Project Engineering Management

Bharat Heavy Electricals Limited

(A Govt. Of India Undertaking)

Ref. Enquiry No.: PE/PG/RTC/E-6157/2018 **Dated: 22.03.2019**

TENDER ENQUIRY THROUGH E-PROCUREMENT

DUE DATE
12.04.2019
BY 02:00PM

SUBJECT: TENDER ENQUIRY FOR RATE CONTRACT OF ELECTRIC HOIST AS PER TECHNICAL SPECIFICATION NO. PE-TS-RC-563-A002 Rev 00

OUR REF: TENDER ENQUIRY NO: PE/PG/RTC/E-6157/2018, DTD-22.03.2019

Dear Sir/ Ma'am,

We are pleased to invite your offer for subject package in two parts strictly as per Clause-2.0 of the enclosed **"Instructions to Bidders"**. Please upload your best quotation/ offer on https://bhel.abcprocure.com for the requirement strictly as per schedule of price format before above mentioned due date & time. The details of the tender enquiry are as mentioned below:

Sl. No	Description for which Rate Contract is desired	Tentative Quantity	Delivery required
1	**ELECTRIC HOISTS-** Refer Technical Specification no. PE-TS-RC-563-A002 Rev 00 for detailed description.	As per BOQ cum price schedule in Annexure-I, II, II, IV & V) cumulative for the Prospective Projects as per Annexure-VII	**For Main Supply-** "Four (04) months from drawing/doc approval for respective project/requirement under the RC. Other schedules like submission of drawings, approval of drawings, inspection etc. shall be as per the Technical Specification no. PE-TS-RC-563-A002 Rev 00 (Drawings/Documents schedule as per Annex-V in Section-II page 50 of 116). In case there are delays in drawing/docs submission and resubmission, that much delay would be reduced from delivery period" **For Essential Spares:** Essential Spares to be delivered within 04 months from manufacturing clearance. Separate dispatch/ manufacturing clearance will be issued for Essential Spares. **For Services at Site (supervision of E&C)**: Vendor to depute their representative to site for carrying out above activities within two weeks of intimation by BHEL, subject to site readiness, failing which LD @ 0.5% per week or part thereof of total contract value for Services at Site for that project shall be levied limited to 10% of contract value for Services at Site.

Your best quotation/offer for the above requirement, in line with our terms and conditions, should be submitted online via e-procurement system. It shall be the responsibility of the bidder to ensure that the Tender is submitted on or before the due date by 2 p.m. Part-I bids shall be opened at 3 p.m. on the due date in the presence of authorized representatives of the bidders, who may like to be present.

Note: -

1. Please note that Part Supplies offered for tender BOQ shall disqualify the bidder's offer.

2. Documents and Credential as per Technical PQR, Techno Commercial Bids and Price Bids should be uploaded on the e-procurement portal.

Please refer GCC Rev-06 & Corrigenda to GCC Rev 06 which is available on www.bhelpem.com. You are requested to kindly download the same.

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DY MANAGER/CMM
BHEL/PS-PEM
POWER PROJECT ENGINEERING INSTITUTE,
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(OFF) 0120-4213591, 9911170053

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1. **Rate contract is proposed for two (2) years (with a provision for further extension after review on mutual consent) in the ratio of 70:30 value wise at L1 FOR SITE price for this package (% of splitting of RC between 2 vendors may be changed during ordering process if any of the bidder in RC is not customer approved & same is to be acceptable to bidders).**

2. L1 Rates shall be counter offered to all bidders who participated in Price Bid Opening/RA for 30% value and in case acceptance of counter offer received from more than one vendor then **acceptance shall be considered as per FINAL Price Bid Opening / Reverse Auction Ranking (as applicable)**. If none accepts L1 rates, RC shall be done with L1 vendor for 100% value.
3. **Evaluation will be done on overall L1 (Total cost to BHEL excluding GST) basis with necessary loading as applicable.**
4. **Rate Contract is proposed to be finalized on total lump sum basis. However, there is % allocation weightage against BOQ quantity of each item which shall be used for arriving at price break up and same will also ensure that item rates of L1 bidder will be lowest for each items compared with other bidders' rate.**

5. Bidders to note the following: -
   i. Rate contract shall be decided on the basis of grand Total Ex works price & Freight Charges of Total BOQ of Electric Hoists as listed in Annexure-I, II, III, IV & V.
   ii. Bidder to give single % of freight charges considering anywhere in India in the freight column. Bidders have to give same % of freight for each line item of Price Schedule.
   iii. Bidders have to quote freight charges in terms of percentage of their quoted total Ex-Works prices. If any bidder will quote freight as Nil/Included, Freight@ 5.67% shall be added to BHEL estimates for evaluating offer of such bidders.
   iv. Bidders to mention applicable GST rate on (total Ex. works + freight) in the specified cells of price schedule. However, may please note that GST shall not be considered in evaluation.
   v. Though evaluation is proposed on Ex Works + Freight, but there is % allocation weightage against BOQ quantity of each item (refer Annexure-I) which shall be used for arriving at price break up. **Bidders need to give only their total ex works price for given BOQ of Main Supply, Spares, Additional Items & Services for respective BOQ at the specific cells ("X") that has been kept opened in the price schedule available in the e-procurement portal (i.e. sl. no. 1.0.0 column no. 9 of Annexure-I). Also Bidders have to fill-up prices for commissioning spares (Annex-II), additional items (Annex-III), Supervision of E&C (Annexure-IV) & essential spares (Annex-V), however total ex-works component for each is to be maintained as per % weightage given in Annexure-I at sl. 1.3.0, 1.4.0, 1.5.0 & 1.6.0 respectively.**
   vi. Rest of the prices shall be derived by BHEL in line with allocation fixed for each item. There is formula applied in price schedule form available in e-procurement portal. As soon as bidder fills the cells for Total Ex works, freight percentage and GST percentage, rest values for e.g. unit ex works – item wise, total ex works – item wise, FOR site price – item wise will filled automatically. Bidders can also validate and cross check the same by using Check Formula button.
   vii. For better clarity to the bidders where value is to be filled is noted as "to be quoted" and for other columns it will be noted as "derived" which denotes shall be derived by BHEL as per allocation fixed against each item.
   viii. HSN Code has been incorporated in BOQ (refer Price Schedule).
   ix. Incomplete offer shall be summarily rejected.
   x. Pre-Qualifying Requirements (PQR): All the bidders (registered/ non-registered) will be asked to submit documents fulfilling PQR requirements along with the bid & their further evaluation shall be done accordingly.

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xi. Bidders to note that their bid shall be conditional subject to qualify PQR by registered vendors & non-registered vendors have to qualify PQR & get registered with PEM for the package.

xii. Additional overhead charges shall be 5% instead of 30% as mentioned in clause no 26.2 of GCC Rev 06

xiii. Quantity variation shall be +30%. Project list is indicative only, BHEL may ask for delivery anywhere in India for any of the project added in the prospective project/ existing projects during RC period.

xiv. CIF is not applicable for the package.

xv. Integrity pact is applicable for this tender.

xvi. Bidders to note Model Conciliation Clause under BHEL Conciliation Scheme, 2018 as per Annexure-X.

xvii. In case of joint bidding, Bidders shall be required to furnish scope matrix which should be clearly defined between foreign bidder and their Indian representative along with the offer for the Main Supply and Erection & Commissioning.

xviii. Bidders are requested to refer following clause regarding Public Procurement (Preference to Make in India) - PPP-MII.

"For this procurement, Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017 & 28.05.2018 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. Vendors are requested to go through the above mentioned orders and confirm the following:"

- The local supplier at the time of tender, bidding or solicitation shall be required to provide self-certification that the item offered meets the minimum local content as per above mentioned orders and shall give details of the location(s) at which the local value addition is made.

TERMS AND CONDITIONS:

1. Procurement of the subject package shall be done through e-procurement
2. Enquiry No., due date etc. must be legibly super scribed on the offers as per clause no. 2.0 of "Instructions to Bidders".
3. Offers should be uploaded in two parts online at https://bhel.abcprocure.com as follows:
   a) Part-I Bid: - Documents and Credential as per Technical PQR and Techno-Commercial offer (along with un-priced copy of un-priced bid and un-priced schedule of Technical-Commercial Deviation, Annexure I & II)
   b) Part II Bid: - Price Bid and Priced schedule of Technical-Commercial Deviation
4. Bidder to note that this is a conditional Tender enquiry and the price bid (Part-II) opening/RA participation shall be subject to following condition:
   a) Techno-commercial qualification/recommendation of bidder by the BHEL-PEM
5. Terms and conditions: -
   a) Part I bid will be opened on date & time mentioned in the NIT or subsequent corrigenda/amendments, if any.
   b) **Techno-commercial offer of only those bidders shall be evaluated who will meet the Technical pre-qualifying requirement of the tender.**
6. **Bidders shall submit their offers meeting the requirements of the following tender documents and other Terms and Conditions included in this Enquiry Letter:**
   - **ANNEXURE-I of GCC Rev. 06**: Letter to be furnished by the Bidders.

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- **ANNEXURE-II: DEVIATION SHEET (COST OF WITHDRAWL)** - To be furnished by the Bidders

All the above Tender Documents shall automatically become a part of the Order/Contract after its finalisation.

7. Vendors shall quote in accordance with the requirements mentioned in the tender documents. In case of deviations (Technical/ Commercial), the same shall be highlighted separately giving Clause references along with the Cost of withdrawal of Deviations as per **Annexure-II to GCC Rev 06 of "DEVIATION SHEET (COST OF WITHDRAWL)"** along with reasons for taking such deviations

   Bidder to note all the points mentioned in "Notes" of Annexure-II to GCC Rev 06

8. ***Please note the following:***

   a. Price format is enclosed for compliance.

   b. SCC enclosed for compliance.

   c. GCC enclosed for compliance. GCC Rev-06 is available on www.bhelpem.com. You are requested to kindly download the same. GST related corrigenda to GCC Rev.06 is enclosed.

9. Tenders shall be submitted strictly in accordance with the requirements of the above tender documents.
10. Standard pre-printed terms & conditions of the tenderers shall not be considered valid.
11. Validity of offer shall be as per **Clause No. 7.0, "Instructions to Bidders" of GCC Rev 06.**
12. Unsolicited fresh/revised Price Bids shall not be entertained.
13. Purchaser shall be under no obligation to accept the lowest or any other tender and shall be entitled to accept or reject any/all tender(s) in part or full without assigning any reason whatsoever.
14. Late tenders will be rejected.
15. **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) have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL:**

S No.	IEM	Address	
1	Shri D. R. S Chaudhary, IAS (Retd)	E-1/164, Arera Colony, Bhopal 462016 (M. P.)	Dilip.chaudhary@icloud.com
2	Mrs. Pravin Tripathi IA & AS (Retd.)	D-243, Anupam Gardens, Lane IB, Neb Sarai, Sainik Farms, New Delhi- 110068	Pravin.tripathi@gmail.com

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. (Refer Annexure-XI for Integrity pact).

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 the any of the IEMs mentioned in the NIT. All correspondence with the IEMs shall be done through email only.

"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 officials whose contact details are provided above in NIT".

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16. Tenders and all correspondence thereof, shall be addressed to the undersigned by name & designation and sent at the following address:

Mr. I P SINGH, DGM/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 **Kind Attn: I P SINGH/ CMM** **E-MAIL: indra.pal.singh@bhel.in** **Ph. No. 0120-4368749 ,9818989654**	**Mr. N C SHARMA, DY 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 **Kind Attn: N C SHARMA/ CMM** **E-MAIL: ncsharma@bhel.in** **Ph. No. 0120-4213591 ,9911170053**

17. Definition of Terms is also enclosed. These definitions will apply to all the tender documents including this Enquiry Letter.

18. **PRE-QUALIFICATION REQUIREMENT: -**
Bidders is requested to fill up the details in "TECHNICAL PRE-QUALIFYING REQUIREMENT" as per the conditions mentioned in the PQR and also to submit the credentials.
Bids of only those bidders shall be evaluated who meet the Technical pre-qualifying requirements (if applicable).

19. Bidders to note that their bid shall be conditional subject to qualify PQR by registered vendors & non-registered vendors have to qualify PQR & get registered with PEM for the package.
For registration in PEM "Bidders needs to apply & get registered for subject package with PEM before P-2 (price bid opening) & **hence you need to apply online for registration on PEM web portal & have to enclose acknowledgement with this effect with the bid documents**"

20. Bidder has to submit "NO DEVIATION CERTIFICATE FOR COMMERCIAL TERMS AND CONDITIONS AS PER GCC (06), SCC AND NIT". In case of deviations, bidder to clearly mention the same with their techno-commercial offer.

21. All the above Tender Documents shall automatically become a part of the Order/Contract after its finalization.

22. **The offers of the bidders who are on the banned list as also the offer of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL website www.bhel.com.**

23. **"The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website http://www.bhel.com and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice."**
BHEL Fraud prevention policy is also uploaded in vendor's section on www.bhelpem.com.

24. **Bidders are requested to visit constantly our website to update themselves for any technical or commercial change in the NIT.**

25. All corrigenda, addenda, amendments, time extensions, clarifications etc. to the tender will be hosted on BHEL websites only (www.bhelpem.com., www.bhel.com & https://bhel.abcprocure.com under subject tender reference. Bidders are requested to visit our websites from time to time to keep themselves updated. **Bidders**

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may go through the Sellers' manual & Help documents provided on E-Procurement Portal website & obtain required Digital Signature Certificate for participating in the subject Tender.

26. Bidders to submit their offers strictly in line with the enclosed price format.
27. Inspection shall be done by BHEL/ END CUSTOMER/Third party Agency (finalized by BHEL).
28. Any other taxes & duties applicable on the date of bid but not quoted by the bidders shall be to bidder account.
29. Delivery terms for dispatches shall be FOR Dispatch Station.
30. This enquiry is subject to Conditions/ limits if any imposed in PMD / Vendor registration.
31. Foreign & indigenous bidders participating through open/limited tender will necessarily have to but class III DSCs issued by the certifying authorities in India. Basic procedure/ checklist is uploaded on www.bhel.com.
32. Non- registered bidder to submit the credentials required for Registration in BHEL PEM: -
"Online Registration Portal is operational in BHEL. Non-registered Vendors, who wish to apply for registration with BHEL-PEM, have to apply through Online Registration Portal available at www.bhelpem.com - vendor section - Online Supplier Registration. All credentials and/or documents duly signed and stamped related to registration has to be uploaded on the website and submit the application for registration. One set of hard copy of the filled-up SRF downloaded from Online Registration Portal duly signed and stamped has to be submitted."
33. Purchaser reserves the right to split up the scope of the tender enquiry and place the orders for different scope/ items with different bidders and also increase or decrease the quantity.
34. BHEL reserves the right to go for Reverse Auction (RA) (Guidelines as available on www.bhel.com) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. Bidders to give their acceptance with the offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA.
Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'Process compliance form' (to the designated service provider) as well as 'Online sealed bid' in the Reverse Auction. Non-submission of 'Process compliance form' or 'Online sealed bid' by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).

The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with the offer. The envelope sealed price bid of successful L1 bidder in RA, if conducted, shall also be opened after RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. The bidder having submitted this offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rates.

If it is found that L1 bidder has quoted higher in online sealed bid in comparison to envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender in the unit, it will be considered as fraud and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com)."

As a reminder to the bidders, system will flash following message (in RED Color) during the course of 'online sealed bid':

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"Bidders to submit online sealed bid less than or equal to their envelope sealed bid already submitted to BHEL"

Detailed guidelines of reverse auction 2016 are available in "information section" of www. bhelpem.com, same are applicable for subject tender.

Link for RA guidelines to be followed as:
http://www.bhel.com/vender_registration/pdf/Guidelines%20for%20Reverse%20Auction-2016.pdf

IMPORTANT INSTRUCTION TO BIDDERS IN CASE OF REVERSE AUCTION

"The Bidders have to quote the Single Price (i.e. Total Ex-works + Freight) (excl. GST) in Reverse Auction. Price are to be inclusive of Packing & Forwarding charges, all the routine & type tests as per tender scope, Freight as applicable, including loading (if any). De-loading (if any) shall be done in line with NIT terms".

