Bharat Heavy Electricals Limited
(A Govt. of India Undertaking)
PROJECT ENGINEERING MANAGEMENT
NOTICE INVITING TENDER (NIT)

Enquiry No- E-7496/2024 Date- 06.05.2024

BHEL invites offers from reputed Suppliers as per following terms and conditions -

1. Tender Type	Open Tender (Domestic-Indian)	
2. Mode of Enquiry	E - PROCUREMENT	
3. Project	Framework Agreement (Rate Contract) of Electric Hoist	
4. Executing Agency	BHEL-PEM	
5. Package	**Electric Hoist**	
6. Whether Package is DIVISIBLE or NON - DIVISIBLE	DIVISIBLE	
7. Due Date & Time	16.05.2024	
8. Earnest Money Deposit (EMD)	Not Applicable	
9. Tender Cost	NIL	
10. Numbers of Part bid	**2-Part Bid (Techno-Commercial and Price Bid)**	
11. Technical Scope	As per Tech. Spec No: PE-TS-RC3-563-A002 Rev 00	
12. Pre-Bid clarifications	Suppliers to contact BHEL-PEM (over phone/mail/visit-BHEL-PEM) for any clarification (technical or commercial) at least 05 days before due date of tender opening & get it clarified well before due date so that offers by the Suppliers may be submitted within due date & time.	
13. Schedule of Pre-Bid Meeting	Pre-bid meeting may be conducted, if required, and the same shall be communicated through corrigenda for this tender enquiry before technical bid opening.	
14. Prequalification Requirement	Financial PQR- YES	Technical PQR- YES
15. Delivery terms	For Supply Portion: FOR Despatch station	
16. Delivery Schedule: -		
Engineering	Drawing/ documents submission & re-submission schedule shall be as per Technical Specification: PE-TS-RC3-563-A002 Rev 00.	
Main Supply along with commissioning spares (“A”)	163 days from the date of PO.	
Mandatory Spares	90 days from BHEL clearance date	
Supervision of E&C	Supplier to depute their personnel at site within 04 weeks from the date of intimation by BHEL.	

Notes:

a. Supplier to start manufacturing/supply only after getting the applicable engineering Drgs./Docs. approved from BHEL/End Customer.

b. Drawings /documents submission/re-submission schedule shall be as per Technical specification (PE-TS-RC3-563-A002 Rev 00) which shall be used for progress monitoring purpose and required course correction, if any.

c. The delivery date specified is for completion of the deliveries. Deliveries to start progressively so as to meet the completion schedule.

d. The delivery conditions specified are for contractual purposes. However, to meet project requirement, BHEL may ask for early deliveries without any compensation thereof.

16.2 Validity of contract placed on basis of Framework Agreement (Rate Contract) for individual projects (PO rates, terms and conditions):

Supplier has to make supply of goods/services as per the delivery time mentioned above. However, due to unavoidable circumstances if delay happens in providing inputs/ clearances (inputs, Engineering approvals, deputing inspector for inspection, issuance of MDCC and any hold imposed owing to site issues etc.) for which delivery time extension is admissible as per point no.16.3, in such situation it shall be obligatory at Supplier part to execute the contract at PO rates, terms and conditions where inputs/ clearances has been accorded within validity of contract. Validity period for various activities shall be as defined below or as mentioned in the NIT.

16.2.1 Contract for main supply shall be valid for 365 ('C') days from the PO date. However, delay at Supplier's end (if any) shall be added to the validity period and contract validity shall get extended by the delay period at Supplier's end.

For example: Original Delivery period for main supply: A (in days)

Delay at Supplier's end: B (in days beyond "A" days)

Contract validity: C+B (in days)

16.2.2 Validity of the contract for Mandatory spares and Supervision of E&C:

Validity of contract for services (Supervision of E&C) shall be one year over and above contractual validity period for main supply including quantity variation (if any) as specified at point no. 2.1 above

Notes:

a. B is the Supplier delay days beyond original contractual delivery period for main supply /extended delivery period owing to time taken by BHEL.

b. Main supply, applicable in the contract released/ cleared for manufacturing within contractual validity period, to be supplied by Supplier/supplier at PO rates, terms and conditions.

c. Execution of the contract quantities released beyond contract validity period shall be decided on mutual consent basis at PO rates, terms and conditions.

16.3 Delivery Extension: Extension of contractual delivery time:

Delivery time mentioned in the NIT includes Engineering completion time (time for drawing/document submission/resubmission by the Supplier and review/approval of the same by the BHEL/End customer), manufacturing, inspection, Packing and dispatch time. Due diligence is to be observed by the Supplier to ensure timely completion of engineering and supply.

During the execution of the contract, time loss occurred owing to the reason attributable to BHEL besides force majeure shall be considered for delivery time extension to the Supplier as given below: -

i. Any Delay in providing comments/ approval on Primary drawing/documents beyond the stipulated time as specified in NIT.

ii. Time Loss in approval of the drawing/document as a result of increase in the iteration not attributable to the Supplier (i.e. resubmission owing to end customer comments) as certified by BHEL. Time extension equivalent to the resubmission time noted in the tech. spec and consequential increase in the approval time in lieu of increase in iteration shall be applicable. However, for incomplete re- submission time loss shall be in Supplier account.

iii. Delay in providing engineering input/material by BHEL.

iv. Delay in deputing inspector for inspection and delay in release of MDCC in line with GCC

<table>
<tr><td colspan="3">v. Any hold put by BHEL for whatever reasons during execution of contract (within contract validity period), time extension equivalent to hold period shall be admissible. However, in the event hold period continues for more than 30 days then, an additional fifteen days for the purposes of mobilization and demobilization of resources shall also be admissible.

Note: Extension in delivery period if any with or without imposition of LD shall be considered after detailed delay analysis based on provisions given above. However, no delay analysis will be applicable if supply is completed within delivery schedule as specified in Purchase order.</td></tr>
<tr><td colspan="3">17. Prices shall be Firm till completion of contract. PVC Formula, If applicable :- Not Applicable</td></tr>
<tr><td colspan="3">18. Validity of offer shall be as per cl. no.7 (instruction to Suppliers) of GCC Rev 07.</td></tr>
<tr><td colspan="2">19. CIF Content</td><td>Not Available</td></tr>
<tr><td colspan="2">20. Integrity Pact Applicability</td><td>YES</td></tr>
<tr><td colspan="3">21. In line with cl. No. 12 of (ITB) GCC Rev07, following Independent External Monitors (IEMs) have been appointed by BHEL.

Shri Otem Dai, IAS (Retd.) (iem1@bhel.in)
Shri Bishwamitra Pandey, IRAS (Retd.) (iem2@bhel.in)
Shri Mukesh Mittal, IRS (Retd.) (iem3@bhel.in)</td></tr>
<tr><td rowspan="5">22. Performance Security (PS)</td><td rowspan="2">PS applicability</td><td>No Performance Security (PS) against the current enquiry (for Framework Agreement (Rate Contract) for Electric Hoist package).
However, Suppliers to note that Performance Security shall be submitted for orders placed by Project Groups of BHEL-PEM on the Framework Agreement (Rate Contract).
L1 Supplier will have to submit Bank Guarantee for each POs (irrespective of value) which will be placed under the (Framework Agreement) Rate Contract finalised through this tender considering RC as original contract as per format mentioned in in GCC Rev 07.
Relevant details of the PS to be submitted on the basis of Framework Agreement (Rate Contract) as following:</td></tr>
<tr><td>Validity of PS: As per clause no-11.0 of GCC Rev-07.
PS Submission: PS should be in favour of BHEL-PEM.</td></tr>
<tr><td>I</td><td>Initially 10% of the contract value (total Ex-works price). However, 5% of the contract value (as above) will be released after completion of Main Supply based on certification by Project Group.</td></tr>
<tr><td></td><td>OR</td></tr>
<tr><td>II</td><td>5% of the contract value (total Ex-works price). Additional 5% of the contract value will be retained from first bill & subsequent bill(s) of the same contract. The retention amount will be released after completion of Main Supply based on certification by Project Group.</td></tr>
</table>

	Modes of deposit	Performance security may be furnished in the following forms: a) Local cheques of Scheduled Banks (subject to realization)/ Pay Order/ Demand Draft/ Electronic Fund Transfer in favour of BHEL. b) Bank Guarantee from Scheduled Banks / Public Financial Institutions as defined in the Companies Act. The Bank Guarantee format should have the approval of BHEL. c) Fixed Deposit Receipt issued by Scheduled Banks / Public Financial Institutions as defined in the Companies Act (FDR should be in the name of the Contractor, a/c BHEL). d) Securities available from Indian Post offices such as National Savings Certificates, Kisan Vikas Patras etc. (held in the name of Contractor furnishing the security and duly endorsed/ hypothecated/ pledged, as applicable, in favour of BHEL). e) Insurance Surety Bond. (Note: BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith) Performance Security is to be furnished within 14 days from the date of PO/LOA and it should remain valid for a period of 60 (sixty) days beyond the date of completion of all contractual obligations of the supplier, including warranty obligations.
	Remarks for PS	a) The performance security will be forfeited and credited to BHEL's account in the event of a breach of contract by the supplier. b) Performance security should be refunded to the contractor without interest, after he duly performs and completes the contract in all respects but not later than 60(sixty) days of completion of all such obligations including the warranty under the contract. The Performance Security shall not carry any interest.
23. Breach of contract, Remedies and Termination (Tenderer to note that this clause will supersede any clause regarding recovery amount from Tenderer due to Breach on contract mentioned anywhere in GCC Rev. 07 and its corrigendum)		In case of Breach of Contract, BHEL shall recover 10% of the contract value from the Supplier using following instruments: (i) encashment of security instruments like EMD, Performance Security with executing agency (PEM) against the said contract. (ii) balance amount (if value of security instruments is less than 10% of the contract value) from other financial remedies i.e. available bills of the Supplier, retention amount etc. with executing agency (PEM) (iii) balance amount from security instruments like EMD, Performance Security and other financial remedies i.e. available bills of the Supplier, retention amount etc. with other units of BHEL. (iv) if recovery is not possible then legal remedies shall be pursued.

24. **Tender Evaluation -** The evaluation currency for this tender shall be INR. Evaluation will be done on overall L1 (Total Package Price including Freight excluding taxes) basis with necessary loading as applicable.

In the course of evaluation, if more than one Supplier happens to occupy L-1 status, effective L-1 will be decided by soliciting discounts from the respective L-1 Suppliers.

In case more than one Supplier happens to occupy the L-1 status even after soliciting discounts, the L-1 Supplier shall be decided by a toss/draw of lots, in the presence of the respective L-1 Supplier (s) or their representative(s). Ranking will be done accordingly. BHEL's decision in such situations shall be final & binding

25. Terms & Conditions: - The terms & conditions shall be as per enclosed special conditions of the contract (copy enclosed), GCC Rev 07 & Corrigendum 01 to GCC Rev-07 which is available on https://pem.bhel.com/gcc.aspx and other Terms and Conditions included in this Enquiry Letter.

26. **Payment Terms:**

I. Payment of basic price of supplied materials (as per PO/ approved billing schedule) along with freight and taxes and duties (as applicable), shall be paid against receipt of material (receipted LR) at site on pro-rata basis. 10% of basic price of materials supplied will be retained as security deposit which will be released on pro – rata basis as below:

II. On receipt of Material Receipt Certificate (MRC) from project site engineer of owner/purchaser and on submission of certificate of submission of all the final documents for the package (as per Annexure IX(A)), duly certified by Engineering Department of Purchaser.

III. Mandatory spares: Payment of basic price of supplied materials (as per PO/ approved billing schedule) along with freight and taxes and duties (as applicable), shall be paid against receipt of material (receipted LR) at site on pro-rata basis. 10% of basic price of materials supplied will be retained as security deposit which will be released on pro – rata basis as below:

On receipt of Material Receipt Certificate (MRC) from project site engineer of owner/purchaser and on submission of certificate of submission of all the final documents for the package (as per Annexure IX(A) of GCC Rev 07), duly certified by Engineering Department of Purchaser.

IV. Services: Services charges shall not exceed 2% of the Total contract value.

a) Supervision of E&C:100% payment shall be released after successful completion of the activity on pro rata basis, on Site certification/ certification by engineering as applicable.

Notes:

1) Supplier to submit Bank guarantee as per prescribed format for each of the above-mentioned payment of Engineering charges and BG shall be valid for at least 18 months from the date of order and further extended till completion of supplies (excluding mandatory spares). In case the recovery of dues does not get completed within the aforesaid BG period, the contractor shall renew the BG or submit fresh BG for the outstanding amount, valid for at least 6 months plus additional three months claim period and further extended till completion of supplies (excluding mandatory spares). These BGs shall be returned after completion of supplies or on recovery of the amount released against the BGs (whichever is earlier).
2) The above-mentioned BGs shall be in addition to the Performance Security. Performance Security shall be as per the PS clause mentioned above. Also, the above-mentioned payment shall be subject to submission of PS.
3) BHEL is entitled to make recovery of the entire outstanding amount in case the Supplier fails to comply with the BG requirement.

4) In case of breach of contract, recovery of Engineering charges shall be made in addition to recovery under clause no. 24.

27. Supplier to note that this is an Open Tender enquiry & Reverse Auction participation shall be subject to following condition:
a. Qualifying Technical & Financial Pre-Qualification Requirement.
b. Techno-commercial acceptance of offer by BHEL-PEM.
c. Registration in BHEL-PEM for Electric Hoist package

The Suppliers who are not registered with BHEL-PEM may apply for registration in BHEL-PEM through Registration Portal available at www.pem.bhel.com -->Supplier section-->online supplier registration. All credentials and/or documents duly signed & stamped related to registration has to be uploaded on the website & submit the application for registration. One set of hard copy filled-up SRF downloaded from Online Registration Portal duly signed & stamped has to be submitted.

28. Clause no 9.6 (excluding notes) of GCTC of GCC Rev. 07 shall be read as-
"Suppliers shall submit billing documents for payment directly to BHEL. Payment will be released within days as mentioned below after submission of complete documents as per clause no 9.7.2 – 9.7.5:
a. 90 days for non MSME as per MSMED Act
b. 45 days for Suppliers qualified and registered as Micro and Small Enterprises MSEs as per MSMED Act
c. 60 days for Suppliers qualified as Medium Enterprises as per MSMED Act."

29. Suppliers are requested to refer clause no 26.0 (Make in India) of instructions to Supplier of GCC Rev 07. Further, following shall be taken into consideration for submitting bids by Suppliers:

- For this procurement, Public Procurement (preference to make in India), order 2017, Dt:- 15.06.17, 28.05.18 & 29.05.19, 16.09.2020 and subsequent orders issued by the respective nodal ministry shall be applicable even if issued after issue of this NIT but before finalization of contract/PO/WO against this NIT. In the event of any nodal ministry prescribing higher or lower percentage of purchase preference and / or local content in respect of this procurement, same shall be applicable. Suppliers are requested to go through the above mentioned orders and submit their in adherence to Public Procurement (preference to make in India), order 2017, Dt:- 15.06.17, 28.05.18 & 29.05.19 and subsequent orders.

- Minimum Local Content prescribed for Electric Hoist package by Nodal Ministry is 60% and hence for this procurement, as per Public Procurement (preference to make in India), order 2017, Dt:- 15.06.17, 28.05.18, 29.05.19 & 16.09.2020 and subsequent orders issued by the nodal ministry, **this package is reserved for only Class-I supplier having Minimum local Content 60%**. Class-II and Non-Local suppliers are not eligible to quote for this enquiry.

  Please submit the extract of AGM Resolution of your company regarding appointment of statutory auditor or cost auditor of current year.

30. Purchase preference to MSE Supplier :

Suppliers to note that contract of subject tender is proposed to be done with Two (02) Suppliers in the ratio of 70-30 value-wise at L1 FOR site price as follows:

Splitting criteria:
Case 1: If L1 is Non-MSE Supplier, then order for 70% value shall be given to L1 Supplier. MSE preference criteria shall be exercised for balance 30% value in order wherein L1 Rates (Ex works + Freight) shall be counteroffered to all techno-commercially qualified MSE Suppliers. In case acceptance of counteroffer is received from more than one MSE Supplier then acceptance shall be considered as per FINAL Reverse Auction Ranking (as applicable). If MSE Suppliers regret to match L-1 rates then 30% value shall be counter-offered to all Non-MSE Techno-commercially approved Suppliers. In case acceptance of counter offer is received from more than one Supplier, then acceptance of lowest Supplier(s) as per FINAL Reverse Auction Ranking.

Case 2: If L1 is MSE Supplier then order for 70% value shall be given to L1 Supplier. MSE preference criteria shall be exercised for balance 30% value in order wherein L1 Rates (Ex works + Freight) shall be counteroffered to balance techno-commercially qualified MSE Suppliers. In case acceptance of counter offer is received from more than one MSE Suppliers then acceptance shall be considered as per FINAL Reverse Auction Ranking (as applicable). If MSE Suppliers regret to match L-1 rates then 30% value shall be counteroffered to all Non-MSE Techno-commercially approved Suppliers. In case acceptance of counter offer is received from more than one Supplier, then acceptance of lowest bidder(s) as per FINAL Reverse Auction Ranking.

However, if none of the Supplier accepts counteroffered L1 rates, then contract shall be awarded to L1 Supplier for 100% value.

31. All corrigenda, addenda, amendments, time extensions, clarifications, etc. to the tender will be hosted on BHEL website (www.bhel.com), https://eprocurebhel.co.in/nicgep/app & BHEL-PEM website (www.pem.bhel.com). Suppliers should regularly visit websites to keep themselves updated.

32. If Supplier mentions Not Applicable / Not required / Not Quoted in BHEL price format, the same to be substantiated by the Supplier. If such item is required to be supplied for system completion in future, same will be supplied free of cost.

33. All other correspondence thereof shall be addressed to the undersigned by name & designation and sent at the following address:

Manish Kumar Sinha / Sr. Mgr.-CMM **M/S Bharat Heavy Electricals Ltd.,** Project Engineering Management, Power Project Engineering Institute, HRD & ESI Complex, Plot No. 25, Sector-16 A, Noida-201301 E-MAIL: manish.sinha@bhel.in Ph. No.	**Kumar Suman Saurabh/ Dy. Manager– CMM** **M/s Bharat Heavy Electricals Ltd.,** Project Engineering Management, Power Project Engineering Institute, HRD & ESI Complex, Plot No 25, Sector-16 A, Noida-201301 E-MAIL: sumansaurabh@bhel.in Ph. No. 9718771765

34. GST shall be payable extra at actual as per the HSN code finalised for the items during detailed BBU.

35. GeM Seller ID shall be mandatory before placement of order/award of contract to the successful Supplier

36. Suppliers to quote freight charges in percentage of their quoted Total Ex-works Prices. Supplier to quote non-zero freight % for supply.

37. Over all (%) quantity variation: The variation on overall package value shall be limited to +/-30%

38. Suppliers shall Quote for the entire scope. Partial scope is not acceptable.

39. Suppliers 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 etc.
Offer of only those Suppliers shall be considered further, who meets the PQR criteria.
Suppliers to furnish latest verification details for checking veracity of document(s) by BHEL. In case the same found not available, Purchaser has right to reject such document from evaluation.
Format for the same is below: -

Sl. No.	Project Name	Customer Name, Contact Address, Phone No. & Email ID	Contract/ Order No.	Value of Contract/ Order	Brief of Work	Completion Date

40. Self-declarations/ auditor's/ accountant's certificates submitted by the manufacturer/ supplier may be verified randomly by the committee constituted as per MoP Order 28-07-2020. In case of false documents/misrepresentation of the facts requisite action against such manufacturer/ supplier will be taken based on the recommendation of the Committee

41. Suppliers to comply Govt. of India, Ministry of Power, order no-25-111612018-PG dated 02/07/2020 regarding mandatory testing of all the imported items/equipment's/components.

42. This item/Package falls under the list of items defined in Para 3 of Ministry guideline ref no.F.20/2/214-PPD(Pt.) dated.20-09-2016 (in respect of procurement of items related to public safety, health, critical security operations and equipment's, etc) & hence no relaxation of PQR for start-up/MSME Suppliers is envisaged for the items/Package.

43. The Supplier declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Supplier(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 Supplier is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines.

44. The offers of the Suppliers who are under suspension as also the offers of the Suppliers, who engage the services of the firms debarred across BHEL, shall be rejected. The list of firms debarred across BHEL is available on BHEL web site www.bhel.com.
    1.0 Integrity commitment, performance of the contract and punitive action thereof:
    1.1. Commitment by BHEL: BHEL commits to take all measures necessary to prevent corruption in connection with the tender process and execution of the contract. BHEL will during the tender process treat all Supplier(s) in a transparent and fair manner, and with equity.
    1.2. Commitment by Supplier/ Supplier/ Contractor:
    1.2.1. The Supplier/ supplier/ contractor commit to take all measures to prevent corruption and will not directly or indirectly influence any decision or benefit which he is not legally entitled to nor will act or omit in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India.
    1.2.2. The Supplier/ supplier/ contractor will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and shall adhere to relevant guidelines issued from time to time by Govt. of India/ BHEL.
    1.2.3. The Supplier/ supplier/ contractor will perform/ execute the contract as per the contract terms & conditions and will not default without any reasonable cause, which causes loss of business/ money/ reputation, to BHEL.
    If any Supplier/ supplier/ contractor during pre-tendering/ tendering/ post tendering/ award/ execution/ post-execution stage indulges in malpractices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the price or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India, then, action may be taken against such Supplier/ supplier/ contractor as per extant guidelines of the company available on www. bhel.com and/or under applicable legal provisions".

45. A Supplier shall not have conflict of interest with other Suppliers. Such conflict of interest can lead to anticompetitive practices to the detriment of Procuring Entity's interests. The Supplier found to have a conflict of interest shall be disqualified. A Supplier 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 Supplier; or
    e) Supplier participates in more than one bid in this bidding process. Participation by a Supplier 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/ 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 authorize 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 Supplier 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. Suppliers must proactively declare such sister/ common business/ management units in same/ similar line of business.

46. All the above terms and conditions, post-bid agreements/MoMs (during Techno- Commercial evaluation) shall automatically become a part of the Order/Contract after its finalization.

47. Suppliers to note that offers shall be submitted strictly in accordance with the requirements of tender documents. Suppliers shall upload their complete offer meeting the requirements of the tender documents on e-procurement portal https://eprocurebhel.co.in/nicgep/app.

Following documents need to be uploaded:

- Offer forwarding/ Covering letter with Un-price bid, ANNEXURE-II DEVIATION SHEET (COST OF WITHDRAWAL)
- Documents required for meeting Technical & Financial PQRs
- Local content certificate in line with Make in India Order dated 16.09.2020 along with AGM as per clause no. 31 of NIT.
- Land Border certificate compliance as per DOE circular dated 23.02.2023
- Integrity pact
- Price bid along with Annexure-II on e-procurement portal - https://eprocurebhel.co.in/nicgep/app

48. It shall be the responsibility of the Supplier to ensure that the tender is uploaded on or before the due date and time. Late offers are not accepted.

49. All other terms and conditions shall be as per Special Conditions of Framework Agreement (Rate Contract), and GCC Rev07 & Corrigenda-01 to GCC Rev 07.

In the event of any contradiction in the terms and conditions mentioned, the order of preference shall be as mentioned in clause no. 36 of GCTC of GCC (Rev.07).

Note - In case you are not making an offer against this enquiry, you are requested to send a regret letter so as to reach us on or before the due date.

RATE CONTRACT

VOLUME – II B & III

TECHNICAL SPECIFICATION
FOR
ELECTRIC WIRE ROPE HOIST

SPECIFICATION NO.: PE-TS-RC3-563-A002 Rev 00

BHARAT HEAVY ELECTRICALS LTD
POWER SECTOR- PROJECT ENGINEERING MANAGEMENT
NOIDA
INDIA

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS	SPECIFICATION No: PE-TS-RC3-563-A002	
		VOLUME: II B & III	
		REV. 00	DATE:16.04.24
	CONTENTS	SHEET :	

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	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOIST SPECIFIC TECHNICAL REQUIREMENT	SPECIFICATION No: PE-TS-RC3-563-A002	
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		REV. 00	DATE: 16.04.24
		SHEET :	

SECTION-I

SPECIFIC TECHNICAL REQUIREMENT

SUB-SECTION IA	**SPECIFIC TECHNICAL REQUIREMENT (MECHANICAL)**
SUB-SECTION IB	**DATA SHEET A**

SUB SECTION-IA

SPECIFIC TECHNICAL REQUIREMENT (MECHANICAL)

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS	**SPECIFICATION No: PE-TS-RC3-563-A002**
		VOLUME: II B
		SECTION-I
		SUB-SECTION-IA
	SPECIFIC TECHNICAL REQUIREMENT	REV 00 / DATE 16.04.24

1.0 INTENT OF SPECIFICATION

1.1 The specification is intended to cover design, engineering, manufacturing, inspection and testing, painting, supply/ delivery duly packed at FOR site including essential spares, erection & commissioning spares, maintenance tools & tackles, all accessories including freight and supervision of Erection & Commissioning at site (as required) in line with drawings/ documents/ test procedures approved by BHEL/ Customer for **ELECTRIC WIRE ROPE HOISTS** as per details in different sections / volumes of this specification**.**

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 contractor of the responsibility of providing such facilities to complete the supply of ELECTRIC WIRE ROPE HOISTS.**

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 **within 10 days of receipt of technical specification.** In absence of any such clarifications, in case of any contradictory requirement, 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 Cost of withdrawal format given in General Condition of Contract (GCC) otherwise, it will be presumed that the vendor's offer is strictly in line with NIT specification. If there are no deviations from the tender document, bidder shall indicate 'NO DEVIATION' in the deviation schedule.

1.9 In case all above requirements are not complied with, the offer may be considered as incomplete and would become liable for rejection.

1.10 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.

BHEL	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS SPECIFIC TECHNICAL REQUIREMENT	SPECIFICATION No: PE-TS-RC3-563-A002 VOLUME: II B SECTION-I SUB-SECTION-IA REV 00 / DATE 16.04.24

1.0.0 SCOPE OF WORK

1.1.0 SUPPLY

1.1.1 Equipment and services to be furnished by the bidder for the WIRE ROPE ELECTRIC HOIST with accessories as per the details given in data sheet A. Any equipment / accessories not specified in the specification but required to make the hoist units complete and efficient shall also be under the bidder's scope of work.

Each hoist shall include all necessary items but shall not be limited to the following: -

1. Travelling Trolley with drive arrangement.
2. Hoisting mechanism (motor and gear box, wire rope, load hook and hook block)
3. Electrical equipment's (control panel, motor, limit switches, DSL current collector etc)
4. Cable for motor, brake, limit switches, etc.
5. Painting of hoist.
6. Power supply thru' DSL along with fixing brackets/ trailing cable with festoon/taut wire arrangement (project specific).
7. Testing of hoist at manufacturers works.
8. Main isolating switch with earth fault protection and power cable from 1.5M above ground / operating floor upto DSL/junction box/terminal box.
9. Pendent push button with fixed type cabling / festoon type cabling arrangement. (project specific).
10. Initial fill of lubricants, grease etc.
11. Any equipment / accessories not specified here but required to make the equipment complete and efficient shall be under bidder's scope of work.

1.1.2 Maintenance Tools and Tackles

A complete unused new set of tools & tackles and accessories along with detailed instructions and maintenance manual for the hoists shall be supplied. Each tool and wrench shall be stamped, so as it can be easily identified for use. The tools shall be supplied in steel toolbox and with a copy of instruction manual. The items supplied shall be of the best quality and specially protected against rusting and minimum the following shall be provided. The tools and tackles shall be suitable for maintenance of electric hoists of various capacities.

S. No.	Description	Qty.
1	Complete set of ring spanners (Indicate the sizes offered)	1 Set
2	Complete set of screwdrivers (Min. 6 nos. Indicate the sizes)	1 Set
3.	Adjustable Spanner	1 No.

4.	Insulated pliers	1 No.
5	Wrench spanner	1 No.
6.	Grease Gun	1 No.
7.	Oil Gun	1 No.
8.	Hand Lamp	1 No.
9	Line tester	1 No.

Note: All maintenance tools & tackles are to be supplied in a tool box.

1.1.3 Erection and commissioning spares. (For details refer price format)- Bidder shall supply overload relays, fuse links, limit switch etc for commissioning of the electric hoists as specified in price format (project specific). One set shall mean 100% requirement for one electric hoist. In case any additional spares and or quantity are required, the same shall also be included if it is deemed necessary for commissioning of hoists.

1.1.4 Essential Spares – Shall be project specific. General list is given at Annexure II, Section II, Volume IIB for reference. Prices to be quoted in Price schedule.

1.2.0 Services to be provided by the bidder

1.2.1. Design, engineering with associated documentation. Erection and commissioning procedure with illustrative drawings shall be submitted by successful bidder for carrying out the erection and commissioning of hoist, sub assembly along with its accessories at site including operation and maintenance manual.

1.2.2. Document approval by customer under Approval category or information category shall not absolve the vendor of their contractual obligations of completing the work as per specification requirement. Any deviation from specified requirement shall be reported by the vendor in writing and require written approval. Unless any change in specified requirement has been brought out by the vendor during detail engineering in writing while submitting the document to customer for approval, approved document (with implicit deviation) will not be cited as a reason for not following the specification requirement. In case vendor submits revised drawing after approval of the corresponding drawing, any delay in approval of revised drawing shall be to vendor's account and shall not be used as a reason for extension in contract completion

1.2.3. Packing, forwarding and transportation to site.

Normal : In general packing shall be for normal environment in wooden box for protection from rain, wind etc for long period of storage. Complete list in form of Bill of Quantity carrying

all technical details of the items/components shall be furnished separately for each electric hoist. Refer Section IIA for packing details.

1.3.0. Inspection and Testing

Shall be as per enclosed standard manufacturing quality plan and approved drawings /documents and relevant IS codes. The standard manufacturing quality plan is included in this specification to enable the bidder to understand the extent of inspection and testing requirements to execute the job. Procedure is indicated at Annexure IV, Volume IIB. The successful bidder has to follow the requirement in the above documents along with the relevant standards. If available existing RQP/SQP approved by NTPC/BHEL or any other agency involved in the specific project shall be used if required/accepted by the end user i.e Customer.

1.4.0. Drawing / design document for submission: Drawing/ design documents to be submitted as per list & submission schedule attached as Annexure-V, Section II, Volume IIB.

Any other design document/ drawing as required by customer/ BHEL shall be submitted by bidder during detail engineering without any implication.

1.5.0 Number of drawing and documents for submission

The number of prints / copies required for various drawing and documents are listed in Annexure –V, Section II, Volume IIB of this specification.

1.6.0 **Supervision of erection & commissioning:** Bidders shall also be required to extend supervision of erection and commissioning of equipment's under the scope of supply of this specification on project to project basis (as per requirement). Rate on per visit and per man day basis shall be quoted in the price schedule. The actual no of days shall be informed on project to project basis, as and when required.

Scope for charges per visit including service at site as per price schedule: Total lump sum price for visits should include travel expenses to & fro site, insurance (if applicable) & boarding and lodging etc for one day of stay at site including supervision charges for erection, commissioning, load testing or any other service at site. .

Scope for charges for subsequent stay at site as per price schedule:: shall include charges for supervision of erection, commissioning, load testing or any other service at site including boarding & lodging for subsequent stay at site. This shall be from the day of actual commencement of supervision at site/ availability at site for supervision activity, excluding travel time to & from site. These charges shall commence if the representative of vendor has to provide service at site beyond one day.

Note: Bidder shall be informed at least 10 days in advance for the requirement of visit at site. Visiting team shall consist of one or two expert as deemed necessary by the bidder.

2.0.0. **Works Excluded**

2.1.0 Supply of ISMB / monorail.

2.2.0 Erection and Commissioning of electric hoists.

2.3.0 Purchaser shall provide single point 415V, 3 or 4 phase, and 50Hz supply (3 wire or 4 wire shall be project specific) at any point of the bay or in the middle of the bay. Vendor shall provide main isolating switch at 1.5 M above the ground / operating floor level to receive this power and cable required from isolating switch to DSL.

Any other supply required by the bidder shall be arranged by the bidder, using suitable transformer as per the specification.

