compliance cum confirmation certificate

SUB-SECTION IIIC – Electrical Load Data

SUB-SECTION IIID – Pre Bid Clarification



TITLE: 5X800 MW TSGENCO YADADRI TPS

TECHNICAL SPECIFICATION FOR
WORKSHOP EQUIPMENT

SPECIFICATION NO. PE – TS - 417 - 568 – A001

SECTION III

SUB SECTION

REV 0

SHEET OF

DOCUMENTS TO BE FURNISHED WITH OFFER FOR TECHNICAL EVALUATION

- 1) SCHEDULE OF TECHNICAL DEVIATION (IF ANY)
OR

‘NO DEVIATION CERTIFICATE’ – Clearly mentioning that bidder has considered
‘No - Deviation’ from the technical specification provided by BHEL.

- 2) SIGNED AND STAMPED COPY OF COMPLIANCE CUM CONFIRMATION
CERTIFICATE.
- 3) Compliance to Electrical load list (Not to Exceed), duly signed and stamped
- 4) Un priced copy of price format indicating quoted/ not applicable against each
row/column

NOTE:

i) NO OTHER DOCUMENTS OTHER THAN THOSE LISTED ABOVE ARE REQUIRED
TO BE SUBMITTED FOR TECHNICAL EVALUATION. IN CASE ANY OTHER
DOCUMENT IS FURNISHED, THE SAME WILL NOT BE TAKEN INTO
CONSIDERATION FOR TECHNICAL EVALUATION.



**TITLE: 5X800 MW TSGENCO YADADRI TPS
TECHNICAL SPECIFICATION FOR
WORKSHOP EQUIPMENT
COMPLIANCE CUM CONFIRMATION
CERTIFICATE**

SPEC. NO.: PE-TS-417-568-A001

VOLUME: III

SECTION: III

REV. NO. 0

Date:

COMPLIANCE CUM CONFIRMATION CERTIFICATE

The bidder shall confirm compliance with following by signing/ stamping this compliance certificate (every sheet) and furnish same with the offer.

- a) The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusions other than those mentioned under "exclusion" in section C and those resolved as per 'Schedule of Deviations', if applicable, with regard to same.
- b) There are no other deviations w.r.t. specifications other than those furnished in the 'Schedule of Deviations'. Any other deviation, stated or implied, taken elsewhere in the offer stands withdrawn unless specifically brought out in the 'Schedule of Deviations'.
- c) Bidder shall submit QP in the event of order based on the guidelines given in the specification & QP enclosed therein. QP will be subject to BHEL/ CUSTOMER approval & customer hold points for inspection/ testing shall be marked in the QP at the contract stage. Inspection/ testing shall be witnessed as per same apart from review of various test certificates/ Inspection records etc. This shall be within the contracted price with no extra implications to BHEL after award of the contract.
- d) All drawings/ data-sheets/ calculations etc. submitted along with the offer shall be considered for reference only, same shall be subject to BHEL/ CUSTOMER approval in the event of order.

- e) The offered materials shall be either equivalent or superior to those specified in the specification & shall meet the specified/ intended duty requirements. In case the material specified in the specifications is not compatible for intended duty requirements then same shall be resolved by the bidder with BHEL during the pre - bid discussions, otherwise BHEL/ Customer's decision shall be binding on the bidder whenever the deficiency is pointed out.

For components where materials are not specified, same shall be suitable for intended duty, all materials shall be subject to approval in the event of order.

- f) The commissioning spares shall be supplied on 'As Required Basis' & prices for same included in the base price itself.
- g) All sub vendors shall be subject to BHEL/ CUSTOMER approval in the event of order.
- h) Guarantee for plant /equipment shall be as per relevant clause of GCC /SCC /Other Commercial Terms & Conditions.
- i) In the event of order, all the material required for completing the job at site shall be supplied by the bidder within the ordered price and within purview of the tender specification even if the same are additional to approved billing break up, approved drawing or approved Bill of quantities.
- j) Schedule of drawings submissions, comment incorporations & approval shall be as stipulated in the specifications. The successful bidder shall depute his design personnel to BHEL's/ Customer's/ Consultant's office for across the table resolution of issues and to get documents approved in the stipulated time.