35. If any bidder has mentioned the term Not Applicable / Not required / Not Quoted in BHEL price format. The bidder needs to substantiate the same. If the same item will be required in future for the system same will be supplied free of cost.
36. L1 bidder will have to submit Bank Guarantee for each POs (irrespective of value) which will be placed under the Rate Contract finalised through this tender considering RC as original contract as per format mentioned in **Annexure-IX** to NIT instead of format mentioned in GCC Rev 06
37. All other terms and conditions shall be as per GCC Rev 06 and Special Conditions of Rate Contract as per attached Annexure-VII. In the event of any contradiction in the terms and conditions mentioned, the order of preference shall be NIT / corrigenda related to GCC Rev.06/ Rate contract SCC / GCC Rev. 06

Thanking you,
Yours faithfully,
For and on behalf of BHEL

नरेश चन्द्र शर्मा / Naresh Chandra Sharma
उप प्रबंधक (सी. एम. एम.) / Dy. Manager (C.M.M.)
भारत हेवी इलेक्ट्रिकल्स लिमिटेड / Bharat Heavy Electricals Ltd.
पावर सेक्टर–परियोजना अभियांत्रिकी प्रबंधन
Power Sector-Project Engineering Management
पीपीईआई भवन, एच.आर.ई. ... काम्पलेक्स
PPEI Bldg, ...
प्लाट नं. 25, ...
Plot No. 25 ...

22/03

N C Sharma/Dy. Mgr.
(Name & Signature of official)

Enclosure:

1. Enquiry Terms & Conditions
2. Price Format– Annexure I, II, III, IV & V
3. Techno-Commercial Deviation Sheet (As per GCC Rev 06) – Annexure VI
4. RC-SCC – ANNEXURE VII
5. Prospective Project List – Annexure VIII
6. Annexure IX - BG Format
7. Annexure-X- Model Conciliation Clause under BHEL Conciliation Scheme, 2018
8. Integrity Pact-Annexure-XI
9. Technical PQR-Annexure-XII
10. Technical Specifications
11. Corrigenda to GCC Rev 06

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ANNEXURE- I

PRICE FORMAT-RATE CONTRACT FOR ELECTRIC HOIST

S.No	Description of equipment / item	UOM	TOTAL TENTATIVE QUANTITY	HSN CODE	UNIT EX-WORKS PRICE (DULY PACKED)IN PERCENTAGE OF TOTAL EX WORKS PRICE OF ELECTRIC HOIST GIVEN AT SL NO-1.00 OF COUMN 9	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 COUMN 9	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	11	12
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						100.00	TO BE QUOTED = Rs X	Derived	Derived	Derived
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	NOS	2	84251110	0.1836	Derived	0.3673	Derived			Derived
1.1.2	Non hazardous Capacity-2T Lift-6 m	NOS	8	84251110	0.1946	Derived	1.5566	Derived			Derived
1.1.3	Non hazardous Capacity-2T Lift-12m	NOS	10	84251110	0.1989	Derived	1.9895	Derived			Derived
1.1.4	Non hazardous Capacity-3T Lift - 6 m.	NOS	36	84251110	0.2267	Derived	8.1613	Derived			Derived
1.1.5	Non hazardous Capacity-3T Lift - 9m	NOS	65	84251110	0.2325	Derived	15.1138	Derived			Derived
1.1.6	Non hazardous Capacity - 3T Lift -12m.	NOS	3	84251110	0.2505	Derived	0.7515	Derived			Derived
1.1.7	Non hazardous Capacity - 3T Lift- 15m.	NOS	6	84251110	0.2810	Derived	1.6862	Derived			Derived
1.1.8	Non hazardous Capacity -3T Lift- 24m.	NOS	1	84251110	0.3585	Derived	0.3585	Derived			Derived
1.1.9	Non hazardous.Capacity - 3T Lift- 32m.	NOS	1	84251110	0.3635	Derived	0.3635	Derived			Derived
1.1.10	Non hazardous.Capacity-5T Lift- 6m	NOS	16	84251110	0.2737	Derived	4.3786	Derived			Derived
1.1.11	Non hazardous.Capacity- 5T Lift- 9m	NOS	63	84251110	0.3010	Derived	18.9626	Derived			Derived
1.1.12	Non hazardous Capacity- 5T Lift-15m.	NOS	8	84251110	0.3280	Derived	2.6236	Derived			Derived
1.1.13	Non hazardous Capacity - 5T Lift- 24m	NOS	4	84251110	0.3684	Derived	1.4735	Derived			Derived
1.1.14	Non hazardous Capacity - 5T Lift- 32m	NOS	1	84251110	0.4043	Derived	0.4043	Derived			Derived
1.1.15	Non hazardous Capacity - 8T Lift- 6m.	NOS	1	84251110	0.3826	Derived	0.3826	Derived			Derived
1.1.16	Non hazardous Capacity - 8T Lift-9m.	NOS	5	84251110	0.3905	Derived	1.9527	Derived			Derived
1.1.17	Non hazardous Capacity - 8T Lift-20m	NOS	1	84251110	0.4797	Derived	0.4797	Derived			Derived
1.1.18	Non hazardous Capacity - 8T Lift-37m	NOS	3	84251110	0.5561	Derived	1.6684	Derived			Derived

S.No	Description of equipment / item	UOM	TOTAL TENTATIVE QUANTITY	HSN CODE	UNIT EX-WORKS PRICE (DULY PACKED)IN PERCENTAGE OF TOTAL EX WORKS PRICE OF ELECTRIC HOIST GIVEN AT SL NO-1.00 OF COUMN 9	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 COUMN 9	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.)
1.1.19	Non hazardous Capacity -10T Lift- 6m	NOS	8	84251110	0.4438	Derived	3.5504	Derived	% TO BE QUOTED	% TO BE QUOTED	Derived
1.1.20	Non hazardous Capacity - 10T Lift-9m	NOS	7	84251110	0.4643	Derived	3.2499	Derived			Derived
1.1.21	Non hazardous Capacity - 10T Lift- 12m	NOS	6	84251110	0.4792	Derived	2.8754	Derived			Derived
1.1.22	Non hazardous Capacity - 10T Lift- 18m	NOS	2	84251110	0.5111	Derived	1.0222	Derived			Derived
1.1.23	Non hazardous.Capacity- 10T Lift -24 m.	NOS	2	84251110	0.5242	Derived	1.0483	Derived			Derived
1.1.24	Non hazardous Capacity - 10T Lift - 35 m	NOS	7	84251110	0.6449	Derived	4.5141	Derived			Derived
1.1.25	Non hazardous Capacity - 12T Lift- 6m.	NOS	1	84251110	0.4493	Derived	0.4493	Derived			Derived
1.1.26	Non hazardous Capacity-12T Lift- 12m.	NOS	2	84251110	0.4867	Derived	0.9735	Derived			Derived
1.1.27	Non hazardous Capacity - 12T Lift- 18m.	NOS	1	84251110	0.5092	Derived	0.5092	Derived			Derived
1.1.28	Non hazardous Capacity - 12T Lift- 24m.	NOS	1	84251110	0.5391	Derived	0.5391	Derived			Derived
1.1.29	Non hazardous Capacity - 15T Lift- 6m	NOS	1	84251110	0.4591	Derived	0.4591	Derived			Derived
1.1.30	Non hazardous Capacity-15T Lift- 12m	NOS	2	84251110	0.5167	Derived	1.0334	Derived			Derived
1.1.31	Non hazardous.Capacity-15T Lift-15m	NOS	12	84251110	0.6114	Derived	7.3370	Derived			Derived
1.1.32	Non hazardous.Capacity-15T Lift-20m	NOS	1	84251110	0.6339	Derived	0.6339	Derived			Derived
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	NOS	1	84251110	0.3961	Derived	0.3961	Derived			Derived
1.2.2	Hazardous Capacity- 3T Lift- 9m	NOS	1	84251110	0.3979	Derived	0.3979	Derived			Derived
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 0.155% of "X" at sl. No. 1.00 col. 9)**						
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 0.863% of "X" at sl. No. 1.00 col. 9)**						
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 0.033% of "X" at sl. No. 1.00 col. 9)**						
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 7.286% of "X" at sl. No. 1.00 col. 9)**						
1.7.0	**GRAND TOTAL (1.1.1 to 1.6.0) :**										**Derived = Rs Y**

Note:-

1. Bidder to note that evaluation shall be done on Grand Total Ex works price + Freight charges, however, Bidder to quote total Ex works prices mentioned at 1.1.1 to 1.6.0 (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-RC-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.
9. BOQ mentioned in the spares list is tentative and may vary during the project execution.

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	7	8	9
	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)							
G	COMISSIONING SPARES For 12T capacity Electric Hoist- Non Hazardous Area							
i)	Overload Relay	84311010	1 SET					
ii)	Limit Switch	84311010	1 SET					
iii)	Fuse Link	84311010	1 SET					

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.)
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)							
	Hazardous Area							
I	**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)							
J	**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)							
K	**GRAND TOTAL [A to J] (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) DSL (100 AMPS)	1	METER	84311010					
1.2	PVC SHROUDED (SS) DSL (40 AMPS)	1	METER	84311010					
1.3	PVC SHROUDED (Cu) DSL (160 AMPS)	1	METER	84311010					
1.4	PVC SHROUDED (GS) DSL (100 AMPS)	1	METER	84311010					
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	84311010					
2.2	TRAILING POWER (Cu) CABLE - 8T & 10T Non hazardous area.	1	METER	84311010					
2.3	TRAILING POWER (Cu) CABLE - 12T & 15T Non hazardous area.	1	METER	84311010					
2.4	TRAILING POWER (Cu) CABLE - 2T hazardous area.	1	METER	84311010					
2.5	TRAILING POWER (Cu) CABLE -3T hazardous area.	1	METER	84311010					
3	**Variable Voltage Variable Frequecny (VVVF) Drives for creep speed of motions as follows**								
3.1	VVVF drive for hoisting motion -1T	1	NOS.	84311010					
3.2	VVVF drive for hoisting motion -2T	1	NOS.	84311010					
3.3	VVVF drive for hoisting motion -3T	1	NOS.	84311010					
3.4	VVVF drive for hoisting motion -5T	1	NOS.	84311010					
3.5	VVVF drive for hoisting motion -8T	1	NOS.	84311010					
3.6	VVVF drive for hoisting motion-10T	1	NOS.	84311010					
3.7	VVVF drive for hoisting motion -12T	1	NOS.	84311010					
3.8	VVVF drive for hoisting motion-15T	1	NOS.	84311010					
3.9	VVVF drive for CT motion-1T	1	NOS.	84311010					
3.10	VVVF drive for CT motion-2T	1	NOS.	84311010					
3.11	VVVF drive for CT motion-3T	1	NOS.	84311010					
3.12	VVVF drive for CT motion-5T	1	NOS.	84311010					
3.13	VVVF drive for CT motion-8T	1	NOS.	84311010					
3.14	VVVF drive for CT motion-10T	1	NOS.	84311010					
3.15	VVVF drive for CT motion-12T	1	NOS.	84311010					
3.16	VVVF drive for CT motion-15T	1	NOS.	84311010					

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.)
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-RC-563-A002	1	METER OF TRAVEL	84311010					
5	**Maintenance tools and tackles** as per clause 1.1.2 of Sub section IA, Volume IIB , Specification no PE- TS-RC-563-A002.	1	SET	84311010					
	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.									

BHEL

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-RC-563-A002.							
1.1	**Charges per visit**	1	NOS.	998732				
1.2	**Charges per Man-day**	1	NOS.	998732				
	GRAND TOTAL [1.1 to 1.2] (TOTAL EX-WORKS 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	84311010					
2.00	Bearings for gear box for hoisting motion	100% for one EH	84311010					
3.00	Bearings for gear box for CT motion	100% for one EH	84311010					
4.00	Hoist pulley bearings	100% for one EH	84311010					
5.00	Hook thrust bearing	100% for one EH	84311010					
6.00	Drum bearing	100% for one EH	84311010					
7.00	Bearing Seal	100% for one EH	84311010					
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH	84311010					
9.00	Input pinion for CT Gearbox	100% for one EH	84311010					
10.00	Gear wheel for CT Gearbox	100% for one EH	84311010					
11.00	Internal clip for Hoist Gearbox	100% for one EH	84311010					
12.00	Internal clip for CT Gearbox	100% for one EH	84311010					
13.00	Complete Gear box / gear set for hoisting motion	100% for one EH	84311010					
14.00	Complete Gear box for CT motion	100% for one EH	84311010					
	Oil seals							
15.00	Oil seals for CT gear box	100% for one EH	84311010					
16.00	Oil seals for Hoist gear box	100% for one EH	84311010					
	Brakes							
17.00	Brake liners for							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
18.00	Brake springs for							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
19.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
20.00	Diode bridge	100% for one EH	84311010					
21.00	Brake assembly for hoisting	100% for one EH	84311010					
22.00	Brake assembly for CT motion	100% for one EH	84311010					
	Wheels							
23.00	CT wheel assembly (complete) (driving)	100% for one EH	84311010					
24.00	CT wheel assembly (complete) (idle)	100% for one EH	84311010					
25.00	**Wire rope**							
a)	suitable for 9 m lift	100% for one EH	84311010					
26.00	Rope Guide	100% for one EH	84311010					
27.00	Rope Tightner	100% for one EH	84311010					
28.00	Rope sheave assembly	100% for one EH	84311010					
29.00	Rubber bushes for flexible couplings	100% for one EH	84311010					
	Electrical spares							
30.00	Contactors	1 no of each type, size and rating for one EH	84311010					
31.00	Main contactors	1 set for one EH	84311010					
32.00	Auxiliary contactors	1 set for one EH	84311010					
33.00	Overload relays.	1 no of each type, size and rating for one EH	84311010					
34.00	Relay	1 no of each type for one EH	84311010					
35.00	Timers of each type	1 set for one EH	84311010					
36.00	MCBs.	1 set for one EH	84311010					
37.00	MCCB	1 set for one EH	84311010					
38.00	Switch Fuse Units	1 No. for one EH	84311010					
39.00	Fuses of each type	1 set for one EH	84311010					
40.00	Fuse links	1 set for one EH	84311010					
41.00	Control circuit fuses	1 set for one EH	84311010					
42.00	Limit Switches for							
i)	Main Hoist	1 set for one EH	84311010					
ii)	Cross Travel	1 set for one EH	84311010					
43.00	Door limit switch	1 set for one EH	84311010					
44.00	Selector switch	1 set for one EH	84311010					
45.00	Current Collector shoes/ rollers	1 Set for one EH	84311010					
46.00	Complete current collector assembly	1 Set for one EH	84311010					
47.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH	84311010					
48.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH	84311010					
49.00	Control module of VVVF drive	1 no. of each type and rating for one EH	84311010					
50.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH	84311010					
51.00	Dynamic braking resistance	1 no. of each type and rating for one EH	84311010					
52.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH	84311010					
53.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH	84311010					
54.00	Indicating lamps of each type	1 set for one EH	84311010					
55.00	Electric meter	1 set for one EH	84311010					
56.00	Resistor element of each size and type	1 set for one EH	84311010					
57.00	Hooter	1 set for one EH	84311010					
58.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH	84311010					
ii)	Motor of travel motion	1 set for one EH	84311010					
iii)	Terminal plates	1 set for one EH	84311010					
iv)	Motor Terminal Block	1 set for one EH	84311010					
v)	Space Heaters	1 set for one EH	84311010					
vi)	Greasing arrangements	1 set for one EH	84311010					
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH	84311010					
viii)	Stator winding coils for all type of LT motors	1 set for one EH	84311010					
ix)	Rotor pinion	1 set	84311010					
x)	Dust seals and gaskets for each type of motors	1 set for one EH	84311010					
xi)	Cooling Fans	1 no for each type and rating of motor	84311010					
xii)	Fan Cover	1 no for each type and rating of motor	84311010					