3.0.0. Deviations

If the bid submitted has got any deviation from the technical stipulations in the tender document, bidder shall tabulate the same in the appropriate “Schedule of Deviations” , given in General Condition of Contract (GCC), furnishing full particular of such deviations along with cost of withdrawal of deviation. Priced copy shall be submitted along with price schedule. Unpriced schedule shall be submitted along with technical offer. Unpriced format should contain

“ QUOTED” / “NIL” / “NA” against each deviation. Deviations are to be furnished with mention to specific clause number. Reasons / explanations for such deviations shall be furnished. If there are no deviations from the tender document, bidder shall furnish NO DEVIATION CERTIFICATE regarding the same.

4 .0.0. Makes of Sub - Vendor items

Reference list for makes of various items /components, assemblies will be as per Annexure-I, Section II, Volume II-B of the specification. However final list of makes of sub vendor shall be approved by BHEL/Customer during detail engineering without any commercial & delivery implication to BHEL.

6.0.0 INFORMATION TO BE FURNISHED BY BIDDER ALONG WITH OFFER

6.1.0 Bidder shall submit only the documents indicated at Section IIIA, Volume III of this specification. If there is any deviation, the same shall be furnished by the bidder in a separate Deviation Schedule. Bidder to specifically note that deviation mentioned elsewhere (other than in a separate Deviation Schedule) shall not be taken cognizance of in any case.

QUALITY ASSURANCE AND INSPECTION REQUIREMENT

233720/2024/PS-PEM-MAX

MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN	SPEC. NO:	DATE:
	CUSTOMER:	QP NO.: PE-QP-STD-563-A002	DATE:
	PROJECT:	PO NO.:	DATE:
	ITEM: ELECTRIC HOIST	SYSTEM: EH / SECTION: MH	SHEET 1 of 5

SL NO.	COMPONENT & OPERATIONS	CHARACTERIST-ICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					6				*	**			
					M	B/C			D	M	B	C	
1	2	3	4	5			7	8	9				10
A.	**RAW MATERIAL**												
A.1	MS PLATES FOR HOIST STRUCTURE, GEAR BOX, & ROPE DRUM (IF FABRICATED)	CHEMICAL & MECHANICAL PROPERTIES	MA	CHEMICAL & MECHANICAL	1 SAMPLE / HEAT		IS 2062 E250 GR- A/ BR APPROVED DRAWING/DATA SHEET		MTC/ LAB TEST REPORT	√	P	V	V	In the absence of correlated TC Lab testing shall be done.
		ULTRASONIC TEST OF PLATES (For Thk >25mm)	MA	NDT	100%	100%	ASTM A 435	ASTM A 435	IR	√	P	V	V	
A.2	PIPE FOR ROPE DRUM (IF SEAM LESS PIPE IS USED)	CHEMICAL & MECHANICAL PROPERTIES & ACID ETCHING	MA	CHEMICAL & MECHANICAL	1 SAMPLE / HEAT/SIZE		ASTM A106 GR A/B APPROVED DRAWING/DATA SHEET		MTC/IR/LAB TEST REPOT	√	P	V	V	In the absence of correlated TC Lab testing shall be done.
		ULTRASONIC TEST FOR SEAMLESS PIPE (For Thk >25mm)	MA	UT	100%	100%	ASTM E-213	ASTM E-213	IR	√	P	V	V	
A.3	FORGINGS / ROLLED BARS FOR GEARS, PINIONS & WHEELS	CHEMICAL & MECHANICAL PROPERTIES	MA	CHEMICAL & MECHANICAL	1 SAMPLE / HEAT/SIZE		APPROVED DRAWING/DATA SHEET.		MTC/ LAB TEST REPORT	√	P	V	V	In the absence of correlated TC Lab testing shall be done.
		ULTRASONIC TEST	MA	NDT	100%	100%	ASTM A 388	REFER NOTE-1	IR	√	P	V	V	Only for dia/thickness 40 mm & above
B.	**BOUGHT OUT ITEMS**													
B.1	HOOKS	MAKE & DIMENSIONS	MA	VISUAL	100%	100%	IS 15560/ AS PER APPROVED BOI LIST		TC	√	P	V	V	
		CHEMICAL & MECHANICAL	MA	CHEMICAL & MECHANICAL	1 SAMPLE / HEAT/SIZE		IS 1875/APPROVED DATA SHEETS /DRAWINGS.		IR	√	P	V	V	
		PROOF LOAD TEST	MA	MECHANICAL	100%	100%	IS-15560/IS 3815/APP. DRG./ DS	IS-15560/IS 3815/APP. DRG./ DS	IR	√	P	V	V	
		UT FOR INNER DEFECTS	CRITICAL	NDT	100%	100%	ASTM A 388	REFER NOTE-1	IR	√	P	V	V	On shank portion only
		DPT TEST BEFORE & AFTER PROOF LOAD TEST	CRITICAL	NDT ON MACHINED SURFACE	100%	100%	ASTM E-165	NO DEFECTS	IR	√	P	V	V	

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Reviewed by:			Reviewed by:		

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Sign & Date	
Seal	

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	PROJECT:	PO NO.:	DATE:
	ITEM: ELECTRIC HOIST	SYSTEM: EH	SECTION: MH	SHEET 2 of 5

SL NO.	COMPONENT & OPERATIONS	CHARACTERIST-ICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					6				*	**			
					M	B/C			D	M	B	C	
1	2	3	4	5			7	8	9				10
B.2	WIRE ROPES	MAKE, TYPE & IDENTIFICATION	MA	VISUAL	100%	100%	AS PER APPROVED BOI LIST	MTC	√	P	V	V	
		DIMENSION, BRAKING STRENGTH, CONST.	MA	REVIEW	100%	100%	IS-2266 / APPROVED DRAWING/DATA SHEET	MTC	√	P	V	V	
B.3	PULLEY/SHEAVE	CHEMICAL, MECHANICAL VISUAL DIMENSION	MA	REVIEW	100%	100%	APPROVED DRAWING/DATA SHEET/MFG STD	MTC/IR/LAB REPORT	√	P	V	V	
B.4	MOTOR<30 KW	MAKE/TYPE/RATING, ROUTINE TEST	MA	VISUAL, REVIEW	100%	100%	APPROVED DRAWING/DATA SHEET/ AS PER APPROVED BOI LIST	MTC	√	P	V	V	
B.5	GEAR BOX	MAKE / TYPE / RATING / REDUCTION RATIO/ BACKLASH & TOOTH CONTACT	MA	VISUAL	100%	100%	APPROVED DRAWING/DATA SHEET/ AS PER APPROVED BOI LIST/ MFG STD	IR	√	P	V	V	
		NO LOAD RUN TEST (NOISE LEVEL, TEMP.RISE, OIL LEAKAGE, VIBRATION)	MA	VISUAL	100%	100%	NOISE LEVEL < 85 dB at 1 mtr TEMP. RISE= AMB+30 °C NO OIL LEAKGE APPROVED DRAWING/DATA SHEET	IR	√	P/V	V	V	
B.6	BRAKE	MAKE / TYPE / RATING	MA	VISUAL	100%	100%	APPROVED DRAWING / DATA SHEET / AS PER APPROVED BOI LIST	MTC/IR	√	P	V	V	
		ROUTINE TEST	MA	REVIEW	100%	100%		MTC	√	P	V	V	
B.7	LIMIT SWITCH, RELAY, CONTACTOR, TRANSFORMER/ PUSH BUTTON /TERMINAL BLOCK, SELECTOR SWITCH, INDICATION LAMP /SFU	MAKE/TYPE/RATING	MA	VISUAL	100%	100%	APPROVED DRAWING / DATA SHEET / AS PER APPROVED BOI LIST	IR	√	P	V	V	
B.8	CABLES - LT POWER / CONTROL	MAKE / TYPE / RATING	MA	VISUAL	100%	100%	APPROVED DRAWING / DATA SHEET / AS PER APPROVED BOI LIST	MTC/IR	√	P	V	V	
		ROUTINE TEST	MA	REVIEW	100%	100%		MTC	√	V	V	V	
B.9	VVVF DRIVE (AS APPLICABLE)	MAKE / TYPE / RATING	MA	VISUAL	100%	100%	APPROVED DRAWING / DATA SHEET / AS PER APPROVED BOI LIST	MTC/IR	√	P	V	V	
		ROUTINE TEST	MA	REVIEW	100%	100%			√	P	V	V	

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	PROJECT:	PO NO.:	DATE:
	ITEM: ELECTRIC HOIST	SYSTEM: EH	SECTION: MH	SHEET 3 of 5

SL NO.	COMPONENT & OPERATIONS	CHARACTERIST-ICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					6					*	**		
					M	B/C				D	M	B	C	
1	2	3	4	5			7	8	9					10
B.10	CONTROL PANEL & PANDENT STATION BOX	MAKE/TYPE/RATING	MA	VISUAL	100%	100%	APPROVED DRAWING / DATA SHEET / AS PER APPROVED BOI LIST		IR	√	P	V	V	
		SHEET /GLAND PLATE THICKNESS, PAINT SHADE, DFT, ADHESION	MA	VISUAL	100%	100%			IR	√	P	V	V	
C	IN PROCESS INSPECTION													
C.1	ROLLING & WELDING OF ROPE DRUM (IF FABRICATED)	WPS, PQR & WPQ	MA	REVIEW	100%	100%	AS PER ASME SEC-IX		QW 481-84	√	P	V	V	NTPC/BHEL/TUV/LLOYD/ DNV approved WPS& qualified welders to be used. In case of non availability of the same, WPS to be submitted for approval.
		ROLLING & WELD PREPARATION	MA	VISUAL & MEASURE	100%	100%	AS PER DRAWING.		IR	√	P	V	V	
		NDT TEST ON WELD	MA	DPT	100%	10%	ASTM E 165	ASME SECTION VIII DIV-1 APPENDIX-8 CL.NO.8.4	IR	√	P	V	V	
		RT OF BUTT WELD JOINTS (IF APPLICABLE)	CRTICAL	RT	100%	100%	ASME SEC-V	ASME SEC-VIII, DIV-1	IR	√	P	V	V	
C.2	ROPE DRUM, PULLEY & HOOK SHANK (AFTER FINAL MACHINING)	VISUAL & DIMENSION	MA	VISUAL & MEASURE	100%	100%	MANUFACTURE DRAWING		IR	√	P	V	V	
		NDT ON MACHINE SURFACE	MA	DPT	100%	100%	ASTM E 165	ASME SECTION VIII DIV-1 APPENDIX-8 CL.NO.8.4	IR	√	P	V	V	
C.3	TROLLEY STRUCTURE	WELD SOUNDNESS DIMENSIONS	MA	DPT & VISUAL & MEASUREMENT	100%	100%	ASTM E 165	ASME SECTION VIII DIV-1 APPENDIX-8 CL.NO.8.4	IR	√	P	V	V	
C.4	GEAR & PINIONS, WHEELS (AFTER FINAL MACHINING)	NDT ON MACHINE SURFACE	MA	DPT	100%	100%	ASTM E 165	ASME SEC-VIII, DIV-1 APPEND.8 CL.8.4	IR	√	P	V	V	

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	CUSTOMER:	QP NO.: PE-QP-STD-563-A002	DATE:
	PROJECT:	PO NO.:	DATE:
	ITEM: ELECTRIC HOIST	SYSTEM: EH / SECTION: MH	SHEET 4 of 5

SL NO.	COMPONENT & OPERATIONS	CHARACTERIST-ICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					6					*	**		
					M	B/C				D	M	B	C	
1	2	3	4	5			7	8	9					10
C.5	STRESS REVIEVING OF GEAR BOXES (IF FABRICATED)	SR OF GEAR BOX CASING	MA	SR>25mm Thick	100%	100%	ASME SEC. VIII DIV I UCS 56	ASME SEC. VIII DIV I UCS 56	SR REPORT	√	P	V	V	
D	**FINAL INSPECTION**													
	COMPLETE ASSEMBLED HOIST ALONG WITH ACTUAL CONTROL PANEL, VVFD & PUSH BUTTON (AS APPLICABLE)	VISUAL & DIMENSION	MA	VISUAL & MEASURE	100%	100%	IS:3938/ APPROVED DRAWING / DATA SHEET		IR	√	P	W	V	.
D.1	NO LOAD TEST & FULL LOAD TEST	CURRENT DRAWN, SPEED OF HOIST ENCHING OPERATION, INTERLOCKING SEQUENCE OPEARTION	MA	VISUAL & MEASURE	100%	100%	IS:3938/ APPROVED DRAWING / DATA SHEET		IR	√	P	W	V	
	OVERLOAD TEST AT 125%	HOLDING CAPACITY OF BRAKES	MA	VISUAL	100%	100%	IS:3938/ APPROVED DRAWING / DATA SHEET		IR	√	P	W	V	
D.2	CONTROL PANEL	VISUAL, MAKE, VERIFICATION & DIMENSION	MA	VISUAL & MEASURE	100%	100%	IS:3938/ APPROVED DRAWING / DATA SHEET		IR	√	P	W	V	
		INGRESS PROTECTION BY PAPER INSERTION METHOD	MA	VISUAL	100%	100%	IS:3938/ APPROVED DRAWING / DATA SHEET		IR	√	P	W	V	
		HV/IR	MA	MEASURE	100%	100%	IS:3938/ APPROVED DRAWING / DATA SHEET		IR	√	P	W	V	
		PAINT SHADE, DFT	MA	VISUAL & MEASURE	100%	100%	IS:3938/ APPROVED DRAWING / DATA SHEET		IR	√	P	W	V	
D.3	SPARES (MANDATORY / RECOMMENDED SPARE / COMMISSIONING SPARES/ TOOLS & TACKLES)	VERIFICATION OF MAKE, TYPE, SIZE, RATING	MA	REVIEW OF INTERNAL INSPECTION REPORTS / MFR'S TC / COC	100%	-	APPROVED SPARE LIST		APPD DRG / DATA SHEET	IR / COC		P	W	

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Reviewed by:			Reviewed by:		

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MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN	SPEC. NO:	DATE:
	CUSTOMER:	QP NO.: PE-QP-STD-563-A002	DATE:
	PROJECT:	PO NO.:	DATE:
	ITEM: ELECTRIC HOIST	SYSTEM: EH / SECTION: MH	SHEET 5 of 5

SL NO.	COMPONENT & OPERATIONS	CHARACTERIST-ICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					6				*	**			
					M	B/C			D	M	B	C	
1	2	3	4	5			7	8	9				10
D.4	PAINTING OF HOIST	VISUAL DFT, MEASUREMENT & PAINT SHADE	MA	VISUAL & MEASUREMENT	100%	100%	APPROVED DRAWING / DATA SHEET	IR	√	P	V	V	
D.5	PACKING	PACKING SOUNDNESS	MA	VISUAL	100%	100%	APPROVED DOCUMENT/ PACKING SPECIFICATION	IR	√	P	V	V	

LEGENDS:
*__D:__ *RECORDS, INDENTIFIED 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

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SUB SECTION-IB

DATA SHEET A

TECHNICAL DATA SHEET

S.N..	DESCRIPTION	TECHNICAL PARTICULARS
1.0	Type	Electric wire rope hoist
2.0	Scope (Qty., Capacity, Lift, Travel Length)	The scope shall be specific for particular projects and shall be given at the time of enquiry of individual project as per scope of enquiry.
3.0	Type of service	Indoor/outdoor to be informed on project to project basis.
4.0	Overload test	125% of SWL
5.0	Design Ambient temperature	Project specific info. shall be provided
6.0	General Design & duty	As per IS: 3938 latest conforming to Class-II
7.0	Operating speed /Creep speed	Creep speed - 10% of main speed
7.1	Hoisting motion	2.5 M/Min to 5 M/Min (To be informed on project to project basis)
7.2	Trolley motion	10 M/min to 15 M/min (To be informed on project to project basis)
8.0	Type of transmission	Through Electric motor and gearbox
9.0	**Wire Rope**	
9.1	Construction / core	Extra flexible plough steel, 6 x36 construction, (Steel / Fiber core to be informed project to project basis). Grade 1960 N/mm^2 / 1770 N/mm^2. Galvanized wire rope may also be required depending project requirement.
9.2	Code	IS:2266
9.3	Number of falls	Min. 4
9.4	Factor of safety	5 to 6
10.0	**Load Hook and block**	NORMALISED HOOK ONLY
10.1	Type of load hook	Shank type swiveling with safety latch and also with swivel lock pin.
10.2	Load hook Code	IS: 15560
10.3	Load hook Material	As per IS: 1875, minimum Class 3
10.4	Hook suspension	Thrust bearing
10.5	Material of block suspension	Fabricated from steel plate, Material: IS: 2062 grade A or B
11.0	**Gear & pinion**	
11.1	Type	Spur / Helical
11.2	Material	Gear: 16 Mn Cr 5 / 20 Mn Cr 5 / C40 / C50 / EN19 / EN24 / SAE 8620 / 16 Cr Ni 4 / 18 Ni Cr Mo5 / 39 Ni Cr. MO3 / 42 Cr MO4

11.3	Lubrication	Oil splash / grease lubricated
11.4	Bearing type	Antifriction Ball / Roller
12.0	Trolley drive	
12.1	**Wheel**	Single flanged
12.2	Wheel conform to (Std. / code)	IS: 3938
12.3	Wheel material	Cast, forged or rolled steel to be decided in detail engineering.
12.4	Bearing type	Antifriction Ball / Roller
12.5	Trolley type	Adjustable type to accommodate beams flange width of standard sizes given in schedule attached at end of this data sheet. Trolley shall be designed to accommodate higher or lower flange widths. However actual beam size shall be confirmed during detail engineering before manufacturing clearance.
12.6	Hardness	200 BHN (max)
13.0	**SHEAVE**	
13.1	Material	Fabricated from steel plate. IS: 2062 Gr. B / carbon steel casting as per IS 1030 or as per IS: 3938.
13.2	Bearing type	Antifriction Ball / Roller
14.0	**BRAKE (HOIST**)	
14.1	Type	DC EM (disc type- fail to safe) For a specific project, hoists 10 ton & above (2 nos. approx), EHT type brake shall be provided for hoisting and trolley motion.
14.2	Capacity	150 % of rated motor torque
14.3	Number	One number.
15.0	**BRAKE (TROLLEY)**	
15.1	Type	DC EM (disc type- fail to safe)
15.2	Capacity	125 % of rated motor torque
15.3	Number	One number for each motor.
16.0	**Lubrication**	Oil splash/Grease lubrication
17.0	**ROPE DRUM**	
17.1	Material	Seamless steel pipe. ASTM A106 Gr A /B /ASTM 53 grade B; Fabricated from MS as per IS 2062 Gr A/B.
17.2	Flange / Flangeless	Flanged
17.3	Type of groove	RHO and LHO/LHO/RHO lay type to suit the layout requirement for nearest hook approaches.(Shall be decided during detail engineering).
18.0	**TYPE OF POWER SUPPLY TO**	

	HOIST		
18.1	CT travel	Shrouded Bus Bar (Copper/Galvanized Steel /Stainless Steel/Galvanized Iron) Conductor Type DSL / EPR flexible trailing cable for hoist mounted panels. (To be informed on project to project basis.) The indicated ratings of Shrouded bus bar DSL in price schedule is minimum. Next higher rating to be quoted in case of unavailability.	
19.0	MOTORS	HOIST & TROLLEY	
19.1	Type	Sq. Cage induction, TEFC, S4 duty, 40% /60% CDF. Service class of motor shall be Class 2 / Class 4 as per IS:3938, to be informed on project to project basis.	
19.2	Number of start	150/300 starts / hr (Project specific)	
19.3	Voltage , Phase and Frequency	415V ± 10%, 3 phase, 50 Hz, 3 wire/ 4 wire shall be informed during detail engineering.	
19.4	Class of insulation	Class “F” and temperature rise limited to class “B” or 70°C	
19.5	Type of enclosure	TEFC	
19.6	Degree of protection provided for enclosure	IP-55	
19.7	Margin	The motor rating shall be arrived considering 15%/ 25%(project specific) margin over the maximum power requirement.	
20.0	**LIMIT SWITCHES**	Hoisting / lowering	Trolley
20.1	Type (project specific)	-Snap action, self-actuating type	Two/ one-way lever
		Rotary geared + gravity type	Two/ one-way lever
20.2	Construction	Shall be housed in robust metallic, oil and dust tight enclosure conforming to IP-65. At least 2 NO and 2 NC contacts shall be provided for each limit switch. Material of contact shall be high grade silver cadmium plated with high conductivity and non-corrosive type.	
21.0	CONTROL PANEL (Hoist mounted).	* Fabricated from CRCA steel sheet min 2 mm thick. * Degree of protection shall be IP 55. * Power on indicating lamps shall be provided * Panel illumination lamps (LED type) operated by door switch. * 2 nos earthing bolts on panel. * 20 % spares terminals (clip on type) shall be provided. * Power and control terminals (clip on type) shall be on separate channels. * Gland plate thickness shall be minimum 3mm. * Gland plate shall be double brass compression type.	
22.0	Quantity	As per manufacturer design.	
23.0	Pendent Push buttons station	Up /down / forward / Reverse push buttons (glow type). Indicative marking for easy operation shall be provided. 1.Suitable for IP 55 protection 2.Ambient temp (-25 to 60 deg C) 3.Suitable for upto: 1.5 X 14C cable entry. 4.Pendant cable shall be multicore EPR flexible. 5.PVC coated steel wire rope for pendant shall be 2 mm.	
24.0	Power cables	Extruded FRLS PVC inner sheath, Extruded FRLS PVC TYPE ST2 outer sheathed/ EPR flexible Cu cable (Project specific) (Min. size 4 sq. mm for Cu & 10 sq mm for Al)	

25.0	Control cable	Extruded FRLS PVC inner sheath, Extruded FRLS PVC TYPE ST2 outer sheathed /EPR flexible Cu cable / Al cable (Project specific) (Min. size 2.5 sq. mm for Cu & 10 sq mm for Al)
26.0	Control Voltage (AC)	110 V / 24V (Shall be informed on project to project basis)
27.0	Control for motions	
27.1	Speed Control	Thru' VVVF with minimum 6 pulse design
27.2	Starting torque of VVVF	Upto 200% typical
27.3	Starting current	Less than 150 % of rated torque
27.4	Temperature	Capable of withstanding upto 50^{o}C without derating.
28.0	Control Transformer	Dry type, with insulation class B or better.
28.1	Quantity & rating	2 x 100% with minimum 20% over loading to be considered while sizing the rating.

29.0 OTHER REQUIREMENTS

1. Inching operation of hoist is to be through main hoist motor.
2. DSL phase indicating lamps (LED type) to be provided.
3. Pull out torque of motor at rated voltage shall be 275% of full load torque.
4. Earthing conductor size shall be minimum as follows
   a) Push buttons – 8 SWG GI wire
   b) Panel & motors – 25 x 3 mm GS flats
5. Bearing life shall be 20 years minimum or 10,000 working hours whichever is more.
6. Spring or rubber buffers shall be provided on the trolley

30.0 SPECIAL HAZARDOUS AREA REQUIREMENT (PROJECT SPECIFIC).

1. All wheels shall be provided with phosphor bronze type /equivalent or better.
2. Any other mechanism where two non-lubricated parts mate, one of them shall be for non-ferrous material like phosphor bronze, aluminum bronze.
3. All electrical components/ equipment for hoist shall meet the requirements of hazardous area & shall be flame proof/explosion proof type. Motor located in hazardous area shall have flameproof enclosure conforming to IS: 2148 /Equiv.
4. Coupling guards shall be non-sparking (i.e. non-ferrous/non-metallic) type.
5. Travel DSL shall be flexible trailing cable type.
6. Hoists shall be suitable for hazardous area (i.e. Zone-2) for gas group IIA, IIB

Note:

1. For items/components having multiple choice of material of construction, rating, type , size etc , the final selection shall be on project to project basis during detail engineering. Bidder to note that there shall be no price implication on final selection of the same.

2. The bidder shall fill Technical details against each item marked (*), during detailed engineering only.

3. In case of discrepancy between the Data sheet and requirement given elsewhere in the technical specification, bidder to bring out the same within 10 days of issue of enquiry. In case the same is noticed during detail engineering the more stringent of the two as per the interpretation of Purchaser/Customer shall be applicable.

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOIST STANDARD TECHNICAL REQUIREMENT	SPECIFICATION No: PE-TS-RC3-563-A002	
		VOLUME: II B	
		SECTION-II	
		REV. 00	DATE: 16.04.24
		SHEET :	

SECTION-II

STANDARD TECHNICAL REQUIREMENT

SUB-SECTION IIA	**STANDARD TECHNICAL REQUIREMENT (MECHANICAL)**
SUB-SECTION IIB	**STANDARD TECHNICAL REQUIREMENT (ELECTRICAL)**

SUB SECTION-IIA

STANDARD TECHNICAL REQUIREMENT (MECHANICAL)

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS	SPECIFICATION No: PE-TS-RC3-563-A002
		VOLUME: II B
		SECTION-II
		SUB-SECTION-IIA
	STANDARD TECHNICAL REQUIREMENT	REV 00 / DATE 16.04.24

1.0.0 STANDARD TECHNICAL SPECIFICATION

This specification covers the design, engineering, manufacture, inspection and testing at manufacturer's /sub vendor's works, properly packed and delivery to site for the Electric wire rope hoist as specified in the Technical Data Sheet A/B enclosed. The equipment specified shall include all accessories required for trouble free operation.

2.0.0 Design Particulars

The electric wire rope hoist covered in this specification shall be of most optimum headroom type suitable as specified in Data Sheet-A. Equipment offered shall be conforming to specification requirements as per IS: 3938 (latest edition) and other specified Indian Standards.

3.0.0 Technical Particulars

3.1.0 Type - Electrically operated with trolley suitable for non – hazardous or hazardous area to be informed on project to project basis.

The hoist shall be used indoors for most of the areas. However for some specific areas (to be informed on project to project basis) the hoists shall be suitable for outdoor application. In such cases suitable protection like canopy etc for motor along with suitable protection and rating for electrical panel and components shall be provided.

3.2.0 Applicable Indian Standards DESCRIPTION

i) IS: 2266 Specification for steel wire ropes for general engineering purposes.
ii) IS: 4029 Guide testing induction motor.
iii) IS: 900 Code of practice for installation and maintenance of induction motor.
iv) IS: 4237 General requirement of switchgear and control gear for voltage motor exceeding 1000 Volts.
v) IS: 694 Copper conductors PVC insulated cables for voltage up to 1000 Volts
vi) IS: 3043 Code of practice for earthing.
vii) 1S: 1822 Motor starters for Voltages up to 650V.
viii) IS: 2147 Degree of protection provided by enclosures for low voltage switch— gear and control gear.
ix) IS: 1554 PVC insulated (Heavy-duty) electric cables for working voltages and

including 1100 volts.

x) IS: 325 Three phase induction motors.

xi) IS: 15660 Point hook with shank.

xii) IS 9968 Part I Flexible trailing cables

4.0.0 Quality Plan & Inspection

To ensure that the equipment and services are in accordance with the specification, the Bidder shall follow/adopt BHEL's Standard Manufacturing quality plan enclosed herewith to control critical activities at all essential points.

Inspection shall be carried out by BHEL, BHEL nominated third party inspection agency/Customer or its representative as the case may be in line with the approved drawing / document.

5.0. Name Plate for load indication

The hoists shall have a permanent inscription of English on each side, readily visible from the ground level, stating the following:

Name of manufacturer

Capacity (in tons)

Maximum Lift (in meters)

Serial No.

Any other detail as per IS 3938.

6.0.0 Painting Procedure – Indicative painting procedure is elaborated at Annexure III. Actual painting procedure shall be informed on project to project basis.

6.1.0 All surfaces to be painted shall be thoroughly cleaned of all grease, oil, loose mill scale, dust, rust and any other foreign matter. Mechanical cleaning by power tool and scrapping with steel wire brushes shall be adopted to clear the surfaces.

6.2.0 Machined and bearing surface shall be protected with varnish or thick coat of grease.

6.3.0 Details of painting shall be specified elsewhere in the specification.

7.0.0 COLOR SCHEME- Indicative scheme is given at Annexure III for reference. Actual color scheme shall be informed on project to project basis.

Color scheme shall be intimated to Bidder during the contract execution stage and the same shall be strictly followed without any commercial and delivery implication to BHEL.

8.0.0 GENERAL DESIGN FEATURE

8.1.0 Design shall conform to IS: 3938 (Latest edition) and other standards as specified.

8.2.0 Parts requiring replacement or lubrication shall be easily accessible & without dismounting type.

8.3.0 Equipment shall include the devices as required and comply with applicable standards / specification requirements.

8.4.0 Defects in material are not acceptable/allowed. Rectification of any flaw is permissible only with the approval of Purchaser/Customer.

8.5.0 Hoist shall be rigid in construction and all movements shall be smooth and non-jerky.

8.6.0 Design shall provide for easy maintenance of all parts, particularly the wheel bearings.

8.7.0 Both hoists and trolleys shall be driven electrically. Wheels shall be single flanged type and to suit different monorail beam sizes. Design shall allow without dismantling, increase or decrease in wheel to wheel gap to make the hoist suitable for different flange width of ISMB. Suitable washers and length of load pin shall be provided for this purpose.

8.8.0 Hook shall be swivelling type and fitted with a safety latch.

8.9.0 Hoists shall be designed for low headroom and for closest hook approaches.

8.10.0 Two no end stoppers of MOC IS 2062 and of adequate capacity shall be supplied for each electric hoist.

8.11.0 Gear Box: Gears shall be completely covered and enclosed in oil tight casing & sealed with gasket. The gearboxes shall be of mild steel or cast steel as per IS 3938. All fabricated gearboxes shall be stress relieved.

Gears shall be of cast or forged steel and pinions shall be forged steel and shall be machine cut. Gear and pinion teeth shall be treated for resistance to wear.

8.12.0 Bearing: Ball and roller antifriction bearing shall be used throughout, except where specified otherwise. Life of bearing shall be calculated in accordance with manufacturers recommendations. Provision shall be made for service lubrication of all bearings. Bearing enclosures shall be designed as far as possible to exclude dirt and prevent oil leakage.

8.13.0 Couplings : Motor shafts shall be connected to gear box input extension shafts through flexible gear coupling.

8.14.0 Wire ropes: Ropes of steel /fibre core as specified in Data Sheet – A/B shall be of right hand lay, of 6x36 construction of best plough steel having minimum tensile strength as 160-180 kg/mm2. Left hand lay wire ropes shall not be used (Reverse bend ropes shall not be used).

9.0 ELECTRICAL MOTOR DESIGN

Motor shall be squirrel cage induction type, and suitable for AC supply of 415V, 3 /4 phase, 50 Hz, 40%/60% CDF with IP—55 degree of protection. Motors shall be class 'F' insulated with temperature rise limited class B & suitable for 150 starts per hour/ 300 starts per hour (to be informed on project to project basis.) Motors shall conform to IS 325, IS 12615:2011 and IS/IEC 60034-1:2014 as per norms. Motor terminal box shall be provided with suitable earthing stud inside the terminal box. It shall be possible to rotate the terminal box by 90 degrees. Insulation shall be minimum Class F or better insulation materials with additional phase insulating material, extra end-turn bracing and Class H spike resistant wire.

Motors shall be capable of a 20 second stall at six times full load current without injurious heating to motor components.

The pull out torque of the motor shall not be less than 275 % of the full load torque. All the motors shall be suitable for reversing, frequent starting and braking.

10.0 Protective Panel / Controls

Heavy duty, electrical panel, direct on reversing type Air brake contactors, electrically interlocked for safety with necessary control gears such as control transformer, MCB (Control and Power), limit switches, thermostat, space heater, neutral link, ON/OFF 3 Phase door interlock switch, wrong connection preventor, overload relays, single phase preventor, indicating lamps, cable glands, lugs, terminals, cables etc. housed in totally enclosed IP- 55 degree of panel. Control voltage shall be 24V/110V.Actual control voltage level shall be informed on project to project basis. Control circuit shall be protected by individual control MCB's with minimum. short ckt. rating 9kA and rating 16A.