**TITLE: 5X800 MW TSGENCO YADADRI TPS
TECHNICAL SPECIFICATION FOR
WORKSHOP EQUIPMENT
COMPLIANCE CUM CONFIRMATION
CERTIFICATE**

SPEC. NO.: PE-TS-417-568-A001

VOLUME: III

SECTION: III

REV. NO. 0

Date:

- k) As built drawings shall be submitted as and when required during the project execution.
- l) The bidder has not tempered with this compliance cum confirmation certificate and if at any stage any tempering in the signed copy of this document is noticed then same shall be treated as breach of contract and suitable actions shall be taken against the bidder.

LOAD TITLE	RATING (KW / A)		UNIT (U)/STN (S)	Nos.		VOLTAGE CODE*	FEEDER CODE**	EMER. LOAD (Y)	CONT.(C)/ INTT.(I)	STARTING TIME >5 SEC (Y)	LOCATION	BOARD NO.	CABLE		BLOCK CABLE DRG. No.	CONT ROL CODE	REMA RKS	LOAD No.	VERIFICATI ON FROM MOTOR DATASHEE T (Y/N)	KKS NO
	NAME PLATE (Range of Load)	MAX. CONT. DEMAND (MCR)		RUNNING	STANDBY								SIZE CODE	NOs						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Heavy duty lathe	10		S	1		D	S													
Precision lathe	5		S	1		D	S													
Shaper	4		S	1		D	S													
Slotter	3		S	1		D	S													
Universal milling machine	10		S	1		D	S													
Radial drilling machine	5		S	1		D	S													
Hydraulic plate shering machine	10		S	1		D	S													
Power hacksaw	2		S	1		D	S													
Hydraulic press	5		S	1		D	S													
Cylindrical grinder	7.5		S	1		D	S													
Surface grinder	5.5		S	1		D	S													
Balancing machine	10		S	1		D	S													
Tool and cutter grinder	2		S	1		D	S													
Column type drill	3		S	1		D	S													
NOTES: 1. COLUMN 1 TO 12 & 18 SHALL BE FILLED BY THE REQUISITIONER (ORIGINATING AGENCY); REMAINING COLUMNS ARE TO BE FILLED UP BY PEM (ELECTRICAL)/ CUSTOMER 2. ABBREVIATIONS : * VOLTAGE CODE (7):- (ac) A=11 KV, B=6.6 KV, C=3.3 KV, D=415 V, E=240 V (1 PH), F=110 V (cc): G=220 V, H=110 V, J=48 V, K=+24V, L=-24 V : ** FEEDER CODE (8):- U=UNIDIRECTIONAL STARTER, B=BI-DIRECTIONAL STARTER, S=SUPPLY FEEDER, D=SUPPLY FEEDER (CONTACTER CONTROLLED)																				
	LOAD DATA (ELECTRICAL)	JOB NO.		417		ORIGINATING AGENCY				PEM (ELECTRICAL)										
		PROJECT TITLE		5X800 MW YADADRI TPS		NAME				DATA FILLED UP ON										
		SYSTEM				SIGN.				DATA ENTERED ON										
		DEPTT. / SECTION		MAX		SHEET 1 OF 1		REV. 00		DE'S SIGN. & DATE										



TITLE 5X800 MW TSGENCO YADADRI TPS

TECHNICAL SPECIFICATION FOR
WORKSHOP EQUIPMENT

SPECIFICATION NO. PE – TS - 417 - 568 – A001

SECTION III

SUB SECTION

REV 0

SHEET OF

PRE-BID CLARIFICATION SCHEDULE

S. No.	Section/Clause /Page No.	Statement of the referred clause	Clarification Required

The bidder hereby certifies that above mentioned are the only clarifications required on the technical specification for the subject package.

SIGNATURE: _____

NAME: _____

DESIGNATION: _____

COMPANY: _____

DATE: _____

COMPANY SEAL