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.)
xiii)	Complete Set of Coupling	1 set for one EH	84311010					
xiv)	End shield (DE & NDE)	1 set of each type	84311010					
59.00	Transformer	1 set for one EH	84311010					
60.00	1.1 KV Grade power cables for each type and size.	1 m	84311010					
61.00	1.1 KV Grade control cables for each type and size.	1 m	84311010					
62.00	Control Trailing Cable for Electrical Hoist	1 m	84311010					
63.00	Power Trailing Cable for Electrical Hoist	1 m	84311010					
64.00	Power terminal block	1 set for one EH	84311010					
65.00	Control terminal block	1 set for one EH	84311010					
66.00	End plates for Power & Control terminal block	1 set for one EH	84311010					
	Total (1 to 66)							
B	**ESSENTIAL SPARES (2T CAPACITY- NON HAZARDOUS AREA)**							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH	84311010					
2.00	Bearings for gear box for hoisting motion	100% for one EH	84311010					
3.00	Bearings for gear box for CT motion	100% for one EH	84311010					
4.00	Hoist pulley bearings	100% for one EH	84311010					
5.00	Hook thrust bearing	100% for one EH	84311010					
6.00	Drum bearing	100% for one EH	84311010					
7.00	**Bearing Seal**	100% for one EH	84311010					
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH	84311010					
9.00	Input pinion for CT Gearbox	100% for one EH	84311010					
10.00	Gear wheel for CT Gearbox	100% for one EH	84311010					
11.00	Internal clip for Hoist Gearbox	100% for one EH	84311010					
12.00	Internal clip for CT Gearbox	100% for one EH	84311010					
13.00	Complete Gear box / gear set for hoisting motion	100% for one EH	84311010					
14.00	**Complete Gear box for CT motion**	100% for one EH	84311010					
	Oil seals							
15.00	Oil seals for CT gear box	100% for one EH	84311010					
16.00	**Oil seals for Hoist gear box**	100% for one EH	84311010					
	Brakes							
17.00	Brake liners for							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
18.00	Brake springs for							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
19.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
20.00	Diode bridge	100% for one EH	84311010					
21.00	Brake assembly for hoisting	100% for one EH	84311010					
22.00	**Brake assembly for CT motion**	100% for one EH	84311010					
	Wheels							
23.00	CT wheel assembly (complete) (driving)	100% for one EH	84311010					
24.00	**CT wheel assembly (complete) (idle)**	100% for one EH	84311010					
25.00	Wire rope							
a)	suitable for 6 m lift	100% for one EH	84311010					
b)	suitable for 12 m lift	100% for one EH	84311010					
26.00	Rope Guide	100% for one EH	84311010					
27.00	Rope Tightner	100% for one EH	84311010					
28.00	Rope sheave assembly	100% for one EH	84311010					
29.00	**Rubber bushes for flexible couplings**	100% for one EH	84311010					
	Electrical spares							
30.00	Contactors	1 no of each type, size and rating for one EH	84311010					
31.00	Main contactors	1 set for one EH	84311010					
32.00	Auxiliary contactors	1 set for one EH	84311010					
33.00	Overload relays.	1 no of each type, size and rating for one EH	84311010					
34.00	Relay	1 no of each type for one EH	84311010					
35.00	Timers of each type	1 set for one EH	84311010					
36.00	MCBs.	1 set for one EH	84311010					
37.00	MCCB	1 set for one EH	84311010					
38.00	Switch Fuse Units	1 No. for one EH	84311010					
39.00	Fuses of each type	1 set for one EH	84311010					
40.00	Fuse links	1 set for one EH	84311010					
41.00	Control circuit fuses	1 set for one EH	84311010					
42.00	Limit Switches for							
i)	Main Hoist	1 set for one EH	84311010					
ii)	Cross Travel	1 set for one EH	84311010					
43.00	Door limit switch	1 set for one EH	84311010					
44.00	Selector switch	1 set for one EH	84311010					
45.00	Current Collector shoes/ rollers	1 Set for one EH	84311010					
46.00	Complete current collector assembly	1 Set for one EH	84311010					
47.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH	84311010					
48.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH	84311010					
49.00	Control module of VVVF drive	1 no. of each type and rating for one EH	84311010					
50.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH	84311010					
51.00	Dynamic braking resistance	1 no. of each type and rating for one EH	84311010					
52.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH	84311010					
53.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH	84311010					
54.00	Indicating lamps of each type	1 set for one EH	84311010					
55.00	Electric meter	1 set for one EH	84311010					
56.00	Resistor element of each size and type	1 set for one EH	84311010					
57.00	Hooter	1 set for one EH	84311010					
58.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH	84311010					
ii)	Motor of travel motion	1 set for one EH	84311010					
iii)	Terminal plates	1 set for one EH	84311010					
iv)	Motor Terminal Block	1 set for one EH	84311010					
v)	Space Heaters	1 set for one EH	84311010					
vi)	Greasing arrangements	1 set for one EH	84311010					
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH	84311010					
viii)	Stator winding coils for all type of LT motors	1 set for one EH	84311010					

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	84311010					
x)	Dust seals and gaskets for each type of motors	1 set for one EH	84311010					
xi)	Cooling Fans	1 no for each type and rating of motor	84311010					
xii)	Fan Cover	1 no for each type and rating of motor	84311010					
xiii)	Complete Set of Coupling	1 set for one EH	84311010					
xiv)	End shield (DE & NDE)	1 set of each type	84311010					
59.00	Transformer	1 set for one EH	84311010					
60.00	1.1 KV Grade power cables for each type and size.	1 m	84311010					
61.00	1.1 KV Grade control cables for each type and size.	1 m	84311010					
62.00	Control Trailing Cable for Electrical Hoist	1 m	84311010					
63.00	Power Trailing Cable for Electrical Hoist	1 m	84311010					
64.00	Power terminal block	1 set for one EH	84311010					
65.00	Control terminal block	1 set for one EH	84311010					
66.00	End plates for Power & Control terminal block	1 set for one EH	84311010					
	Total (1 to 66)							
C	**ESSENTIAL SPARES (3T CAPACITY- NON HAZARDOUS AREA)**							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH	84311010					
2.00	Bearings for gear box for hoisting motion	100% for one EH	84311010					
3.00	Bearings for gear box for CT motion	100% for one EH	84311010					
4.00	Hoist pulley bearings	100% for one EH	84311010					
5.00	Hook thrust bearing	100% for one EH	84311010					
6.00	Drum bearing	100% for one EH	84311010					
7.00	Bearing Seal	100% for one EH	84311010					
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH	84311010					
9.00	Input pinion for CT Gearbox	100% for one EH	84311010					
10.00	Gear wheel for CT Gearbox	100% for one EH	84311010					
11.00	Internal clip for Hoist Gearbox	100% for one EH	84311010					
12.00	Internal clip for CT Gearbox	100% for one EH	84311010					
13.00	Complete Gear box / gear set for hoisting motion	100% for one EH	84311010					
14.00	Complete Gear box for CT motion	100% for one EH	84311010					
	Oil seals							
15.00	Oil seals for CT gear box	100% for one EH	84311010					
16.00	Oil seals for Hoist gear box	100% for one EH	84311010					
	Brakes							
17.00	Brake liners for							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
18.00	Brake springs for							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
19.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
20.00	Diode bridge	100% for one EH	84311010					
21.00	Brake assembly for hoisting	100% for one EH	84311010					
22.00	Brake assembly for CT motion	100% for one EH	84311010					
	Wheels							
23.00	CT wheel assembly (complete) (driving)	100% for one EH	84311010					
24.00	CT wheel assembly (complete) (idle)	100% for one EH	84311010					
25.00	**Wire rope**							
a)	suitable for 6 m lift	100% for one EH	84311010					
b)	suitable for 9 m lift	100% for one EH	84311010					
c)	suitable for 12 m lift	100% for one EH	84311010					
d)	suitable for 15 m lift	100% for one EH	84311010					
e)	suitable for 24 m lift	100% for one EH	84311010					
f)	suitable for 32 m lift	100% for one EH	84311010					
26.00	Rope Guide	100% for one EH	84311010					
27.00	Rope Tightner	100% for one EH	84311010					
28.00	Rope sheave assembly	100% for one EH	84311010					
29.00	Rubber bushes for flexible couplings	100% for one EH	84311010					
	Electrical spares							
30.00	Contactors	1 no of each type, size and rating for one EH	84311010					
31.00	Main contactors	1 set for one EH	84311010					
32.00	Auxiliary contactors	1 set for one EH	84311010					
33.00	Overload relays.	1 no of each type, size and rating for one EH	84311010					
34.00	Relay	1 no of each type for one EH	84311010					
35.00	Timers of each type	1 set for one EH	84311010					
36.00	MCBs.	1 set for one EH	84311010					
37.00	MCCB	1 set for one EH	84311010					
38.00	Switch Fuse Units	1 No. for one EH	84311010					
39.00	Fuses of each type	1 set for one EH	84311010					
40.00	Fuse links	1 set for one EH	84311010					
41.00	Control circuit fuses	1 set for one EH	84311010					
42.00	Limit Switches for							
i)	Main Hoist	1 set for one EH	84311010					
ii)	Cross Travel	1 set for one EH	84311010					
43.00	Door limit switch	1 set for one EH	84311010					
44.00	Selector switch	1 set for one EH	84311010					
45.00	Current Collector shoes/ rollers	1 Set for one EH	84311010					
46.00	Complete current collector assembly	1 Set for one EH	84311010					
47.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH	84311010					
48.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH	84311010					
49.00	Control module of VVVF drive	1 no. of each type and rating for one EH	84311010					
50.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH	84311010					
51.00	Dynamic braking resistance	1 no. of each type and rating for one EH	84311010					
52.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH	84311010					
53.00	Push buttons, PBPBs.(complete with contact elements)	1 set for one EH	84311010					
54.00	Indicating lamps of each type	1 set for one EH	84311010					
55.00	Electric meter	1 set for one EH	84311010					
56.00	Resistor element of each size and type	1 set for one EH	84311010					
57.00	Hooter	1 set for one EH	84311010					

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	415 V Motor							
i)	Motor of hoist motion	1 set for one EH	84311010					
ii)	Motor of travel motion	1 set for one EH	84311010					
iii)	Terminal plates	1 set for one EH	84311010					
iv)	Motor Terminal Block	1 set for one EH	84311010					
v)	Space Heaters	1 set for one EH	84311010					
vi)	Greasing arrangements	1 set for one EH	84311010					
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH	84311010					
viii)	Stator winding coils for all type of LT motors	1 set for one EH	84311010					
ix)	Rotor pinion	1 set	84311010					
x)	Dust seals and gaskets for each type of motors	1 set for one EH	84311010					
xi)	Cooling Fans	1 no for each type and rating of motor	84311010					
xii)	Fan Cover	1 no for each type and rating of motor	84311010					
xiii)	Complete Set of Coupling	1 set for one EH	84311010					
xiv)	End shield (DE & NDE)	1 set of each type	84311010					
59.00	Transformer	1 set for one EH	84311010					
60.00	1.1 KV Grade power cables for each type and size.	1 m	84311010					
61.00	1.1 KV Grade control cables for each type and size.	1 m	84311010					
62.00	Control Trailing Cable for Electrical Hoist	1 m	84311010					
63.00	Power Trailing Cable for Electrical Hoist	1 m	84311010					
64.00	Power terminal block	1 set for one EH	84311010					
65.00	Control terminal block	1 set for one EH	84311010					
66.00	End plates for Power & Control terminal block	1 set for one EH	84311010					
	Total (1 to 66)							
D	**ESSENTIAL SPARES (5T CAPACITY- NON HAZARDOUS AREA)**							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH	84311010					
2.00	Bearings for gear box for hoisting motion	100% for one EH	84311010					
3.00	Bearings for gear box for CT motion	100% for one EH	84311010					
4.00	Hoist pulley bearings	100% for one EH	84311010					
5.00	Hook thrust bearing	100% for one EH	84311010					
6.00	Drum bearing	100% for one EH	84311010					
7.00	Bearing Seal	100% for one EH	84311010					
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH	84311010					
9.00	Input pinion for CT Gearbox	100% for one EH	84311010					
10.00	Gear wheel for CT Gearbox	100% for one EH	84311010					
11.00	Internal clip for Hoist Gearbox	100% for one EH	84311010					
12.00	Internal clip for CT Gearbox	100% for one EH	84311010					
13.00	Complete Gear box / gear set for hoisting motion	100% for one EH	84311010					
14.00	Complete Gear box for CT motion	100% for one EH	84311010					
	Oil seals							
15.00	Oil seals for CT gear box	100% for one EH	84311010					
16.00	Oil seals for Hoist gear box	100% for one EH	84311010					
	Brakes							
17.00	Brake liners for							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
18.00	Brake springs for							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
19.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
20.00	Diode bridge	100% for one EH	84311010					
21.00	Brake assembly for hoisting	100% for one EH	84311010					
22.00	Brake assembly for CT motion	100% for one EH	84311010					
	Wheels							
23.00	CT wheel assembly (complete) (driving)	100% for one EH	84311010					
24.00	CT wheel assembly (complete) (idle)	100% for one EH	84311010					
25.00	**Wire rope**							
a)	suitable for 6 m lift	100% for one EH	84311010					
b)	suitable for 9 m lift	100% for one EH	84311010					
c)	suitable for 15m lift	100% for one EH	84311010					
d)	suitable for 24 m lift	100% for one EH	84311010					
e)	suitable for 32 m lift	100% for one EH	84311010					
26.00	Rope Guide	100% for one EH	84311010					
27.00	Rope Tightner	100% for one EH	84311010					
28.00	Rope sheave assembly	100% for one EH	84311010					
29.00	Rubber bushes for flexible couplings	100% for one EH	84311010					
	Electrical spares							
30.00	Contactors	1 no of each type, size and rating for one EH	84311010					
31.00	Main contactors	1 set for one EH	84311010					
32.00	Auxiliary contactors	1 set for one EH	84311010					
33.00	Overload relays.	1 no of each type, size and rating for one EH	84311010					
34.00	Relay	1 no of each type for one EH	84311010					
35.00	Timers of each type	1 set for one EH	84311010					
36.00	MCBs.	1 set for one EH	84311010					
37.00	MCCB	1 set for one EH	84311010					
38.00	Switch Fuse Units	1 No. for one EH	84311010					
39.00	Fuses of each type	1 set for one EH	84311010					
40.00	Fuse links	1 set for one EH	84311010					
41.00	Control circuit fuses	1 set for one EH	84311010					
42.00	Limit Switches for							
i)	Main Hoist	1 set for one EH	84311010					
ii)	Cross Travel	1 set for one EH	84311010					
43.00	Door limit switch	1 set for one EH	84311010					
44.00	Selector switch	1 set for one EH	84311010					
45.00	Current Collector shoes/ rollers	1 Set for one EH	84311010					
46.00	Complete current collector assembly	1 Set for one EH	84311010					
47.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH	84311010					
48.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH	84311010					
49.00	Control module of VVVF drive	1 no. of each type and rating for one EH	84311010					
50.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH	84311010					