The electrical protective panel shall be a cubicle fabricated from 2 mm thick sheet steel with lockable-hinged door. It shall be dust and vermin proof with degree of protection as IP-55 or as specified in data sheet A. All the equipment inside the panel shall have permanent identification. The panels shall be front connected type with front-hinged door for access to wiring and terminals. Engraved nameplate shall be furnished for all panels and also for the

equipments and devices mounted there on. The following minimum equipments shall be provided.

a) One triple pole air break type main contactor with thermal overload relay.

b) One triple pole main line connecting/disconnecting switch.

c) Switch fuse unit with D.O.L. starter for each motion.

d) Thermal overload relay for each drive. It shall be ambient temperature compensated and adjustable type.

e) Contactors, timer and auxiliary contactors.

f) Control transformer with fuses.

g) Indicating lamps to indicate the live condition of all three phases.

h) Other equipments as per supplier's standard practice. Air break contactors shall conform to category AC-4 duty. The contactor drop off voltage shall be between 45-50% of rated voltage.

i) All internal wiring shall be identified with numbering ferrules at both ends as per the relevant wiring diagram.

11.0 LIMIT SWITCH: The hoist mechanism of the hoist shall be provided with rotary/gravity/snap action type limit switch to open the control circuit and in order to prevent the hook from over hoisting and over lowering. One gravity type back-up limit switch of hand-reset type shall be provided. This switch shall operate in the event of failure of main limit switch if called for in data sheet "A". Rotary + gravity type hand reset limit switches shall be provided for hoisting.

Lever operated limit switches shall be provided for cross traverse. These limit switches shall be self-reset type.

The limit switches shall be housed in robust metallic oil and dust tight enclosure conforming to IP:65. At least 2 NO and 2 NC contacts shall be provided for each limit switch. All limit switch shall confirm to IEC-60947-5-1. Material of contact shall be high grade silver cadmium plated with high conductivity and non-corrosive type.

12.0 Brake: The hoist and cross traverse motors shall be fitted with DC electro-magnetic disc type brakes designed, built to arrest, and hold safely the full load capacity of load. The brakes shall be fail-safe type wherein failure of current immediately applies the brake. Manual reset of brake shall be provided.

13.0 PUSH BUTTON STATION

Pendent push button station shall be provided with glow type push buttons for hoisting/lowering, cross traverse forward/reverse and emergency stop (mushroom head type)

etc. The contactors are operated by pendent push button station suspended from the hoist for easy operation and suspension is made on steel wire/ link chain. Normally pendent shall be fixed type. However, in specific cases movable type pendent may be required which shall be informed on project to project basis. Necessary, T track / taut wire arrangement including fixing arrangements such as auxiliary beam, brackets, supporting plates etc. as applicable shall be provided in order to clear the pendent and its cable from auxiliary structure, piping, equipment's etc. Necessary cable glands, lugs, terminals along with connecting cable of 14Core,1.5sqmm copper flexible cable shall be provided. Emergency stop push button shall be mushroom head (lockable) type. Push buttons shall return to off position when released.

It shall be suspended by wire rope to prevent pull on the cables. The following minimum push buttons key operated type.

a) Main" ON", "OFF" push button key operated and lockable in "OFF" position.

This push button will operate the main contactor.

b) Hoist and lower directions. (2Nos.)

c) Trolley travels both directions. (2 Nos.)

d) Inching speed for hoisting & lowering

e) Inching speed for trolley motion.

f) Creep speeds (Project specific)

h) Emergency stop push button (mushroom type).

i) Alarm bell push button.

14.0 Grounding

The hoist structure, motor frame and all other electrical equipments shall be grounded in accordance with the Indian Electricity Rules. The connections from hoist to 4th conductor of down shop leads shall be by means of current collector.

The equipment fed by flexible cables shall be grounded by means of fourth core provided in the flexible trailing cable. Pendent push button station shall be earthed separately and independently.

15.0 POWER SUPPLY TO HOIST:

Purchaser shall provide single point 415V, 3 /4 phase, and 50Hz supply (3 wire or 4 wire shall be informed on project to project basis) at any point of the bay. Bidder shall provide main isolating switch at 1.5 M above the ground / operating floor level to receive this incoming power. The details of incoming cable shall be provided to the bidder on project to project basis during detail engineering. It shall be bidders responsibility to supply isolators suitable for

the incoming cable. Isolating switch shall be equipped with MCCB with three indicators for phases.

Power feeding to the hoist shall be thru one of the following methods to be informed on project to project basis.

.i) Shrouded Bus Bar Conductor Type DSL complete with brackets and other fixing arrangements.

ii) EPR flexible trailing cable : Trailing cable shall be 1100 V grade, tinned copper, heat resistant, with EPR insulation and as per Class – 5 of IS-8130. Also should have inner PCP sheath and outer CSP sheath with nylon chord reinforcement & heat resistant, oil resistant and flame retardant heavy duty FRLS type complete with DSL trolley on T track / taut wire arrangement retractable type including necessary fixing arrangements such as auxiliary beam, brackets, supporting plates, junction box etc.

DSL/Flexible trailing cables (requirement to be informed on project to project basis) shall be sized considering both hoisting, travel motion as well as other auxiliary power requirement. Voltage drop requirement of maximum 3% across the DSL/trailing cable from the incoming supply to motor terminal with hoist at extreme end of travel and with allowance of minimum 20% for wear & tear shall be considered while sizing the conductor along with other factors like derating etc . Calculation for the same be furnished as and when required by purchaser/end customer.

The collector system per conductor shall be spring loaded type metallic shoes to maintain adequate contact pressure.

16.0 WIRING SYSTEM

a) The supplier shall furnish all power, control and auxiliary circuit wiring of the equipment and the panel located on the trolley.

b) The wiring shall be complete in all respect to ensure the proper functioning of the equipment.

c) Power cables shall be Extruded FRLS PVC inner sheath, Extruded FRLS PVC TYPE ST2 outer sheathed. Minimum size 4 mm sq for Copper of suitable sizes as specified in Data Sheet A.

d) For selecting the cable rating, cable for power wiring, consideration shall be given to the motor duty, ambient temperature grouping and disposition of the cables voltage drop etc.

e) All control and auxiliary external circuit wiring shall be done with Extruded FRLS PVC inner sheath, Extruded FRLS PVC TYPE ST2 outer sheathed. Minimum size 2.5 mm sq.

f) Armoured cables or un-armoured running through the flexible conduits may be used for power wiring / control and auxiliary circuit wiring shall run through flexible conduits.

g) Each motor shall be wired independently. Power and control wiring shall be effectively separated.

h) Each wire shall be identified at both ends with wire designation in accordance with circuit wiring diagram.

i) All wire termination to the panels shall be provided with clamp type connections screw. Type terminals with screw directly impinging on conductors are not acceptable.

j) Multi-way terminal blocks complete with screw nut, washer and marking strips shall be furnished for terminating the panel wiring and outgoing.

k) Not more than two wires shall be connected to any terminal on either side of terminal block. If necessary number of terminals shall be jumped together to provide the wiring points

l) Each terminal block shall be marked with designation in accordance with conductors wiring diagram.

m) Adequate short circuit protection shall be provided for main and individual circuits.

n) All power & control cables shall be tagged at both ends (as per approved drawings) for quick identification. The cables & wiring system for each motion shall be independent & common runs shall be avoided. Power cables & control cables shall be effectively separated & all connections shall be terminated to terminal box suitable for outside connections.

TECHNICAL SPECIFICATION FOR VVVF DRIVE

1.0 General

a) This part of the specification describes the general requirements for the Variable Voltage Variable frequency Drives, herein referred to as AC Drives, for use with standard IEC design AC squirrel cage induction motors. The nominal values, the standard documents and the drive's minimum performance are defined in this part. **To avoid any mismatch between the motor and its control equipment, the AC Drive shall be capable of auto adjustment by automatic measurement of the motor parameters with/without motor rotation.**

i. Speed control of hoist shall be through Variable Voltage Variable Frequency System (VVVF) with minimum 6 (six) pulse design.

ii. Necessary input & output devices to be provided to reduce harmonics, as per IEE519, at supply side of the drive at the switchgear.

iii. All necessary protections e.g. Input Phase Loss, Earth Fault, Over Voltage, Output Short Circuit, Load Loss, Input Transient Protection, Overload etc. to be provided.

iv. VVVF system shall be capable of generating suitable starting torque (220% typical) with / without encoder, however starting current shall not exceed 150% of the rated torque.

v. VVVF system shall be capable of withstanding upto 50 deg C. ambient temp without derating

vi. Squirrel cage Induction motor with VPI insulation shall be provided with VVVF system.

vii. Protective Pane Provided with isolating switch, power contactor control and indication to switch ON/OFF power to starter panels, control and lighting transformer.

viii. Starter Panel:

Separate VVVF system panels to be provided for CT, LT and hoist motion

(a) Contactors: AC 4 duty for reversing application AC 3 duty for non-reversing application

(b)Switches: AC 23 for motor application, AC 22 for other application.

(c)Fuses: HRC

(d)Overload relay: Temperature compensated, bimetallic with single phasing preventor.

ix. Panel shall be fabricated out of 2 mm thick rolled sheet steel. IP 55 degree of protection. Paint shade shall be RAL 9002 for front & rear and RAL 5012 for side covers. Space heaters to be provided.

2.0 User interface

2.1 General

The user interface shall be identical throughout the power range and type to avoid confusion amongst the users and need for training in several different units.

2.2 Inputs and outputs

A. At least, the following standard Inputs and Outputs shall be provided, to be used in interface with the control system:

Analogue Inputs	:	1 x Programmable differential voltage input $\pm$ 10V,
		1 x Programmable current input 0(4) - 20mA
		1 x Programmable voltage input 0 – 10V
Analogue Output	:	1 x Programmable analogue outputs 0(4) - 20mA or 0 – 10V
Logic inputs	:	6 x Programmable logic Inputs isolated from the mains

Relay Outputs : 2 x Programmable Digital outputs with a changeover dry contact

All the control terminals shall be clearly marked.

B. At least, it shall be possible to assigned the following functions to the I/Os:

Analogue input	**Analogue outputs**
Speed reference Summing reference	Motor current Motor frequency Motor torque Motor power
Logic input	**Relay or logic outputs (open collector)**
Forward Reverse Jog Preset speeds Reference switching Ramp switching Parameter sets selection Fast stop Freewheel stop + speed - speed External fault	Ready Drive running High speed attained Drive fault Frequency threshold attained Motor thermal state attained Torque or current limitation attained Brake control

2.3 Programming terminal

A. The AC drive shall have a keypad /display for programming and controlling purposes. An IP54 or IP65 remote mounting shall be possible at a distance of 10m.

B. Password protection shall be provided to avoid unauthorized tampering with the set parameters.

C. The programming terminal shall be able to display the commercial reference of the AC drive and of the options, the software version, the serial number

D. Direct keypad entry shall be provided to observe the following actual parameters. Any one of the following parameters or actual values shall be selected to be always displayed:-

i. Input Voltage
ii. Input Frequency
iii. Output Frequency
iv. Output Power
v. Output Current
vi. Motor Speed

The following parameters shall always be displayed during normal operation:-

i. Drive Status

The following drive control functions at least shall be available from the keypad:-

i. Run
ii. Stop
iii. Local / Remote selection.
iv. Forward/Reverse (if function enabled)
v. Accelerate
vi. Decelerate
vii. Parameter setting

2.4 Application programming

The AC Drive shall be designed for both simple and the most complicated applications, yet it shall be user friendly. It shall be possible to reset the parameter settings back to the original factory settings through the keypad.

2.5 PC Tools

The AC Drive Supplier shall have a Windows based PC software available for monitoring and controlling the AC Drives, and the software shall be offered as an option. The software shall be supplied with the necessary hardware and a provision for connecting a PC with the AC Drives. It shall be possible to set and modify parameters, control the drive, read actual values and make trend analysis using the software.

3.0 Software features

A. Restart

In the event of a fault trip due to over voltage, over current or loss of analogue signal, the AC DRIVE shall be programmable to attempt an automatic restart. For safety reasons, the maximum number of attempts shall be within a selectable time. If the fault does not clear after the attempts, the drive shall lock out.

B. Brake logic control

The AC Drive shall have a built-in function to control a mechanical brake in order to move the load in a smooth and safe way. The brake logic control shall be adapted to the different movements: hoisting, travel, orientation.

4.0 Preferred makes:

As per attached sub-vendor list.

ANNEXURES

BHEL	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS STANDARD TECHNICAL REQUIREMENT	SPECIFICATION No: PE-TS-RC3-563-A002 VOLUME: II B SECTION-II SUB-SECTION-IIA REV 00 DATE 16.04.24

ANNEXURE-I

MAKES OF SUB VENDORS ITEMS (AS PER APPLICABILITY)

SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
1.	STEEL	SAIL		
		TISCO		
		JINDAL		
		ESSAR		
2.	HOOKS	STEEL FORGING & ENGG. CO.,	KOLKATA	
		SIMRITI FORGING		
		KARACHIWALA		UP TO 25T CAPACITY
3.	GEAR COUPLINGS	ALLIANCE		
		FLEX-TRANS (formerly known as HICLIFF)		
		SAHARA		
		NUTECH		
		OEM		
4.	WIRE ROPE	USHA MARTIN		
		FORT WILLIAMS		
		BHARAT WIRE ROPES		
5.	BEARINGS	SKF		
		FAG		
		TATA		
		NBC		
6.	MOTORS	SIEMENS		
		NGEF (up to 15KW)		
		CROMPTON		
		KIRLOSKAR		
		BHARAT BIJLI		
		MARATHON		
		ABB		
		LHP		
7.	BRAKES	ELECTROMAG		
		SPEED-O- CONTROL		
		BCH		FOR DCEM BRAKES ONLY
		KAKKU		
8.	CONTACTOR	SIEMENS		
		L&T		
		SCHNEIDER (Earlier TELE MECHANIQUE)		
		BCH		
9.	OVER LOAD RELAYS	SIEMENS		
		L&T		
		ABB		
		SCHNEIDER (Earlier TELE MACHANIQUE)		
10.	HRC FUSES	SIEMENS		
		L&T		

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS STANDARD TECHNICAL REQUIREMENT	SPECIFICATION No: PE-TS-RC3-563-A002 VOLUME: II B SECTION-II SUB-SECTION-IIA REV 00 DATE 16.04.24

SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		ENGLISH ELECTRIC		
		GE POWER		
		EATON (BUSSMANN)		
		ABB		
11.	ISOLATING SWITCH	SIEMENS		
		L&T		
		CONTROL & SWITCH GEAR		
		ABB		
12.	SWITCH FUSE UNITS	SIEMENS		
		L&T		
		CONTROL & SWITCH GEAR	-	
		ABB		
13.	TIME DELAY RELAYS	SIEMENS		
		L&T		
		ABB		
		BCH		
		SCHNEIDER (Earlier TELE MACHANIQUE)		
14.	TRANSFORMERS	INDCOIL		
		LOGICSTAT		
		KAPPA		
		AUTOMATIC ELECTRIC		
		PRECISE ELECTRICALS		
		SILKAAN ELECTRIC MFG. CO. LTD.		
		SOUTHERN ELECTRIC		
		NEC		
15.	CABLE LUGS (HEAVY DUTY)	DOWELLS		
		UML ENGINEERS	KOLKATA	
		JAINSON		
16.	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	

BHEL	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS STANDARD TECHNICAL REQUIREMENT	SPECIFICATION No: PE-TS-RC3-563-A002 VOLUME: II B SECTION-II SUB-SECTION-IIA REV 00 DATE 16.04.24

SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		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	
		THERMO CABLES LTD	HYDERABAD	
17.	PVC CONTROL CABLES	ADVANCE CABLE TECHNOLOGIES (P) LTD	BANGALORE	
		APAR INDUSTRIES LTD., CMI LTD	MUMBAI	
		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	
18.	TRAILING CABLES	NICCO	KOLKATA	
		UNIVERSAL	SATNA	
		INCAB		
		ICL	NEW DELHI	
		APAR INDUSTRIES LTD	MUMBAI	
		CMI LTD	FARIDABAD	

SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		KEI INDUSTRIES LTD	NEW DELHI	
		SUYOG ELECTRICALS LTD	VADODARA	
19.	XLPE POWER CABLES	APAR INDUSTRIES LTD	MUMBAI	
		CORDS CABLE INDUSTRIES LTD	NEW DELHI	
		CRYSTAL CABLE INDUSTRIES LTD	KOLKATA	
		DIAMOND POWER INFRASTRUCTURE LTD	VADODARA	
		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	
20.	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	
		UNIVERSAL CABLES LTD	SATNA	
21.	CABLE GLAND	COMMET		
		SUNIL&CO		

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SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		ARUP ENGINEERING		
		JAINSON		
		DOWELL		
22.	PUSH BUTTONS	SIEMENS		
		L&T		
		BCH		
		SCHNEIDER		
23.	LIMIT SWITCHES	SPEED-O-CONTROL		
		ELECTROMAG		
24.	PENDENT PUSH BUTTON STATION	OEM		
25.	INDICATING LAMPS	TECKNIC		
		BCH		
		SIEMENS		
		STANDARD		
26.	MCB	MDS		
		INDO COPP		
		STANDARD		
		SIEMENS		
		L&T		
		ABB		
		SCHNEIDER		
27.	PANELS	OEM		
		RITTAL		
		PYROTECH		
28.	RESISTANCE BOXES	ENAPROS		
		OEM		
		SAFEX FIRE SERVICES LTD		
		UNITED FIRE EQUIPMENTS PVT. LTD		
		ZENITH FIRE SERVICES (INDIA) PVT LTD		
29.	VVVF	YASKAWA		
		ABB		
		SIEMENS		
		SCHNIEDER		
		FUJI ELECTRIC		
		MITSUBISHI ELECTRIC		
		CG POWER & INDUSTRIAL SOLUTION LTD		
30.	SHROUDED DSL	SUSHEEL		
		STROMAG		
31.	LOAD CELL	IPA		
		SARTORIUS		
32.	GEAR BOX	OEM		* = Applicable for Geared Motors only (if applicable for project)
		ELECON ENGINEERS		
		SHANTI GEARS		
		PBL*		

SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		NAW*		
		NORD*		
		SEW*		
		BONGFILIOLI*		

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. 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.

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS **STANDARD TECHNICAL REQUIREMENT**	**SPECIFICATION No: PE-TS-RC3-563-A002** **VOLUME: II B** **SECTION-II** **SUB-SECTION-IIA** REV 00 / DATE 16.04.24

ANNEXURE II

ESSENTIAL SPARES LIST FOR ELECTRIC WIRE ROPE HOIST (PROJECT SPECIFIC)

	Mechanical spares	**Quantity**
	Bearings	
1	Bearings for trolley wheel	100% for one EH
2	Bearings for gear box for hoisting motion	100% for one EH
3	Bearings for gear box for CT motion	100% for one EH
4	Hoist pulley bearings	100% for one EH
5	Hook thrust bearing	100% for one EH
6	Drum bearing	100% for one EH
7	Bearing Seal	100% for one EH
	Gears	
8	Input pinion for Hoist Gearbox	100% for one EH
9	Input pinion for CT Gearbox	100% for one EH
10	Gear wheel for Hoist Gearbox	100% for one EH
11	Gear wheel for CT Gearbox	100% for one EH
12	Internal clip for Hoist Gearbox	100% for one EH
13	Internal clip for CT Gearbox	100% for one EH
14	Complete Gear box / gear set for hoisting motion	100% for one EH
15	Complete Gear box / gear set for CT motion	100% for one EH
16	**Oil seals**	
i)	Oil seals for CT gear box	100% for one EH
ii)	Oil seals for Hoist gear box	100% for one EH
17	**Brakes**	
18	Brake liners for	
i)	Hoist brake	100% for one EH
ii)	CT brake	100% for one EH
19	Brake springs for	
i)	Hoist brake	100% for one EH
ii)	CT brake	100% for one EH
20	Brake coil/ solenoid for brake	
i)	Hoist brake	100% for one EH
ii)	CT brake	100% for one EH
21	Diode bridge	100% for one EH
22	Brake assembly for hoisting	100% for one EH
23	Brake assembly for CT motion	100% for one EH
24	**Wheels**	
i)	CT wheel assembly (complete) (driving)	100% for one EH
ii)	CT wheel assembly (complete) (idle)	100% for one EH
25	**Wire rope**	
a)	For various capacity & lift of Electric Hoist	100% for one EH
26	Rope Guide	100% for one EH
27	Rope Tightner	100% for one EH

28	Rope sheave assembly	100% for one EH
29	Rubber bushes for flexible couplings	100% for one EH
30	Thrusters with cups and seals for electro-hydraulic thruster brakes	1 set for one EH
31	Local Control Station	One (1) No. each type
	Electrical spares	
32	Contactors	1 no of each type, size and rating for one EH
33	Main contactors	1 set for one EH
34	Auxiliary contactors	1 set for one EH
35	Overload relays.	1 no of each type, size and rating for one EH
36	Relay	1 no of each type for one EH
37	Timers of each type	1 set for one EH
38	MCBs.	1 set for one EH
39	MCCB	1 set for one EH
40	Switch Fuse Units	1 No. for one EH
41	Fuses of each type	1 set for one EH
42	Fuse links	1 set for one EH
43	Control circuit fuses	1 set for one EH
44	Limit Switches for	
i)	Main Hoist	1 set for one EH
ii)	Cross Travel	1 set for one EH
45	Door limit switch	1 set for one EH
46	Selector switch	1 set for one EH
47	Current Collector shoes/ rollers	1 Set for one EH
48	Complete current collector assembly	1 Set for one EH
49	VVVF Drive for Hoisting	1 no. of each type and rating for one EH
50	VVVF drive for Cross travel	1 no. of each type and rating for one EH
51	Control module of VVVF drive	1 no. of each type and rating for one EH
52	Power supply modules of VVVF drive	1 set for one EH
53	Dynamic braking resistance	1 no. of each type and rating for one EH
54	Push buttons -Contact Element	1 no of each type, size and rating for one EH
55	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH
56	Indicating lamps of each type	1 set for one EH
57	Electric meter	1 set for one EH
58	Resistor element of each size and type	1 set for one EH
59	Hooter	1 set for one EH
60	415 V Motor	
i)	Motor of hoist motion	1 set for one EH
ii)	Motor of travel motion	1 set for one EH
iii)	Terminal plates	1 set for one EH
iv)	Motor Terminal Block	1 set for one EH
v)	Space Heaters	1 set for one EH
vi)	Greasing arrangements	1 set for one EH
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH
viii)	Stator winding coils for all type of LT motors	1 set for one EH
ix)	Rotor pinion	1 set
x)	Dust seals and gaskets for each type of motors	1 set for one EH
xi)	Cooling Fans	1 no for each type and rating of motor
xii)	Fan Cover	1 no for each type and rating of motor
xiii)	Complete Set of Coupling	1 set for one EH
xiv)	End shield (DE & NDE)	1 set of each type
61	Transformer	1 set for one EH

62	1.1 KV Grade power cables for each type and size.	1 m
63	1.1 KV Grade control cables for each type and size.	1 m
64	Control Trailing Cable for Electrical Hoist	1 m
65	Power Trailing Cable for Electrical Hoist	1 m
66	Power terminal block	1 set for one EH
67	Control terminal block	1 set for one EH
68	End plates for Power & Control terminal block	1 set for one EH
69	Carbon brushes and brush holders for all slip ring type motors	1 set for one EH
70	Make and trip coils	1 set for one EH

Note:

1. The above list is indicative for variety of spares required. Actual price is to be quoted by bidder against the spares items as indicated in the price schedule.
2. “One (1) set of each type & size” is defined as 100% requirement for one electric wire rope hoist.
3. 100% of total population of each type, size and rating is defined as 100% requirement for each hoist.

ANNEXURE III
PAINTING (PROJECT SPECIFIC)

Painting of the equipment shall be carried out to protect the same from rusting / corrosion during shipping, long storage at site, erection, and during its normal operation / usage.

Whilst the essential requirements of surface preparation and painting are specified here, these in no way relieve the contractor of his responsibility to carry out his work in accordance with good practices. However, any deviation/modification from the specification shall be referred to the purchaser for approval.

The following specification shall be followed in general for electric wire rope hoists and its accessories. Vendor to note that the same is indicative and specific requirement (including color coding) shall be informed on project to project basis.

Hoist:

A) SURFACE CLEANING -Shot blast cleaning/ abrasive blast cleaning to SA 2 1/2 (near white metal) 35-50 microns.
PRIMER PAINT:-
2 COATS OF AIR DRYING EPOXY POLYAMIDE RESIN BASED RED OXIDE ZINC PHOSPHATE
DFT-100 MICRON (50 MICRON PER COAT).

INTERMEDIATE PAINT:-2 PACK OF AIR DRYING HIGH BUILD EPOXY RESIN BASED PAINT WITH MIO /TiO2
DFT 100 MICRONS.

FINISH PAINT: TWO COATS OF AIR DRYING EPOXY POLYAMIDE ENAMEL SUITABLY PIGMENTED 75 MICRON WITH GLOSSY FINISH. (Min 35 MICRON/COAT). ADDITIONAL ONE COAT (MINIMUM DFT OF 25 MICRONS) OF FINISH COAT OF POLYURETHANE SHALL BE PROVIDED.

TOTALDFT=300 MICRON

Shade
Structure: Golden yellow , RAL 1004

B) Steel surface which is to be painted shall be cleaned of dust and grease and the heavier layers of rust shall be removed by chipping prior to actual surface preparation. The surface shall be abrasive blasted to Sa 2½ finish as per SIS05-5900. Primer paint shall be Zinc Silicate/phosphate of approved brand. Dry film thickness of each primer shall be 60 microns. Two intermediate MIO Epoxy paint, and one top polyurethane coating of approved brand shall be applied. Dry film thickness of each intermediate coat shall be 90 microns and top polyurethane coating shall be 30 microns. The under coat and finish coat shall be of different tint to distinguish the same from finish paint. The total dry film thickness shall be 330 microns
Shade
Structure: Golden yellow , Shade 356 of IS 5 / Shade 540 of IS 5.

C) Surface preparation : Steel Surfaces : Blasting according to SIS 055900 grade Sa 2½
Primer: One (1) layers of Primer paint shall be Solvent based IZS - VS of 60%. Zn Dust - 1.77 kg/ltr minimum. Zn dust by weight - minimum 85%. Pot life 12 hrs/ 21 Deg.- Paint to meet compositional & performance specifications for SSPC Paint 20, Level 1, DFT 75 µm.

Touch up: One (1), Two component Zinc rich Primer meeting performance and compositional specifications of SSPC Paint 20 Level2, DFT 75 µm.
Mid Coat: One (1), 2 pack High build High Solid Lamellar MIO based Epoxy Mid coat., DFT 200 µm.
Finish Coat: One (1) finishing coats of 2 pack Acrylic Aliphatic Polyurethane top coat - with Gloss retention of at least 90% on QUVB exposure of minimum 1000 hrs. DFT 75 µm.
DFT : 330µm
Mechanical Components and Motor: Surface preparation : Blasting according to SIS 055900 grade Sa 2½
Catalyzed Zn rich Primer with a VS of 60% min, complying to SSPC Paint 20 level 2 DFT 75 µm.
Finish Coat : Two (2) finishing coat of two component High Build high Solid Aliphatic Amine Cured Epoxy coating. - Min VS 85%. DFT 200 µm.
Total DFT : 275 µm

Panel:

Surface preparation by (7) tank process & phosphating to coating weight of 16.15 gm Per sq. mtr.

Primer: HB Epoxy based polyamide cured (2) pack zinc phosphate primer %VS=58 min. One coat.
DFT 80 µ per coat.

Finish : Aliphatic Acrylic (2) pack polyurethane paint /chlorinated rubber paint two coat.
DFT 65 µ per coat.

Total DFT : 205 µ

Or Powder coated – 75 µ Total DFT.

Paint shade RAL-9002 for complete panel except on end covers whose shade shall be RAL-5012 or RAL 7032 or RAL7035 / shade 631 of IS 5 to be informed on project to project basis.

ANNEXURE IV- INSPECTION AND TESTING REQUIREMENT

Procedure for Load/Overload testing of Electric wire rope hoist at Manufacturer's Works

Objective: To demonstrate final No load, Load, Overload, Deflection & Functional tests of assembled hoist for the purpose of acceptance in line with IS 3938 and other relevant standards.

Basic Assumptions / Inputs for testing at Works:

1) Actual job hook shall be used for load, overload tests for hoisting.

2) Actual wire ropes shall be used for load, overload testing.

3) Shop cables can be used for temporary power supply for the purpose of showing various functional tests at shop.

4) Interlock and limit switch operation check will be shown for hoisting and CT motion.

Procedure for Load / Overload testing: Complete procedure shall be as per IS 3938.

1) All electrical and mechanical equipment shall be tested in accordance with the appropriate Indian Standards at the hoist or equipment maker's works.

2) The motor currents shall be checked and shall be within the rated full load current of each motor at safe working load. Normal speeds shall be achieved during full load tests.

3) The hoist shall be tested at manufacturer's works at 125 percent of the safe working load. The hoist shall be capable of lifting load from mid-air.

4) Brakes -The brakes shall be capable of holding a load 25 percent in excess of maximum safe working load when the load is suspended by the hook.

5) Safety device - Test for the effectiveness of the automatic device to limit the upward and downward travel of the hook.

6) Any test required by the purchaser beyond those called for in the appropriate Indian Standard shall be carried out.

7) Insulation Tests - Before the hoist is connected to the supply, the insulation of the electrical equipment shall be tested by a suitable instrument and any defect revealed shall be rectified.

8) All hoists performance test shall be duly certified by government approved agency.

ANNEXURE – V

A.0 DRAWINGS/DESIGN DOCUMENTS FOR SUBMISSION (during detailed engineering)

Sl. No.	BHEL DRG.NO	Customer's drawing no	DRAWING TITLE	PRIMARY/ SECONDARY	SUBMISSION SCHEDULE - WEEK NUMBER FROM DATE OF P.O	Remarks
1	PE-V0-XXX-563-A210	SHALL BE INFORMED ON PROJECT TO PROJECT BASIS	Mechanism Sizing Calculation OF ELECTRIC HOIST	Primary	R-0 within 21 days from PO & subsequent revisions within 7 days of comments received from BHEL. BHEL shall furnish comments / approval on each submission within 18 days from receipt.	For Customer's approval
2	PE-V0-XXX-563-A201		Manufacturing Quality Plan with Sub vendor list OF ELECTRIC HOIST	Primary		For Customer's approval
3	PE-V0-XXX-563-A219		Schematic Circuit Diagram of ELECTRIC HOIST.	Primary		For Customer's information
4	PE-V0-XXX-563-A202		GA Drawing for Electric Hoist, DSL arrangement and painting details OF ELECTRIC HOIST	Primary		For Customer's approval
5	PE-V0-XXX-563-A208		Erection & commissioning procedure OF ELECTRIC HOIST	Secondary	R-0 within 30 days from PO & subsequent revisions within 7 days of comments received from BHEL. BHEL shall furnish comments / approval on each submission within 18 days from receipt.	For BHEL's information
6	PE-V0-XXX-563-A209		Sea worthy packing (if applicable) OF ELECTRIC HOIST	Secondary		
7	PE-V0-XXX-563-A207		Mandatory spare parts list (if applicable) OF ELECTRIC HOIST	Secondary		For Customer's approval
8	PE-V0-XXX-563-A218		Detailed BOM/BOQ for Hoist	Secondary		For BHEL's information

9	PE-V0-XXX-563-A206		O & M Manual OF ELECTRIC HOIST	Secondary	within 30 days of issuance of MDCC	For Customer's information
	XXX= PROJECT TO PROJECT BASIS					

Notes:
INCOMPLETE DRAWINGS/DOCUMENTS SHALL NOT BE TREATED AS SUBMITTED.

B.0 NO.OF DRAWINGS/DOCUMENTS FOR SUBMISSION

A.	Drawing for Approval	No. of prints/copies (hard prints)
i.	For approval	8
ii.	For final distribution (after the vendor obtains final approval from the customer).	12
B.	Certificate, reports etc. (Material test, inspection report and all other type of tests etc.)	6
C.	O&M Manual (One copy to be supplied with Tools and tackles)	
I.	Draft for approval	2
ii.	For final distribution	12

Note:
a) The number of prints/hard copies are indicative and may change on project to project basis.

b) Bidder to note that all the drawings and documents shall also be submitted on CD's (compact dics) in following software.

I. All the drawings shall be prepared in AutoCAD.
II. All the documents shall be prepared MS word / EXCEL.
III. PDF files for all drawings/documents shall also be submitted.

C.0 DOCUMENT MANAGEMENT SYSTEM

Bidder to note that BHEL reserves the right for drawing/document submission through web based Document Management System. Bidder would be provided access to the DMS for drawing/document 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).
- Pop ups from our external DMS should not be blocked.
- Vendor's internal proxy setting should not block DMS application's link (https://www.bhelpem.com/WrenchWeb)

ANNEXURE -VI

Check List for Operation & Maintenance Manual

0Project name :
1Project number :
2Package Name :
3PO reference :
4Document number :
5Revision number :

Sl.no. & Sections	Description	Tick (√)if included in Manual			Remarks
		Yes	No	Not Applicable	
1.	**Cover page**				
1.1	Project Name				
1.2	Customer/consultant Name				
1.3	Name of Package				
1.4	Supplier details with phone, FAX ,email address , Emergency Contact number				
1.5	Name and sign of prepared by , checked by & approved by				
1.6	Revision history with approval Details				
2.0	**Index**				
2.1	showing the sections & related page nos All the pages should be numbered section wise				
3.0	**Description of Plant/System**				
3.1	Description /write up of operating principle of system equipment/ associated sub-systems & accessories/controls system , operating conditions, performance parameters under normal , start up and special cases				
3.2	Equipment list and basic parameter with Tag numbers				
3.3	Data sheets approved by Customer/for information and catalogues provided by original manufacturer				
3.4	Associated other packages and Interface /terminal points				
3.5	P&ID & Process Diagrams				
3.6	GA Layout drawings, As-built drawings , Actual photograph of items/system (Drawings of A2 & bigger sizes are to be attached in the last)				
3.7	Single line/wiring diagrams				
3.8	Control philosophy /control write-ups				
4.0	**Commissioning Activities (if not covered in separate document i.e. erection**				

	manual, commissioning manual)				
4.1	Pre-Commissioning Checks				
4.2	handling of items at site				
4.3	Storage at site				
4.4	Unpacking & Installation procedure				
5.0	**Operation Guidelines for plant personal/user/operator**				
5. 1	Interlock & Protection logic along with the limiting values of protection settings for the equipment along with brief philosophy behind the logic, drawings etc. to be provided.				
5. 2	Start up, normal operation and shut down procedure for equipments along with the associated systems in step by step mode. Valve sequence chart, step list, interlocks etc. with Equipment isolating procedures to be mentioned.				
5. 3	Do's & Don't of the equipments.				
5. 4	Safety precautions to be taken during normal operation. Safety symbols, Emergency instructions on total power failure condition/lubrication failure/any other condition				
5. 5	Parameters to be monitored with normal values and limiting values				
5. 6	Trouble shooting with causes and remedial measures				
5. 7	Routine operational checks, recommended logs & records				
5. 8	Changeover schedule if more than one auxiliary for the same purpose is given				
5. 9	Painting requirement and schedule				
5. 10	Inspection, repair , Testing and calibration procedures				
6.0	**Maintenance guidelines for plant personal**				
6.1	List of Special Tools and Tackles required for Overhaul/Trouble shooting including special testing equipment required for calibration etc.				
6.2	Stepwise dismantling and re-assembly procedure clearly specifying the tools to be used, checks to be made, records to be maintained, clearances etc. to be mentioned. Tolerances for fitment of various components to be given.				
6.3	Preventive Maintenance & Overhauling schedules linked with running hours/calendar period along with checks to be given				

6.4	Long term maintenance schedules especially for structural, foundations etc.				
6.5	Consumable list along with the estimated quantity required during commissioning, normal running and during maintenance like Preventive Maintenances and Overhaul. Storage/handling requirement of consumables/self-life.				
6.6	List of lubricants with their Indian equivalent, Lubrication Schedule, Quantity required for each equipment for complete replacement is to be given				
6.7	List of vendors & Sub-vendors with their latest addresses, service centres ,Telephone Nos., Fax Nos., Mobile Nos., e-mail IDs etc.				
6.8	List of mandatory and recommended spare parts list				
6.9	Tentative Lead time required for ordering of spares from the equipment supplier				
6.10	Guarantee and warranty clauses				
7.0	**Statutory and other specific requirements considerations.**				
8.0	**List of reference documents**				
9.0	**Binding as per requirement**				

Checked by

Dealing Engineer

Key Resource Person

Section Head

ANNEXURE –VII

PACKING PROCEDURE

COMMON GUIDELINES FOR PACKING

1. **GENERAL:**

The Components/Assemblies need to be packed suitably to avoid physical damage & corrosion during transit & long storage. This packing shall be suitable for different handling operations and for the adverse conditions during transportation and during indoor / outdoor storage of materials.

All the equipment shall be suitably protected, coated, covered or boxed and crated to prevent damage or deterioration during transit, handling and storage at site till the time of erection. The Contractor shall be responsible for all loss or damage during transportation, handling and storage due to improper packing.

The identification marking indicating the name and address of the consignee shall be clearly marked in indelible ink on two opposite sides and top of each of the packages. In addition the Contractor shall include in the marking gross and net weight, outer dimension and cubic measurement.

Each package shall be accompanied by a packing note (in weather proof paper) quoting specifically the name of the Contractor, the number and date of contract and names of the office placing the contract, nomenclature of contents and Bill of Material.

2. **TYPES OF PACKING:**

The following 5 types of packing have been standardized for packing of General Components/ Assemblies.

1) '**OP**' - Open Type.

2) '**PP**' - Partially Packed.

3) '**CP**' – Crate/Box Packing - Components/Equipment requiring physical protection.

4) '**CQ**' - Case Packing – Machined components-Small & Medium Components/ Assemblies/ Equipment which require corrosion & physical protection.

5) **'CR'** - Case Packing – Electrical/Electronic Components/ Assemblies, which require special packing viz. Water Proof, Shock Proof etc…

3. **DESCRIPTION OF TYPES OF PACKING:**

The various types of packing, as standardized above, are described below.

3.1 'OP' - Open Type

In case, of components which are not affected by water & dust and do not require special protection, are generally not machined, shall be sent as open packages. However, these components may be sent in crates, wherever necessary.

3.2 'PP' - Partially Packed

Components which need special protection at selected portions only shall be despatched partially packed. Machined surfaces should not be allowed to come directly in contact with the wood. Such surfaces should be protected with 100GSM(Colourless) Multi Layered Cross Laminated Polyethylene
Film. All sharp corners and edges shall be protected by rubber mats to prevent damage to the polyethylene film.

3.3 'CP' - Crate Packing

Assemblies/Components which need only physical protection from the point of view of handling shall be despatched duly packed in crates.

3.4 'CQ' - Case Packing - Machined Components/Assemblies/Equipment

Small and medium sized components/assemblies/equipment due to size/weight and to avoid handling and pilferage problems shall be packed in Case/Containers. Wherever required adequate quantity of silica gel or VCI Powder/Tablets,

packed in thin muslin cloth cotton bags shall be suitably placed. Small machines/components of less weight shall be provided with suitable cushioning by Rubberised coir. The components inside the case shall be entirely covered with100GSM(Colourless) Multi Layered Cross Laminated Polyethylene Film, wherever required. This may be prescribed for electronic parts/critical machined components/surfaces.
For mechanical product like valves where motors are separately securely wrapped in polyethylene, the requirement of individual component wrapping shall be exempted.

3.5 'CR' - Case Packing - Electrical & Electronic Components/Assemblies

Delicate components likely to be damaged e.g. Gauges, Instruments etc. are to be wrapped in waxed paper or polyethylene air bubble film and packed in cartons. Adequate quantity of Silica gel packed in cotton bags of 100grams each are to be suitably placed in the cartons. The cartons shall be entirely covered with 100GSM(Colourless) Multi Layered Cross Laminated Polyethylene Film before being packed in the cases. VCI Powder/Tablets can be used as an alternative to Silica Gel.
Empty space in the cartons shall be filled with rubberized coir to get proper cushioning effect. The cartons shall be manufactured from corrugated Fiber Board.

4 PREPARATION OF PACKING CASES

4.1 DIMENSIONS:

a) Thickness of planks for Front, rear, top and bottom sides and binding, jointing battens shall be 25/20mm +2/-3 mm as per applicable drawings of the respective units.

b) Width of all planks including the tongue shall be more than 125mm and after plaining it shall be minimum 100mm.

c) Minimum number of planks shall be used for a shook.

d) Horizontal, vertical, diagonal planks shall be given for binding (number of such planks depend on the dimension of panel.

e) Width of binding planks shall be minimum 100mm.

f) Distance between any 2 binding planks shall be less than 750mm.

g) diagonal planks shall be used in between vertical binding planks when distance between inner to inner of vertical planks is more than 750mm

h) Distance of the outer edges of these planks from the edge of case shall be less than 250mm.

i) Diagonal planks are not required for top planks and width side, if the width of pallet is less than 750mm.

4.2 JOINTING OF PLANKS

Single length planks shall be used for cubicles whose overall length is less than 2400mm. For cubicles of length more than 2400mm, jointing is permitted. The jointing shall be done with one single or maximum of 2 planks of wood same as other planks of width 250 mm (minimum) with two rows of nails on either side of the joint in zigzag manner. From the joint along height side, it shall be of lap joint with overlap of at least the width of plank.

4.3 TONGUE AND GROOVE JOINTS

Two consecutive planks shall be joined by tongue and groove joint. Depth of tongue shall be 12+1 mm, thickness of tongue shall be 8 +1 mm. The groove dimensions shall be such that the tongue fits tightly into the groove to make a good joint. This type of joint can be done based on the product requirement wherever required.

4.4 PERMISSIBLE DEFECTS

Wood shall be free from knots, bows, visible sign of infection and any kind of decay caused by insects, fungus, etc.
End splits: Longest end splits at each end shall be measured and lengths added together. The added length shall not exceed 60mm per meter run of shook's. Wood pins shall be used to prevent further development of split.
Surface cracks: Surface cracks with a maximum depth of 3mm are permissible. A continuous crack of any depth all along the length is not allowed.

4.5 OTHER MATERIALS

4.5.1 NAILS

The dia. of the nails shall be 3.15mm. The length of the nails shall be 65mm wherever two planks of 25mm thickness are joined and 75mm wherever a 25mm planks is joined to a 50mm plank.

4.5.2 BLUE NAILS

These are used for nailing bituminized Kraft paper/hessian cloth to the planks. The length of the nails shall be 16mm.

4.5.3 HOOP IRON STRIPS

These are used for strapping the boxes. The width of the strips shall be 19+1mm and thickness 0.6+0.01mm. The material shall be free from rust.If sufficient nailing is done for bigger boxes, strapping need not be done.

4.5.4 CLIPS

These shall be used for strapping the hoop iron strips on the boxes.

4.5.5 BRACKETS

These brackets are used for nailing to the corners of cubicle boxes. The brackets shall be of mild steel of thickness min 2mm and width 25+1mm. The brackets shall be of "L" shape, the length of each side being 100+2mm. Two holes shall be provided towards the end of each side for screwing /nailing.

4.5.6 FASTENERS

Bolts, double nuts, spring washers will have to be used for packing of some special items like transformers, reactors, breakers, etc., to hold the job to the bottom plank of the box. The bolts, nuts, washers will be provided by the vendor. Drilling of holes will have to be done using contractor's tools.

4.5.7 MULTI LAYERED CROSS LAMINATED POLYTHELENE FILM

100GSM (Colourless) Multi Layered Cross Laminated Polythelene Film are used to make covers to the jobs individually. The cross lamination gives qualities of extra toughness, together with flexibility and lightness coupled with good weather resistance to ultra violet rays.

4.5.8 RUBBERISED COIR:

The rubberized coir is used as cushioning material. For the packing of loose items, items are to be arrested by using rubberized coir. For the packing of cubicles rubberized coir of thickness 25mm and width 75mm shall be used.

4.5.9 FOAM RUBBER / 'U' FOAM:

This is used for covering the delicate items. This material is provided by the vendor.

4.5.10 MARKING PLATE:

This shall be of anodized aluminium sheet. Size of the marking plate shall be maintained minimum of size as per the details specified in the Figure 4.

4.5.11 PACKING SLIP HOLDER:

This shall be of galvanized iron tinned sheet /Aluminium sheet

4.5.12 SILICA GEL:

Silical gel shall be used for such products only where moisture needs to be avoided.

4.5.13 COTTON BAGS:

These are used for holding silica gel. The bags shall have the following matter indicated on them:

BHEL-UNIT NAME PLACE	-PINCODE
SILICA GEL	-INDICATING TYPE
BLUE :	-ACTIVE
ROSE :	-REDUCED ACTIVITY
WHITE :	-NO ACTIVITY. TO BE REPLACED WITH FRESH SILICA GEL

4.5.14 COTTON/ PLASTIC TAPE:

This is used for tying small items. And also to prevent vibrations of moving parts within the cubicles.

4.5.15 MARKING INK:

The ink used normally is black in color. In some special cases other color also will have to be used. The ink shall be non-fading/indelible and non-washable by water.

4.5.16 POLYETHYLENE BAGS:

These are to be used for keeping the Packing slips. The bag shall be of size 70mm X 100mm (minimum).

4.5.17 Hessian cloth, twine thread, paint will have to be used in packing certain items.

4.5.18 Mechanical Latching clamps:

For CLW Railway panels and similar Panels self-locking clamps can also be used on need basis in conjunction with or apart from regular bolt and nut fixing arrangement. For reusable boxes, these clamps provide easy locking and unlocking arrangement. These clamps will be made available from BHEL in some cases.

4.5.19 STICKERS

The following stickers to be put by the vendor on cubicles/Boxes after packing.

1) Case No sticker: 2 nos. Size 25.Cm x 0.45Cm
2) BHEL Monogram sticker: 1 no. Size 1.75Cm x 2.3Cm
3) Address sticker: 2 nos. Size 3.8Cm x 3.0Cm
4) Direction sticker “Front” & “Back” - 4 nos. Size 2.0Cm x 0.75Cm
5) Chain Mark Sticker: 4 Nos. Size – 3.0Cm x 0.75Cm
6) "Fragile” sticker: 2 Nos. Size. 2.1Cm x 1.5Cm
7) "DO NOT STACK” sticker - 2 Nos. Size 3.0Cm x 2.2Cm

In place of stickers, writing all the details legibly with paint shall be allowed & respective units may take decision accordingly.

5. PACKING OF CUBICLES:

5.1 The packing is to be done as per clause 4 in all respects.

5.2 The cubicles are already fixed on wooden pallets. Hence the contractor need not arrange the bottom pallets normally.

5.3 The cubicles will be of different sizes both width wise and lengthwise. The cubicles may be made up of single suite, 2 Suite, 3 Suite, 4 Suite, etc., The width of the cubicles generally varies from 400 mm to 1650mm.The length of the cubicle, generally varies from 1500 mm to 4800 mm. The height is normally 2430 mm. In some cases, the height may be less/more.

5.4 MULTI LAYER CROSS LAMINATED POLY FILM

The inner surface of 4 sides of shook's shall be nailed with Multi-layer cross laminated poly film (as per 4.5.7) using blue nails (as per 4.5.2) wherever 2 pieces of Cross laminated poly film are used, the joint shall have an overlap of minimum 20mm.

The inner surface of top cover shall be nailed with Multi-layer cross laminated poly film (as per 4.5.7). This sheet shall project outside on 4 sides by at least 100mm and shall be nailed properly on sides. Joining of sheets should have overlap of minimum 20mm.

The cubicles shall be covered with Multi-layer cross laminated poly film (as per 4.5.7).

5.5 SILICA GEL:

Silica gel (as per 4.5.12) packed in cotton bags shall be kept at different places inside the cubicle as per BHEL-Unit directions. Each suit of cubicle shall be provided with 1 kg of Silica gel (for a 4 suit cubicle 4 kgs of Silica Gel to be used. The bag containing silica gel to be as per 4.5.13).

5.6 LOOSE PARTS:

Any loose parts in the cubicles shall be tied using cotton/ plastic tape. Wooden battens shall be provided wherever necessary.

5.7 WOODEN BATTENS:

In case of cubicle which are not rectangular in shape like control desks, sufficient number of wooden rafters/battens of proper size shall be provided to give strength to the package.

5.8 RUBBERISED COIR:

Gap between the cubicle and the case shall be filled with rubberized coir (as per 5.5.8) with distance between consecutive layers less than 500mm.

5.9 CLAMPING:

Packing shall be bound at edges by nailing M.S. Clamps / Brackets (as per 5.5.5). Each vertical edge shall have minimum 3 clamps. Top horizontal edges will have one clamp for every meter length of package. However, minimum 4 clamps shall be nailed at the top for any cubicle.

5.10 PACKING SLIP:

Packing slip kept in the polyethylene bag (As per 5.5.16) shall be placed in the box at appropriate place. In addition, one more packing slip covered in polyethylene cover and packing slip holder (as per 5.5.11) shall be nailed to front / rear of case.

5.11 MARKING PLATE:

One no. (As per 5.5.10) shall be nailed to the front side of the case.

5.12 CASE MOUNTING:

After complete packing, stencil marking of various details and marking of symbols shall be done as per BHEL instructions using indelible / non washable marking ink.

5.13 Different types (Typical) of Cubicles with sizes for Packing

1. Single suite cubicle - 900 x 950 x2500
2. Two suite cubicle - 1650 x 950 x 2500
3. Three suite cubicle - 2400 x 950 x2500
4. Four suite cubicle - 3150 x 950 x 2500
5. Regulation cub - 1300 x 1350 x 2500
6. Thy cub - 2870 x 1350 x 2500
7. VFD Cub - 3800 x 1550 x 2500

6 PACKING OF LOOSE ITEMS/SPARES

1) Shape of cases shall be square, rectangular with single gabled roof or with double gabled roof depending on the nature of the job to be packed. Construction shall be as per drawings enclosed. Only gable will be additional as required.

2) Wood with Tongue and Groove joint as per clause 4.3.

3) Width of planks shall be at least 100 mm. Width of binding planks (battens) shall be at least 75mm.

4) External surface of planks on front and rear shall be plane 100% (except bottom plank).

5) Inner surfaces of all 6 sides shall be lined with Multi Layered Cross Laminated Polythelene Film (as per clause 4.5.7) using blue nails.

6) Rubberized coir of minimum 25mm thickness and 100 mm width shall be nailed to inner surfaces of bottom and 4 sides of box.

7) Internal packing: Items that go into the box shall be packed using 100GSM, (Colourless) Multi Layered Cross

Laminated Polyethylene Film. Any space left between the job and the sides and the top of the box shall be filled with rubberized coir to get proper cushioning effect.

8) Certain items like transformers, reactors, breakers, etc., shall be bolted to the bottom of the box using bolts, nuts and washers.

9) Silica gel as per clause 4.5.12 held in cotton bags as per clause 4.5.13 shall be kept at proper places in the box.

10) Packing slip kept in polyethylene bag (clause 4.5.16) shall be placed in the box.

11) Marking plate as per clause 4.5.10 shall be nailed to side of the box.

12) Two numbers of hoop iron strips as per clause 4.5.3 shall be strapped tightly on the case using clips.

13) Stencil marking of various details and marking of various symbols shall be done as per BHEL instructions using indelible/non-washable marking ink.

14) Loose items to be kept inside the cubicle

- The components which are removed from cubicle for shipping purpose only, such as meters shall be kept inside the cubicle individually, kept in wooden box and tied firmly in bottom of Cubicle.
- Other items which are given loose in addition to cubicle shall be packed in separate boxes.

7 BOX SIZES

7.1 BOX SIZES

Table 1 – SPARES WOODEN BOX DETAILS

SNO	BOX TYPE	BOX SIZE (in mm)	BOX Wt (in KG)	Carrying Capacity
1	A	800 X 200 X 200	15	
2	B	1500 X 200 X 200	22	
3	C	2000 X 200 X 200	27	
4	D	1100 X 200 X 200	15	
5	E	200 X 200 X 200	5	
6	F	320 X 250 X 260	13	
7	G	320 X 250 X 430	16	
8	H	430 X 370 X 430	23	
9	I	1100 X 400 X 400	45	
10	J	1500 X 500 X 400	65	
11	K	2000 X 500 X 400	93	
12	L	2500 X 500 X 400	88	
13	M	900 X 600 X 600	100	
14	N	3000 X 400 X 400	60	
15	P	600 X 500 X 400	35	
16	Q	710 X 630 X 600	90	
17	R	850 X 630 X 670	102	
18	S	1000 X 770 X 670	140	
19	T	2500 X 850 X 800	180	
20	U	1500 X 700 X 700	120	
21	W	1200X900X600	120	

22	Y	450 X 200 X 200	10	

Table 2 – WOODEN BOX DETAILS

BOX TYPE	BOX SIZE (in MM)	BOX Wt (in KG)	Carrying Capacity
1	320X250X260	10	
2	320X250X430	15	
3	430X370X430	25	
4	670X670X470	65	
5	720X630X600	75	
6	1000X770X660	100	
7	1100X430X670	80	
8	1200X1200X900	80	
9	1300X770X1050	155	
10	2500X850X800	225	
11	2000X1500X1200	305	
12	1850X1050X1250	260	
13	2000X800X800	180	
14	2600X1500X1600	470	
15	250X250X600	20	
16	250X250X880	30	
17	300X300X700	25	
18	380X380X880	45	
19	510X510X1400	60	
20	570X570X1400	80	
21	575X575X1875	105	
22	3600X1100X1100	390	
23	900X500X800	110	
24	2000X950X740	225	
25	1600X1120X700	220	
26	2500X2000X1200	490	
27	2900X1900X1400	525	
28	3000X1000X900	370	
29	3200X2200X950	450	
30	2150X1100X750	325	
31	2000X2000X700	130	
32	700X1200X1325	130	

TABLE 3 STEEL BOXES

TYPE	DIMENSION IN MM	WEIGHT	CARRYING

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS STANDARD TECHNICAL REQUIREMENT	SPECIFICATION No: PE-TS-RC3-563-A002 VOLUME: II B SECTION-II SUB-SECTION-IIA REV 00 / DATE 16.04.24

S.NO. LENGTH		BREADTH	HEIGHT			CAPACITY (KGS)
1	I	2480	1680	1500	339	4500
2	II	1200	900	600	61	2000
3	IIB	1800	850	950	115	2500
4	III	900	600	600	29	1000
5	IV	600	450	500	19	750
6	V	400	350	300	11	500

TYPICAL PATTERN OF WOODEN BOX

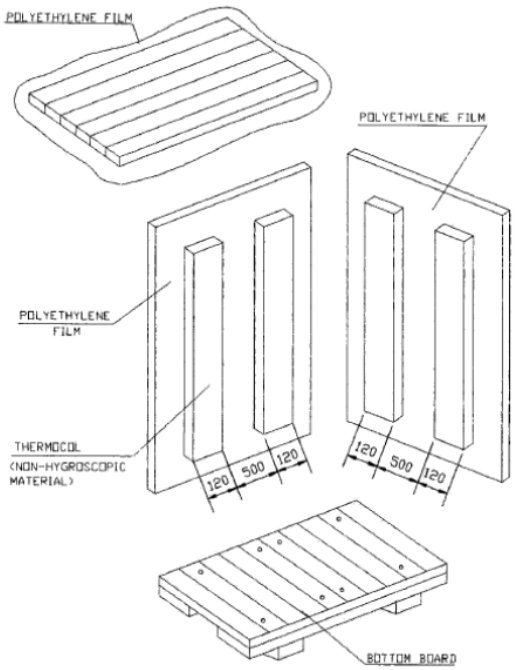


Figure 1

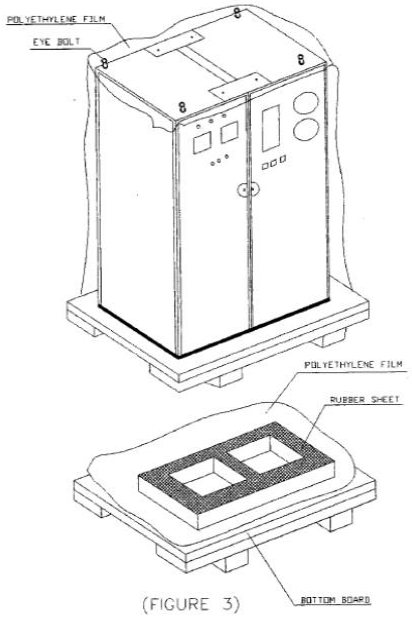
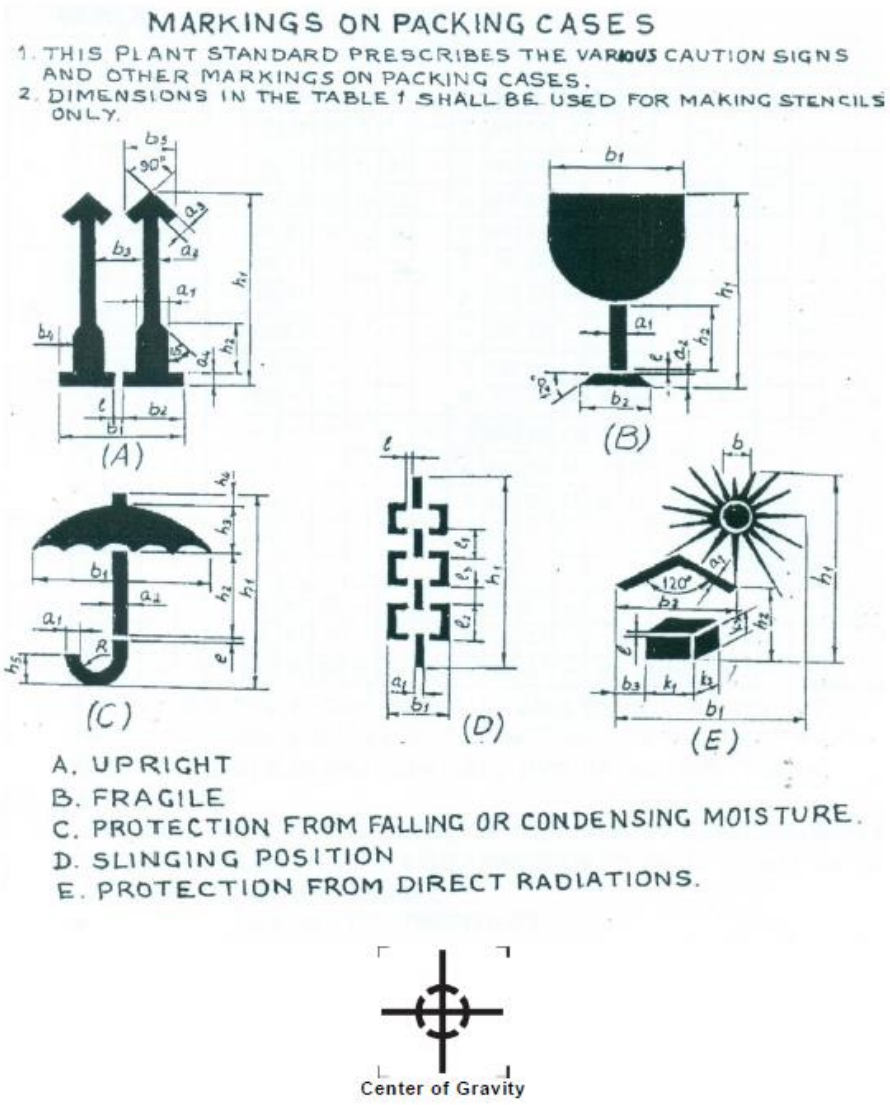


Figure 2

7.3 SEALED PACKING:

Components sub-assemblies and assemblies sensitive to climatic conditions shall be packed seal tight. All the openings of the sensitive components, sub-assemblies and assemblies shall be blanketed to prevent the ingress of dust and moisture. The components sub-assemblies and assemblies are completely covered with 2 layers of polyethylene sheet. All sharp corners and edges are to be protected by rubber mats to prevent the polyethylene sheet from damage. Top surface of the case shall be free from dents to prevent rain water pockets.

8 MARKINGS/STENCILINGS


MARKINGS ON PACKING CASES
1. THIS PLANT STANDARD PRESCRIBES THE VARIOUS CAUTION SIGNS AND OTHER MARKINGS ON PACKING CASES.
2. DIMENSIONS IN THE TABLE 1 SHALL BE USED FOR MAKING STENCILS ONLY.
(A)
(B)
(C)
(D)
(E)
A. UPRIGHT
B. FRAGILE
C. PROTECTION FROM FALLING OR CONDENSING MOISTURE.
D. SLINGING POSITION
E. PROTECTION FROM DIRECT RADIATIONS.

Center of Gravity

Figure 3

DESIGN-ATION		DIMENSION IN MM																						
		a1	a2	a3	a4	b1	b2	b3	b4	b5	b	l	h1	h2	h3	h4	h5	k1	k2	k3	l1	l2	l3	R
A	1	12	5	5	4	52	25	19	8	21		2	84	23										
	2	17	7	7	6	75	36	29	11	30		3	119	33										
	3	24	10	10	8	104	50	38	16	42		4	168	46										
	4	34	14	14	11	147	71	59	23	60		5	239	65										
B	1	5	5			50	33					2	84	25										
	2	7	7			71	47					3	119	36										
	3	10	10			100	66					4	168	50										
	4	14	14			142	94					5	239	71										
C	1	4	3			66						2	80	39	19	5	11							6
	2	6	4			85						3	114	55	27	7	16							9
	3	8	6			120						4	160	78	38	10	22							12
	4	11	9			170						5	227	110	54	14	31							17
D	1	6				30						4	148								30	30	10	
	2	9				42						5	209								42	42	14	
E	1	3				69	47	10			16	2	91	26				17	8	11				
	2	4				98	67	15			23	3	128	33				24	11	16				
	3	6				138	94	20			32	4	182	62				34	16	22				

Table 4

Black and Red Marking Ink to IS:1234 "Ink, Stencil, Oil Base, For Marking Porous Surfaces" or duplicating ink stencilling, oil base for marking porous surfaces.

All cases containing fragile items are to be stencilled with red marking and stencilling paint/ink **"HANDLE WITH CARE", "FRAGILE DO NOT TURN OVER".**

Besides the caution signs the product information's shall be stencilled of letters with 13mm to 50mm height.

In case of consignment consists of more than one package, each package shall carry its package no as given in shipping list. All caution signs shall be stencilled in high quality full glossy out door finishing paint red in colour (AA56126). All other markings shall be carried out in black enamel.

Caution signs & other markings shall be stencilled on both the end shooks & the side shooks.

Caution sign (for slinging) shall be stencilled only on side shooks at the appropriate place.

Note: Incase the size of package is small for using the stencils, then hand written letters/figures shall be allowed.