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.)
51.00	Dynamic braking resistance	1 no. of each type and rating for one EH	84311010					
52.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH	84311010					
53.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH	84311010					
54.00	Indicating lamps of each type	1 set for one EH	84311010					
55.00	Electric meter	1 set for one EH	84311010					
56.00	Resistor element of each size and type	1 set for one EH	84311010					
57.00	Hooter	1 set for one EH	84311010					
58.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH	84311010					
ii)	Motor of travel motion	1 set for one EH	84311010					
iii)	Terminal plates	1 set for one EH	84311010					
iv)	Motor Terminal Block	1 set for one EH	84311010					
v)	Space Heaters	1 set for one EH	84311010					
vi)	Greasing arrangements	1 set for one EH	84311010					
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH	84311010					
viii)	Stator winding coils for all type of LT motors	1 set for one EH	84311010					
ix)	Rotor pinion	1 set	84311010					
x)	Dust seals and gaskets for each type of motors	1 set for one EH	84311010					
xi)	Cooling Fans	1 no for each type and rating of motor	84311010					
xii)	Fan Cover	1 no for each type and rating of motor	84311010					
xiii)	Complete Set of Coupling	1 set for one EH	84311010					
xiv)	End shield (DE & NDE)	1 set of each type	84311010					
59.00	Transformer	1 set for one EH	84311010					
60.00	1.1 KV Grade power cables for each type and size.	1 m	84311010					
61.00	1.1 KV Grade control cables for each type and size.	1 m	84311010					
62.00	Control Trailing Cable for Electrical Hoist	1 m	84311010					
63.00	Power Trailing Cable for Electrical Hoist	1 m	84311010					
64.00	Power terminal block	1 set for one EH	84311010					
65.00	Control terminal block	1 set for one EH	84311010					
66.00	End plates for Power & Control terminal block	1 set for one EH	84311010					
	Total (1 to 66)							
E	**ESSENTIAL SPARES (8T CAPACITY- NON HAZARDOUS AREA)**							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH	84311010					
2.00	Bearings for gear box for hoisting motion	100% for one EH	84311010					
3.00	Bearings for gear box for CT motion	100% for one EH	84311010					
4.00	Hoist pulley bearings	100% for one EH	84311010					
5.00	Hook thrust bearing	100% for one EH	84311010					
6.00	Drum bearing	100% for one EH	84311010					
7.00	Bearing Seal	100% for one EH	84311010					
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH	84311010					
9.00	Input pinion for CT Gearbox	100% for one EH	84311010					
10.00	Gear wheel for CT Gearbox	100% for one EH	84311010					
11.00	Internal clip for Hoist Gearbox	100% for one EH	84311010					
12.00	Internal clip for CT Gearbox	100% for one EH	84311010					
13.00	Complete Gear box / gear set for hoisting motion	100% for one EH	84311010					
14.00	Complete Gear box for CT motion	100% for one EH	84311010					
	Oil seals							
15.00	Oil seals for CT gear box	100% for one EH	84311010					
16.00	Oil seals for Hoist gear box	100% for one EH	84311010					
	Brakes							
17.00	Brake liners for							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
18.00	Brake springs for							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
19.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
20.00	Diode bridge	100% for one EH	84311010					
21.00	Brake assembly for hoisting	100% for one EH	84311010					
22.00	Brake assembly for CT motion	100% for one EH	84311010					
	Wheels							
23.00	CT wheel assembly (complete) (driving)	100% for one EH	84311010					
24.00	CT wheel assembly (complete) (idle)	100% for one EH	84311010					
25.00	**Wire rope**							
a)	suitable for 20 m lift	100% for one EH	84311010					
b)	suitable for 37 m lift	100% for one EH	84311010					
26.00	Rope Guide	100% for one EH	84311010					
27.00	Rope Tightner	100% for one EH	84311010					
28.00	Rope sheave assembly	100% for one EH	84311010					
29.00	Rubber bushes for flexible couplings	100% for one EH	84311010					
	Electrical spares							
30.00	Contactors	1 no of each type, size and rating for one EH	84311010					
31.00	Main contactors	1 set for one EH	84311010					
32.00	Auxiliary contactors	1 set for one EH	84311010					
33.00	Overload relays.	1 no of each type, size and rating for one EH	84311010					
34.00	Relay	1 no of each type for one EH	84311010					
35.00	Timers of each type	1 set for one EH	84311010					
36.00	MCBs.	1 set for one EH	84311010					
37.00	MCCB	1 set for one EH	84311010					
38.00	Switch Fuse Units	1 No. for one EH	84311010					
39.00	Fuses of each type	1 set for one EH	84311010					
40.00	Fuse links	1 set for one EH	84311010					
41.00	Control circuit fuses	1 set for one EH	84311010					
42.00	Limit Switches for							
i)	Main Hoist	1 set for one EH	84311010					
ii)	Cross Travel	1 set for one EH	84311010					
43.00	Door limit switch	1 set for one EH	84311010					
44.00	Selector switch	1 set for one EH	84311010					
45.00	Current Collector shoes/ rollers	1 Set for one EH	84311010					
46.00	Complete current collector assembly	1 Set for one EH	84311010					

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.)
47.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH	84311010					
48.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH	84311010					
49.00	Control module of VVVF drive	1 no. of each type and rating for one EH	84311010					
50.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH	84311010					
51.00	Dynamic braking resistance	1 no. of each type and rating for one EH	84311010					
52.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH	84311010					
53.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH	84311010					
54.00	Indicating lamps of each type	1 set for one EH	84311010					
55.00	Electric meter	1 set for one EH	84311010					
56.00	Resistor element of each size and type	1 set for one EH	84311010					
57.00	Hooter	1 set for one EH	84311010					
58.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH	84311010					
ii)	Motor of travel motion	1 set for one EH	84311010					
iii)	Terminal plates	1 set for one EH	84311010					
iv)	Motor Terminal Block	1 set for one EH	84311010					
v)	Space Heaters	1 set for one EH	84311010					
vi)	Greasing arrangements	1 set for one EH	84311010					
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH	84311010					
viii)	Stator winding coils for all type of LT motors	1 set for one EH	84311010					
ix)	Rotor pinion	1 set	84311010					
x)	Dust seals and gaskets for each type of motors	1 set for one EH	84311010					
xi)	Cooling Fans	1 no for each type and rating of motor	84311010					
xii)	Fan Cover	1 no for each type and rating of motor	84311010					
xiii)	Complete Set of Coupling	1 set for one EH	84311010					
xiv)	End shield (DE & NDE)	1 set of each type	84311010					
59.00	Transformer	1 set for one EH	84311010					
60.00	1.1 KV Grade power cables for each type and size.	1 m	84311010					
61.00	1.1 KV Grade control cables for each type and size.	1 m	84311010					
62.00	Control Trailing Cable for Electrical Hoist	1 m	84311010					
63.00	Power Trailing Cable for Electrical Hoist	1 m	84311010					
64.00	Power terminal block	1 set for one EH	84311010					
65.00	Control terminal block	1 set for one EH	84311010					
66.00	End plates for Power & Control terminal block	1 set for one EH	84311010					
	Total (1 to 66)							
F	**ESSENTIAL SPARES (10T CAPACITY- NON HAZARDOUS AREA)**							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH	84311010					
2.00	Bearings for gear box for hoisting motion	100% for one EH	84311010					
3.00	Bearings for gear box for CT motion	100% for one EH	84311010					
4.00	Hoist pulley bearings	100% for one EH	84311010					
5.00	Hook thrust bearing	100% for one EH	84311010					
6.00	Drum bearing	100% for one EH	84311010					
7.00	Bearing Seal	100% for one EH	84311010					
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH	84311010					
9.00	Input pinion for CT Gearbox	100% for one EH	84311010					
10.00	Gear wheel for CT Gearbox	100% for one EH	84311010					
11.00	Internal clip for Hoist Gearbox	100% for one EH	84311010					
12.00	Internal clip for CT Gearbox	100% for one EH	84311010					
13.00	Complete Gear box / gear set for hoisting motion	100% for one EH	84311010					
14.00	Complete Gear box for CT motion	100% for one EH	84311010					
	Oil seals							
15.00	Oil seals for CT gear box	100% for one EH	84311010					
16.00	Oil seals for Hoist gear box	100% for one EH	84311010					
	Brakes							
17.00	Brake liners for							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
18.00	Brake springs for							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
19.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
20.00	Diode bridge	100% for one EH	84311010					
21.00	Brake assembly for hoisting	100% for one EH	84311010					
22.00	Brake assembly for CT motion	100% for one EH	84311010					
	Wheels							
23.00	CT wheel assembly (complete) (driving)	100% for one EH	84311010					
24.00	CT wheel assembly (complete) (idle)	100% for one EH	84311010					
25.00	**Wire rope**							
a)	suitable for 6 m lift	100% for one EH	84311010					
b)	suitable for 9 m lift	100% for one EH	84311010					
c)	suitable for 12 m lift	100% for one EH	84311010					
d)	suitable for 18 m lift	100% for one EH	84311010					
e)	suitable for 24 m lift	100% for one EH	84311010					
f)	suitable for 35 m lift	100% for one EH	84311010					
26.00	Rope Guide	100% for one EH	84311010					
27.00	Rope Tightner	100% for one EH	84311010					
28.00	Rope sheave assembly	100% for one EH	84311010					
29.00	Rubber bushes for flexible couplings	100% for one EH	84311010					
	Electrical spares							
30.00	Contactors	1 no of each type, size and rating for one EH	84311010					
31.00	Main contactors	1 set for one EH	84311010					
32.00	Auxiliary contactors	1 set for one EH	84311010					
33.00	Overload relays.	1 no of each type, size and rating for one EH	84311010					
34.00	Relay	1 no of each type for one EH	84311010					
35.00	Timers of each type	1 set for one EH	84311010					
36.00	MCBs.	1 set for one EH	84311010					
37.00	MCCB	1 set for one EH	84311010					

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.)
38.00	Switch Fuse Units	1 No. for one EH	84311010					
39.00	Fuses of each type	1 set for one EH	84311010					
40.00	Fuse links	1 set for one EH	84311010					
41.00	Control circuit fuses	1 set for one EH	84311010					
42.00	Limit Switches for							
i)	Main Hoist	1 set for one EH	84311010					
ii)	Cross Travel	1 set for one EH	84311010					
43.00	Door limit switch	1 set for one EH	84311010					
44.00	Selector switch	1 set for one EH	84311010					
45.00	Current Collector shoes / rollers	1 Set for one EH	84311010					
46.00	Complete current collector assembly	1 Set for one EH	84311010					
47.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH	84311010					
48.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH	84311010					
49.00	Control module of VVVF drive	1 no. of each type and rating for one EH	84311010					
50.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH	84311010					
51.00	Dynamic braking resistance	1 no. of each type and rating for one EH	84311010					
52.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH	84311010					
53.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH	84311010					
54.00	Indicating lamps of each type	1 set for one EH	84311010					
55.00	Electric meter	1 set for one EH	84311010					
56.00	Resistor element of each size and type	1 set for one EH	84311010					
57.00	Hooter	1 set for one EH	84311010					
58.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH	84311010					
ii)	Motor of travel motion	1 set for one EH	84311010					
iii)	Terminal plates	1 set for one EH	84311010					
iv)	Motor Terminal Block	1 set for one EH	84311010					
v)	Space Heaters	1 set for one EH	84311010					
vi)	Greasing arrangements	1 set for one EH	84311010					
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH	84311010					
viii)	Stator winding coils for all type of LT motors	1 set for one EH	84311010					
ix)	Rotor pinion	1 set	84311010					
x)	Dust seals and gaskets for each type of motors	1 set for one EH	84311010					
xi)	Cooling Fans	1 no for each type and rating of motor	84311010					
xii)	Fan Cover	1 no for each type and rating of motor	84311010					
xiii)	Complete Set of Coupling	1 set for one EH	84311010					
xiv)	End shield (DE & NDE)	1 set of each type	84311010					
59.00	Transformer	1 set for one EH	84311010					
60.00	1.1 KV Grade power cables for each type and size.	1 m	84311010					
61.00	1.1 KV Grade control cables for each type and size.	1 m	84311010					
62.00	Control Trailing Cable for Electrical Hoist	1 m	84311010					
63.00	Power Trailing Cable for Electrical Hoist	1 m	84311010					
64.00	Power terminal block	1 set for one EH	84311010					
65.00	Control terminal block	1 set for one EH	84311010					
66.00	End plates for Power & Control terminal block	1 set for one EH	84311010					
	Total (1 to 66)							
G	**ESSENTIAL SPARES (12T CAPACITY- NON HAZARDOUS AREA)**							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH	84311010					
2.00	Bearings for gear box for hoisting motion	100% for one EH	84311010					
3.00	Bearings for gear box for CT motion	100% for one EH	84311010					
4.00	Hoist pulley bearings	100% for one EH	84311010					
5.00	Hook thrust bearing	100% for one EH	84311010					
6.00	Drum bearing	100% for one EH	84311010					
7.00	Bearing Seal	100% for one EH	84311010					
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH	84311010					
9.00	Input pinion for CT Gearbox	100% for one EH	84311010					
10.00	Gear wheel for CT Gearbox	100% for one EH	84311010					
11.00	Internal clip for Hoist Gearbox	100% for one EH	84311010					
12.00	Internal clip for CT Gearbox	100% for one EH	84311010					
13.00	Complete Gear box / gear set for hoisting motion	100% for one EH	84311010					
14.00	Complete Gear box for CT motion	100% for one EH	84311010					
	Oil seals							
15.00	Oil seals for CT gear box	100% for one EH	84311010					
16.00	Oil seals for Hoist gear box	100% for one EH	84311010					
	Brakes							
17.00	Brake liners for							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
18.00	Brake springs for							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
19.00	Brake coil / solenoid for brake							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
20.00	Diode bridge	100% for one EH	84311010					
21.00	Brake assembly for hoisting	100% for one EH	84311010					
22.00	Brake assembly for CT motion	100% for one EH	84311010					
	Wheels							
23.00	CT wheel assembly (complete) (driving)	100% for one EH	84311010					
24.00	CT wheel assembly (complete) (idle)	100% for one EH	84311010					
25.00	**Wire rope**							
a)	suitable for 6 m lift	100% for one EH	84311010					
b)	suitable for 12 m lift	100% for one EH	84311010					
c)	suitable for 18 m lift	100% for one EH	84311010					
d)	suitable for 24 m lift	100% for one EH	84311010					
26.00	Rope Guide	100% for one EH	84311010					
27.00	Rope Tightner	100% for one EH	84311010					
28.00	Rope sheave assembly	100% for one EH	84311010					
29.00	Rubber bushes for flexible couplings	100% for one EH	84311010					
	Electrical spares							
30.00	Contactors	1 no of each type, size and rating for one EH	84311010					

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.)
31.00	Main contactors	1 set for one EH	84311010					
32.00	Auxiliary contactors	1 set for one EH	84311010					
33.00	Overload relays.	1 no of each type, size and rating for one EH	84311010					
34.00	Relay	1 no of each type for one EH	84311010					
35.00	Timers of each type	1 set for one EH	84311010					
36.00	MCBs.	1 set for one EH	84311010					
37.00	MCCB	1 set for one EH	84311010					
38.00	Switch Fuse Units	1 No. for one EH	84311010					
39.00	Fuses of each type	1 set for one EH	84311010					
40.00	Fuse links	1 set for one EH	84311010					
41.00	Control circuit fuses	1 set for one EH	84311010					
42.00	Limit Switches for							
i)	Main Hoist	1 set for one EH	84311010					
ii)	Cross Travel	1 set for one EH	84311010					
43.00	Door limit switch	1 set for one EH	84311010					
44.00	Selector switch	1 set for one EH	84311010					
45.00	Current Collector shoes/ rollers	1 Set for one EH	84311010					
46.00	Complete current collector assembly	1 Set for one EH	84311010					
47.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH	84311010					
48.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH	84311010					
49.00	Control module of VVVF drive	1 no. of each type and rating for one EH	84311010					
50.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH	84311010					
51.00	Dynamic braking resistance	1 no. of each type and rating for one EH	84311010					
52.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH	84311010					
53.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH	84311010					
54.00	Indicating lamps of each type	1 set for one EH	84311010					
55.00	Electric meter	1 set for one EH	84311010					
56.00	Resistor element of each size and type	1 set for one EH	84311010					
57.00	Hooter	1 set for one EH	84311010					
58.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH	84311010					
ii)	Motor of travel motion	1 set for one EH	84311010					
iii)	Terminal plates	1 set for one EH	84311010					
iv)	Motor Terminal Block	1 set for one EH	84311010					
v)	Space Heaters	1 set for one EH	84311010					
vi)	Greasing arrangements	1 set for one EH	84311010					
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH	84311010					
viii)	Stator winding coils for all type of LT motors	1 set for one EH	84311010					
ix)	Rotor pinion	1 set	84311010					
x)	Dust seals and gaskets for each type of motors	1 set for one EH	84311010					
xi)	Cooling Fans	1 no for each type and rating of motor	84311010					
xii)	Fan Cover	1 no for each type and rating of motor	84311010					
xiii)	Complete Set of Coupling	1 set for one EH	84311010					
xiv)	End shield (DE & NDE)	1 set of each type	84311010					
59.00	Transformer	1 set for one EH	84311010					
60.00	1.1 KV Grade power cables for each type and size.	1 m	84311010					
61.00	1.1 KV Grade control cables for each type and size.	1 m	84311010					
62.00	Control Trailing Cable for Electrical Hoist	1 m	84311010					
63.00	Power Trailing Cable for Electrical Hoist	1 m	84311010					
64.00	Power terminal block	1 set for one EH	84311010					
65.00	Control terminal block	1 set for one EH	84311010					
66.00	End plates for Power & Control terminal block	1 set for one EH	84311010					
	Total (1 to 66)							
H	**ESSENTIAL SPARES (15T CAPACITY- NON HAZARDOUS AREA)**							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH	84311010					
2.00	Bearings for gear box for hoisting motion	100% for one EH	84311010					
3.00	Bearings for gear box for CT motion	100% for one EH	84311010					
4.00	Hoist pulley bearings	100% for one EH	84311010					
5.00	Hook thrust bearing	100% for one EH	84311010					
6.00	Drum bearing	100% for one EH	84311010					
7.00	Bearing Seal	100% for one EH	84311010					
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH	84311010					
9.00	Input pinion for CT Gearbox	100% for one EH	84311010					
10.00	Gear wheel for CT Gearbox	100% for one EH	84311010					
11.00	Internal clip for Hoist Gearbox	100% for one EH	84311010					
12.00	Internal clip for CT Gearbox	100% for one EH	84311010					
13.00	Complete Gear box / gear set for hoisting motion	100% for one EH	84311010					
14.00	Complete Gear box for CT motion	100% for one EH	84311010					
	Oil seals							
15.00	Oil seals for CT gear box	100% for one EH	84311010					
16.00	Oil seals for Hoist gear box	100% for one EH	84311010					
	Brakes							
17.00	Brake liners for							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
18.00	Brake springs for							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
19.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
20.00	Diode bridge	100% for one EH	84311010					
21.00	Brake assembly for hoisting	100% for one EH	84311010					
22.00	Brake assembly for CT motion	100% for one EH	84311010					
	Wheels							
23.00	CT wheel assembly (complete) (driving)	100% for one EH	84311010					
24.00	CT wheel assembly (complete) (idle)	100% for one EH	84311010					
25.00	**Wire rope**							
a)	suitable for 6 m lift	100% for one EH	84311010					
b)	suitable for 12 m lift	100% for one EH	84311010					