	BHEL – <unit> - <location> - <pin>				
CONSIGNEE					
MATERIAL					
CUSTOMER REF.			MO. NO.		
DESPATCH ADVICE NOTE NO			CASE NO		
DIMENSIONS(MM) L x B x H			NET WT –KGS	GROSS WT –KGS	
SPECIAL INSTRUCTIONS	HANDLE WITH CARE - KEEP DRY DO NOT DROP - DO NOT TILT				

Figure 4 – TYPICAL MARKING PLATE (225 X 170)

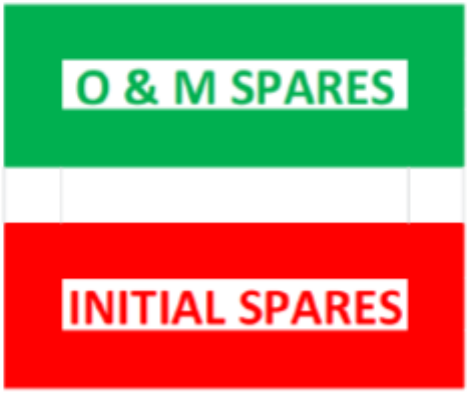


Figure 5

Easy spares [Initial and O&M] Traceability and Identification at units and as well as at sites:

9 STANDARD METHOD OF PACKING

Table 5 - Standard Method of Packing

DESCRIPTION	CASE	CRATE	SKID	BUNDLE	BARE	DRUM	METAL DRUM	FIBRE DRUM
PRESSUE VESSELS								
TOWERS					O			
TANKS					O			
VESSELS					O			
GASKETS	O							

FASTENERS	O							
COVERS		O						
EXCHANGERS								
HEAT EXCHANGERS					O			
TUBE BUNDLE	O							
SHELL					O			
AIR FIN COOLERS					O			
COLOUMNS, MOTOR SUSPENSIONS, PLENUM CHAMBERS, SCREEN GUARDS, ETC					O			
BEARING BLOCKS	O							
FANS	O	O						
MOTORS	O							
GASKETS	O							
FASTENERS	O							
TEST FLANGES			O					
TEST RINGS			O					
COVERS			O					
CRYOGENIC VESSELS								
COLD CONVERTERS					O			
HORIZONTAL STORAGE TANKS					O			
TRANSPORTATION TANK					O			
COLD BOX					O			
DRYING UNIT					O			
DRYING BOTTLES					O			
MOISTURE SEPARATORS					O			
SILENCERS					O			
ONGC SKIDS					O			
VAPORISER		O						
SPECIAL PRODUCTS								
SI/VI PIPING		O						
CRO BIO CONTAINERS	O							
DESCRIPTION	**CASE**	**CRATE**	**SKID**	**BUNDLE**	**BARE**	**DRUM**	**METAL DRUM**	**FIBRE DRUM**
AIR BOTTLES	O							
TITANIUM BOTTLE	O							
WAR HEAD CONTAINER	O							
MISSILE CONTAINER	O							
FUEL CONTAINER	O							
AIR LOCK ASSEMBLY	O							
BOILER DRUMS					O			
BOILER ITEMS								
COILS			O					
PANELS					O			

HEADERS			O		O			
FEEDERS								
MACHINED ITEMS								
SHELL SEGMENTS					O			
SHELL SEGMENTS IN STACKS					O			
SPHERE PETALS								
COLOUMNS, BASE PLATES, TIERCOS, PIPES, NOZZLE E1, F1, INTERNAL PIPES, PADS ETC.					O			
ROLLERS	O							
VALVE TRAYS								
VALVE TRAY COMPONENTS	O							
LATTICE GIRDERS		O						
FASTENERS	O							
GASKETS	O							
SUB CONTRACTS								
FAB STRUCTURALS					O			
SUPPORTING STRUCTURALS					O			
STRUCTURE SUB ASSEMBLY					O			
FAB PIPES					O			
GRATINGS					O			
STAIR CASES					O			
HANDRAILS/ PLATFORMS					O			
BOUGHT OUT COMPONENTS								
IRON & STEEL (LIKE PLATES, BEAMS, ANGLES, CHANNELS ETC.)					O			
PIPE FITTINGS								
CS PIPES, TUBES					O			
SS PIPES, TUBES					O			
FIN TUBES	O							
ELBOWS		O			O			
DESCRIPTION	**CASE**	**CRATE**	**SKID**	**BUNDLE**	**BARE**	**DRUM**	**METAL DRUM**	**FIBRE DRUM**
FLANGES	O	O						
VALVES	O							
GAUGES	O							
DEMISTERS		O						
ABSCRBANTS (LIKE MOLECULAR SIEVES, ACTIVATED ALUMINA, MOBILE SORBID)						O		
PAINT TINS		O						
PAINT DRUMS						O		
IGNITORS	O							
SPRAY NOZZLES	O							
ELECTRICAL INSTRUMENTATION								

MOTORS, PUMPS, COMPRESSORS, TURBINES	O							
SWITCH BOARDS, DISTRIBUTION BOARDS, STARTERS, JUNCTION BOXES		O						
INDICATORS, VIBRATOR SWITCHES	O							
CABLE BUNDLES, CABLE DRUMS					O			
CABLE TRAYS, CABLE RACKS, EARTHING MATERIAL		O						
OPERATIONAL SPARES	O							

10 PROCEDURE FOR HANDLING OF COMPONENTS

The purpose of this procedure is to protect the quality of the components/equipment while handling in various stages of manufacturing packing & despatching.

10.1 Adequate care shall be taken in handling the material, and components to avoid damage during receipts, storage issue manufacture & despatch operations.

10.2 Appropriate material handling equipment like fork lifters, cranes etc. shall be used where needed.

10.3 Lifting by crane and transportation by trolley of critical items and large components like rotors castings etc. shall be done carefully.

10.4 For critical items, where specified, special handling fixtures shall be used for lifting.

10.5 Slings and shackles used for lifting the components/equipment shall be checked for fitness and suitability before use.

10.6 Slings used on machined surfaces shall be suitably padded. No slings shall be used on journal surfaces.

10.7 Precision machined components like blades, catches, rollers etc. shall be lifted using suitable wooden pallets.

10.8 HANDLING OF COMPONENTS ON RECEIPT/DESPATCH

Before loading/unloading a packing case from the carrier look for the following shipping instructions painted on the packing case.

a) The markings showing the upright position.

b) The markings showing the sling position

c) Markings showing the fragile contents.

d) Other required markings as per clause no.10

10.8.1 Appropriate cranes and slings should be used for different components/ cases. Slings should normally make an angle as minimum as possible (width wise) but in no case more than 15º.

10.8.2 Handling and lifting should be done without jerks or impacts.

10.8.3 Immediately after receipt of the goods, the packing should be examined all-round for any sign of damage. If necessary, lift the cover or a number of boards of the case so as to make the contents visible. In the event of sealed

packing being used the plastic sheeting should not be damaged. It is imperative that the packing material is restored in original condition after the inspection.

10.8.4 On receipt of the equipment it should be checked with the shipping list and missing or damage if any should be reported immediately. It is important to arrange for immediate examination to determine the extent of the damage, the cause of the damage and where applicable the person or persons responsible for the damage. According to general practice when transporting by railway or by road vehicle the carrier concerned should be immediately called upon (within specified periods) for jointly establishing a statement of the damage. This is essential as a basis for a subsequent claim and possible damage report to the insurance company.

10.8.5 Protective coating applied on machined surfaces should not be disturbed. The plastic covering should be put back carefully so that it prevents ingress of dust and moisture. Some packing may have vapour phase inhibitor (VPI) paper enclosed inside the packing cases. This should be restored to its original place as far as possible.

10.8.6 Silica gel and such other chemicals kept in the box as desiccants and indicators should also be left in the box itself.

11 GENERAL GUIDELINES FOR ODC TRANSPORTATION/DESPATCH

Based on the Dimensions/Weight indicated in the Transportation Sketch, the type of Trailer is decided and indicated in the Tender Enquiry.

11.1 TRANSPORTATION:

1. LOW BED TRAILERS (LB 8):

Well Bed Length	: 10000mm
Over Gooseneck	: 13000mm
Width	: 3000mm
Carrying Capacity	: 40MT

2. LOW BED TRAILERS (LB 16):

Well Bed Length	: 12000mm
Over Gooseneck	: 16000mm
Width	: 3000mm
Carrying Capacity	: 75MT

3. TOW TYPE TRAILERS (WITH FRONT DOLLEY 16 TYRES): 12000MM length
(for Exceptional equipment length: 30000mm and above)

Bigger Dia equipment are loaded in the Well with overhanging.

Smaller Dia equipment with excess length are loaded over Gooseneck with rear hanging.
The Vehicle Dimensions are defined above are only guidelines for selection based on actual Dimensions/ Weight of the Consignment

11.2 PACKING:

For all ODCs, Wooden Saddles are cut to the diameter of equipment as per the Transportation Sketch.

Wooden Saddles	For Diameter up to 4000mm	For Diameter above 4000mm
Length:	1836/2743mm (6'0"/9'0")	3353mm (11'0")
Width:	300mm (1'0")	300mm (1'0")
Height:	Saddle + one/two wedges a top	Saddle + three/four wedges a top

Number of Saddles:	
Minimum	3 in case of Loading inside Well +1 when loaded on Gooseneck
Maximum:	4 in case of Loading inside Well +2 when loaded on Gooseneck

For Securing the equipment firmly on the Trailer, 19mm (3/4"), wire rope with 25mm (1") Heavy Duty Turn Buckles / BD Clamps are used as Lashing for the equipment.

12 GUIDELINES FOR HANDLING/LOADING/LASHING

- Jobs to be checked for complete painting before loading.
- Components to be lifted with Nylon belts. This protects painting, edges and attachments.
- All the components to be transported by putting inside the properly fabricated Crating
- Small components may fall down while transporting without closed crating and there are chances of missing of small parts. Hence, it is always better to transport small components in closed containers/crating. Loose to be being shipped in a closed crating.
- No component loaded over the crating.
- **LASHING:** Use Nylon belts only for lashing of all components. It prevents removal off painting and cut in the materials.

SUB SECTION-IIB

STANDARD TECHNICAL REQUIREMENT (ELECTRICAL)

BHEL	TITLE : **ELECTRICAL EQUIPMENT SPECIFICATION FOR ELECTRIC HOISTS**	SPECIFICATION NO. VOLUME NO. : **II-B** SECTION : **C** REV NO. : **00** DATE : SHEET : 1 OF 3

TECHNICAL SPECIFICATION

FOR

ELECTRIC HOISTS

(ELECTRICAL PORTION)

	TITLE : ELECTRICAL EQUIPMENT SPECIFICATION FOR ELECTRIC HOISTS	SPECIFICATION NO.
		VOLUME NO. : **II-B**
		SECTION : **C**
		REV NO. : **00** DATE :
		SHEET : 2 OF 3

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 equipments.
d) Electrical load requirement for Single girde crane and electric hoist.
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".

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.

	TITLE : ELECTRICAL EQUIPMENT SPECIFICATION FOR ELECTRIC HOISTS	SPECIFICATION NO.
		VOLUME NO. : **II-B**
		SECTION : **C**
		REV NO. : **00** DATE :
		SHEET : 3 OF 3

4.0 List of enclosures :

a) Electrical scope between BHEL & vendor (Annexure –I)
b) Technical specification for motors.
c) Datasheets & quality plan for motors.
d) Electrical Load data format (Annexure –II)
e) BHEL cable listing format (Annexure –III)
f) Datasheet for Cables
g) Conduit and pipe specification

REV: 00 DATE: 12.03.2015

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

PACKAGE: ELECTRIC HOISTS
SCOPE OF VENDOR: SUPPLY

ANNEXURE - I

S. NO	DETAILS	SCOPE SUPPLY	SCOPE E&C	REMARKS
1	Isolating Switch	Vendor	BHEL	BHEL will provide one number 415 V(3ph, 3W) supply feeder only up to isolating switches for cranes/ hoists. Any other voltage level (AC/DC) required will be derived by the vendor. Motor starter shall be part of crane/ hoist control panel. OR BHEL will provide one number 415 V(3ph, 4W) supply feeder only up to isolating switches for cranes/hoists. Any other voltage level (AC/DC) required will be derived by the vendor. Motor starter shall be part of crane/ hoist control panel.
2	Power cables, control cables, screened control cables and any special cables (if required) between equipment supplied by vendor.	Vendor	BHEL	Cable from supply feeder to isolating switch shall be in BHEL scope.
3	Cabling material (cable trays, accessories, cable tray supporting system, conduits etc).	Vendor	BHEL	
4	Equipment Earthing	BHEL	BHEL	All equipment metallic enclosures / frames, metal structure etc. shall be grounded at two points each to the nearest grounding points / risers provided by BHEL
5	Motors	Vendor	BHEL	
6	Cable glands and lugs 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 & control cables.
7	a) Input cable schedules (C & I) b) Cable interconnection details for above c) Cable block diagram	Vendor Vendor Vendor	- - -	Cable listing for Control and Instrumentation Cable in enclosed excel format shall be submitted by vendor during detailed engineering stage.
8	Equipment layout drawings	Vendor	-	
9	Electrical Equipment GA drawing	Vendor	-	For necessary interface review.

Note:
Power supply by BHEL at S no 1 whether 3ph, 3W or 3ph, 4W shall be project specific.

	TITLE : GENERAL TECHNICAL REQUIREMENTs FOR LV MOTORS	SPECIFICATION NO. PE-SS-999-506-E101 VOLUME NO. : II-B REV NO. : 00 DATE : 29/08/2005 SHEET : 1 OF 1

GENERAL TECHNICAL REQUIREMENTS

FOR

LV MOTORS

SPECIFICATION NO.: PE-SS-999-506-E101 Rev 00

BHEL	SYSTEM TITLE : **GENERAL TECHNICAL REQUIREMENTs** **FOR** **LV MOTORS**	SPECIFICATION NO. PE-SS-999-506-E101 VOLUME NO. : **II-B** SECTION : **D** REV NO. : **00** DATE : 29/08/2005 SHEET : 1 OF 4

1.0 INTENT OF SPECIFIATION

The specification covers the design, materials, constructional features, manufacture, inspection and testing at manufacturer's work, and packing of Low voltage (LV) squirrel cage induction motors along with all accessories for driving auxiliaries in thermal power station.

Motors having a voltage rating of below 1000V are referred to as low voltage (LV) motors.

2.0 CODES AND STANDARDS

Motors shall fully comply with latest edition, including all amendments and revision, of following codes and standards:

IS:325	Three phase Induction motors
IS : 900	Code of practice for installation and maintenance of induction motors
IS: 996	Single phase small AC and universal motors
IS: 4722	Rotating Electrical machines
IS: 4691	Degree of Protection provided by enclosures for rotating electrical machines
IS: 4728	Terminal marking and direction of rotation rotating electrical machines
IS: 1231	Dimensions of three phase foot mounted induction motors
IS: 8789	Values of performance characteristics for three phase induction motors
IS: 13555	Guide for selection and application of 3-phase A.C. induction motors for different types of driven equipment
IS: 2148	Flame proof enclosures for electrical appliance
IS: 5571	Guide for selection of electrical equipment for hazardous areas
IS: 12824	Type of duty and classes of rating assigned
IS: 12802	Temperature rise measurement for rotating electrical machnines
IS: 12065	Permissible limits of noise level for rotating electrical machines
IS: 12075	Mechanical vibration of rotating electrical machines

In case of imported motors, motors as per IEC-34 shall also be acceptable.

3.0 DESIGN REQUIREMENTS

3.1 Motors and accessories shall be designed to operate satisfactorily under conditions specified in data sheet-A and Project Information, including voltage & frequency variation of supply system as defined in Data sheet-A

3.2 Motors shall be continuously rated at the design ambient temperature specified in Data Sheet-A and other site conditions specified under Project Information
Motor ratings shall have at least a 15% margin over the continuous maximum demand of the driven equipment, under entire operating range including voltage & frequency variation specified above.

3.3 Starting Requirements

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

3.3.2 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 as per Data Sheet - A during the starting period of motors.

3.3.3 The following frequency of starts shall apply

i) Two starts in succession with the motor being initially at a temperature not exceeding the rated load temperature.

ii) 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)

iii) Motors for coal conveyor and coal crusher application shall be suitable for three consecutive hot starts followed by one hour interval with maximum twenty starts per day and shall be suitable for mimimum 20,000 starts during the life time of the motor

3.4 **Running Requirements**

3.4.1 Motors shall run satisfactorily at a supply voltage of 75% of rated voltage for 5 minutes with full load without injurious heating to the motor.

3.4.2 Motor shall not stall due to voltage dip in the system causing momentary drop in voltage upto 70% of the rated voltage for duration of 2 secs.

3.5 **Stress During bus Transfer**

3.5.1 Motors shall withstand the voltage, heavy inrush transient current, mechanical and torque stress developed due to the application of 150% of the rated voltage for at least 1 sec. caused due to vector difference between the motor residual voltage and the incoming supply voltage during occasional auto bus transfer.

3.5.2 Motor and driven equipment shafts shall be adequately sized to satisfactorily withstand transient torque under above condition.

3.6 Maximum noise level measured at distance of 1.0 metres from the outline of motor shall not exceed the values specified in IS 12065.

3.7 The max. vibration velocity or double amplitude of motors vibration as measured at motor bearings shall be within the limits specified in IS: 12075.

4.0 **CONSTRUCTIONAL FEATURES**

4.1 Indoor motors shall conform to degree of protection IP: 54 as per IS: 4691. Outdoor or semi-indoor motors shall conform to degree of protection IP: 55 as per IS: 4691and shall be of weather-proof construction. Outdoor motors shall be installed under a suitable canopy

4.2 Motors upto 160KW shall have Totally Enclosed Fan Cooled (TEFC) enclosures, the method of cooling conforming to IC-0141 or IC-0151 of IS: 6362.

Motors rated above 160 KW shall be Closed Air Circuit Air (CACA) cooled

4.3 Motors shall be designed with cool[illegible]oth directions of rotation.

BHEL	TITLE : **GENERAL TECHNICAL REQUIREMENTs FOR LV MOTORS**	SPECIFICATION NO. PE-SS-999-506-E101 VOLUME NO. : **II-B** SECTION : **D** REV NO. : **00** DATE : 29/08/2005 SHEET : 3 OF 4

4.4. Motors shall not be provided with any electric or pneumatic operated external fan for cooling the motors.

4.5 Frames shall be designed to avoid collection of moisture and all enclosures shall be provided with facility for drainage at the lowest point.

4.6 In case Class 'F' insulation is provided for LV motors, temperature rise shall be limited to the limits applicable to Class 'B' insulation.
In case of continuous operation at extreme voltage limits the temperature limits specified in table-1 of IS:325 shall not exceed by more than 10°C.

4.7 **Terminals and Terminal Boxes**

4.7.1 Terminals, terminal leads, terminal boxes, windings tails and associated equipment shall be suitable for connection to a supply system having a short circuit level, specified in the Data Sheet-A.

Unless otherwise stated in Data Sheet-A, motors of rating 110 kW and above will be controlled by circuit breaker and below 110 kW by switch fuse-contactor. The terminal box of motors shall be designed for the fault current mentioned in data sheet "A".

4.7.2 unless otherwise specified or approved, phase terminal boxes of horizontal motors shall be positioned on the left hand side of the motor when viewed from the non-driving end.

4.7.3 Connections shall be such that when the supply leads R, Y & B are connected to motor terminals A B & C or U, V & W respectively, motor shall rotate in an anticlockwise direction when viewed from the non-driving end. Where such motors require clockwise rotation, the supply leads R, Y, B will be connected to motor terminals A, C, B or U W & V respectively.

4.7.4 Permanently attached diagram and instruction plate made preferably of stainless steel shall be mounted inside terminal box cover giving the connection diagram for the desired direction of rotation and reverse rotation.

4.7.5 Motor terminals and terminal leads shall be fully insulated with no bar live parts. Adequate space shall be available inside the terminal box so that no difficulty is encountered for terminating the cable specified in Data Sheet-A.

4.7.6 Degree of protection for terminal boxes shall be IP 55 as per IS 4691.

4.7.7 Separate terminal boxes shall be provided for space heaters.. If this is not possible in case of LV motors, the space heater terminals shall be adequately segregated from the main terminals in the main terminal box. Detachable gland plates with double compression brass glands shall be provided in terminal boxes.

4.7.8. Phase terminal boxes shall be suitable for 360 degree of rotation in steps of 90 degree for LV motors.

4.7.9 Cable glands and cable lugs as per cable sizes specified in Data Sheet-A shall be included. Cable lugs shall be of tinned Copper, crimping type.

4.8 Two separate earthing terminals suitable for connecting G.I. or MS strip grounding conductor of size given in Data Sheet-A shall be provided on opposite sides of motor frame. Each terminal box shall have a grounding terminal.

4.9 **General**

BHEL	SYSTEM TITLE : **GENERAL TECHNICAL REQUIREMENTs** **FOR** **LV MOTORS**	SPECIFICATION NO. PE-SS-999-506-E101 VOLUME NO. : **II-B** SECTION : **D** REV NO. : **00** DATE : 29/08/2005 SHEET : 4 OF 4

4.9.1 Motors provided for similar drives shall be interchangeable.

4.9.2 Suitable foundation bolts are to be supplied alongwith the motors.

4.9.3 Motors shall be provided with eye bolts, or other means to facilitate safe lifting if the weight is 20Kgs. and above.

4.9.4 Necessary fitments and accessories shall be provided on motors in accordance with the latest Indian Electricity rules 1956.

4.9.5 All motors rated above 30 kW shall be provided with space heaters to maintain the motor internal air temperature above the dew point. Unless otherwise specified, space heaters shall be suitable for a supply of 240V AC, single phase, 50 Hz.

4.9.6 Name plate with all particulars as per IS: 325 shall be provided

4.9.7 Unless otherwise specified, the colour of finish shall be grey to Shade No. 631 and 632 as per IS:5 for motors installed indoor and outdoor respectively. The paint shall be epoxy based and shall be suitable for withstanding specified site conditions.

5.0 INSPECTION AND TESTING

5.1 All materials, components and equipments covered under this specification shall be procured, manufactured, as per the BHEL standard quality plan No. PED-506-00-Q-006/0 and PED-506-00-Q-007/2 enclosed with this specification and which shall be complied.

5.2 LV motors of type-tested design shall be provided. Valid type test reports not more than 5 year shall be furnished. In the absence of these, type tests shall have to be conducted by manufacturer without any commercial implication to purchaser.

5.3 All motors shall be subjected to routine tests as per IS: 325 and as per BHEL standard quality plan.

5.4 Motors shall also be subjected to additional tests, if any, as mentioned in Data Sheet A.

6.0 DRAWINGS TO BE SUBMITTED AFTER AWARD OF CONTRACT

a) OGA drawing showing the position of terminal boxes, earthing connections etc.
b) Arrangement drawing of terminal boxes.
c) Characteristic curves:
(*To be given for motor above 55 kW unless otherwise specified in Data Sheet*).

i) Current vs. time at rated voltage and minimum starting voltage.
ii) Speed vs. time at rated voltage and minimum starting voltage.
iii) Torque vs. speed at rated voltage and minimum voltage.
For the motors with solid coupling the above curves i), ii), iii) to be furnished for the motors coupled with driven equipment. In case motor is coupled with mechanical equipment by fluid coupling, the above curves shall be furnished with and without coupling.
iv) Thermal withstand curve under hot and cold conditions at rated voltage and max. permissible voltage.

TITLE	**LV MOTORS** **DATA SHEET-A**	SPECIFICATION NO. VOLUME II B SECTION D REV NO. 00 DATE 16/01/2016 SHEET 1 OF 1

1.0	Design ambient temperature	:	50 °C
2.0	Maximum acceptable kW rating of LV motor	:	Upto 160KW
3.0	Installation (Indoors/ Outdoors)	:	As required
4.0	Degree Of Protection	:	IP55
5.0	Cooling	:	TEFC
6.0	Details of supply system		
	a) Rated voltage (with variation)	:	415V ± 10%
	b) Rated frequency (with variation)	:	50 Hz (Variation: +5% TO –5%)
	c) Combined voltage & freq. variation	:	10% (sum of absolute values)
	d) System fault level at rated voltage	:	50 kA for 1 sec
	e) Short time rating for terminal box	:	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 **(30KW & ABOVE)**	:	240 V, 1Φ , 50 Hz
12.0	Rating up to which Single phase motor	:	Acceptable below 0.20 Kw
13.0	TYPE OF STARTER PROVIDED IN MCC	:	DOL
14.0	Locked rotor current		
	a) Limit as percentage of FLC	:	As per IS 12615
	b) Permissible tolerance, if any	:	
15.0	Additional tests	:	As per QP
16.0	Flame-proof motor		
	a) Enclosure suitable (As per IS:2148)	:	As per requirement
	b) Classification of Hazardous area (As per IS: 5572 part-I)	:	As per requirement
	c) Degree of protection	:	IP65
17.0	Makes	:	AS PER ANNUXURE
18.0	Terminal box	:	Suitable to rotate at 90 degrees
19.0	Paint shade	:	Shall be given during detailed engg.

Note: LT motor shall be energy efficient class IE-3 in line with IS -12615-2011.

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	

S. No.	Description	Data to be filled by successful bidder
	c) 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 ≥ 55KW)	
	a) Torque speed characteristic	
	b) Thermal withstand characteristic	
	c) Current vs time	
	d) Speed vs time	

		QUALITY PLAN	CUSTOMER :			PROJECT TITLE			SPECIFICATION : NUMBER :			
			BIDDER/ VENDOR :			QUALITY PLAN NUMBER PED-506-00-Q-006, REV-01			SPECIFICATION TITLE			
		SHEET 1 OF 2	SYSTEM			ITEM AC ELECT. MOTORS BELOW 55KW (LV)			SECTION			VOLUME III
SL. NO.	COMPONENT/OPERATION	CHARACTERISTICS CHECK	CAT.	TYPE/ METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY P	AGENCY W	AGENCY V	REMARKS
1	2	3	4	5	6	7	8	9	10			11
1.0	ASSEMBLY	1.WORKMANSHIP	MA	VISUAL	100%	MANUF'S SPEC	MANUF'S SPEC	-DO-	2	-	-	
		2.DIMENSIONS	MA	-DO-	-DO-	MFG. DRG./ MFG. SPEC.	MFG. DRG./ MFG. SPEC.	-DO-	2	-	-	
		3.CORRECTNESS COMPLETENESS TERMINATIONS/ MARKING/COLOUR CODE	MA	VISUAL	100%	MFG.SPEC./ RELEVANT IS	MFG.SPEC. RELEVANT IS	-DO-	2	-	-	
2.0	PAINTING	1.SHADE	MA	VISUAL	SAMPLE	MANUFR'S SPEC/BHEL SPEC./RELEVANT STANDARD	BHEL SPEC. SAME AS COL.7	LOG BOOK	2	-	-	
3.0	TESTS	1.ROUTINE TEST INCLUDING SPECIAL TEST AS PER BHEL SPEC.	MA	-DO-	100%	IS-325/ BHEL SPEC./ DATA SHEET	SAME AS COL.7	TEST REPORT	2	1		NOTE -1 & NOTE-3
		2.OVERALL DIMENSIONS & ORIENTATION	MA	MEASUREMENT & VISUAL	100%	APPROVED DRG/DATA SHEET	APPROVED DRG/DATA SHEET & RELEVANT IS	INSPN. REPORT	2	1	-	NOTE -1 & NOTE-3
	BHEL		**PARTICULARS**		**BIDDER/VENDOR**							
			NAME									
			SIGNATURE									

	QUALITY PLAN		CUSTOMER :			PROJECT TITLE			SPECIFICATION : NUMBER :			
			BIDDER/ VENDOR :			QUALITY PLAN NUMBER PED-506-00-Q-006, REV-01			SPECIFICATION : TITLE :			
		SHEET 2 OF 2	SYSTEM			ITEM AC ELECT. MOTORS BELOW 55KW (LV)			SECTION			VOLUME III
SL. NO.	COMPONENT/OPERATION	CHARACTERISTICS CHECK	CAT.	TYPE/ METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY P	AGENCY W	AGENCY V	REMARKS
1	2	3	4	5	6	7	8	9	10	10	10	11
		3.NAMEPLATE DETAILS	MA	VISUAL	100%	IS-325 & DATA SHEET	IS-325 & DATA SHEET	INSPN. REPORT	2	1	-	

NOTES:

1 ROUTINE TESTS ON 100% MOTORS SHALL BE DONE BY THE VENDOR. HOWEVER, BHEL SHALL WITNESS ROUTINE TESTS ON RANDOM SAMPLES. THE SAMPLING PLAN SHALL BE MUTUALLY AGREED UPON

2 WHERE EVER CUSTOMER IS INVOLVED IN INSPECTION, (1) SHALL MEAN BHEL AND CUSTOMERS BOTH TOGETHER.

3 FOR EXHAUST/VENTILATION FAN MOTORS OF RATING UPTO 1.5KW , ONLY ROUTINE TEST CERTIFICATES SHALL BE FURNISHED FOR SCRUTINY.

Legends for Inspection agency

1. BHEL/CUSTOMER
2. VENDOR (MOTOR MANUFACTURER)
3. SUB-VENDOR (RAW MATERIAL/COMPONENTS SUPPLIER)

P. PERFORM
W. WITNESS
V. VERIFY

BHEL	**PARTICULARS**	**BIDDER/VENDOR**	
	NAME		
	SIGNATURE		
	DATE		BIDDER'S/VENDORS COMPANY SEAL

	DOCUMENT TITLE	SPECIFICATION NO.
BHEL	**TECHNICAL SPECIFICATION FOR 1.1 kV XLPE POWER CABLES**	VOLUME II B
		SECTION D
		REVISION 0
		SHEET 1 OF 2

DATA SHEET-A

1.0	Type of Cable	LT XLPE POWER CABLE OF FRLSH TYPE	
2.0	Standard applicable in general	IS:7098 (Part-1), IS:8130, IS:5831, IS:10810, IS:3975, ASTMD:2843, ASTMD:2863, IEC-754-1, IEC:60332 (Part-1), IEC:60332-3-23, IEEE:60383	
3.0	Voltage Grade	1.1kV	
4.0	Number of cores, cross sectional area of conductors	As per requirement	
5.0	Formula for calculating short circuit current for different durations	Ish= k A/ √ (t) where, Ish = Short circuit current in kA t = Fault clearing time in sec. K = a constant = 0.094 for Aluminium conductor XLPE insulation = 0.141 for copper conductor XLPE insulation	
6.0	Installation Conditions for specified current rating		
(a)	Ambient air temperature	**50 deg. C**	
(b)	Ambient temp. for underground cable	**50 deg. C**	
(c)	Thermal resistivity of soil	150 deg. C cm/W	
7.0	**CONDUCTOR**		
(a)	Material	Aluminium	Copper
	Grade and Class	STRANDED COMPACTED PLAIN Aluminium OF H2 GRADE & CLASS 2.	STRANDED COMPACTED HIGH CONDUCTIVITY PLAIN ANNEALED COPPER.
(b)	Standard Applicable	IS: 8130	
	Shape	Circular / shaped as per IS	
(d)	Min. number of strands	As per Table-2 of IS: 8130	
8.0	**INSULATION**		
(a)	Material	XLPE	
(b)	Standard Applicable	IS: 7098 Part-I	
(c)	Continuous withstand temperature	90°C	
(d)	Short-circuit withstand temperature	250°C	
(e)	Method of application	By extrusion; sleeve extrusion not permitted.	
9.0	**CORE IDENTIFICATION**	Colour coding as per IS.	
10.0	**INNER SHEATH**		
(a)	Material	Extruded FRLS PVC Type ST2 as per IS: 5831	
(b)	Colour	*Black*	
(c)	Whether FRLS	*Yes*	
(d)	Inner sheath applicable for single core cable	*No*	
(e)	Fillers	Acceptable	

	DOCUMENT TITLE **TECHNICAL SPECIFICATION FOR 1.1 kV XLPE POWER CABLES**	SPECIFICATION NO. VOLUME II B SECTION D REVISION 0 SHEET 2 OF 2

(f)	Material of fillers (if permitted)	Same as inner sheath (Material of filler to be compatible with that of inner sheath)
(g)	Method of application	
(1)	Multi-core cables:	
(i)	With fillers	*Pressure/Vacuum extruded*
(ii)	Without fillers	*Pressure extruded*
11.0	**ARMOUR (where applicable)**	
(a)	Material:	
(i)	Single core cables	Non Magnetic Hard drawn Aluminium Round Wire H4 grade to IS: 3975 & 7098 part-1
(ii)	Multi-core cables	Galvanised Steel *Round Wire* armour conforming to (i) Type *'a'/ 'b'* as per Table- 6 of IS 7098-I and (ii) IS 3975 as per project requirements.
(b)	Minimum Coverage	90%
(c)	Gap between armour wires	Shall not exceed one armour wire space (No cross-over/ over-riding)
(d)	Breaking load of joint	95 % of normal armour
12.0	**OUTERSHEATH**	
(a)	Material	Extruded FRLS PVC Type ST2 as per IS: 5831
(b)	Colour	*Black*
(c)	Whether FRLS	Yes
(d)	Method of application	Extruded

SECTION-III

DOCUMENTS TO BE SUBMITTED BY BIDDER

IIIA	LIST OF DOCUMENTS TO BE SUBMITTED ALONG WITH BID
IIIB	COMPLIANCE CUM CONFIRMATION CERTIFICATE
IIIC	DEVIATION SCHEDULE (AS PER FORMAT IN GCC)
IIID	PRE-BID CLARIFICATION SCHEDULE

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS DOCUMENTS TO BE SUBMITTED BY BIDDER	SPECIFICATION No: PE-TS-RC3-563-A002
		VOLUME: III
		SECTION-III
		SUB-SECTION-IIIA
		REV 00 / DATE 16.04.24

SUB SECTION-IIIA
LIST OF DOCUMENTS TO BE SUBMITTED ALONG WITH BID

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS	**SPECIFICATION No: PE-TS-RC3-563-A002**
		VOLUME: III
		SECTION-III
		SUB-SECTION-IIIA
	DOCUMENTS TO BE SUBMITTED BY BIDDER	REV 00 / DATE 16.04.24

DRAWINGS / DOCUMENTS TO BE SUBMITTED WITH THE BID:

Bidder shall submit the following drawings / documents along with their bid

a) Deviation schedule with reference to specific clauses of the specification along with reason for such deviation in the format given under General Condition of Contract (GCC)

Or

No deviation certificate

b) Copy of pre-bid clarifications, if any, duly signed & stamped

c) Signed/ Stamped copy of Compliance cum Confirmation Certificate (Vol-III)

d) Un priced copy of price format indicating **"quoted"** against each row/column along with cost of withdrawal / price implication format for deviations.

OFFER WILL BE CONSIDERED AS INCOMPLETE IN ABSENCE OF ANY OF ABOVE DOCUMENTS. DOCUMENT OTHER THAN ABOVE, IF ANY, SUBMITTED WITH THE OFFER WILL NOT FORM PART OF CONTRACT AND ACCORDINGLY WILL NOT BE CONSIDERED FOR BID EVALUATION.

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS DOCUMENTS TO BE SUBMITTED BY BIDDER	SPECIFICATION No: PE-TS-RC3-563-A002
		VOLUME: III
		SECTION-III
		SUB-SECTION-IIIB
		REV 00 / DATE 16.04.24

SUB SECTION-IIIB
COMPLIANCE CUM CONFIRMATION CERTIFICATE

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS	SPECIFICATION No: PE-TS-RC3-563-A002
		VOLUME: III
		SECTION-III
		SUB-SECTION-IIIB
	DOCUMENTS TO BE SUBMITTED BY BIDDER	REV 00 / DATE 16.04.24

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.

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.

m) Regarding commercial documents / deviations, BHEL clarified that commercial documents / deviations shall not been considered during technical evaluation. However if any issue in the commercial documents / deviation related to technical requirements needs to be highlighted and resolve in technical evaluation only.
No aspect of commercial issues needs to be highlighted / resolved in technical evaluation and their offer is strictly in compliance with technical specification. BHEL also clarified to the bidder any technical deviations (e.g. related to MDL, required documentation etc. for completion of the project) raised by them in commercial deviation either explicit or implicit shall be considered null and void even if agreed by BHEL during commercial evaluation stage.
Bidder agreed to confirm and compliance with technical specification and subsequent clarification on bids during pre- award discussion.

SUB SECTION-IIIC
DEVIATION SCHEDULE

TO BE SUBMITTED IN FORMAT GIVEN WITH GENERAL CONDITIONS OF CONTRACT (GCC)

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS DOCUMENTS TO BE SUBMITTED BY BIDDER	SPECIFICATION No: PE-TS-RC3-563-A002 VOLUME: III SECTION-III SUB-SECTION-IIID REV 00 / DATE 16.04.24

SUB SECTION-IIID
PRE-BID CLARIFICATION SCHEDULE

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS **DOCUMENTS TO BE SUBMITTED BY BIDDER**	**SPECIFICATION No: PE-TS-RC3-563-A002** **VOLUME: III** **SECTION-III** **SUB-SECTION-IIID** REV 00 / DATE 16.04.24

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

233719/2024/PS-PEM-MAX

	PRE-QUALIFICATION REQUIREMENT (TECHNICAL) PROJECT: RATE CONTRACT PACKAGE : - ELECTRIC HOISTS	PE-PQ-RC3-563-A002	
		DATE	17/04/2024
		REV NO	00

1.0	Bidder should have capabilities for design, manufacture and having testing facility for Electric Hoist of minimum 3T capacity.
2.0	The Bidder has to submit following supporting documents meeting above mentioned pre-qualifying requirement: 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 prequalifying 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 meeting the minimum pre-qualifying requirement.
3.0	Bidder shall submit design documents to substantiate technical parameters specified in PQR, if the same is not mentioned in performance certificate/purchase order.
4.0	Bidder should have manufactured and supplied Two hundred (200) nos of Electric Hoists during the last two (2) preceding years from the date of bid submission. Relevant PO/LOI/LOA/WO along with respective Material dispatch clearance certificate (MDCC)/ Material receipt certificate (MRC)/Lorry receipt (LR)/ Supply invoice shall be submitted to establish the above.
5.0	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.
6.0	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.
7.0	Consideration of offer shall be subject to customer's approval of bidders, if applicable.
8.0	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.

S K Bhawani
GM (MM)

17/04/24

PREPARED BY

REVIEWED BY

17/4/24

APPROVED BY

	PRE - QUALIFYING REQUIREMENTS
PROJECT:	RATE CONTRACT
PACKAGE:	ELECTRIC HOIST

CRITERIA FOR EVALUATION - FINANCIAL :

	Amount (in Rs.)
Average annual financial turnover during the last Three Financial Years should not be less than Rs.Two Crore Eighty Four Lakh only	2,84,00,000.00

Notes:-

a) The bidder has to submit financial accounts (audited, if applicable comprising of Audit report, Balance Sheet, Profit & Loss A/c Statement and Notes/Schedules pertaining to Turnover/Sales/Revenue), for last three years (or from the date of incorporation, whichever is less) as on tender due date to review the above criteria. In case the incorporation of vendor is less than 3 years, average annual financial turnover shall be calculated based on available information as below:-

i) If the accounts are available for <= 1 Financial Year, the Average Annual Turnover shall be calculated based on available information divided by 1 (One).

ii) If the accounts are available for >1 but < = 2 Financial Years, the Average Annual Turnover shall be calculated based on available information divided by 2 (Two).

iii) If the accounts are available for >2 but <= 3 Financial Years, the Average Annual Turnover shall be calculated based on available information divided by 3 (Three).

b) Foreign bidder is to submit a latest report from reputed third party business rating agency like Dun & Bradstreet, Credit reform etc. in addition to the documents mentioned at point (a) above for review of above criteria.

c) Other Income shall not be considered for arriving at Annual Turnover/Sales.For evaluation purpose,turnover figure excluding taxes shall be considered.

d) For evaluation of foreign bidder, exchange rate (TT selling rate of SBI) as on scheduled date of tender opening (Part-I bid in case of two part bid) shall be considered.

e)Bidder who is 50% or above subsidiary of any other company including those registered outside India and does not meet any of the above Financial Criteria, such bidder may be qualified based on credentials of its holding company provided such holding company meets the above PQR criteria. In such case, the Bidder would be required to furnish a Letter of Support from its Holding Company, pledging unconditional and irrevocable financial support for the execution of the Contract by the Bidder in case of award.

f)In cases where audited results for the last financial year as on the date of Techno Commercial bid opening are not available, a Certificate would be required from CEO/CFO stating that the financial results of the Company are under audit as on the date of Techno-commercial bid opening and are not available.

ANNEXURE- I

PRICE FORMAT-RATE CONTRACT FOR ELECTRIC HOIST

S.No	Description of equipment / item	HSN CODE	TOTAL TENTATIVE QUANTITY	UOM	UNIT EX-WORKS PRICE (DULY PACKED)IN PERCENTAGE OF TOTAL EX WORKS PRICE OF ELECTRIC HOIST GIVEN AT SL NO-1.00 OF COLUMN 8	UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL EX-WORKS PRICE (DULY PACKED) IN PERCENTAGE OF TOTAL EX WORKS PRICE OF ELECTRIC HOIST GIVEN AT SL NO-1.00 OF COLUMN 8	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (Rs.)
1	2		3	4	5	6	7	8	9		10
1.0.0	Total lump sum firm price inclusive of all prevailing taxes, duties and other levies for 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, fill of lubricants & consumables, forwarding, proper packing, shipment and delivery at site complete with all accessories alongwith spares for erection, startup and commissioning, additional items ,essential spares and Supervision of Erection and Comissioning for the total scope defined as per BHEL's NIT & tender technical specification, amendment & agreements till placement of order.							**TO BE QUOTED = Rs X**	#VALUE!	#VALUE!	#VALUE!
1.1.0	Electric Wire Rope Hoists including **isolating switch, cable from isolationg switch to DSL, fixed type pendent push button, end stoppers** and any other item/s required to make the following electric hoists complete and suitable for travel in **both Straight as well as Curved path** with all accessories and working in **NON HAZARDOUS area.**										
1.1.1	Non hazardous Capacity-1T Lift-9m		4	NOS	**0.156**	#VALUE!	0.624	#VALUE!			#VALUE!
1.1.2	Non hazardous Capacity-1T Lift-15m		14	NOS	**0.184**	#VALUE!	2.571	#VALUE!			#VALUE!
1.1.3	Non hazardous Capacity-2T Lift-6 m		5	NOS	**0.227**	#VALUE!	1.134	#VALUE!			#VALUE!
1.1.4	Non hazardous Capacity-2T Lift-9 m		30	NOS	**0.243**	#VALUE!	7.303	#VALUE!			#VALUE!
1.1.5	Non hazardous Capacity-2T Lift-13 m		5	NOS	**0.265**	#VALUE!	1.327	#VALUE!			#VALUE!
1.1.6	Non hazardous Capacity-2T Lift-17 m		2	NOS	**0.246**	#VALUE!	0.491	#VALUE!			#VALUE!
1.1.7	Non hazardous Capacity-3T Lift - 6 m.		31	NOS	**0.165**	#VALUE!	5.111	#VALUE!			#VALUE!
1.1.8	Non hazardous Capacity-3T Lift - 9m		57	NOS	**0.273**	#VALUE!	15.549	#VALUE!			#VALUE!
1.1.9	Non hazardous Capacity - 3T Lift- 15m.		3	NOS	**0.174**	#VALUE!	0.522	#VALUE!			#VALUE!
1.1.10	Non hazardous Capacity -3T Lift- 19m.		4	NOS	**0.196**	#VALUE!	0.784	#VALUE!			#VALUE!
1.1.11	Non hazardous.Capacity-5T Lift- 6m		10	NOS	**0.189**	#VALUE!	1.889	#VALUE!			#VALUE!
1.1.12	Non hazardous.Capacity- 5T Lift- 9m		59	NOS	**0.189**	#VALUE!	11.145	#VALUE!			#VALUE!
1.1.13	Non hazardous Capacity- 5T Lift-14m.		4	NOS	**0.284**	#VALUE!	1.137	#VALUE!			#VALUE!
1.1.14	Non hazardous Capacity - 5T Lift- 17m		4	NOS	**0.417**	#VALUE!	1.666	#VALUE!			#VALUE!
1.1.15	Non hazardous Capacity - 5T Lift- 20m		2	NOS	**0.435**	#VALUE!	0.870	#VALUE!			#VALUE!
1.1.16	Non hazardous Capacity - 8T Lift- 9m. .		1	NOS	**0.251**	#VALUE!	0.251	#VALUE!			#VALUE!
1.1.17	Non hazardous Capacity - 8T Lift-12m.		2	NOS	**0.268**	#VALUE!	0.535	#VALUE!			#VALUE!
1.1.18	Non hazardous Capacity - 8T Lift-22m		3	NOS	**0.306**	#VALUE!	0.919	#VALUE!	**% TO BE QUOTED**	**% TO BE QUOTED**	#VALUE!
1.1.19	Non hazardous Capacity - 8T Lift-26m		1	NOS	**0.328**	#VALUE!	0.328	#VALUE!			#VALUE!

S.No	Description of equipment / item	HSN CODE	TOTAL TENTATIVE QUANTITY	UOM	UNIT EX-WORKS PRICE (DULY PACKED)IN PERCENTAGE OF TOTAL EX WORKS PRICE OF ELECTRIC HOIST GIVEN AT SL NO-1.00 OF COLUMN 8	UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL EX-WORKS PRICE (DULY PACKED) IN PERCENTAGE OF TOTAL EX WORKS PRICE OF ELECTRIC HOIST GIVEN AT SL NO-1.00 OF COLUMN 8	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (Rs.)
1.1.20	Non hazardous Capacity - 10T Lift-10m		13	NOS	**0.306**	**#VALUE!**	3.972	**#VALUE!**			**#VALUE!**
1.1.21	Non hazardous Capacity - 10T Lift- 14m		6	NOS	**0.299**	**#VALUE!**	1.795	**#VALUE!**			**#VALUE!**
1.1.22	Non hazardous Capacity - 10T Lift- 20m		12	NOS	**0.332**	**#VALUE!**	3.987	**#VALUE!**			**#VALUE!**
1.1.23	Non hazardous Capacity - 10T Lift - 35 m		4	NOS	**0.548**	**#VALUE!**	2.193	**#VALUE!**			**#VALUE!**
1.1.24	Non hazardous Capacity - 12.5T Lift- 10m.		1	NOS	**0.540**	**#VALUE!**	0.540	**#VALUE!**			**#VALUE!**
1.1.25	Non hazardous Capacity-12.5T Lift- 18.5m.		15	NOS	**0.540**	**#VALUE!**	8.103	**#VALUE!**			**#VALUE!**
1.1.26	Non hazardous Capacity - 12.5T Lift- 35.5m.		9	NOS	**0.690**	**#VALUE!**	6.211	**#VALUE!**			**#VALUE!**
1.1.27	Non hazardous Capacity - 15T Lift- 8m		9	NOS	**0.587**	**#VALUE!**	5.279	**#VALUE!**			**#VALUE!**
1.1.28	Non hazardous.Capacity-15T Lift-15m		11	NOS	**0.626**	**#VALUE!**	6.888	**#VALUE!**			**#VALUE!**
1.1.29	Non hazardous.Capacity-15T Lift-22m		3	NOS	**0.780**	**#VALUE!**	2.339	**#VALUE!**			**#VALUE!**
1.1.30	Non hazardous.Capacity-30T Lift-9m		2	NOS	**1.945**	**#VALUE!**	3.890	**#VALUE!**			**#VALUE!**
1.2.0	Electric Wire Rope Hoists including **isolating switch, fixed type pendent push button end stoppers** and any other item/s required to make the following electric hoists complete and suitable for travel in **both Straight as well as Curved path** with all accessories and working in **HAZARDOUS AREA.**										
1.2.1	Hazardous.Capacity-2T Lift- 12m		1	NOS	**0.322**	**#VALUE!**	0.322	**#VALUE!**			**#VALUE!**
1.2.2	Hazardous Capacity- 3T Lift- 12m		1	NOS	**0.323**	**#VALUE!**	0.323	**#VALUE!**			**#VALUE!**
1.3.0	**Commissioning spares for Electric hoists (Break up as per Annexure II: bidder to fill up)**				**Refer Annexure-II for BOQ (Total ex-works value of Commissioning spares for Electric hoists component is 0.262% of "X" at sl. No. 1.00 col. 8)**						
1.4.0	**Additional Items of Electric Hoists (Break up as per Annexure III: bidder to fill up)**				**Refer Annexure-III for BOQ (Total ex-works value of Additional Items of Electric Hoists component is 1.583% of "X" at sl. No. 1.00 col. 8)**						
1.5.0	**Supervision of erection and commissioning of electric hoists and its accessories (Break up as per Annexure IV: Bidder to fill up)**				**Refer Annexure-IV for BOQ (Total ex-works value of Supervision of erection and commissioning of electric hoists and its accessories component is 0.056% of "X" at sl. No. 1.00 col. 8)**						
1.6.0	**Essential Spares for Electric hoists (Break up as per Annexure V: Bidder to fill up)**				**Refer Annexure-V for BOQ (Total ex-works value of Essential Spares for Electric hoists component is 17.012% of "X" at sl. No. 1.00 col. 8)**						
1.7.0	**GRAND TOTAL (1.0.0+1.3.0+1.4.0+1.5.0+1.6.0): (1.1.1 to 1.6.0)**					**#VALUE!**	**100.000**	**#VALUE!**	**#VALUE!**	**#VALUE!**	**#VALUE!**

Note:-

1. Bidder to note that evaluation shall be on Grand Total Ex works price + Freight charges, however, Bidder to quote total Ex works of the ELECTRIC HOISTS mentioned at 1.1.1 to 1.2.2(Rs X) only as per the BOQ above. The item wise break up of Ex works prices (unit as well as total) for all the items in the BOQ shall be derived as per the formulae indicated above by BHEL. Indigenous bidder also need to indicate taxes percentage in the respective column and freight percentage of Ex works value considering delivery anywhere in India in the freight column.
2. Rate contract shall be decided on the basis of grand Total Ex works price + Freight charges of Total BOQ
3. % Freight as quoted for Main Supply items, same shall also be considered for Essential spares, Additional items & commissioning spares.
4. Value is to be filled only where "to be quoted" is mentioned and for other columns where "derived" is mentioned same shall be derived by BHEL as per % allocation fixed against each item
5. Bidder to note that grand total price indicated above at 1.7.0 shall be considered for evaluation and hence should be complete in all respect for the full scope defined and considering all terms and conditions agreed.
6. Prices shall remain firm during contract execution.
7. For any Technical clarification please refer Technical Specification No-PE-TS-RC3-563-A002 Rev00
8. Bidder to fill up prices for essential spares, additional items, commissioning spares & supervision of E&C, however % weighatage for total ex-works shall be maintained as mentioned above.

ANNEXURE-II TO RATE CONTRACT

PRICE FORMAT-COMISSIONING SPARES FOR ELECTRIC HOIST

S.No	Description of equipment / item	HSN CODE	TOTAL TENTATIVE QUANTITY	UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (Rs.)
1	2	3	4	5	6	8	9	10
	Non Hazardous Area							
A	**COMISSIONING SPARES For 1T capacity Electric Hoist- Non Hazardous Area**							
i)	Overload Relay	84311010	1 SET					
ii)	Limit Switch	84311010	1 SET					
iii)	Fuse Link	84311010	1 SET					
iv)	Any Other	84311010	1 SET					
	Total (i to iv)							
B	**COMISSIONING SPARES For 2T capacity Electric Hoist- Non Hazardous Area**							
i)	Overload Relay	84311010	1 SET					
ii)	Limit Switch	84311010	1 SET					
iii)	Fuse Link	84311010	1 SET					
iv)	Any Other	84311010	1 SET					
	Total (i to iv)							
C	**COMISSIONING SPARES For 3T capacity Electric Hoist- Non Hazardous Area**							
i)	Overload Relay	84311010	1 SET					
ii)	Limit Switch	84311010	1 SET					
iii)	Fuse Link	84311010	1 SET					
iv)	Any Other	84311010	1 SET					
	Total (i to iv)							
D	**COMISSIONING SPARES For 5T capacity Electric Hoist- Non Hazardous Area**							
i)	Overload Relay	84311010	1 SET					
ii)	Limit Switch	84311010	1 SET					
iii)	Fuse Link	84311010	1 SET					
iv)	Any Other	84311010	1 SET					
	Total (i to iv)							
E	**COMISSIONING SPARES For 8T capacity Electric Hoist- Non Hazardous Area**							
i)	Overload Relay	84311010	1 SET					
ii)	Limit Switch	84311010	1 SET					
iii)	Fuse Link	84311010	1 SET					
iv)	Any Other	84311010	1 SET					
	Total (i to iv)							
F	**COMISSIONING SPARES For 10T capacity Electric Hoist- Non Hazardous Area**							
i)	Overload Relay	84311010	1 SET					
ii)	Limit Switch	84311010	1 SET					
iii)	Fuse Link	84311010	1 SET					
iv)	Any Other	84311010	1 SET					
	Total (i to iv)							

S.No	Description of equipment / item	HSN CODE	TOTAL TENTATIVE QUANTITY	UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (Rs.)
G	**COMISSIONING SPARES For 12.5T capacity Electric Hoist- Non Hazardous Area**							
i)	Overload Relay	84311010	1 SET					
ii)	Limit Switch	84311010	1 SET					
iii)	Fuse Link	84311010	1 SET					
iv)	Any Other	84311010	1 SET					
	Total (i to iv)							
H	**COMISSIONING SPARES For 15T capacity Electric Hoist- Non Hazardous Area**							
i)	Overload Relay	84311010	1 SET					
ii)	Limit Switch	84311010	1 SET					
iii)	Fuse Link	84311010	1 SET					
iv)	Any Other	84311010	1 SET					
	Total (i to iv)							
I	**COMISSIONING SPARES For 30T capacity Electric Hoist- Non Hazardous Area**							
i)	Overload Relay	84311010	1 SET					
ii)	Limit Switch	84311010	1 SET					
iii)	Fuse Link	84311010	1 SET					
iv)	Any Other	84311010	1 SET					
	Total (i to iv)							
	Hazardous Area							
J	**COMISSIONING SPARES For 2T capacity Electric Hoist- Hazardous Area**							
i)	Overload Relay	84311010	1 SET					
ii)	Limit Switch	84311010	1 SET					
iii)	Fuse Link	84311010	1 SET					
iv)	Any Other	84311010	1 SET					
	Total (i to iv)							
K	**COMISSIONING SPARES For 3T capacity Electric Hoist- Hazardous Area**							
i)	Overload Relay	84311010	1 SET					
ii)	Limit Switch	84311010	1 SET					
iii)	Fuse Link	84311010	1 SET					
iv)	Any Other	84311010	1 SET					
	Total (i to iv)							
L	**GRAND TOTAL [A to K] (TOTAL EX-WORKS VALUE SHOULD BE EQUALTO VALUE DERIVED BASED ON % WEIGHTAGE INDICATED AT S.N. 1.3.0 OF ANNEX-I PRICE SCHEDULE)**							

NOTE

1) ONE SET SHALL MEAN 100% REQUIREMENT FOR ONE ELECTRIC HOIST.
2) ABOVE QUOTED UNIT RATES SHALL BE CONSIDERED FOR ORDERING AS PER ACTUAL PROJECT REQUIREMENT.

ANNEXURE- III TO RATE CONTRACT

PRICE FORMAT FOR ADDITIONAL ITEMS -RATE CONTRACT FOR ELECTRIC HOIST

S.NO	DESCRIPTION OF EQUIPMENT / ITEM	TOTAL TENTATIVE QUANTITY	UOM	HSN CODE	UNIT PRICE EX-WORKS (DULY PACKED) (RS)	TOTAL PRICE EX-WORKS (DULY PACKED) (RS)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (RS.)
1	2	3	4	5	6	7	8	9	10
1	**PVC SHROUDED BUS BAR TYPE DSL suitable for both straight and curved path complete with all accessories for following minimum ratings.**								
1.1	PVC SHROUDED (GI)/(GS) DSL (100 AMPS)	1	METER						
1.2	PVC SHROUDED (SS) DSL (40 AMPS)	1	METER						
1.3	PVC SHROUDED (Cu) DSL (160 AMPS)	1	METER						
2	**FLEXIBLE TRAILING POWER (Cu) CABLE , complete with all accessories suitable for following capacities of electric hoists.**								
2.1	TRAILING POWER (Cu) CABLE - upto 5T Non hazardous area.	1	METER OF TRAVEL						
2.2	TRAILING POWER (Cu) CABLE - 8T & 10T Non hazardous area.	1	METER OF TRAVEL						
2.3	TRAILING POWER (Cu) CABLE - 12.5T & 15T Non hazardous area.	1	METER OF TRAVEL						
2.4	TRAILING POWER (Cu) CABLE - 30T Non hazardous area.								
2.5	TRAILING POWER (Cu) CABLE - 2T hazardous area.	1	METER OF TRAVEL						
2.6	TRAILING POWER (Cu) CABLE -3T hazardous area.	1	METER OF TRAVEL						
3	**Variable Voltage Variable Frequecny (VVVF) Drives for creep speed of motions as follows**								
3.1	VVVF drive for hoisting motion -1T	1	NOS.						
3.2	VVVF drive for hoisting motion -2T	1	NOS.						
3.3	VVVF drive for hoisting motion -3T	1	NOS.						
3.4	VVVF drive for hoisting motion -5T	1	NOS.						
3.5	VVVF drive for hoisting motion -8T	1	NOS.						
3.6	VVVF drive for hoisting motion-10T	1	NOS.						
3.7	VVVF drive for hoisting motion -12.5T	1	NOS.						
3.8	VVVF drive for hoisting motion-15T	1	NOS.						
3.9	VVVF drive for hoisting motion-30T	1	NOS.						
3.10	VVVF drive for CT motion-1T	1	NOS.						
3.11	VVVF drive for CT motion-2T	1	NOS.						
3.12	VVVF drive for CT motion-3T	1	NOS.						
3.13	VVVF drive for CT motion-5T	1	NOS.						
3.14	VVVF drive for CT motion-8T	1	NOS.						
3.15	VVVF drive for CT motion-10T	1	NOS.						
3.16	VVVF drive for CT motion-12.5T	1	NOS.						
3.17	VVVF drive for CT motion-15T	1	NOS.						
3.18	VVVF drive for CT motion-30T	1	NOS.						
4	Trailing cable for **movable type pendent push button** along with required fixing arrangment (for all capacity of hoist) if specifically required as per clause 13.0 of Sub section IIA, Volume IIB , Specification no PE- TS-RC3-563-A002	1	METER OF TRAVEL						

S.NO	DESCRIPTION OF EQUIPMENT / ITEM	TOTAL TENTATIVE QUANTITY	UOM	HSN CODE	UNIT PRICE EX-WORKS (DULY PACKED) (RS)	TOTAL PRICE EX-WORKS (DULY PACKED) (RS)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (RS.)
5	**Maintenance tools and tackles** as per clause 1.1.2 of Sub section IA, Volume IIB , Specification no PE- TS-RC3-563-A002.	1	SET						
	GRAND TOTAL [1 to 5] (TOTAL EX-WORKS VALUE SHOULD BE EQUALTO VALUE DERIVED BASED ON % WEIGHTAGE INDICATED AT S.N. 1.4.0 OF ANNEX-I PRICE SCHEDULE)								
ABOVE QUOTED UNIT RATES SHALL BE CONSIDERED FOR ORDERING AS PER ACTUAL PROJECT REQUIREMENT.									

ANNEXURE- IV TO RATE CONTRACT

PRICE FORMAT FOR SERVICE PART (SUPERVISION OF ERECTION AND COMISSIONING) -RATE CONTRACT FOR ELECTRIC HOIST

S.NO	DESCRIPTION OF EQUIPMENT / ITEM	TOTAL TENTATIVE QUANTITY	UOM	HSN CODE	UNIT PRICE EX-WORKS (RS)	TOTAL PRICE EX-WORKS (RS)	APPLICABLE GST RATE % ON TOTAL EX-WORKS	TOTAL F.O.R. SITE PRICE (RS.)
1	2	3	4	5	6	7	8	9
1	SERVICE part comprising of **Supervision of erection and commissioning** of electric hoists and its accessories(Refer clause 1.6.0 of Sub section IA, Volume IIB , Specification no PE- TS-RC3-563-A002.							
1.1	**Charges per visit**	1	NOS.					
1.2	**Charges per Man-day**	1	NOS.					
	GRAND TOTAL [1.1 to 1.2] (TOTAL VALUE SHOULD BE EQUALTO VALUE DERIVED BASED ON % WEIGHTAGE INDICATED AT S.N. 1.5.0 OF ANNEX-I PRICE SCHEDULE)							

ABOVE QUOTED UNIT RATES SHALL BE CONSIDERED FOR ORDERING AS PER ACTUAL PROJECT REQUIREMENT.

ANNEXURE- V TO RATE CONTRACT

ESSENTIAL SPARES- NON HAZARDOUS AREA

PRICE FORMAT-ESSENTIAL SPARES FOR ELECTRIC HOIST

S.No	Description of equipment / item	QUANTITY	HSN CODE	UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (Rs.)
1	2	3	4	5	6	7	8	9
A	**ESSENTIAL SPARES (1T CAPACITY- NON HAZARDOUS AREA)**							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH						
2.00	Bearings for gear box for hoisting motion	100% for one EH						
3.00	Bearings for gear box for CT motion	100% for one EH						
4.00	Hoist pulley bearings	100% for one EH						
5.00	Hook thrust bearing	100% for one EH						
6.00	Drum bearing	100% for one EH						
7.00	Bearing Seal	100% for one EH						
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH						
9.00	Input pinion for CT Gearbox	100% for one EH						
10.00	Gear wheel for Hoist Gearbox	100% for one EH						
11.00	Gear wheel for CT Gearbox	100% for one EH						
12.00	Internal clip for Hoist Gearbox	100% for one EH						
13.00	Internal clip for CT Gearbox	100% for one EH						
14.00	Complete Gear box / gear set for hoisting motion	100% for one EH						
15.00	Complete Gear box / gear set for CT motion	100% for one EH						
16.00	**Oil seals**							
i)	Oil seals for CT gear box	100% for one EH						
ii)	Oil seals for Hoist gear box	100% for one EH						
17.00	**Brakes**							
18.00	Brake liners for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
19.00	Brake springs for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
20.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
21.00	Diode bridge	100% for one EH						
22.00	Brake assembly for hoisting	100% for one EH						
23.00	Brake assembly for CT motion	100% for one EH						
24.00	**Wheels**							
i)	CT wheel assembly (complete) (driving)	100% for one EH						
ii)	CT wheel assembly (complete) (idle)	100% for one EH						
25.00	**Wire rope**							
a)	suitable for 9 m lift	100% for one EH						
b)	suitable for 15 m lift	100% for one EH						
26.00	Rope Guide	100% for one EH						
27.00	Rope Tightner	100% for one EH						
28.00	Rope sheave assembly	100% for one EH						
29.00	Rubber bushes for flexible couplings	100% for one EH						
30.00	Thrusters with cups and seals for electro-hydraulic thruster brakes	1 set for one EH						
31.00	Local Control Station	One (1) No. each type						
	Electrical spares							
32.00	Contactors	1 no of each type, size and rating for one EH						
33.00	Main contactors	1 set for one EH						
34.00	Auxiliary contactors	1 set for one EH						
35.00	Overload relays	1 no of each type, size and rating for one EH						
36.00	Relay	1 no of each type for one EH						
37.00	Timers of each type	1 set for one EH						
38.00	MCBs.	1 set for one EH						
39.00	MCCB	1 set for one EH						
40.00	Switch Fuse Units	1 No. for one EH						
41.00	Fuses of each type	1 set for one EH						
42.00	Fuse links	1 set for one EH						
43.00	Control circuit fuses	1 set for one EH						
44.00	Limit Switches for							
i)	Main Hoist	1 set for one EH						
ii)	Cross Travel	1 set for one EH						
45.00	Door limit switch	1 set for one EH						
46.00	Selector switch	1 set for one EH						
47.00	Current Collector shoes/ rollers	1 Set for one EH						
48.00	Complete current collector assembly	1 Set for one EH						
49.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH						
50.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH						
51.00	Control module of VVVF drive	1 no. of each type and rating for one EH						
52.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH						
53.00	Dynamic braking resistance	1 no. of each type and rating for one EH						
54.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH						
55.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH						
56.00	Indicating lamps of each type	1 set for one EH						
57.00	Electric meter	1 set for one EH						
58.00	Resistor element of each size and type	1 set for one EH						
59.00	Hooter	1 set for one EH						