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.)
c)	suitable for 15 m lift	100% for one EH	84311010					
d)	suitable for 20 m lift	100% for one EH	84311010					
26.00	Rope Guide	100% for one EH	84311010					
27.00	Rope Tightner	100% for one EH	84311010					
28.00	Rope sheave assembly	100% for one EH	84311010					
29.00	Rubber bushes for flexible couplings	100% for one EH	84311010					
	Electrical spares							
30.00	Contactors	1 no of each type, size and rating for one EH	84311010					
31.00	Main contactors	1 set for one EH	84311010					
32.00	Auxiliary contactors	1 set for one EH	84311010					
33.00	Overload relays.	1 no of each type, size and rating for one EH	84311010					
34.00	Relay	1 no of each type for one EH	84311010					
35.00	Timers of each type	1 set for one EH	84311010					
36.00	MCBs.	1 set for one EH	84311010					
37.00	MCCB	1 set for one EH	84311010					
38.00	Switch Fuse Units	1 No. for one EH	84311010					
39.00	Fuses of each type	1 set for one EH	84311010					
40.00	Fuse links	1 set for one EH	84311010					
41.00	Control circuit fuses	1 set for one EH	84311010					
42.00	Limit Switches for							
i)	Main Hoist	1 set for one EH	84311010					
ii)	Cross Travel	1 set for one EH	84311010					
43.00	Door limit switch	1 set for one EH	84311010					
44.00	Selector switch	1 set for one EH	84311010					
45.00	Current Collector shoes/ rollers	1 Set for one EH	84311010					
46.00	Complete current collector assembly	1 Set for one EH	84311010					
47.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH	84311010					
48.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH	84311010					
49.00	Control module of VVVF drive	1 no. of each type and rating for one EH	84311010					
50.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH	84311010					
51.00	Dynamic braking resistance	1 no. of each type and rating for one EH	84311010					
52.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH	84311010					
53.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH	84311010					
54.00	Indicating lamps of each type	1 set for one EH	84311010					
55.00	Electric meter	1 set for one EH	84311010					
56.00	Resistor element of each size and type	1 set for one EH	84311010					
57.00	Hooter	1 set for one EH	84311010					
58.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH	84311010					
ii)	Motor of travel motion	1 set for one EH	84311010					
iii)	Terminal plates	1 set for one EH	84311010					
iv)	Motor Terminal Block	1 set for one EH	84311010					
v)	Space Heaters	1 set for one EH	84311010					
vi)	Greasing arrangements	1 set for one EH	84311010					
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH	84311010					
viii)	Stator winding coils for all type of LT motors	1 set for one EH	84311010					
ix)	Rotor pinion	1 set	84311010					
x)	Dust seals and gaskets for each type of motors	1 set for one EH	84311010					
xi)	Cooling Fans	1 no for each type and rating of motor	84311010					
xii)	Fan Cover	1 no for each type and rating of motor	84311010					
xiii)	Complete Set of Coupling	1 set for one EH	84311010					
xiv)	End shield (DE & NDE)	1 set of each type	84311010					
59.00	Transformer	1 set for one EH	84311010					
60.00	1.1 KV Grade power cables for each type and size.	1 m	84311010					
61.00	1.1 KV Grade control cables for each type and size.	1 m	84311010					
62.00	Control Trailing Cable for Electrical Hoist	1 m	84311010					
63.00	Power Trailing Cable for Electrical Hoist	1 m	84311010					
64.00	Power terminal block	1 set for one EH	84311010					
65.00	Control terminal block	1 set for one EH	84311010					
66.00	End plates for Power & Control terminal block	1 set for one EH	84311010					
	Total (1 to 66)							
I	**ESSENTIAL SPARES (2T CAPACITY- HAZARDOUS AREA)**							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH	84311010					
2.00	Bearings for gear box for hoisting motion	100% for one EH	84311010					
3.00	Bearings for gear box for CT motion	100% for one EH	84311010					
4.00	Hoist pulley bearings	100% for one EH	84311010					
5.00	Hook thrust bearing	100% for one EH	84311010					
6.00	Drum bearing	100% for one EH	84311010					
7.00	**Bearing Seal**	100% for one EH	84311010					
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH	84311010					
9.00	Input pinion for CT Gearbox	100% for one EH	84311010					
10.00	Gear wheel for CT Gearbox	100% for one EH	84311010					
11.00	Internal clip for Hoist Gearbox	100% for one EH	84311010					
12.00	Internal clip for CT Gearbox	100% for one EH	84311010					
13.00	Complete Gear box / gear set for hoisting motion	100% for one EH	84311010					
14.00	**Complete Gear box for CT motion**	100% for one EH	84311010					
	Oil seals							
15.00	Oil seals for CT gear box	100% for one EH	84311010					
16.00	**Oil seals for Hoist gear box**	100% for one EH	84311010					
	Brakes							
17.00	Brake liners for							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
18.00	Brake springs for							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
19.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					

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.)
20.00	Diode bridge	100% for one EH	84311010					
21.00	Brake assembly for hoisting	100% for one EH	84311010					
22.00	**Brake assembly for CT motion**	100% for one EH	84311010					
	Wheels							
23.00	CT wheel assembly (complete) (driving)	100% for one EH	84311010					
24.00	**CT wheel assembly (complete) (idle)**	100% for one EH	84311010					
25.00	Wire rope							
a)	suitable for 12 m lift	100% for one EH	84311010					
26.00	Rope Guide	100% for one EH	84311010					
27.00	Rope Tightner	100% for one EH	84311010					
28.00	Rope sheave assembly	100% for one EH	84311010					
29.00	**Rubber bushes for flexible couplings**	100% for one EH	84311010					
	Electrical spares							
30.00	Contactors	1 no of each type, size and rating for one EH	84311010					
31.00	Main contactors	1 set for one EH	84311010					
32.00	Auxiliary contactors	1 set for one EH	84311010					
33.00	Overload relays.	1 no of each type, size and rating for one EH	84311010					
34.00	Relay	1 no of each type for one EH	84311010					
35.00	Timers of each type	1 set for one EH	84311010					
36.00	MCBs.	1 set for one EH	84311010					
37.00	MCCB	1 set for one EH	84311010					
38.00	Switch Fuse Units	1 No. for one EH	84311010					
39.00	Fuses of each type	1 set for one EH	84311010					
40.00	Fuse links	1 set for one EH	84311010					
41.00	Control circuit fuses	1 set for one EH	84311010					
42.00	Limit Switches for							
i)	Main Hoist	1 set for one EH	84311010					
ii)	Cross Travel	1 set for one EH	84311010					
43.00	Door limit switch	1 set for one EH	84311010					
44.00	Selector switch	1 set for one EH	84311010					
45.00	Current Collector shoes/ rollers	1 Set for one EH	84311010					
46.00	Complete current collector assembly	1 Set for one EH	84311010					
47.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH	84311010					
48.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH	84311010					
49.00	Control module of VVVF drive	1 no. of each type and rating for one EH	84311010					
50.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH	84311010					
51.00	Dynamic braking resistance	1 no. of each type and rating for one EH	84311010					
52.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH	84311010					
53.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH	84311010					
54.00	Indicating lamps of each type	1 set for one EH	84311010					
55.00	Electric meter	1 set for one EH	84311010					
56.00	Resistor element of each size and type	1 set for one EH	84311010					
57.00	Hooter	1 set for one EH	84311010					
58.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH	84311010					
ii)	Motor of travel motion	1 set for one EH	84311010					
iii)	Terminal plates	1 set for one EH	84311010					
iv)	Motor Terminal Block	1 set for one EH	84311010					
v)	Space Heaters	1 set for one EH	84311010					
vi)	Greasing arrangements	1 set for one EH	84311010					
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH	84311010					
viii)	Stator winding coils for all type of LT motors	1 set for one EH	84311010					
ix)	Rotor pinion	1 set	84311010					
x)	Dust seals and gaskets for each type of motors	1 set for one EH	84311010					
xi)	Cooling Fans	1 no for each type and rating of motor	84311010					
xii)	Fan Cover	1 no for each type and rating of motor	84311010					
xiii)	Complete Set of Coupling	1 set for one EH	84311010					
xiv)	End shield (DE & NDE)	1 set of each type	84311010					
59.00	Transformer	1 set for one EH	84311010					
60.00	1.1 KV Grade power cables for each type and size.	1 m	84311010					
61.00	1.1 KV Grade control cables for each type and size.	1 m	84311010					
62.00	Control Trailing Cable for Electrical Hoist	1 m	84311010					
63.00	Power Trailing Cable for Electrical Hoist	1 m	84311010					
64.00	Power terminal block	1 set for one EH	84311010					
65.00	Control terminal block	1 set for one EH	84311010					
66.00	End plates for Power & Control terminal block	1 set for one EH	84311010					
	Total (1 to 66)							
J	**ESSENTIAL SPARES (3T CAPACITY- HAZARDOUS AREA)**							
	Mechanical spares							
	Bearings							
1.00	Bearings for trolley wheel	100% for one EH	84311010					
2.00	Bearings for gear box for hoisting motion	100% for one EH	84311010					
3.00	Bearings for gear box for CT motion	100% for one EH	84311010					
4.00	Hoist pulley bearings	100% for one EH	84311010					
5.00	Hook thrust bearing	100% for one EH	84311010					
6.00	Drum bearing	100% for one EH	84311010					
7.00	Bearing Seal	100% for one EH	84311010					
	Gears							
8.00	Input pinion for Hoist Gearbox	100% for one EH	84311010					
9.00	Input pinion for CT Gearbox	100% for one EH	84311010					
10.00	Gear wheel for CT Gearbox	100% for one EH	84311010					
11.00	Internal clip for Hoist Gearbox	100% for one EH	84311010					
12.00	Internal clip for CT Gearbox	100% for one EH	84311010					
13.00	Complete Gear box / gear set for hoisting motion	100% for one EH	84311010					
14.00	Complete Gear box for CT motion	100% for one EH	84311010					
	Oil seals							
15.00	Oil seals for CT gear box	100% for one EH	84311010					
16.00	Oil seals for Hoist gear box	100% for one EH	84311010					
	Brakes							
17.00	Brake liners for							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
18.00	Brake springs for							

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)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
19.00	Brake coil/ solenoid for brake							
i)	Hoist brake	100% for one EH	84311010					
ii)	CT brake	100% for one EH	84311010					
20.00	Diode bridge	100% for one EH	84311010					
21.00	Brake assembly for hoisting	100% for one EH	84311010					
22.00	Brake assembly for CT motion	100% for one EH	84311010					
	Wheels							
23.00	CT wheel assembly (complete) (driving)	100% for one EH	84311010					
24.00	CT wheel assembly (complete) (idle)	100% for one EH	84311010					
25.00	**Wire rope**							
a)	suitable for 9 m lift	100% for one EH	84311010					
26.00	Rope Guide	100% for one EH	84311010					
27.00	Rope Tightner	100% for one EH	84311010					
28.00	Rope sheave assembly	100% for one EH	84311010					
29.00	Rubber bushes for flexible couplings	100% for one EH	84311010					
	Electrical spares							
30.00	Contactors	1 no of each type, size and rating for one EH	84311010					
31.00	Main contactors	1 set for one EH	84311010					
32.00	Auxiliary contactors	1 set for one EH	84311010					
33.00	Overload relays.	1 no of each type, size and rating for one EH	84311010					
34.00	Relay	1 no of each type for one EH	84311010					
35.00	Timers of each type	1 set for one EH	84311010					
36.00	MCBs.	1 set for one EH	84311010					
37.00	MCCB	1 set for one EH	84311010					
38.00	Switch Fuse Units	1 No. for one EH	84311010					
39.00	Fuses of each type	1 set for one EH	84311010					
40.00	Fuse links	1 set for one EH	84311010					
41.00	Control circuit fuses	1 set for one EH	84311010					
42.00	Limit Switches for							
i)	Main Hoist	1 set for one EH	84311010					
ii)	Cross Travel	1 set for one EH	84311010					
43.00	Door limit switch	1 set for one EH	84311010					
44.00	Selector switch	1 set for one EH	84311010					
45.00	Current Collector shoes/ rollers	1 Set for one EH	84311010					
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47.00	VVVF Drive for Hoisting	1 no. of each type and rating for one EH	84311010					
48.00	VVVF drive for Cross travel	1 no. of each type and rating for one EH	84311010					
49.00	Control module of VVVF drive	1 no. of each type and rating for one EH	84311010					
50.00	Power supply module of VVVF drive	1 no. of each type and rating for one EH	84311010					
51.00	Dynamic braking resistance	1 no. of each type and rating for one EH	84311010					
52.00	Push buttons -Contact Element	1 no of each type, size and rating for one EH	84311010					
53.00	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH	84311010					
54.00	Indicating lamps of each type	1 set for one EH	84311010					
55.00	Electric meter	1 set for one EH	84311010					
56.00	Resistor element of each size and type	1 set for one EH	84311010					
57.00	Hooter	1 set for one EH	84311010					
58.00	415 V Motor							
i)	Motor of hoist motion	1 set for one EH	84311010					
ii)	Motor of travel motion	1 set for one EH	84311010					
iii)	Terminal plates	1 set for one EH	84311010					
iv)	Motor Terminal Block	1 set for one EH	84311010					
v)	Space Heaters	1 set for one EH	84311010					
vi)	Greasing arrangements	1 set for one EH	84311010					
vii)	Bearings (DE and NDE) for each type and rating of motors.	1 set for one EH	84311010					
viii)	Stator winding coils for all type of LT motors	1 set for one EH	84311010					
ix)	Rotor pinion	1 set	84311010					
x)	Dust seals and gaskets for each type of motors	1 set for one EH	84311010					
xi)	Cooling Fans	1 no for each type and rating of motor	84311010					
xii)	Fan Cover	1 no for each type and rating of motor	84311010					
xiii)	Complete Set of Coupling	1 set for one EH	84311010					
xiv)	End shield (DE & NDE)	1 set of each type	84311010					
59.00	Transformer	1 set for one EH	84311010					
60.00	1.1 KV Grade power cables for each type and size.	1 m	84311010					
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62.00	Control Trailing Cable for Electrical Hoist	1 m	84311010					
63.00	Power Trailing Cable for Electrical Hoist	1 m	84311010					
64.00	Power terminal block	1 set for one EH	84311010					
65.00	Control terminal block	1 set for one EH	84311010					
66.00	End plates for Power & Control terminal block	1 set for one EH	84311010					
	Total (1 to 66)							
	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-RC-563-A002

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

ANNEXURE-VI: DEVIATION SHEET (COST OF WITHDRAWL)

PACKAGE:- ELECTRIC HOIST- RATE CONTRACT

TENDER ENQUIRY REF NO-RATE CONTRACT - NIT REF NO-E---/2018 , DTD ----

NAME OF VENDOR:-

SL NO	VOLUME/ SECTION	PAGE NO.	CLAUSE NO.	TECHNICAL SPECIFICATION/ TENDER DOCUMENT	COMPLETE DESCRIPTION OF DEVIATION	COST OF WITHDRAWL OF DEVIATION	REFERENCE OF PRICE SCHEDULE ON WHICH COST OF WITHDRAWL OF DEVIATION IS APPLICABLE	NATURE OF COST OF WITHDRAWL OF DEVIATION (POSITIVE/ NEGATIVE)	REASONS FOR QUOTING DEVIATION
TECHNICAL DEVIATIONS									
COMMERCIAL DEVIATIONS									

PARTICULARS OF BIDDERS/ AUTHORISED REPRESENTATIVE

NAME	**DESIGNATIONS**	**SIGN & DATE**	

NOTES:

1. For self manufactured items of bidder, cost of withdrawl of deviation will be applicable on the basic price (i.e. excluding taxes, duties & freight) only.
2. For directly dispatchable items, cost of withdrawl of deviation will be applicable on the basic price including taxes, duties & freight.
3. All the bidders have to list out all their Technical & Commercial Deviations (if any) in detail in the above format.
4. Any deviation not mentioned above and shown separately or found hidden in offer, will not be taken cognizance of.
5. 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
6. Bidder shall furnish price copy of above format along with price bid.
7. The final decision of acceptance/ rejection of the deviations quoted by the bidder shall be at discretion of the Purchaser.
8. Bidders to note that any deviation (technical/commercial) not listed in above and asked after Part-I opening shall not be considered
9. For deviations w.r.t. Payment terms, Liquidated damages, Firm prices and submission of E1/ E2 forms before claiming 10% payment, if a bidder chooses not to give any cost of withdrawl of deviation loading as per Annexure-VIII of GCC, Rev-06 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.
10. Any deviation mentioned in priced copy of this format, but not mentioned in the un-priced copy, shall not be accepted.
11. 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.
12. 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.
13. In case nature of cost of withdrawl (positive/negative) is not specified it shall be assumed as positive.
14. In case of descrepancy in the nature of impact (positive/ negative), positive will be considered for evaluation and negative for ordering.
15. In case of no deviations bidder to specifically mention " NIL DEVIATION" in the above format and submit signed and stamped copy of same with their offer.

BHEL / PEM / CMM
SPECIAL CONDITIONS OF RATE CONTRACT

ANNEXURE- VII: SPECIAL CONDITION OF RATE CONTRACT FOR ELECTRIC HOISTS

1. BHEL/PEM intends to enter into Rate Contract for supply of the tendered items for a period of two years. The Rate Contract shall come into force from the date of issue of Purchase order for Rate Contract. Validity for ordering shall be two years from the purchase order for Rate Contract.

2. 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

3. Transit Insurance is in BHEL scope

4. 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.

5. The prices shall remain firm (except for those items in which PVC is applicable as per NIT) during the period of two years with a provision for further extension after review on mutual consent.

6. 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.

7. Mode of dispatch shall be by road through Schedule Bank/BHEL (PEM) approved transporters.

8. Other terms and conditions shall be as per Standard Technical specification no, GCC Rev 06 & Corrigenda to GCC Rev 06, Enquiry letter.

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

10. Tentative quantity is given in enquiry.

11. Bidders to submit offer for RC of said items ONLINE via e-Procurement System 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.

12. 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.

ANNEX-VIII
TENTATIVE PROJECT LIST

SL NO.	TENTATIVE PROJECT LIST
1	2X800 MW Darlipali STPP
2	2X500 MW NTPC MAUDA STAGE I-FGD
3	3X660 MW NTPC BARH STPP STAGE I-FGD
4	2X660 MW NTPC BARH STAGE II FGD
5	NORTH KARANPURA FGD
6	Nabinagar (250 MW) FGD
7	Nabinagar (660 MW) FGD
8	Neyveli TPS-II (2nd Expn) TG Pkg
9	Neyveli TPS-II (2nd Expn) SG Pkg
10	Talcher Stg III-Main Plant Pkg
11	2X660 MW BTPP at Buxar by STPL
12	5 X 800 MW YADADRI

Note-
Project list is indicative only, BHEL may ask for delivery anywhere in India for any of the project added in the prospective project/ existing projects during RC period.

RATE CONTRACT

VOLUME – II B & III

TECHNICAL SPECIFICATION
FOR
ELECTRIC WIRE ROPE HOIST

SPECIFICATION NO.: PE-TS-RC-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-RC-563-A002**
		VOLUME: II B & III
		REV. 00 / **DATE: 15.01.19**
	CONTENTS	**SHEET :**

CONTENTS

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOIST SPECIFIC TECHNICAL REQUIREMENT	SPECIFICATION No: PE-TS-RC-563-A002	
		VOLUME: II B	
		SECTION-I	
		REV. 00	DATE: 15.01.19
		SHEET :	

SECTION-I

SPECIFIC TECHNICAL REQUIREMENT

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

PEM-6666-0

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS **SPECIFIC TECHNICAL REQUIREMENT**	**SPECIFICATION No: PE-TS-RC-563-A002** **VOLUME: II B** **SECTION-I** **SUB-SECTION-IA** REV 00 DATE 15.01.19

SUB SECTION-IA

SPECIFIC TECHNICAL REQUIREMENT (MECHANICAL)

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS SPECIFIC TECHNICAL REQUIREMENT	SPECIFICATION No: PE-TS-RC-563-A002	
		VOLUME: II B	
		SECTION-I	
		SUB-SECTION-IA	
		REV 00	DATE 15.01.19

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.

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS SPECIFIC TECHNICAL REQUIREMENT	SPECIFICATION No: PE-TS-RC-563-A002	
		VOLUME: II B	
		SECTION-I	
		SUB-SECTION-IA	
		REV 00	DATE 15.01.19

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.

Note:

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)

PEM-6666-0

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS SPECIFIC TECHNICAL REQUIREMENT	SPECIFICATION No: PE-TS-RC-563-A002	
		VOLUME: II B	
		SECTION-I	
		SUB-SECTION-IA	
		REV 00	DATE 15.01.19

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

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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.

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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.

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QUALITY ASSURANCE AND INSPECTION REQUIREMENT

	MANUFACTURERS NAME & ADDRESS		STANDARD MANUFACTURING QUALITY PLAN				PROJECT		RATE CONTRACT			
	AS PER APPROVED VENDOR LIST		ITEM:	ELECTRIC WIRE ROPE HOIST	QP NO	PE-TS-RC-563-A002	PACKAGE		ELECTRIC WIRE ROPE HOIST			
					REV	00	CONTRACT No					
					DATE	15.01.19	CONTRACTOR		BHEL-PEM			
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Sl.No	COMPONENT & OPERATIONS	CHARACTERISTICS	CATEGORY	TYPE OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	D*	AGENCY M	AGENCY C	AGENCY N	REMARKS
1	2	3	4	5	6	7	8	9		**	10		11
1.0	**RAW-MATERIALS**												
1.1	a) STRUCTURAL MATERIAL b) RAW MATERIAL FOR HOIST AND GEAR BOX HOUSING, TROLLEY PLATE, ROPE DRUM IF FABRICATED	CHEMICAL & MECHANICAL PROPERTIES	MA	Lab analysis	1 SAMPLE PER LOT/HEAT %	IS 2062 /APPD. DRG./ DATA SHEET		MTC/IR	√	P/V	V	V	Test shall be carried out in absence of mill TC or non-correlation of TC with material.BHEL to identify Samples for testing. Test to be carried out at NABL accredited Lab. Reports to be submitted for verification during inspection.
		NDT	MA	UT	100%	ASTM A388-2004	NOTE 1	IR	√	P	V	V	
1.1 A	SEAMLESS PIPE FOR ROPE DRUM	CHEMICAL , MECHANICAL	MA	Lab analysis	1 SAMPLE /HEAT/LOT	Approved drg/ASTM A 106 Grade A or B		MTC/IR	√	P/V	V	V	Test shall be carried out in absence of mill TC or non-correlation of TC with material.BHEL to identify Samples for testing. Test to be carried out at NABL accredited Lab. Reports to be submitted for verification during inspection
		Flattening & Acid Etching test	MA	PHYSICAL & METALLOGRAPHY	1 SAMPLE /pipe	No cracks, pitting, rusting , damage etc		IR	√	P	V	V	
		SURFACE DEFECTS	MA	Visual	100%								
1.2	FORGINGS FOR GEARS,PINIONS, SHAFT/AXLES, WHEELS ETC	CHEMICAL & MECHANICAL PROPERTIES	MA	Lab analysis	100%	APPD. DRG./ DATA SHEET	APPD. DRG./ DATA SHEET / IS:3938	LAB. REPORT / MANUFACTURER'S TEST CERTIFICATE	√	P	V	V	
		NDT	CR	UT	100%	ASTM A 388	NOTE 1	INSPN. REPORT	√	P	**V**	V	IF DIA or THK > 50mm
		Hardeness , surface defects after hardfacing and machining/grinding.	MA	Hardness, DPT/MPI	100%	HRC/BHN, ASTM E -165 /E-709, No linear indication		MTC	√	P	**V**	V	
1.3	WIRE ROPE	Dimensional, type, constrcution ,	MI	measurement	100%	APPD. DRG./ DATA SHEET	APPD. DRG./ DATA SHEET	MFRS' TEST CERT.	√	P	V	V	
		EXAMINATION OF REPORT OF BREAKING LOAD CAPACITY.	CR	Review of TC	100%	IS: 2266		MFRS' TEST CERT.	√	P	V	V	

	MANUFACTURERS NAME & ADDRESS		STANDARD MANUFACTURING QUALITY PLAN				PROJECT		RATE CONTRACT			
	AS PER APPROVED VENDOR LIST		ITEM:	ELECTRIC WIRE ROPE HOIST	QP NO	PE-TS-RC-563-A002	PACKAGE		ELECTRIC WIRE ROPE HOIST			
					REV	00	CONTRACT No					
					DATE	15.01.19	CONTRACTOR		BHEL-PEM			
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Sl.No	COMPONENT & OPERATIONS	CHARACTERISTICS	CATEGORY	TYPE OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	D*	AGENCY M	AGENCY C	AGENCY N	REMARKS
1	2	3	4	5	6	7	8	9		**	10		11
1.4	HOOKS	CHEMICAL & MECHANICAL PROPERTIES	MA	LAb analysis	100%	APPROVED DRG/DATA SHEET IS:15560		MFRS' TEST CERT.	√	P	V	V	Welding not allowed in hooks for safety latch.
		U.T IF SHANK DIA > 50mm	CR	NDT	100%	ASTM A 388	NOTE 1	INSPN. REPORT	√	P	V/W	V	SHANK PORTION ONLY
		Dimension & PROOF LOAD TESTING	CR	Measurment , PROOF LOAD TEST	100%	APPROVED DRG/DATA SHEET / IS:3938 / IS:15560		QCR	√	P	V/W	V	
		MPI/DPT AFTER PROOF LOAD	CR	NDT	100%	ASTM E-165	NO CRACKS	INSPN. REPORT	√	P	V/W	V	
1.5	SHEAVES	MECH	MA	Tensile & hardness	1/lot	Approved drgs		MTC/IR	√	P	V	V	
1.6	CASTING FOR BEARING PLATE, ROPE GUIDES, PULLEYS ETC	CHEMICAL & MECHANICAL	MA	LAB ANALYSIS	1/LOT/HEAT	APPROVED DRG/MFG STANDARD	APPROVED DRG/MFG STANDARD	LAB REPORT	√	P	V	V	
		DPT ON MACHINED SURFACE	MA	NDT	100%	ASTM E-165	NO CRACKS	INSPN. REPORT	√	P	V	V	
2.0	**IN-PROCESS**												
2.1	Welding process capability and welder skill	WPS,PQR & WPQ	MA	Welding procedure approval and Welder performance qualification in accordance with ASME Section IX	100%	ASME Section IX		WPS,PQR & WPQ (QW-482/483/484)	√	P	V	V	In case approved WPS/PQR/WPQ from BHEL/NTPC/EIL/LLOYDS/TPL available, then documents/records to be submitted for verification during inspection, else, Vendor shall get the approval of Welding Procedure / Welder from the identified agency prior to carrying out welding at the job.
2.2	Welding of trolley, rope drum, gear box housing etc	Fillet weld	MA	LPI/MPI	100%	ASTM E165 or Eq/ No cracks or linear indication		INSPN. REPORT	√	P	V	V	10% DPT random
		Butt welds	MA	DPT & RT	100%	ASME SEC VIII, DIV 1, UW 51/52		RT FILM & REPORT	√	P	V	V	100% RT & DPT for butt weld in tension and 25 % RT & 100% DPT in compression. 100% RT & DPT shall be carried out on longitudinal & circumferential BUTT weld joints of rope drum.
2.3	NDT OF LOAD BEARING BUTT WELDS (**IF ANY**)	WELD QUALITY OF BUTT WELDS IN TENSION	CR	DPT & RT	100%	ASME SEC. VIII DIV. I	ASME SEC. VIII DIV. 4 . CLUW-51 FOR RT APPENDIX -8 FOR PT	INSPN. REPORT ND FILM	√	P	W	V/W	FILMS TO BE REVIEWED BY BHEL & END CUSTOMER/THIRD PARTY. DPT SHALL BE CHP .
2.4	**GEAR BOXES**												

		MANUFACTURERS NAME & ADDRESS		STANDARD MANUFACTURING QUALITY PLAN				PROJECT			RATE CONTRACT		
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						REV	00	CONTRACT No					
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						PAGE	1 of 4						
Sl.No	COMPONENT & OPERATIONS	CHARACTERISTICS	CATEGORY	TYPE OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	D*	AGENCY M	AGENCY C	AGENCY N	REMARKS
1	2	3	4	5	6	7	8	9		**	10		11
	COMPLETE ASSEMBLY	OVERALL DIMENSIONS. LEAK TEST, REDUCTION RATIO, BACK LASH AND CONTACT PATTERN,	MA	MEAS./VISUAL	100%	MFG. DRG./KERSON E TEST	MFG. DRG./NO LEAKAGE WHEN FILLED	INSPN. REPORT	√	P	V	V	
	NO LOAD RUN TEST FOR 4 HRS	CHECK FOR OIL LEAKAGE, VIBRATION, NOISE ,TEMP. RISE.	MA	PERFORMANCE	100%	APPROVED DRGS /No leakage,Noise 85dbA maxat 1 mtrs, vibration 75 microns max, oil temp rise <20 deg above ambient max		- DO -	√	P	V	V	
3.0	**ELECTRICALS**												
1	MOTORS & CABLES	Make, type , rating	MA	Visual /measurment	100%	Apprvd drg	IS 325 / IS:3938	IR, MTC	√	P	V	V	For motor refer Note: 2
		ROUTINE TESTS											
3	LIMIT SWITCHES,SFU, ISOLATOR, O/L RELAY, MCB, FUSES,PUSH BUTTONS,CONTACTOR, INDICATING LAMPS etc	Make , type , rating, functional, Continuity	MA	Review of TC	100%	Approved drgs		IR	√	P	V	V	
4	BRAKES	Make , type , rating, HV/IR, Functional test	MA	Review of routine test report	100%	Approved drgs		IR, MTC	√	P	V	V	
5	DSL	Make , type , rating, dimension	MA	Review of TC	100%	Approved drgs		IR	√	P	V	V	
6	Control transformer	Make , type , rating, input/output	MA	Review of TC	100%	Approved drgs		IR	√	P	V	V	
7	CONTROL PANEL, PENDANT PUSH BUTTON	* FIXING OF COMPONENTS WIRING MARKING CONTINUITY * FUNCTIONAL TEST * IR & H.V. TEST * IP - PROTECTION TEST * PAINT SHADE, THICKNESS, SHEET THICHKNESS, ADHESION TEST * DIMENSION * DOP- PAPER INSERTION TEST	MA	VISUAL/MEASURE	100%	APPD.DRG. WIRING DIAGRAM,	APPD. DRG. WIRING DIAGRAM,	IR	√	P	V	V	HV of Power circuit at 2kV and control circuit at 1kV. IR of power and control circuit at 500V Meggar with acceptance value of 0.5 Mega Ohm.
8	VVVF DRIVES (IF APPLICABLE)	MAKE , TYPE , RATING , ROUTINE TESTS	MA	VISUAL/ VERIFY	100%	APPROVED DRAWINGS	APPROVED DRAWINGS	MTC	√	P	V	V	
4.0	FINAL INSPECTION												