S.No	Description of equipment / item	QUANTITY	HSN CODE	UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (Rs.)
60.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH						
ii)	Motor of travel motion	1 set for one EH						
iii)	Terminal plates	1 set for one EH						
iv)	Motor Terminal Block	1 set for one EH						
v)	Space Heaters	1 set for one EH						
vi)	Greasing arrangements	1 set for one EH						
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH						
viii)	Stator winding coils for all type of LT motors	1 set for one EH						
ix)	Rotor pinion	1 set						
x)	Dust seals and gaskets for each type of motors	1 set for one EH						
xi)	Cooling Fans	1 no for each type and rating of motor						
xii)	Fan Cover	1 no for each type and rating of motor						
xiii)	Complete Set of Coupling	1 set for one EH						
xiv)	End shield (DE & NDE)	1 set of each type						
61.00	Transformer	1 set for one EH						
62.00	1.1 KV Grade power cables for each type and size.	1 m						
63.00	1.1 KV Grade control cables for each type and size.	1 m						
64.00	Control Trailing Cable for Electrical Hoist	1 m						
65.00	Power Trailing Cable for Electrical Hoist	1 m						
66.00	Power terminal block	1 set for one EH						
67.00	Control terminal block	1 set for one EH						
68.00	End plates for Power & Control terminal block	1 set for one EH						
69.00	Carbon brushes and brush holders for all slip ring type motors	1 set for one EH						
70.00	Make and trip coils	1 set for one EH						
	Total (1 to 70)							
B	**ESSENTIAL SPARES (2T CAPACITY- NON HAZARDOUS AREA)**							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH						
2.00	Bearings for gear box for hoisting motion	100% for one EH						
3.00	Bearings for gear box for CT motion	100% for one EH						
4.00	Hoist pulley bearings	100% for one EH						
5.00	Hook thrust bearing	100% for one EH						
6.00	Drum bearing	100% for one EH						
7.00	Bearing Seal	100% for one EH						
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH						
9.00	Input pinion for CT Gearbox	100% for one EH						
10.00	Gear wheel for Hoist Gearbox	100% for one EH						
11.00	Gear wheel for CT Gearbox	100% for one EH						
12.00	Internal clip for Hoist Gearbox	100% for one EH						
13.00	Internal clip for CT Gearbox	100% for one EH						
14.00	Complete Gear box / gear set for hoisting motion	100% for one EH						
15.00	Complete Gear box / gear set for CT motion	100% for one EH						
16.00	**Oil seals**							
i)	Oil seals for CT gear box	100% for one EH						
ii)	Oil seals for Hoist gear box	100% for one EH						
17.00	**Brakes**							
18.00	Brake liners for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
19.00	Brake springs for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
20.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
21.00	Diode bridge	100% for one EH						
22.00	Brake assembly for hoisting	100% for one EH						
23.00	Brake assembly for CT motion	100% for one EH						
24.00	**Wheels**							
i)	CT wheel assembly (complete) (driving)	100% for one EH						
ii)	CT wheel assembly (complete) (idle)	100% for one EH						
25.00	**Wire rope**							
a)	suitable for 6 m lift	100% for one EH						
b)	suitable for 9 m lift	100% for one EH						
c)	suitable for 12 m lift	100% for one EH						
d)	suitable for 13 m lift	100% for one EH						
e)	suitable for 17 m lift	100% for one EH						
26.00	Rope Guide	100% for one EH						
27.00	Rope Tightner	100% for one EH						
28.00	Rope sheave assembly	100% for one EH						
29.00	Rubber bushes for flexible couplings	100% for one EH						
30.00	Thrusters with cups and seals for electro-hydraulic thruster brakes	1 set for one EH						
31.00	Local Control Station	One (1) No. each type						
	Electrical spares							
32.00	Contactors	1 no of each type, size and rating for one EH						
33.00	Main contactors	1 set for one EH						
34.00	Auxiliary contactors	1 set for one EH						
35.00	Overload relays	1 no of each type, size and rating for one EH						
36.00	Relay	1 no of each type for one EH						
37.00	Timers of each type	1 set for one EH						
38.00	MCBs.	1 set for one EH						
39.00	MCCB	1 set for one EH						

S.No	Description of equipment / item	QUANTITY	HSN CODE	UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (Rs.)
40.00	Switch Fuse Units	1 No. for one EH						
41.00	Fuses of each type	1 set for one EH						
42.00	Fuse links	1 set for one EH						
43.00	Control circuit fuses	1 set for one EH						
44.00	Limit Switches for							
i)	Main Hoist	1 set for one EH						
ii)	Cross Travel	1 set for one EH						
45.00	Door limit switch	1 set for one EH						
46.00	Selector switch	1 set for one EH						
47.00	Current Collector shoes/ rollers	1 Set for one EH						
48.00	Complete current collector assembly	1 Set for one EH						
49.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH						
50.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH						
51.00	Control module of VVVF drive	1 no. of each type and rating for one EH						
52.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH						
53.00	Dynamic braking resistance	1 no. of each type and rating for one EH						
54.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH						
55.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH						
56.00	Indicating lamps of each type	1 set for one EH						
57.00	Electric meter	1 set for one EH						
58.00	Resistor element of each size and type	1 set for one EH						
59.00	Hooter	1 set for one EH						
60.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH						
ii)	Motor of travel motion	1 set for one EH						
iii)	Terminal plates	1 set for one EH						
iv)	Motor Terminal Block	1 set for one EH						
v)	Space Heaters	1 set for one EH						
vi)	Greasing arrangements	1 set for one EH						
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH						
viii)	Stator winding coils for all type of LT motors	1 set for one EH						
ix)	Rotor pinion	1 set						
x)	Dust seals and gaskets for each type of motors	1 set for one EH						
xi)	Cooling Fans	1 no for each type and rating of motor						
xii)	Fan Cover	1 no for each type and rating of motor						
xiii)	Complete Set of Coupling	1 set for one EH						
xiv)	End shield (DE & NDE)	1 set of each type						
61.00	Transformer	1 set for one EH						
62.00	1.1 KV Grade power cables for each type and size.	1 m						
63.00	1.1 KV Grade control cables for each type and size.	1 m						
64.00	Control Trailing Cable for Electrical Hoist	1 m						
65.00	Power Trailing Cable for Electrical Hoist	1 m						
66.00	Power terminal block	1 set for one EH						
67.00	Control terminal block	1 set for one EH						
68.00	End plates for Power & Control terminal block	1 set for one EH						
69.00	Carbon brushes and brush holders for all slip ring type motors	1 set for one EH						
70.00	Make and trip coils	1 set for one EH						
	Total (1 to 70)							
C	**ESSENTIAL SPARES (3T CAPACITY- NON HAZARDOUS AREA)**							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH						
2.00	Bearings for gear box for hoisting motion	100% for one EH						
3.00	Bearings for gear box for CT motion	100% for one EH						
4.00	Hoist pulley bearings	100% for one EH						
5.00	Hook thrust bearing	100% for one EH						
6.00	Drum bearing	100% for one EH						
7.00	Bearing Seal	100% for one EH						
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH						
9.00	Input pinion for CT Gearbox	100% for one EH						
10.00	Gear wheel for Hoist Gearbox	100% for one EH						
11.00	Gear wheel for CT Gearbox	100% for one EH						
12.00	Internal clip for Hoist Gearbox	100% for one EH						
13.00	Internal clip for CT Gearbox	100% for one EH						
14.00	Complete Gear box / gear set for hoisting motion	100% for one EH						
15.00	Complete Gear box / gear set for CT motion	100% for one EH						
16.00	**Oil seals**							
i)	Oil seals for CT gear box	100% for one EH						
ii)	Oil seals for Hoist gear box	100% for one EH						
17.00	**Brakes**							
18.00	Brake liners for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
19.00	Brake springs for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
20.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
21.00	Diode bridge	100% for one EH						

S.No	Description of equipment / item	QUANTITY	HSN CODE	UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (Rs.)
22.00	Brake assembly for hoisting	100% for one EH						
23.00	Brake assembly for CT motion	100% for one EH						
24.00	**Wheels**							
i)	CT wheel assembly (complete) (driving)	100% for one EH						
ii)	CT wheel assembly (complete) (idle)	100% for one EH						
25.00	**Wire rope**							
a)	suitable for 6 m lift	100% for one EH						
b)	suitable for 9 m lift	100% for one EH						
c)	suitable for 12 m lift	100% for one EH						
d)	suitable for 15 m lift	100% for one EH						
e)	suitable for 19 m lift	100% for one EH						
26.00	Rope Guide	100% for one EH						
27.00	Rope Tightner	100% for one EH						
28.00	Rope sheave assembly	100% for one EH						
29.00	Rubber bushes for flexible couplings	100% for one EH						
30.00	Thrusters with cups and seals for electro-hydraulic thruster brakes	1 set for one EH						
31.00	Local Control Station	One (1) No. each type						
	Electrical spares							
32.00	Contactors	1 no of each type, size and rating for one EH						
33.00	Main contactors	1 set for one EH						
34.00	Auxiliary contactors	1 set for one EH						
35.00	Overload relays	1 no of each type, size and rating for one EH						
36.00	Relay	1 no of each type for one EH						
37.00	Timers of each type	1 set for one EH						
38.00	MCBs.	1 set for one EH						
39.00	MCCB	1 set for one EH						
40.00	Switch Fuse Units	1 No. for one EH						
41.00	Fuses of each type	1 set for one EH						
42.00	Fuse links	1 set for one EH						
43.00	Control circuit fuses	1 set for one EH						
44.00	Limit Switches for							
i)	Main Hoist	1 set for one EH						
ii)	Cross Travel	1 set for one EH						
45.00	Door limit switch	1 set for one EH						
46.00	Selector switch	1 set for one EH						
47.00	Current Collector shoes/ rollers	1 Set for one EH						
48.00	Complete current collector assembly	1 Set for one EH						
49.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH						
50.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH						
51.00	Control module of VVVF drive	1 no. of each type and rating for one EH						
52.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH						
53.00	Dynamic braking resistance	1 no. of each type and rating for one EH						
54.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH						
55.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH						
56.00	Indicating lamps of each type	1 set for one EH						
57.00	Electric meter	1 set for one EH						
58.00	Resistor element of each size and type	1 set for one EH						
59.00	Hooter	1 set for one EH						
60.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH						
ii)	Motor of travel motion	1 set for one EH						
iii)	Terminal plates	1 set for one EH						
iv)	Motor Terminal Block	1 set for one EH						
v)	Space Heaters	1 set for one EH						
vi)	Greasing arrangements	1 set for one EH						
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH						
viii)	Stator winding coils for all type of LT motors	1 set for one EH						
ix)	Rotor pinion	1 set						
x)	Dust seals and gaskets for each type of motors	1 set for one EH						
xi)	Cooling Fans	1 no for each type and rating of motor						
xii)	Fan Cover	1 no for each type and rating of motor						
xiii)	Complete Set of Coupling	1 set for one EH						
xiv)	End shield (DE & NDE)	1 set of each type						
61.00	Transformer	1 set for one EH						
62.00	1.1 KV Grade power cables for each type and size.	1 m						
63.00	1.1 KV Grade control cables for each type and size.	1 m						
64.00	Control Trailing Cable for Electrical Hoist	1 m						
65.00	Power Trailing Cable for Electrical Hoist	1 m						
66.00	Power terminal block	1 set for one EH						
67.00	Control terminal block	1 set for one EH						
68.00	End plates for Power & Control terminal block	1 set for one EH						
69.00	Carbon brushes and brush holders for all slip ring type motors	1 set for one EH						
70.00	Make and trip coils	1 set for one EH						
	Total (1 to 70)							
	ESSENTIAL SPARES (5T CAPACITY- NON HAZARDOUS AREA)							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH						

S.No	Description of equipment / item	QUANTITY	HSN CODE	UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (Rs.)
2.00	Bearings for gear box for hoisting motion	100% for one EH						
3.00	Bearings for gear box for CT motion	100% for one EH						
4.00	Hoist pulley bearings	100% for one EH						
5.00	Hook thrust bearing	100% for one EH						
6.00	Drum bearing	100% for one EH						
7.00	Bearing Seal	100% for one EH						
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH						
9.00	Input pinion for CT Gearbox	100% for one EH						
10.00	Gear wheel for Hoist Gearbox	100% for one EH						
11.00	Gear wheel for CT Gearbox	100% for one EH						
12.00	Internal clip for Hoist Gearbox	100% for one EH						
13.00	Internal clip for CT Gearbox	100% for one EH						
14.00	Complete Gear box / gear set for hoisting motion	100% for one EH						
15.00	Complete Gear box / gear set for CT motion	100% for one EH						
16.00	**Oil seals**							
i)	Oil seals for CT gear box	100% for one EH						
ii)	Oil seals for Hoist gear box	100% for one EH						
17.00	**Brakes**							
18.00	Brake liners for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
19.00	Brake springs for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
20.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
21.00	Diode bridge	100% for one EH						
22.00	Brake assembly for hoisting	100% for one EH						
23.00	Brake assembly for CT motion	100% for one EH						
24.00	**Wheels**							
i)	CT wheel assembly (complete) (driving)	100% for one EH						
ii)	CT wheel assembly (complete) (idle)	100% for one EH						
25.00	**Wire rope**							
a)	suitable for 6 m lift	100% for one EH						
b)	suitable for 9 m lift	100% for one EH						
c)	suitable for 14 m lift	100% for one EH						
d)	suitable for 17 m lift	100% for one EH						
e)	suitable for 20 m lift	100% for one EH						
26.00	Rope Guide	100% for one EH						
27.00	Rope Tightner	100% for one EH						
28.00	Rope sheave assembly	100% for one EH						
29.00	Rubber bushes for flexible couplings	100% for one EH						
30.00	Thrusters with cups and seals for electro-hydraulic thruster brakes	1 set for one EH						
31.00	Local Control Station	One (1) No. each type						
	Electrical spares							
32.00	Contactors	1 no of each type, size and rating for one EH						
33.00	Main contactors	1 set for one EH						
34.00	Auxiliary contactors	1 set for one EH						
35.00	Overload relays	1 no of each type, size and rating for one EH						
36.00	Relay	1 no of each type for one EH						
37.00	Timers of each type	1 set for one EH						
38.00	MCBs.	1 set for one EH						
39.00	MCCB	1 set for one EH						
40.00	Switch Fuse Units	1 No. for one EH						
41.00	Fuses of each type	1 set for one EH						
42.00	Fuse links	1 set for one EH						
43.00	Control circuit fuses	1 set for one EH						
44.00	Limit Switches for							
i)	Main Hoist	1 set for one EH						
ii)	Cross Travel	1 set for one EH						
45.00	Door limit switch	1 set for one EH						
46.00	Selector switch	1 set for one EH						
47.00	Current Collector shoes/ rollers	1 Set for one EH						
48.00	Complete current collector assembly	1 Set for one EH						
49.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH						
50.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH						
51.00	Control module of VVVF drive	1 no. of each type and rating for one EH						
52.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH						
53.00	Dynamic braking resistance	1 no. of each type and rating for one EH						
54.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH						
55.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH						
56.00	Indicating lamps of each type	1 set for one EH						
57.00	Electric meter	1 set for one EH						
58.00	Resistor element of each size and type	1 set for one EH						
59.00	Hooter	1 set for one EH						
60.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH						
ii)	Motor of travel motion	1 set for one EH						
iii)	Terminal plates	1 set for one EH						
iv)	Motor Terminal Block	1 set for one EH						
v)	Space Heaters	1 set for one EH						
vi)	Greasing arrangements	1 set for one EH						
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH						
viii)	Stator winding coils for all type of LT motors	1 set for one EH						

S.No	Description of equipment / item	QUANTITY	HSN CODE	UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (Rs.)
ix)	Rotor pinion	1 set						
x)	Dust seals and gaskets for each type of motors	1 set for one EH						
xi)	Cooling Fans	1 no for each type and rating of motor						
xii)	Fan Cover	1 no for each type and rating of motor						
xiii)	Complete Set of Coupling	1 set for one EH						
xiv)	End shield (DE & NDE)	1 set of each type						
61.00	Transformer	1 set for one EH						
62.00	1.1 KV Grade power cables for each type and size.	1 m						
63.00	1.1 KV Grade control cables for each type and size.	1 m						
64.00	Control Trailing Cable for Electrical Hoist	1 m						
65.00	Power Trailing Cable for Electrical Hoist	1 m						
66.00	Power terminal block	1 set for one EH						
67.00	Control terminal block	1 set for one EH						
68.00	End plates for Power & Control terminal block	1 set for one EH						
69.00	Carbon brushes and brush holders for all slip ring type motors	1 set for one EH						
70.00	Make and trip coils	1 set for one EH						
	Total (1 to 70)							
	ESSENTIAL SPARES (8T CAPACITY- NON HAZARDOUS AREA)							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH						
2.00	Bearings for gear box for hoisting motion	100% for one EH						
3.00	Bearings for gear box for CT motion	100% for one EH						
4.00	Hoist pulley bearings	100% for one EH						
5.00	Hook thrust bearing	100% for one EH						
6.00	Drum bearing	100% for one EH						
7.00	Bearing Seal	100% for one EH						
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH						
9.00	Input pinion for CT Gearbox	100% for one EH						
10.00	Gear wheel for Hoist Gearbox	100% for one EH						
11.00	Gear wheel for CT Gearbox	100% for one EH						
12.00	Internal clip for Hoist Gearbox	100% for one EH						
13.00	Internal clip for CT Gearbox	100% for one EH						
14.00	Complete Gear box / gear set for hoisting motion	100% for one EH						
15.00	Complete Gear box / gear set for CT motion	100% for one EH						
16.00	**Oil seals**							
i)	Oil seals for CT gear box	100% for one EH						
ii)	Oil seals for Hoist gear box	100% for one EH						
17.00	**Brakes**							
18.00	Brake liners for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
19.00	Brake springs for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
20.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
21.00	Diode bridge	100% for one EH						
22.00	Brake assembly for hoisting	100% for one EH						
23.00	Brake assembly for CT motion	100% for one EH						
24.00	**Wheels**							
i)	CT wheel assembly (complete) (driving)	100% for one EH						
ii)	CT wheel assembly (complete) (idle)	100% for one EH						
25.00	**Wire rope**							
a)	suitable for 9 m lift	100% for one EH						
b)	suitable for 12 m lift	100% for one EH						
c)	suitable for 22 m lift	100% for one EH						
d)	suitable for 26 m lift	100% for one EH						
26.00	Rope Guide	100% for one EH						
27.00	Rope Tightner	100% for one EH						
28.00	Rope sheave assembly	100% for one EH						
29.00	Rubber bushes for flexible couplings	100% for one EH						
30.00	Thrusters with cups and seals for electro-hydraulic thruster brakes	1 set for one EH						
31.00	Local Control Station	One (1) No. each type						
	Electrical spares							
32.00	Contactors	1 no of each type, size and rating for one EH						
33.00	Main contactors	1 set for one EH						
34.00	Auxiliary contactors	1 set for one EH						
35.00	Overload relays	1 no of each type, size and rating for one EH						
36.00	Relay	1 no of each type for one EH						
37.00	Timers of each type	1 set for one EH						
38.00	MCBs.	1 set for one EH						
39.00	MCCB	1 set for one EH						
40.00	Switch Fuse Units	1 No. for one EH						
41.00	Fuses of each type	1 set for one EH						
42.00	Fuse links	1 set for one EH						
43.00	Control circuit fuses	1 set for one EH						
44.00	Limit Switches for							
i)	Main Hoist	1 set for one EH						
ii)	Cross Travel	1 set for one EH						
45.00	Door limit switch	1 set for one EH						
46.00	Selector switch	1 set for one EH						
47.00	Current Collector shoes/ rollers	1 Set for one EH						
48.00	Complete current collector assembly	1 Set for one EH						

S.No	Description of equipment / item	QUANTITY	HSN CODE	UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (Rs.)
49.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH						
50.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH						
51.00	Control module of VVVF drive	1 no. of each type and rating for one EH						
52.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH						
53.00	Dynamic braking resistance	1 no. of each type and rating for one EH						
54.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH						
55.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH						
56.00	Indicating lamps of each type	1 set for one EH						
57.00	Electric meter	1 set for one EH						
58.00	Resistor element of each size and type	1 set for one EH						
59.00	Hooter	1 set for one EH						
60.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH						
ii)	Motor of travel motion	1 set for one EH						
iii)	Terminal plates	1 set for one EH						
iv)	Motor Terminal Block	1 set for one EH						
v)	Space Heaters	1 set for one EH						
vi)	Greasing arrangements	1 set for one EH						
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH						
viii)	Stator winding coils for all type of LT motors	1 set for one EH						
ix)	Rotor pinion	1 set						
x)	Dust seals and gaskets for each type of motors	1 set for one EH						
xi)	Cooling Fans	1 no for each type and rating of motor						
xii)	Fan Cover	1 no for each type and rating of motor						
xiii)	Complete Set of Coupling	1 set for one EH						
xiv)	End shield (DE & NDE)	1 set of each type						
61.00	Transformer	1 set for one EH						
62.00	1.1 KV Grade power cables for each type and size.	1 m						
63.00	1.1 KV Grade control cables for each type and size.	1 m						
64.00	Control Trailing Cable for Electrical Hoist	1 m						
65.00	Power Trailing Cable for Electrical Hoist	1 m						
66.00	Power terminal block	1 set for one EH						
67.00	Control terminal block	1 set for one EH						
68.00	End plates for Power & Control terminal block	1 set for one EH						
69.00	Carbon brushes and brush holders for all slip ring type motors	1 set for one EH						
70.00	Make and trip coils	1 set for one EH						
	Total (1 to 70)							
	ESSENTIAL SPARES (10T CAPACITY- NON HAZARDOUS AREA)							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH						
2.00	Bearings for gear box for hoisting motion	100% for one EH						
3.00	Bearings for gear box for CT motion	100% for one EH						
4.00	Hoist pulley bearings	100% for one EH						
5.00	Hook thrust bearing	100% for one EH						
6.00	Drum bearing	100% for one EH						
7.00	Bearing Seal	100% for one EH						
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH						
9.00	Input pinion for CT Gearbox	100% for one EH						
10.00	Gear wheel for Hoist Gearbox	100% for one EH						
11.00	Gear wheel for CT Gearbox	100% for one EH						
12.00	Internal clip for Hoist Gearbox	100% for one EH						
13.00	Internal clip for CT Gearbox	100% for one EH						
14.00	Complete Gear box / gear set for hoisting motion	100% for one EH						
15.00	Complete Gear box / gear set for CT motion	100% for one EH						
16.00	**Oil seals**							
i)	Oil seals for CT gear box	100% for one EH						
ii)	Oil seals for Hoist gear box	100% for one EH						
17.00	**Brakes**							
18.00	Brake liners for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
19.00	Brake springs for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
20.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
21.00	Diode bridge	100% for one EH						
22.00	Brake assembly for hoisting	100% for one EH						
23.00	Brake assembly for CT motion	100% for one EH						
24.00	**Wheels**							
i)	CT wheel assembly (complete) (driving)	100% for one EH						
ii)	CT wheel assembly (complete) (idle)	100% for one EH						
25.00	**Wire rope**							
a)	suitable for 10 m lift	100% for one EH						
b)	suitable for 14 m lift	100% for one EH						
c)	suitable for 20 m lift	100% for one EH						
d)	suitable for 35 m lift	100% for one EH						
26.00	Rope Guide	100% for one EH						
27.00	Rope Tightner	100% for one EH						

S.No	Description of equipment / item	QUANTITY	HSN CODE	UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (Rs.)
28.00	Rope sheave assembly	100% for one EH						
29.00	Rubber bushes for flexible couplings	100% for one EH						
30.00	Thrusters with cups and seals for electro-hydraulic thruster brakes	1 set for one EH						
31.00	Local Control Station	One (1) No. each type						
	Electrical spares							
32.00	Contactors	1 no of each type, size and rating for one EH						
33.00	Main contactors	1 set for one EH						
34.00	Auxiliary contactors	1 set for one EH						
35.00	Overload relays	1 no of each type, size and rating for one EH						
36.00	Relay	1 no of each type for one EH						
37.00	Timers of each type	1 set for one EH						
38.00	MCBs.	1 set for one EH						
39.00	MCCB	1 set for one EH						
40.00	Switch Fuse Units	1 No. for one EH						
41.00	Fuses of each type	1 set for one EH						
42.00	Fuse links	1 set for one EH						
43.00	Control circuit fuses	1 set for one EH						
44.00	Limit Switches for							
i)	Main Hoist	1 set for one EH						
ii)	Cross Travel	1 set for one EH						
45.00	Door limit switch	1 set for one EH						
46.00	Selector switch	1 set for one EH						
47.00	Current Collector shoes/ rollers	1 Set for one EH						
48.00	Complete current collector assembly	1 Set for one EH						
49.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH						
50.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH						
51.00	Control module of VVVF drive	1 no. of each type and rating for one EH						
52.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH						
53.00	Dynamic braking resistance	1 no. of each type and rating for one EH						
54.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH						
55.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH						
56.00	Indicating lamps of each type	1 set for one EH						
57.00	Electric meter	1 set for one EH						
58.00	Resistor element of each size and type	1 set for one EH						
59.00	Hooter	1 set for one EH						
60.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH						
ii)	Motor of travel motion	1 set for one EH						
iii)	Terminal plates	1 set for one EH						
iv)	Motor Terminal Block	1 set for one EH						
v)	Space Heaters	1 set for one EH						
vi)	Greasing arrangements	1 set for one EH						
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH						
viii)	Stator winding coils for all type of LT motors	1 set for one EH						
ix)	Rotor pinion	1 set						
x)	Dust seals and gaskets for each type of motors	1 set for one EH						
xi)	Cooling Fans	1 no for each type and rating of motor						
xii)	Fan Cover	1 no for each type and rating of motor						
xiii)	Complete Set of Coupling	1 set for one EH						
xiv)	End shield (DE & NDE)	1 set of each type						
61.00	Transformer	1 set for one EH						
62.00	1.1 KV Grade power cables for each type and size.	1 m						
63.00	1.1 KV Grade control cables for each type and size.	1 m						
64.00	Control Trailing Cable for Electrical Hoist	1 m						
65.00	Power Trailing Cable for Electrical Hoist	1 m						
66.00	Power terminal block	1 set for one EH						
67.00	Control terminal block	1 set for one EH						
68.00	End plates for Power & Control terminal block	1 set for one EH						
69.00	Carbon brushes and brush holders for all slip ring type motors	1 set for one EH						
70.00	Make and trip coils	1 set for one EH						
	Total (1 to 70)							
	ESSENTIAL SPARES (12.5T CAPACITY- NON HAZARDOUS AREA)							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH						
2.00	Bearings for gear box for hoisting motion	100% for one EH						
3.00	Bearings for gear box for CT motion	100% for one EH						
4.00	Hoist pulley bearings	100% for one EH						
5.00	Hook thrust bearing	100% for one EH						
6.00	Drum bearing	100% for one EH						
7.00	Bearing Seal	100% for one EH						
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH						
9.00	Input pinion for CT Gearbox	100% for one EH						
10.00	Gear wheel for Hoist Gearbox	100% for one EH						
11.00	Gear wheel for CT Gearbox	100% for one EH						
12.00	Internal clip for Hoist Gearbox	100% for one EH						
13.00	Internal clip for CT Gearbox	100% for one EH						

S.No	Description of equipment / item	QUANTITY	HSN CODE	UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (Rs.)
14.00	Complete Gear box / gear set for hoisting motion	100% for one EH						
15.00	Complete Gear box / gear set for CT motion	100% for one EH						
16.00	**Oil seals**							
i)	Oil seals for CT gear box	100% for one EH						
ii)	Oil seals for Hoist gear box	100% for one EH						
17.00	**Brakes**							
18.00	Brake liners for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
19.00	Brake springs for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
20.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
21.00	Diode bridge	100% for one EH						
22.00	Brake assembly for hoisting	100% for one EH						
23.00	Brake assembly for CT motion	100% for one EH						
24.00	**Wheels**							
i)	CT wheel assembly (complete) (driving)	100% for one EH						
ii)	CT wheel assembly (complete) (idle)	100% for one EH						
25.00	**Wire rope**							
a)	suitable for 10 m lift	100% for one EH						
b)	suitable for 18.5 m lift	100% for one EH						
c)	suitable for 35.5 m lift	100% for one EH						
26.00	Rope Guide	100% for one EH						
27.00	Rope Tightner	100% for one EH						
28.00	Rope sheave assembly	100% for one EH						
29.00	Rubber bushes for flexible couplings	100% for one EH						
30.00	Thrusters with cups and seals for electro-hydraulic thruster brakes	1 set for one EH						
31.00	Local Control Station	One (1) No. each type						
	Electrical spares							
32.00	Contactors	1 no of each type, size and rating for one EH						
33.00	Main contactors	1 set for one EH						
34.00	Auxiliary contactors	1 set for one EH						
35.00	Overload relays	1 no of each type, size and rating for one EH						
36.00	Relay	1 no of each type for one EH						
37.00	Timers of each type	1 set for one EH						
38.00	MCBs.	1 set for one EH						
39.00	MCCB	1 set for one EH						
40.00	Switch Fuse Units	1 No. for one EH						
41.00	Fuses of each type	1 set for one EH						
42.00	Fuse links	1 set for one EH						
43.00	Control circuit fuses	1 set for one EH						
44.00	Limit Switches for							
i)	Main Hoist	1 set for one EH						
ii)	Cross Travel	1 set for one EH						
45.00	Door limit switch	1 set for one EH						
46.00	Selector switch	1 set for one EH						
47.00	Current Collector shoes/ rollers	1 Set for one EH						
48.00	Complete current collector assembly	1 Set for one EH						
49.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH						
50.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH						
51.00	Control module of VVVF drive	1 no. of each type and rating for one EH						
52.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH						
53.00	Dynamic braking resistance	1 no. of each type and rating for one EH						
54.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH						
55.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH						
56.00	Indicating lamps of each type	1 set for one EH						
57.00	Electric meter	1 set for one EH						
58.00	Resistor element of each size and type	1 set for one EH						
59.00	Hooter	1 set for one EH						
60.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH						
ii)	Motor of travel motion	1 set for one EH						
iii)	Terminal plates	1 set for one EH						
iv)	Motor Terminal Block	1 set for one EH						
v)	Space Heaters	1 set for one EH						
vi)	Greasing arrangements	1 set for one EH						
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH						
viii)	Stator winding coils for all type of LT motors	1 set for one EH						
ix)	Rotor pinion	1 set						
x)	Dust seals and gaskets for each type of motors	1 set for one EH						
xi)	Cooling Fans	1 no for each type and rating of motor						
xii)	Fan Cover	1 no for each type and rating of motor						
xiii)	Complete Set of Coupling	1 set for one EH						
xiv)	End shield (DE & NDE)	1 set of each type						
61.00	Transformer	1 set for one EH						
62.00	1.1 KV Grade power cables for each type and size.	1 m						
63.00	1.1 KV Grade control cables for each type and size.	1 m						
64.00	Control Trailing Cable for Electrical Hoist	1 m						

S.No	Description of equipment / item	QUANTITY	HSN CODE	UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (Rs.)
65.00	Power Trailing Cable for Electrical Hoist	1 m						
66.00	Power terminal block	1 set for one EH						
67.00	Control terminal block	1 set for one EH						
68.00	End plates for Power & Control terminal block	1 set for one EH						
69.00	Carbon brushes and brush holders for all slip ring type motors	1 set for one EH						
70.00	Make and trip coils	1 set for one EH						
	Total (1 to 70)							
	ESSENTIAL SPARES (15T CAPACITY- NON HAZARDOUS AREA)							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH						
2.00	Bearings for gear box for hoisting motion	100% for one EH						
3.00	Bearings for gear box for CT motion	100% for one EH						
4.00	Hoist pulley bearings	100% for one EH						
5.00	Hook thrust bearing	100% for one EH						
6.00	Drum bearing	100% for one EH						
7.00	Bearing Seal	100% for one EH						
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH						
9.00	Input pinion for CT Gearbox	100% for one EH						
10.00	Gear wheel for Hoist Gearbox	100% for one EH						
11.00	Gear wheel for CT Gearbox	100% for one EH						
12.00	Internal clip for Hoist Gearbox	100% for one EH						
13.00	Internal clip for CT Gearbox	100% for one EH						
14.00	Complete Gear box / gear set for hoisting motion	100% for one EH						
15.00	Complete Gear box / gear set for CT motion	100% for one EH						
16.00	**Oil seals**							
i)	Oil seals for CT gear box	100% for one EH						
ii)	Oil seals for Hoist gear box	100% for one EH						
17.00	**Brakes**							
18.00	Brake liners for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
19.00	Brake springs for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
20.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
21.00	Diode bridge	100% for one EH						
22.00	Brake assembly for hoisting	100% for one EH						
23.00	Brake assembly for CT motion	100% for one EH						
24.00	**Wheels**							
i)	CT wheel assembly (complete) (driving)	100% for one EH						
ii)	CT wheel assembly (complete) (idle)	100% for one EH						
25.00	**Wire rope**							
a)	suitable for 8 m lift	100% for one EH						
b)	suitable for 15 m lift	100% for one EH						
c)	suitable for 22 m lift	100% for one EH						
26.00	Rope Guide	100% for one EH						
27.00	Rope Tightner	100% for one EH						
28.00	Rope sheave assembly	100% for one EH						
29.00	Rubber bushes for flexible couplings	100% for one EH						
30.00	Thrusters with cups and seals for electro-hydraulic thruster brakes	1 set for one EH						
31.00	Local Control Station	One (1) No. each type						
	Electrical spares							
32.00	Contactors	1 no of each type, size and rating for one EH						
33.00	Main contactors	1 set for one EH						
34.00	Auxiliary contactors	1 set for one EH						
35.00	Overload relays	1 no of each type, size and rating for one EH						
36.00	Relay	1 no of each type for one EH						
37.00	Timers of each type	1 set for one EH						
38.00	MCBs.	1 set for one EH						
39.00	MCCB	1 set for one EH						
40.00	Switch Fuse Units	1 No. for one EH						
41.00	Fuses of each type	1 set for one EH						
42.00	Fuse links	1 set for one EH						
43.00	Control circuit fuses	1 set for one EH						
44.00	Limit Switches for							
i)	Main Hoist	1 set for one EH						
ii)	Cross Travel	1 set for one EH						
45.00	Door limit switch	1 set for one EH						
46.00	Selector switch	1 set for one EH						
47.00	Current Collector shoes/ rollers	1 Set for one EH						
48.00	Complete current collector assembly	1 Set for one EH						
49.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH						
50.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH						
51.00	Control module of VVVF drive	1 no. of each type and rating for one EH						
52.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH						
53.00	Dynamic braking resistance	1 no. of each type and rating for one EH						
54.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH						
55.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH						
56.00	Indicating lamps of each type	1 set for one EH						
57.00	Electric meter	1 set for one EH						

S.No	Description of equipment / item	QUANTITY	HSN CODE	UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (Rs.)
58.00	Resistor element of each size and type	1 set for one EH						
59.00	Hooter	1 set for one EH						
60.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH						
ii)	Motor of travel motion	1 set for one EH						
iii)	Terminal plates	1 set for one EH						
iv)	Motor Terminal Block	1 set for one EH						
v)	Space Heaters	1 set for one EH						
vi)	Greasing arrangements	1 set for one EH						
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH						
viii)	Stator winding coils for all type of LT motors	1 set for one EH						
ix)	Rotor pinion	1 set						
x)	Dust seals and gaskets for each type of motors	1 set for one EH						
xi)	Cooling Fans	1 no for each type and rating of motor						
xii)	Fan Cover	1 no for each type and rating of motor						
xiii)	Complete Set of Coupling	1 set for one EH						
xiv)	End shield (DE & NDE)	1 set of each type						
61.00	Transformer	1 set for one EH						
62.00	1.1 KV Grade power cables for each type and size.	1 m						
63.00	1.1 KV Grade control cables for each type and size.	1 m						
64.00	Control Trailing Cable for Electrical Hoist	1 m						
65.00	Power Trailing Cable for Electrical Hoist	1 m						
66.00	Power terminal block	1 set for one EH						
67.00	Control terminal block	1 set for one EH						
68.00	End plates for Power & Control terminal block	1 set for one EH						
69.00	Carbon brushes and brush holders for all slip ring type motors	1 set for one EH						
70.00	Make and trip coils	1 set for one EH						
	Total (1 to 70)							
	ESSENTIAL SPARES (30T CAPACITY- NON HAZARDOUS AREA)							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH						
2.00	Bearings for gear box for hoisting motion	100% for one EH						
3.00	Bearings for gear box for CT motion	100% for one EH						
4.00	Hoist pulley bearings	100% for one EH						
5.00	Hook thrust bearing	100% for one EH						
6.00	Drum bearing	100% for one EH						
7.00	Bearing Seal	100% for one EH						
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH						
9.00	Input pinion for CT Gearbox	100% for one EH						
10.00	Gear wheel for Hoist Gearbox	100% for one EH						
11.00	Gear wheel for CT Gearbox	100% for one EH						
12.00	Internal clip for Hoist Gearbox	100% for one EH						
13.00	Internal clip for CT Gearbox	100% for one EH						
14.00	Complete Gear box / gear set for hoisting motion	100% for one EH						
15.00	Complete Gear box / gear set for CT motion	100% for one EH						
16.00	**Oil seals**							
i)	Oil seals for CT gear box	100% for one EH						
ii)	Oil seals for Hoist gear box	100% for one EH						
17.00	**Brakes**							
18.00	Brake liners for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
19.00	Brake springs for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
20.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
21.00	Diode bridge	100% for one EH						
22.00	Brake assembly for hoisting	100% for one EH						
23.00	Brake assembly for CT motion	100% for one EH						
24.00	**Wheels**							
i)	CT wheel assembly (complete) (driving)	100% for one EH						
ii)	CT wheel assembly (complete) (idle)	100% for one EH						
25.00	**Wire rope**							
a)	suitable for 9 m lift	100% for one EH						
26.00	Rope Guide	100% for one EH						
27.00	Rope Tightner	100% for one EH						
28.00	Rope sheave assembly	100% for one EH						
29.00	Rubber bushes for flexible couplings	100% for one EH						
30.00	Thrusters with cups and seals for electro-hydraulic thruster brakes	1 set for one EH						
31.00	Local Control Station	One (1) No. each type						
	Electrical spares							
32.00	Contactors	1 no of each type, size and rating for one EH						
33.00	Main contactors	1 set for one EH						
34.00	Auxiliary contactors	1 set for one EH						
35.00	Overload relays	1 no of each type, size and rating for one EH						
36.00	Relay	1 no of each type for one EH						
37.00	Timers of each type	1 set for one EH						
38.00	MCBs.	1 set for one EH						
39.00	MCCB	1 set for one EH						
40.00	Switch Fuse Units	1 No. for one EH						
41.00	Fuses of each type	1 set for one EH						

S.No	Description of equipment / item	QUANTITY	HSN CODE	UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (Rs.)
42.00	Fuse links	1 set for one EH						
43.00	Control circuit fuses	1 set for one EH						
44.00	Limit Switches for							
i)	Main Hoist	1 set for one EH						
ii)	Cross Travel	1 set for one EH						
45.00	Door limit switch	1 set for one EH						
46.00	Selector switch	1 set for one EH						
47.00	Current Collector shoes/ rollers	1 Set for one EH						
48.00	Complete current collector assembly	1 Set for one EH						
49.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH						
50.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH						
51.00	Control module of VVVF drive	1 no. of each type and rating for one EH						
52.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH						
53.00	Dynamic braking resistance	1 no. of each type and rating for one EH						
54.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH						
55.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH						
56.00	Indicating lamps of each type	1 set for one EH						
57.00	Electric meter	1 set for one EH						
58.00	Resistor element of each size and type	1 set for one EH						
59.00	Hooter	1 set for one EH						
60.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH						
ii)	Motor of travel motion	1 set for one EH						
iii)	Terminal plates	1 set for one EH						
iv)	Motor Terminal Block	1 set for one EH						
v)	Space Heaters	1 set for one EH						
vi)	Greasing arrangements	1 set for one EH						
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH						
viii)	Stator winding coils for all type of LT motors	1 set for one EH						
ix)	Rotor pinion	1 set						
x)	Dust seals and gaskets for each type of motors	1 set for one EH						
xi)	Cooling Fans	1 no for each type and rating of motor						
xii)	Fan Cover	1 no for each type and rating of motor						
xiii)	Complete Set of Coupling	1 set for one EH						
xiv)	End shield (DE & NDE)	1 set of each type						
61.00	Transformer	1 set for one EH						
62.00	1.1 KV Grade power cables for each type and size.	1 m						
63.00	1.1 KV Grade control cables for each type and size.	1 m						
64.00	Control Trailing Cable for Electrical Hoist	1 m						
65.00	Power Trailing Cable for Electrical Hoist	1 m						
66.00	Power terminal block	1 set for one EH						
67.00	Control terminal block	1 set for one EH						
68.00	End plates for Power & Control terminal block	1 set for one EH						
69.00	Carbon brushes and brush holders for all slip ring type motors	1 set for one EH						
70.00	Make and trip coils	1 set for one EH						
	Total (1 to 70)							
	ESSENTIAL SPARES (2T CAPACITY- HAZARDOUS AREA)							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH						
2.00	Bearings for gear box for hoisting motion	100% for one EH						
3.00	Bearings for gear box for CT motion	100% for one EH						
4.00	Hoist pulley bearings	100% for one EH						
5.00	Hook thrust bearing	100% for one EH						
6.00	Drum bearing	100% for one EH						
7.00	Bearing Seal	100% for one EH						
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH						
9.00	Input pinion for CT Gearbox	100% for one EH						
10.00	Gear wheel for Hoist Gearbox	100% for one EH						
11.00	Gear wheel for CT Gearbox	100% for one EH						
12.00	Internal clip for Hoist Gearbox	100% for one EH						
13.00	Internal clip for CT Gearbox	100% for one EH						
14.00	Complete Gear box / gear set for hoisting motion	100% for one EH						
15.00	Complete Gear box / gear set for CT motion	100% for one EH						
16.00	**Oil seals**							
i)	Oil seals for CT gear box	100% for one EH						
ii)	Oil seals for Hoist gear box	100% for one EH						
17.00	**Brakes**							
18.00	Brake liners for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
19.00	Brake springs for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
20.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
21.00	Diode bridge	100% for one EH						
22.00	Brake assembly for hoisting	100% for one EH						
23.00	Brake assembly for CT motion	100% for one EH						
24.00	**Wheels**							

S.No	Description of equipment / item	QUANTITY	HSN CODE	UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (Rs.)
i)	CT wheel assembly (complete) (driving)	100% for one EH						
ii)	CT wheel assembly (complete) (idle)	100% for one EH						
25.00	**Wire rope**							
a)	suitable for 12 m lift	100% for one EH						
26.00	Rope Guide	100% for one EH						
27.00	Rope Tightner	100% for one EH						
28.00	Rope sheave assembly	100% for one EH						
29.00	Rubber bushes for flexible couplings	100% for one EH						
30.00	Thrusters with cups and seals for electro-hydraulic thruster brakes	1 set for one EH						
31.00	Local Control Station	One (1) No. each type						
	Electrical spares							
32.00	Contactors	1 no of each type, size and rating for one EH						
33.00	Main contactors	1 set for one EH						
34.00	Auxiliary contactors	1 set for one EH						
35.00	Overload relays	1 no of each type, size and rating for one EH						
36.00	Relay	1 no of each type for one EH						
37.00	Timers of each type	1 set for one EH						
38.00	MCBs.	1 set for one EH						
39.00	MCCB	1 set for one EH						
40.00	Switch Fuse Units	1 No. for one EH						
41.00	Fuses of each type	1 set for one EH						
42.00	Fuse links	1 set for one EH						
43.00	Control circuit fuses	1 set for one EH						
44.00	Limit Switches for							
i)	Main Hoist	1 set for one EH						
ii)	Cross Travel	1 set for one EH						
45.00	Door limit switch	1 set for one EH						
46.00	Selector switch	1 set for one EH						
47.00	Current Collector shoes/ rollers	1 Set for one EH						
48.00	Complete current collector assembly	1 Set for one EH						
49.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH						
50.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH						
51.00	Control module of VVVF drive	1 no. of each type and rating for one EH						
52.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH						
53.00	Dynamic braking resistance	1 no. of each type and rating for one EH						
54.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH						
55.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH						
56.00	Indicating lamps of each type	1 set for one EH						
57.00	Electric meter	1 set for one EH						
58.00	Resistor element of each size and type	1 set for one EH						
59.00	Hooter	1 set for one EH						
60.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH						
ii)	Motor of travel motion	1 set for one EH						
iii)	Terminal plates	1 set for one EH						
iv)	Motor Terminal Block	1 set for one EH						
v)	Space Heaters	1 set for one EH						
vi)	Greasing arrangements	1 set for one EH						
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH						
viii)	Stator winding coils for all type of LT motors	1 set for one EH						
ix)	Rotor pinion	1 set						
x)	Dust seals and gaskets for each type of motors	1 set for one EH						
xi)	Cooling Fans	1 no for each type and rating of motor						
xii)	Fan Cover	1 no for each type and rating of motor						
xiii)	Complete Set of Coupling	1 set for one EH						
xiv)	End shield (DE & NDE)	1 set of each type						
61.00	Transformer	1 set for one EH						
62.00	1.1 KV Grade power cables for each type and size.	1 m						
63.00	1.1 KV Grade control cables for each type and size.	1 m						
64.00	Control Trailing Cable for Electrical Hoist	1 m						
65.00	Power Trailing Cable for Electrical Hoist	1 m						
66.00	Power terminal block	1 set for one EH						
67.00	Control terminal block	1 set for one EH						
68.00	End plates for Power & Control terminal block	1 set for one EH						
69.00	Carbon brushes and brush holders for all slip ring type motors	1 set for one EH						
70.00	Make and trip coils	1 set for one EH						
	Total (1 to 70)							
	ESSENTIAL SPARES (3T CAPACITY- HAZARDOUS AREA)							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH						
2.00	Bearings for gear box for hoisting motion	100% for one EH						
3.00	Bearings for gear box for CT motion	100% for one EH						
4.00	Hoist pulley bearings	100% for one EH						
5.00	Hook thrust bearing	100% for one EH						
6.00	Drum bearing	100% for one EH						
7.00	Bearing Seal	100% for one EH						
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH						

S.No	Description of equipment / item	QUANTITY	HSN CODE	UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (Rs.)
9.00	Input pinion for CT Gearbox	100% for one EH						
10.00	Gear wheel for Hoist Gearbox	100% for one EH						
11.00	Gear wheel for CT Gearbox	100% for one EH						
12.00	Internal clip for Hoist Gearbox	100% for one EH						
13.00	Internal clip for CT Gearbox	100% for one EH						
14.00	Complete Gear box / gear set for hoisting motion	100% for one EH						
15.00	Complete Gear box / gear set for CT motion	100% for one EH						
16.00	**Oil seals**							
i)	Oil seals for CT gear box	100% for one EH						
ii)	Oil seals for Hoist gear box	100% for one EH						
17.00	**Brakes**							
18.00	Brake liners for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
19.00	Brake springs for							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
20.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH						
ii)	CT brake	100% for one EH						
21.00	Diode bridge	100% for one EH						
22.00	Brake assembly for hoisting	100% for one EH						
23.00	Brake assembly for CT motion	100% for one EH						
24.00	**Wheels**							
i)	CT wheel assembly (complete) (driving)	100% for one EH						
ii)	CT wheel assembly (complete) (idle)	100% for one EH						
25.00	**Wire rope**							
a)	suitable for 12 m lift	100% for one EH						
26.00	Rope Guide	100% for one EH						
27.00	Rope Tightner	100% for one EH						
28.00	Rope sheave assembly	100% for one EH						
29.00	Rubber bushes for flexible couplings	100% for one EH						
30.00	Thrusters with cups and seals for electro-hydraulic thruster brakes	1 set for one EH						
31.00	Local Control Station	One (1) No. each type						
	Electrical spares							
32.00	Contactors	1 no of each type, size and rating for one EH						
33.00	Main contactors	1 set for one EH						
34.00	Auxiliary contactors	1 set for one EH						
35.00	Overload relays	1 no of each type, size and rating for one EH						
36.00	Relay	1 no of each type for one EH						
37.00	Timers of each type	1 set for one EH						
38.00	MCBs.	1 set for one EH						
39.00	MCCB	1 set for one EH						
40.00	Switch Fuse Units	1 No. for one EH						
41.00	Fuses of each type	1 set for one EH						
42.00	Fuse links	1 set for one EH						
43.00	Control circuit fuses	1 set for one EH						
44.00	Limit Switches for							
i)	Main Hoist	1 set for one EH						
ii)	Cross Travel	1 set for one EH						
45.00	Door limit switch	1 set for one EH						
46.00	Selector switch	1 set for one EH						
47.00	Current Collector shoes/ rollers	1 Set for one EH						
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50.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH						
51.00	Control module of VVVF drive	1 no. of each type and rating for one EH						
52.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH						
53.00	Dynamic braking resistance	1 no. of each type and rating for one EH						
54.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH						
55.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH						
56.00	Indicating lamps of each type	1 set for one EH						
57.00	Electric meter	1 set for one EH						
58.00	Resistor element of each size and type	1 set for one EH						
59.00	Hooter	1 set for one EH						
60.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH						
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iii)	Terminal plates	1 set for one EH						
iv)	Motor Terminal Block	1 set for one EH						
v)	Space Heaters	1 set for one EH						
vi)	Greasing arrangements	1 set for one EH						
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH						
viii)	Stator winding coils for all type of LT motors	1 set for one EH						
ix)	Rotor pinion	1 set						
x)	Dust seals and gaskets for each type of motors	1 set for one EH						
xi)	Cooling Fans	1 no for each type and rating of motor						
xii)	Fan Cover	1 no for each type and rating of motor						
xiii)	Complete Set of Coupling	1 set for one EH						
xiv)	End shield (DE & NDE)	1 set of each type						
61.00	Transformer	1 set for one EH						
62.00	1.1 KV Grade power cables for each type and size.	1 m						

S.No	Description of equipment / item	QUANTITY	HSN CODE	UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	FREIGHT CHARGES WITHOUT GST @ % OF TOTAL EX WORKS (INR) (RS.)	APPLICABLE GST RATE % ON (TOTAL EX WORKS + FREIGHT) (INR)	TOTAL F.O.R. SITE PRICE (Rs.)
63.00	1.1 KV Grade control cables for each type and size.	1 m						
64.00	Control Trailing Cable for Electrical Hoist	1 m						
65.00	Power Trailing Cable for Electrical Hoist	1 m						
66.00	Power terminal block	1 set for one EH						
67.00	Control terminal block	1 set for one EH						
68.00	End plates for Power & Control terminal block	1 set for one EH						
69.00	Carbon brushes and brush holders for all slip ring type motors	1 set for one EH						
70.00	Make and trip coils	1 set for one EH						
	Total (1 to 70)							
	GRAND TOTAL OF [A to J] (TOTAL EX-WORKS VALUE SHOULD BE EQUALTO VALUE DERIVED BASED ON % WEIGHTAGE INDICATED AT S.N. 1.6.0 OF ANNEX-I PRICE SCHEDULE)							

	NOTE
1)	ONE SET SHALL MEAN 100% REQUIREMENT FOR ONE ELECTRIC HOIST.FOR DETAIL REFER ANNEXURE II , SUB SECTION IIA OF TECHNICAL SPECIFICATION NO PE-TS-RC3-563-A002.
2)	ABOVE QUOTED UNIT RATES SHALL BE CONSIDERED FOR ORDERING AS PER ACTUAL PROJECT REQUIREMENT.

ANNEXURE-II DEVIATION SHEET (COST OF WITHDRAWAL)									
PROJECT:-						Framework Agreement (Rate Contract)			
PACKAGE :-						Electric Hoist			
TENDER ENQUIRY :-									
NAME OF THE BIDDER									
Sl. No.	Volume/Section	Page No.	Clause No.	Technical Specification/Tender Document No	Complete Description of Deviation	Cost of withdrawal of deviation to be entered by the bidder in	Reference of price Schedule of which Cost of Withdrawal of Deviation is applicable	Nature of cost of withdrawal of deviation (Positive/Negative)	Reasons for quoting deviation
1	**TECHNICAL DEVIATION**								
1.01									
1.02									
1.03									
1.04									
1.05									
2	**COMMERCIAL DEVIATION**								
2.01									
2.02									
2.03									
2.04									
2.05									

NOTES:

1. Cost of Withdrawal of deviation will be applicable on the basic price (i.e. excluding taxes, duties & freight) only.
2. All the bidders have to list out all their technical & commercial deviations (if any) in details in the above format.
3.Any deviation not mentioned above and shown separately or found hidden in offer, will not be taken cognizance of.
4.Bidder shall submit duly filled unpriced copy of above format indicating "quoted" in "cost of withdrawl of deviation" column of the schedule above along with their Techno-commercial offer, wherever applicable. In absence of same, such deviation(s) shall not be considered and offer shall be considered in total compliance to NIT.
5. Bidder shall furnish price copy of above format along with price bid.
6.The final decision of acceptance/ rejection of the deviations quoted by the bidder shall be at discretion of the Purchaser.
7.Bidders to note that any deviation (technical/commercial) not listed in above and asked after Part-I opening shall not be considered.
8. For deviations w.r.t. Credit Period, Liquidated damages, Firm prices if a bidder chooses not to give any cost of withdrawl of deviation loading as per Annexure-VII of GCC, Rev-07 will apply. For any other deviation mentioned in un-priced copy of this format submitted with Part-I bid but not mentioned in priced copy of this format submitted with Priced bid, the cost of withdrawl of deviation shall be taken as NIL.
9. Any deviation mentioned in priced copy of this format, but not mentioned in the un-priced copy, shall not be accepted.
10. All techno-commercial terms and conditions of NIT shall be deemed to have been accepted by the bidder, other than those listed in unpriced copy of this format.
11. Cost of withdrawl is to be given seperately for each deviation. In no event bidder should club cost of withdrawl of more than one deviation else cost of withdrawl of such deviations which have been clubbed together shall be considered as NIL.
12. In case nature of cost of withdrawl (positive/negative) is not specified it shall be assumed as positive.
13. In case of descrepancy in the nature of impact (positive/ negative), positive will be considered for evaluation and negative for ordering.

BHEL / PEM / CMM
SPECIAL CONDITIONS OF RATE CONTRACT

ANNEXURE II TO MOP
SPECIAL CONDITION OF RATE CONTRACT FOR ELECTRIC HOIST

1. BHEL/PEM intends to enter into Framework Agreement (Rate Contract) for supply of the Electric Hoist. Framework Agreement (Rate Contract) Validity for ordering shall be two years from the purchase order for Rate Contract.

2. BHEL-PEM will place purchase order for Framework Agreement (Rate Contract) only on suppliers who are registered with BHEL-PEM. Bidders who are not registered with BHEL-PEM needs to apply & get registered for subject package with PEM before Reverse Auction & hence they need to apply online for registration on PEM web portal & have to enclose acknowledgement with the bid documents else their bid may not be considered for evaluation.

The bidders who are not registered with BHEL-PEM may apply for registration in BHEL-PEM through Registration Portal available at www.pem.bhel.com -->vendor section-->online supplier registration. All credentials and/or documents duly signed & stamped related to registration has to be uploaded on the website & submit the application for registration. One set of hard copy filled-up SRF downloaded from Online Registration Portal duly signed & stamped has to be submitted.

3. Framework Agreement (Rate contract) is proposed to be done with 2 suppliers in ratio of 70:30 value wise at L1 FOR site price (Ex-works + freight) for this package. However, order for a project shall not be split.

4. Quantity variation shall be applicable as +- 30 % of the contract value. Bidders shall be informed that the quantities indicated in the tender are tentative quantities. No minimum quantity is guaranteed by BHEL.

5. This tender is issued by BHEL PEM for Framework Agreement (Rate Contract) of Electric Hoist required at various BHEL project sites. All bidders will be informed the following –

a) As and when requirement arises, the concerned Project Groups of BHEL-PEM will place order directly on the supplier against the Framework Agreement (Rate Contract).

b) The drawings/ documents submission & approval, submission of Performance Security/Performance Bank Guarantee, submission of invoices, processing and release of payment after supply of material shall be dealt as per Framework Agreement (Rate Contract) contract terms and shall be directly done with Project Groups which has placed purchase order noted at sl.no. (a) above.

6. Details of consignee and project site information for dispatch of material shall be intimated at the time of placement of PO for specific project after finalization of RC

7. The items will be required against respective projects. Exact quantities and Project information shall be intimated while placing order for a specific project based on the Rate Contract.

8. The prices shall be FIRM during the period of two years with a provision for further extension after review on mutual consent.

9. Inspection of materials shall be carried out by BHEL/CQA and or by Customer or by an authorized agency at manufacture's works before dispatch, if required. Dispatch of material to be done, only after receipt of BHEL/Customer MDCC. It is responsibility of vendor to for obtain Material Dispatch Clearance Certificate (MDCC) from BHEL or Customer as required before dispatch of material.

   Vendor shall give inspection call on BHEL-CQS web site to applicable inspection agency with a copy of inspection call to BHEL-PEM for arranging Customer participation (if applicable) in inspection / Joint inspection on the proposed date with an advance notice of 15 working days. Inspection charges shall be paid by BHEL-PEM.

Items have to be manufactured as per specification and supplied strictly in accordance with the approved BHEL / Customer's Drawings & Quality Plan. The items/ test certificate of items, which for any reason are not acceptable to BHEL / Customer, shall be required to be retested. No extra charge shall be payable on those account by BHEL.

10. Other terms and conditions shall be as per Standard Technical specification no, GCC Rev 07 & Corrigenda 01 to GCC Rev 07, Enquiry letter.

11. This enquiry is subject to Conditions/ limits if any imposed in PMD/ Vendor registration.

12. Tentative quantity is given in enquiry.

13. Bidders to submit offer for RC of said items ONLINE via BHEL-GePNIC Portal only. Bidder to upload tender documents complete in all respects duly signed & stamped on each and every page by the authorized signatory of the bidder as a token of acceptance of all the terms and conditions of tender.

14. The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendor/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL web site http://www.bhel.com and shall immediately bring to the notice of BHEL Management about any fraud as soon as it comes to their notice.

List of Projects

1. 2X800MW NTPC LARA STPP-STAGE II EPC
2. 2 X 800 MW MEL SINGRAULI TPP -BANDHAURA
3. 2 X 660 MW NTPC TALCHER TPP STAGE-III
4. 1X800 MW TANGEDCO North Chennai-III FGD
5. 2X500MW NTPL TUTICORIN FGD
6. 2x800 MW SINGRAULI STAGE-III
7. 1x800 MW YAMUNANAGAR
8. 2x660 MW RAGHUNATHPUR
9. 3x800 MW TALABIRA
10. PARICHHA FGD

Make In India certification

Letter head of Company/Cost Auditor/Statutory Auditor

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: Enquiry No. PE-LPI/1474 dated

Name of Package:

Dear Sir,
We hereby certify that items offered by us of "----------" meets the requirement in line with NIT and 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 and subsequent orders if any.

Local Content:_____ %

We further confirm that details of location at which the local value addition will be done at our works located at …….....
..... (complete address of the works)

Yours truly
……. (authorized signatory of company)
…… (firm name)

Land Border Certificate

GeM Bid Number: **Dated:**

Tender Title:

This has reference to order no. F.No.7/10/2021-PPD, Ministry of Finance, Department of Expenditure, Public Procurement Division. We, M/s _____**,** confirm the following:

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries; I certify that this M/s _____ *is not from such a country.*

I hereby certify that this M/s _____ *fulfills all requirements in this regard and is eligible to be considered.*

Signature with Company seal

Annexure-1

INTEGRITY PACT

Between

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

and

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

Preamble

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

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

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

Section 1- Commitments of the Principal

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

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

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

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

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

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

2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. The Bidder(s)/ Contractor(s) commits himself to observe the following principles during participation in the tender process and during the contract execution.

2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and shall await their decision in the matter.

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

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

Section 4 - **Compensation for Damages**

4.1 If the Principal has disqualified the Bidder (s) from the tender process before award / order acceptance according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security.

4.2 If the Principal is entitled to terminate the Contract according to Section 3, or terminates the Contract in application of Section 3 above , the Bidder(s)/ Cotractor (s) transgression through a violation of Section 2 above shall be construed breach of contract and the Principal shall be-entitled to demand and recover from the Contractor an amount equal to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee , whichever is higher, as damages, in addition to and without prejudice to its right to demand and recover compensation for any other loss or damages specified elsewhere in the contract.

Section 5 - Previous Transgression

5.1 The Bidder declares that no previous transgressions occurred in the last 3 (three) years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason or action can be taken as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 6 - Equal treatment of all Bidder (s)/ Contractor (s) / Sub-contractor (s)

6.1 The Principal will enter into Integrity Pacts with identical conditions as this Integrity Pact with all Bidders and Contractors.

6.2 In case of Sub-contracting, the Principal Contractor shall take the responsibility of the adoption of Integrity Pact by the Sub-contractor(s) and ensure that all Sub-contractors also sign the Integrity Pact.

6.3 The Principal will disqualify from the tender process all Bidders who do not sign this Integrity Pact or violate its provisions.

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

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

Section 8 -Independent External Monitor(s)

8.1 The Principal appoints competent and credible panel of Independent External Monitor (s) (IEMs) for this Integrity Pact. The task of the IEMs is to review independently and objectively, whether and to what extent the parties comply with the obligations under this Integrity Pact.

8.2 The IEMs are not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.

8.3 The IEMs shall be provided access to all documents/ records pertaining to the Contract, for which a complaint or issue is raised before them as and when warranted. However, the documents/records/information having National Security implications and those documents which have been classified as Secret/Top Secret are not to be disclosed.

8.4 The Principal will provide to the IEMs sufficient information about all meetings among the parties related to the Contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the IEMs the option to participate in such meetings.

8.5 The advisory role of IEMs is envisaged as that of a friend, philosopher and guide. The advice of IEMs would not be legally binding and it is restricted to resolving issues raised by a Bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some Bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.

8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process or during execution of Contract, the matter should be examined by the full panel of IEMs jointly, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.

8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to the CMD, BHEL at the earliest. They may also send their report directly to the CVO, in case of suspicion of serious irregularities requiring legal/ administrative action. Only in case of very serious issue having a specific, verifiable Vigilance angle, the matter should be reported directly to the Commission. IEMs will tender their advice on the complaints within 30 days.

8.8 The CMD, BHEL shall decide the compensation to be paid to the IEMs and its terms and conditions.

8.9 IEMs should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the Prinicpal should be looked into by the CVO of the Principal.

8.10 If the IEMs have reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code / Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the IEMs may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8.11 After award of work, the IEMs shall look into any issue relating to execution of Contract, if specifically raised before them. As an illustrative example, if a Contractor who has been awarded the Contract, during the execution of Contract, raises issue of delayed payment etc. before the IEMs, the same shall be examined by the panel of IEMs. Issues like warranty/ guarantee etc. shall be outside the purview of IEMs.

8.12 However, the IEMs may suggest systemic improvements to the management of the Principal, if considered necessary, to bring about transparency, equity and fairness in the system of procurement.

8.13 The word `Monitor' would include both singular and plural.

Section 9 - Pact Duration

9.1 This Integrity Pact shall be operative from the date this Integrity Pact is signed by both the parties till the final completion of contract for successful Bidder, and for all other Bidders 6 months after the Contract has been awarded. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.

9.2 If any claim is made/ lodged during currency of this Integrity Pact, the same shall be binding and continue to be valid despite the lapse of this Pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 - Other Provisions

10.1 This Integrity Pact is subject to Indian Laws and exclusive jurisdiction shall be of the competent Courts as indicated in the Tender or Contract, as the case may be.

10.2 Changes and supplements as well as termination notices need to be made in writing.

10.3 If the Bidder(s)/ Contractor(s) is a partnership or a consortium or a joint venture, this Integrity Pact shall be signed by all partners of the partnership or joint venture or all consortium members.

10.4 Should one or several provisions of this Integrity Pact turn out to be invalid, the remainder of this Integrity Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

10.5 Only those bidders / contractors who have entered into this Integrity Pact with the Principal would be competent to participate in the bidding. In other words, entering into this Integrity Pact would be a preliminary qualification.

10.6 In the event of any dispute between the Principal and Bidder(s)/ Contractor(s) relating to the Contract, in case, both the parties are agreeable, they may try to settle dispute through Mediation before the panel of IEMs in a time bound manner. In case, the dispute remains unresolved even after mediation by the panel of IEMs, either party may take further action as the terms & conditions of the Contract. The fees/expenses on dispute resolution through mediation shall be shared by both the parties. Further, the mediation proceedings shall be confidential in nature and the parties shall keep confidential all matters relating to the mediation proceedings including any settlement agreement arrived at between the parties as outcome of mediation. Any views expressed, suggestions, admissions or proposals etc. made by either party in the course of mediation shall not be relied upon or introduced as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the dispute that is the subject of mediation proceedings. Neither of the parties shall present IEMs as witness in any Alternative Dispute Resolution or judicial proceedings in respect of the dispute that was subject of mediation.

For & On behalf of the Principal
(Office Seal)

For & On behalf of the Bidder/ Contractor
(Office Seal)

Place _____
Date _____

Witness:_____
(Name & Address) _____
_____

Witness:_____
(Name & Address) _____
_____

Clause on IP in the tender

Integrity Pact (IP)

(a) IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner. Following Independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.

Sl	IEM	Email
1.	Shri Otem Dai, IAS (Retd.)	iem1@bhel.in
2.	Shri Bishwamitra Pandey, IRAS (Retd.)	iem2@bhel.in
3.	Shri Mukesh Mittal, IRS (Retd.)	iem3@bhel.in

(b) The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/ three part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification.

(c) Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEMs shall be done through email only.

Note:

No routine correspondence shall be addressed to the IEM (phone/ post/ email) regarding the clarifications, time extensions or any other administrative queries, etc on the tender issued. All such clarification/ issues shall be addressed directly to the tender issuing (procurement) department's officials whose contact details are provided below:

Details of contact person(s):

(1)
Name:_____
Deptt: _____
Address: _____
Phone: (Landline/ Mobile)
_____
Email: _____
Fax: _____

(2)
Name:_____
Deptt: _____
Address: _____
Phone: (Landline/ Mobile)
_____
Email: _____
Fax: _____