	MANUFACTURERS NAME & ADDRESS	STANDARD MANUFACTURING QUALITY PLAN				PROJECT	RATE CONTRACT
	AS PER APPROVED VENDOR LIST	ITEM:	ELECTRIC WIRE ROPE HOIST	QP NO	PE-TS-RC-563-A002	PACKAGE	ELECTRIC WIRE ROPE HOIST
				REV	00	CONTRACT No	
				DATE	15.01.19	CONTRACTOR	BHEL-PEM
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Sl.No	COMPONENT & OPERATIONS	CHARACTERISTICS	CATEGORY	TYPE OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	D*	AGENCY M	AGENCY C	AGENCY N	REMARKS
1	2	3	4	5	6	7	8	9		**	10		11
4.1	COMPLETELY ASSEMBLED HOIST	1. COMPLETENESS, CORRECTNESS, WELD QUALITY, OVERALL DIMENSIONS.	MA	VISUAL, MEAS	100%	APPD. DRG.	APPD. DRG.	MNFRS' TEST CERT.	√	P	W	W	CHP
4.2	ASSEMBLED HOIST PERFORMANCE WITH ACTUAL CONTROL PANEL, AND PENDENT PUSH BUTTON	1. LOAD TEST	CR	LOAD TEST at SWL	100%	IS:6547 / IS:393	IS:6547 / IS:3938	MNFRS' TEST CERT.	√	P	W	W	CHP
		2. HOISTING & LOWERING SPEED, PERFORMANCE OF CONTROLLERS SWITCHES CONTACTORS, RELAYS AND OTHER CONTROL DEVICES CORRELATIONS OF CIRCUITS AND INTERLOCKS AND SEQUENCES OF OPERATION , CURRENT MEASUREMENT,LIMIT SWITCH OPERATION.	CR	MEAS & VISUAL	100%	IS:3938, TECH SPEC.	TECH SPEC.	MNFRS' TEST CERT.	√	P	W	W	CHP
		3. OPERATION OF ALL PROTECTIVE DEVICES	CR	VISUAL	100%	TECH SPEC	TECH SPEC.	MNFRS' TEST CERT.	√	P	W	W	CHP
4.3	OVER LOAD TEST	OVER LOAD TEST INCLUDING HOLDING CAPACITY OF BRAKES, LIFTING LOAD FROM MID AIR, SOUNDNESS OF WELD AFTER OVERLOAD TEST.	CR	TEST AT 125 % OF SWL	100%	IS:3938	IS:3938	INSPN. REPORT	√	P	W	W	CHP
5	PAINTING												
5.1	PRIMER & FINISHING AND SHADE	Examination - Shade , THICKNESS	MI	visual	100%	DRG. & DATA SHEET & RELV. IS SPEC.		MNFRS' TEST CERT.		P	V		
		DFT	MA	measurement	Sample					P	V		
6	PACKING	STURDINESS, PROTECTION MARKING	MA	VISUAL	100%	MFG STD	Specification	Specification		P	V		
	NOTE:												

		MANUFACTURERS NAME & ADDRESS		STANDARD MANUFACTURING QUALITY PLAN				PROJECT		RATE CONTRACT				
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Sl.No	COMPONENT & OPERATIONS	CHARACTERISTICS	CATEGORY	TYPE OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS	
									D*	M	C	N		
1	2	3	4	5	6	7	8	9		**	10		11	
1	When back wall echo is set to 100% in sound area then a) defect echo shall not exceed 20% b) Back echo shall be minimum 80% in any area. Probe Frequency 2-5 MHz.													
2	Less than 30 KW. Acceptance of motor less than 30 KW is based on COC of the manufacturer & the contractor confirming as follows : It is hereby confirmed that the above mentioned motor/motors was/were manufactured taking care of specific requirement regarding ambient temp, voltage & frequency variation, hot start, pull out torque, starting KVA/KW, temp rise, distance between centerof stud and gland plate and tested in accordance with approved drawing/data sheet.													

		LEGNDS		
		* RECORDS INDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY MANUFACTURER IN QA DOCUMENTATION.		
		** M: MANUFACTURER/SUBCONTRACTOR		
		C: BHEL/BHEL NOMINATED THIRD PARTY INSPECTION AGENCY		
MANUFACTURER/ SUB CONTRACTOR		N: CUSTOMER/CUSTOMER'S CONSULTANT/CUSTOMER'S APPOINTED THIRD PARTY		
		'P'- PERFORM", W"- WITNESS AND "V"- VERIFICATION		
SIGNATURE		" CHP" CUSTOMER HOLD POINT	REVIEWED BY	NAME & SIGN OF APPROVING AUTHORITY &SEAL

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	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS **SPECIFIC TECHNICAL REQUIREMENT**	**SPECIFICATION No: PE-TS-RC-563-A002** **VOLUME: II B** **SECTION-I** **SUB-SECTION-IB** REV 00 DATE 15.01.19

SUB SECTION-IB

SPECIFIC TECHNICAL REQUIREMENT (ELECTRICAL)

(PROJECT SPECIFIC)

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SUB SECTION-IC

DATA SHEET A

BHEL	**TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS** **SPECIFIC TECHNICAL REQUIREMENT**	**SPECIFICATION No: PE-TS-RC-563-A002** **VOLUME: II B** **SECTION-I** **SUB-SECTION-IC** REV 00 DATE 15.01.19

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	50^0 C
6.0	General Design & duty	As per IS: 3938 latest conforming to Class-II
7.0	Operating speed /Creep speed	(Creep speed shall be project specific)
7.1	Hoisting motion	3.5 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 1960N/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	Not less than 5
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

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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)
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.

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BHEL	**TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS** **SPECIFIC TECHNICAL REQUIREMENT**	**SPECIFICATION No: PE-TS-RC-563-A002** **VOLUME: II B** **SECTION-I** **SUB-SECTION-IC** REV 00 DATE 15.01.19

19.0	MOTORS	HOIST	TROLLEY
19.1	Type	Sq. Cage induction, TEFC, S4 duty, 40% /60% CDF. Service class of motor shall be "M8" of IS 3177 / "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 25% margin over the maximum power requirement.	
20.0	**LIMIT SWITCHES**	Hoisting / lowering	Trolley
20.0	Type	-Snap action, self actuating type	Two/ one way lever
20.1	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 & 16 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 & 16 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		

BHEL	**TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS** **SPECIFIC TECHNICAL REQUIREMENT**	**SPECIFICATION No: PE-TS-RC-563-A002** **VOLUME: II B** **SECTION-I** **SUB-SECTION-IC** REV 00 DATE 15.01.19

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°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.
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.

MONORAIL SCHEDULE PE-TS-RC-563-A002

15.01.2019

A. Simply supported/Continuous monorail for Electric Hoist :

Assumptions: 1. Monorail beam span between two consecutive supports point shall not be more than 3.0m.

2. Applicable for all buildings .

Sl no	Electric Hoists capacity in Tonnes	Weight of hoist in Tonnes	Impact (25%)	Total load	Monorail beam span(m)	Monorail beam size
1	3	0.5	0.75	4.25	3.0	ISMB300
2	5	0.7	1.25	6.95	3.0	
3	8	0.875	2	10.875	3.0	ISMB400
4	10	1.09	2.5	13.59	3.0	
5	12	1.3	3	16.3	3.0	ISMB500
6	15	1.5	3.75	20.25	3.0	

B. Propped cantilever monorail for Electric Hoist :

Assumptions: 1. cantilever span of Monorail beam shall not be more than 3.0m or as specified in table below.

2. Applicable for hoist of capacity upto 10.0T.

Sl no	Electric Hoists capacity in Tonnes	Weight of hoist in Tonnes	Impact (25%)	Total load	Monorail beam span(m)	Monorail beam size
1	3	0.5	0.75	4.25	2.0	ISMB450
					3.0	ISMB500
2	5	0.7	1.25	6.95	2.0	ISMB500
					3.0	ISMB600
3	8	0.875	2	10.875	2.0/2.5	ISMB600
4	10	1.09	2.5	13.59	2.0	ISMB600

* ISMB - Indian Standard Medium weight Beams (Refer SP-6 (1)-1964)

Actual beam size shall be reconfirmed on project to project basis.

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SECTION-II

STANDARD TECHNICAL REQUIREMENT

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

BHEL	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS STANDARD TECHNICAL REQUIREMENT	SPECIFICATION No: PE-TS-RC-563-A002 VOLUME: II B SECTION-II SUB-SECTION-IIA REV 00 DATE 15.01.19

SUB SECTION-IIA

STANDARD TECHNICAL REQUIREMENT (MECHANICAL)

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		SECTION-II	
		SUB-SECTION-IIA	
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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.

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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).

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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 ± 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.

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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		

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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	

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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	

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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		

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SR. NO.	ITEM	SUPPLIERS	PLACE	REMARKS
		PBL*		
		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.

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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
	Oil seals	
16	Oil seals for CT gear box	100% for one EH
18	Oil seals for Hoist gear box	100% for one EH
	Brakes	
19	Brake liners for	
i)	Hoist brake	100% for one EH
ii)	CT brake	100% for one EH
20	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
	Wheels	
24	CT wheel assembly (complete) (driving)	100% for one EH
25	CT wheel assembly (complete) (idle)	100% for one EH
26	**Wire rope**	
a)	For various capacity & lift of Electric Hoist	100% for one EH
27	Rope Guide	100% for one EH
28	Rope Tightner	100% for one EH

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29	Rope sheave assembly	100% for one EH
30	Rubber bushes for flexible couplings	100% for one EH
	Electrical spares	
31	Contactors	1 no of each type, size and rating for one EH
32	Main contactors	1 set for one EH
33	Auxiliary contactors	1 set for one EH
34	Overload relays.	1 no of each type, size and rating for one EH
35	Relay	1 no of each type for one EH
36	Timers of each type	1 set for one EH
37	MCBs.	1 set for one EH
38	MCCB	1 set for one EH
39	Switch Fuse Units	1 No. for one EH
40	Fuses of each type	1 set for one EH
41	Fuse links	1 set for one EH
42	Control circuit fuses	1 set for one EH
43	Limit Switches for	
i)	Main Hoist	1 set for one EH
ii)	Cross Travel	1 set for one EH
44	Door limit switch	1 set for one EH
45	Selector switch	1 set for one EH
46	Current Collector shoes/ rollers	1 Set for one EH
47	Complete current collector assembly	1 Set for one EH
48	VVVF Drive for Hoisting	1 no. of each type and rating for one EH
49	VVVF drive for Cross travel	1 no. of each type and rating for one EH
50	Control module of VVVF drive	1 no. of each type and rating for one EH
51	Push buttons -Contact Element	1 no of each type, size and rating for one EH
52	Push buttons, ILPBs.(complete with contact elements)	1 set for one EH
53	Indicating lamps of each type	1 set for one EH
54	Electric meter	1 set for one EH
55	Power supply modules.	1 set for one EH
56	Resistor element of each size and type	1 set for one EH
57	Hooter	1 set for one EH
58	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
59	Transformer	1 set for one EH
60	1.1 KV Grade power cables for each type and size.	1 m
61	1.1 KV Grade control cables for each type and size.	1 m
62	Control Trailing Cable for Electrical Hoist	1 m

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63	Power Trailing Cable for Electrical Hoist	1 m
64	Power terminal block	1 set for one EH
65	Control terminal block	1 set for one EH
66	End plates for Power & Control terminal block	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.

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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.

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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.

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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.

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ANNEXURE – V

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

Sl. No.	BHEL DRG.NO	Customer's drawing no	DRAWING TITLE	SUBMISSION SCHEDULE - WEEK NUMBER FROM DATE OF P.O	Remarks
1	PE-V0-XXX-563-A201	SHALL BE INFORMED ON PROJECT TO PROJECT BASIS	Manufacturing Quality Plan with Sub vendor list OF ELECTRIC HOIST	2	For Customer's approval
2	PE-V0-XXX-563-A202		GA Drawing for Electric Hoist, DSL arrangement and painting details OF ELECTRIC HOIST	3	For Customer's approval
3	PE-V0-XXX-563-A219		Schematic Circuit Diagram of ELECTRIC HOIST.	3	For Customer's information
4	PE-V0-XXX-563-A210		Mechanism Sizing Calculation OF ELECTRIC HOIST	3	For Customer's approval
5	PE-V0-XXX-563-A218		Detailed BOM/BOQ for Hoist	5	For BHEL's information
6	PE-V0-XXX-563-A206		O & M Manual OF ELECTRIC HOIST	6	For Customer's information
7	PE-V0-XXX-563-A211		Electrical Load for Electric hoist	3	For BHEL's information
8	PE-V0-XXX-563-A207		Mandatory spare parts list (if applicable) OF ELECTRIC HOIST	4	For Customer's approval
9	PE-V0-XXX-563-A208		Erection & commissioning procedure OF ELECTRIC HOIST	6	For BHEL's information
10.	PE-V0-XXX-563-A209		Cable schedule and interconnection diagram	4	For BHEL's information
	XXX= PROJECT TO PROJECT BASIS				

Notes:
BHEL/CUSTOMER SHALL COMMENT /APPROVE THE DRAWINGS WITHIN 21 DAYS OF RECIEPT OF DRAWINGS.
VENDOR SHALL RESUBMIT THE REVISED DRAWINGS WITHIN 7-10 DAYS OF RECIEPT OF COMMENTS.

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INCOMPLETE DRAWINGS/DOCUMENTS SHALL NOT BE TREATED AS SUBMITTED.
MANUFACTURING SHALL BE STARTED ON RECIEPT OF CAT II APPROVED DRAWINGS.

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)

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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)**				

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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				

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	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

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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).

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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.

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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	

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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

PEM-6666-0

BHEL	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS STANDARD TECHNICAL REQUIREMENT	SPECIFICATION No: PE-TS-RC-563-A002 VOLUME: II B SECTION-II SUB-SECTION-IIA REV 00 DATE 15.01.19

S.NO. LENGTH	TYPE	DIMENSION IN MM			WEIGHT	CARRYING CAPACITY (KGS)
		BREADTH	HEIGHT			
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

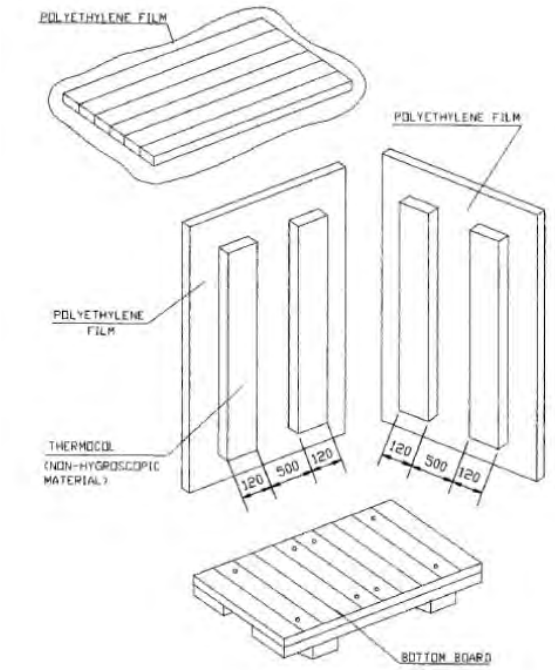

Figure 1

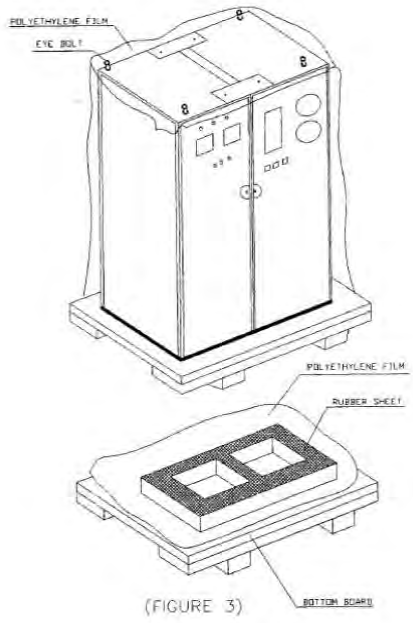

Figure 2

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

PEM-6666-0

BHEL	**TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS** **STANDARD TECHNICAL REQUIREMENT**	**SPECIFICATION No: PE-TS-RC-563-A002** **VOLUME: II B** **SECTION-II** **SUB-SECTION-IIA** REV 00 DATE 15.01.19

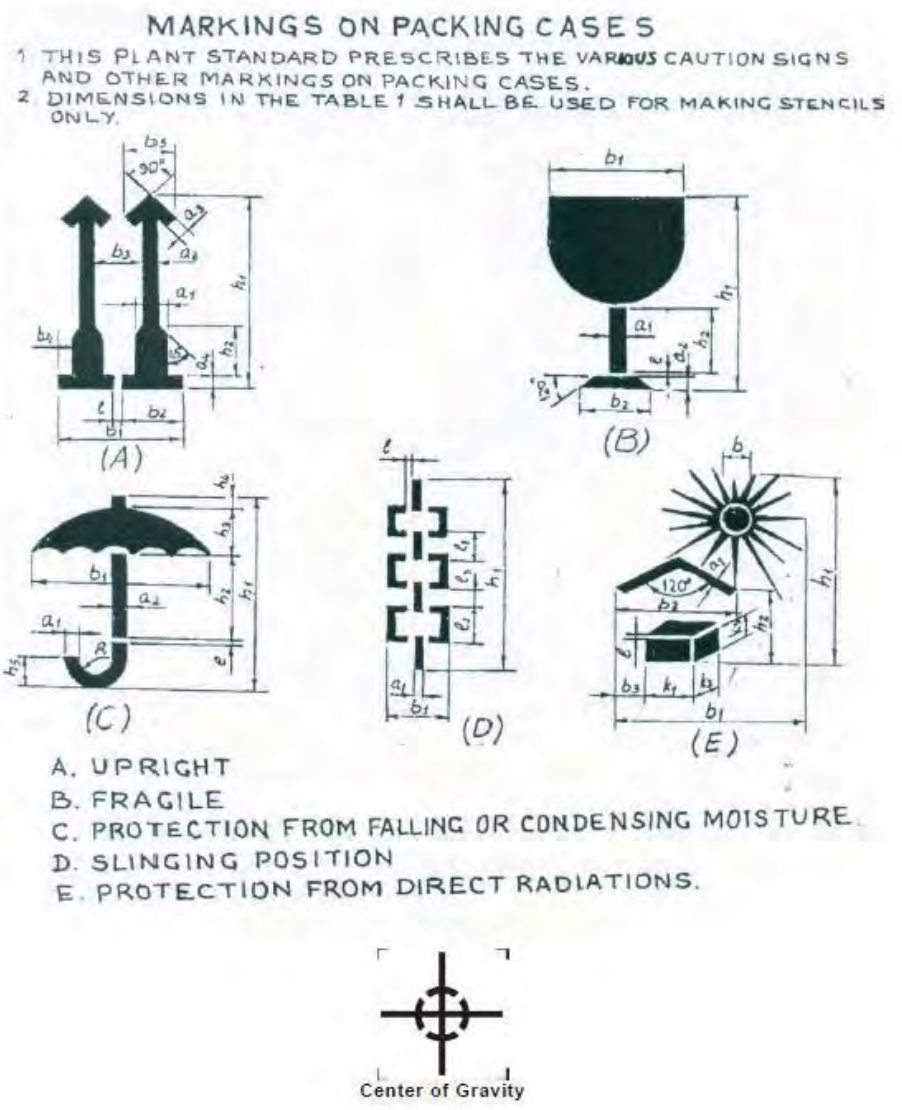

Figure 3

PEM-6666-0

BHEL	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS STANDARD TECHNICAL REQUIREMENT	SPECIFICATION No: PE-TS-RC-563-A002 VOLUME: II B SECTION-II SUB-SECTION-IIA REV 00 DATE 15.01.19

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.

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	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS STANDARD TECHNICAL REQUIREMENT	SPECIFICATION No: PE-TS-RC-563-A002	
		VOLUME: II B	
		SECTION-II	
		SUB-SECTION-IIA	
		REV 00	DATE 15.01.19

	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							

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	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS STANDARD TECHNICAL REQUIREMENT	SPECIFICATION No: PE-TS-RC-563-A002	
		VOLUME: II B	
		SECTION-II	
		SUB-SECTION-IIA	
		REV 00	DATE 15.01.19

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			

PEM-6666-0

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS STANDARD TECHNICAL REQUIREMENT	SPECIFICATION No: PE-TS-RC-563-A002	
		VOLUME: II B	
		SECTION-II	
		SUB-SECTION-IIA	
		REV 00	DATE 15.01.19

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								

PEM-6666-0

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS STANDARD TECHNICAL REQUIREMENT	SPECIFICATION No: PE-TS-RC-563-A002	
		VOLUME: II B	
		SECTION-II	
		SUB-SECTION-IIA	
		REV 00	DATE 15.01.19

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.

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BHEL	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS STANDARD TECHNICAL REQUIREMENT	SPECIFICATION No: PE-TS-RC-563-A002 VOLUME: II B SECTION-II SUB-SECTION-IIB REV 00 DATE 15.01.19

SUB SECTION-IIB

STANDARD TECHNICAL REQUIREMENT (ELECTRICAL)

	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)

BHEL	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.

BHEL	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	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 cooling fans suitable for both directions of rotation.

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**

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	SPECIFICATION NO.
BHEL	**LV MOTORS**	VOLUME II B
	DATA SHEET-A	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.

SUB-VENDOR LIST

The list of approved make of the LT Motors are as mentioned below:

S.No.	LIST OF LT MOTORS
1.	BHARAT BIJLEE LTD.
2.	CROMPTON GREAVES
3.	ASEA BROWN BOVERI
4.	KIRLOSKAR ELECTRIC CO LTD.
5.	NGEF
6.	SIEMENS
7.	MARATHON
8.	GE-POWER
9.	RAJINDRA ELECT INDUSTRIES
10.	LAXMI HYDRAULICS PVT. LTD

However, the final list of makes for the LT Motors is subjected to BHEL/Customer approval, during contract stage, without any commercial implications.

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	W	V	REMARKS
1	2	3	4	5	6	7	8	9	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

	QUALITY PLAN		CUSTOMER :			PROJECT TITLE			SPECIFICATION : NUMBER :			
			BIDDER/ VENDOR :			QUALITY PLAN NUMBER PED-506-00-Q-007, REV-03			SPECIFICATION : TITLE			
	SHEET 1 OF 9		SYSTEM			ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV & MV)			SECTION			VOLUME III
SL. NO.	COMPONENT/OPERATION	CHARACTERISTIC CHECK	CAT.	TYPE/ METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY P	W	V	REMARKS
1	2	3	4	5	6	7	8	9	10			11
1.0	RAW MATERIAL & BOUGHT OUT CONTROL											
1.1	SHEET STEEL, PLATES, SECTION, EYEBOLTS	1.SURFACE CONDITION	MA	VISUAL	100%	-	FREE FROM BLINKS, CRACKS, WAVINESS ETC	LOG BOOK	3	-	-	
		2.DIMENSIONS	MA	MEASUREMENT	SAMPLE	MANFR'S DRG./SPEC	MANFR'S DRG./SPEC	-DO-	3	-	-	
		3.PROOF LOAD TEST (EYE BOLT)	MA	MECH. TEST	-DO-	-DO-	-DO-	INSPEC. REPORT	3	-	2	
1.2	HARDWARES	1.SURFACE CONDITION	MA	VISUAL	100%		FREE FROM CRACKS, UN-EVENNESS ETC.	-DO-	3	-	-	
		2.PROPERTY CLASS	MA	VISUAL	SAMPLES	MANFR'S DRG./SPEC BOOK	RELEVENT IS/SPEC.	SUPPLIERS TC & LOG	3	-	2	PROPERTY CLASS MARKING SHALL BE CHECKED BY THE VENDOR
1.3	CASTING	1.SURFACE CONDITION	MA	VISUAL	100%		FREE FROM CRACKS, BLOW HOLES ETC.	LOG BOOK	3	-	2	
		2.CHEM. & PHY. PROP.	MA	CHEM & MECH TEST	1/HEAT NO.	MANFR'S DRG./SPEC	RELEVENT IS/	SUPPLIER'S TC	3	-	2	HEAT NO. SHALL BE VERIFIED
		3.DIMENSIONS	MA	MEASUREMENT	100%	MANUFR'S DRG.	MANUFR'S DRG.	LOG BOOK	3	-	2	
1.4	PAINT & VARNISH	1.MAKE, SHADE, SHELF LIFE & TYPE	MA	VISUAL	100% CONTINUOUS	MANFR'S DRG./SPEC	MANFR'S DRG./SPEC	LOG BOOK	3	-	2	
BHEL			**PARTICULARS**		**BIDDER/VENDOR**							
			NAME									
			SIGNATURE									
			DATE						BIDDER'S/VENDORS COMPANY SEAL			

BHEL	**QUALITY PLAN**		CUSTOMER :			PROJECT TITLE			SPECIFICATION : NUMBER :			
			BIDDER/ VENDOR :			QUALITY PLAN NUMBER PED-506-00-Q-007, REV-03			SPECIFICATION : TITLE			
	SHEET 2 OF 9		SYSTEM			ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV & MV)			SECTION			VOLUME III
SL. NO.	COMPONENT/OPERATION	CHARACTERISTIC CHECK	CAT.	TYPE/ METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY P	W	V	REMARKS
1	2	3	4	5	6	7	8	9	10			11
1.5	SHAFT (FORGED OR ROLLED)	1. SURFACE COND.	MA	VISUAL	100%	-	FREE FROM VISUAL DEFECTS	-DO-	3	-	-	VENDOR'S APPROVAL IDENTIFICATION SHALL BE MAINTAINED
		2. CHEM. & PHYSICAL PROPERTIES	MA	CHEM. & PHYSICAL TESTS	1/HEAT NO. OR HEAT TREATMENT BATCH NO	MFG. DRG. SPEC.	RELEVANT IS	SUPPLIER'S TC	3	-	2	
		3. DIMENSIONS	MA	MEASUREMENT	100%	-DO-	MANUFR'S DRG.	LOG BOOK	3	-	2	
		4.INTERNAL FLAWS	CR	UT	-DO-	ASTM-A388	MANUFR'S SPEC. BHEL SPEC.	-DO-	3	2	1	FOR DIA OF 55 MM & ABOVE
1.6	SPACE HEATERS, CONNEC-TORS, TERMINAL BLOCKS, CABLES, CABLE LUGS, CARBON BRUSH TEMP. DETECTORS, RTD, BTD'S	1. MAKE & RATING	MA	VISUAL	-DO-	MANUFR'S DRG. SPEC.	MANUFR'S DRG. SPEC.	-DO-	3	-	2	
		2. PHYSICAL COND.	MA	-DO-	-DO-	-	NO PHYS. DAMAGE, NO ELECTRICAL DISCONTINUITY	-DO-	3	-	2	
		3.DIMENSIONS (WHEREVER APPLICABLE)	MA	MEASUREMENT	SAMPLE	MANUFR'S DRG./ SPEC.	MANUFR'S DRG. / SPEC.	-DO-	3	-	2	
		4.PERFORMANCE/ CALIBRATION	MA	TEST	100%	-DO-	-DO-	INSP. REPORT	3	-	2	

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

BHEL	QUALITY PLAN		CUSTOMER :			PROJECT TITLE			SPECIFICATION : NUMBER :			
			BIDDER/ VENDOR :			QUALITY PLAN NUMBER PED-506-00-Q-007, REV-03			SPECIFICATION : TITLE			
	SHEET 3 OF 9		SYSTEM			ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV & MV)			SECTION			VOLUME III
SL. NO.	COMPONENT/OPERATION	CHARACTERISTIC CHECK	CAT.	TYPE/ METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY P	W	V	REMARKS
1	2	3	4	5	6	7	8	9	10			11
1.7	OTHER INSULATING MATERIALS LIKE SLEEVES, BINDINGS CORDS, PAPERS, PRESS BOARDS ETC.	1. SURFACE COND. ETC.	MA	VISUAL	100%	-	NO VISUAL DEFECTS	INSPT. REPORT	3	-	2	
		2. OTHER CHARACTERISTICS	MA	TEST	SAMPLE	MANUF'S SPEC.	MANUF'S SPEC.	LOG BOOK AND OR SUPPLIER'S TC	3	-	2	
1.8	SHEET STAMPING (PUNCHED)	1. SURFACE COND.	MA	VISUAL	100%	-	NO VISUAL DEFECTS (FREE FROM BURS)	LOG BOOK	3	-	-	
		2.DIMENSIONS INCLUDING BURS HEIGHT	MA	MEASUREMENT	SAMPLE	MANUFR'S DRG. .	MANUFR'S DRG.	-DO-	3	-	2	FOR MV MOTOR INSULA-TION/VARNISH THICKNESS SHALL BE MORE THAN THE BURS HEIGHT
		3. ACCEPTANCE TESTS	MA	ELECT. & MECH TESTS	-DO-	MANUF'S SPEC./ RELEVANT IS	RELEVANT IS	SUPPLIER'S TC	3	-	2	
1.9	CONDUCTORS	1. SURFACE FINISH	MA	VISUAL	100%	-	FREE FROM VISUAL DEFECTS	LOG BOOK	3*	-	2*	* MOTOR MANUFACTURER TO CONDUCT VISUAL CHECK FOR SURFACE FINISH ON RANDOM BASIS (10% SAMPLE) AT HIS WORKS AND MAINTAIN RECORD FOR VERIFICATION BY BHEL/CUSTOMER.
		2.ELECT. PROP, & MECH. PROP	MA	ELECT. & MECH.TEST	SAMPLES	RELEVANT IS/ BS OR OTHER STANDARDS	RELEVANT IS/ BS OR OTHER STANDARDS	SUPPLIERS TC & VENDOR'S INSPN. REPORTS	3	-	2	

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

	QUALITY PLAN	CUSTOMER :	PROJECT TITLE	SPECIFICATION : NUMBER :
		BIDDER/ VENDOR :	QUALITY PLAN NUMBER PED-506-00-Q-007, REV-03	SPECIFICATION : TITLE
	SHEET 4 OF 9	SYSTEM	ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV & MV)	SECTION VOLUME III

SL. NO.	COMPONENT/OPERATION	CHARACTERISTIC 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
		3.DIMENSIONS	MA	MEASUREMENT	-DO-	-DO-	-DO-	Log Book	3	-	2	
1.10	BEARINGS	1.MAKE & TYPE	MA	VISUAL	100%	MANFR'S DRG./ APPROVED DATASHEET	MANFR'S DRG./ APPROVED DATASHEET	-DO-	3	-	2	
		2.DIMENSIONS	MA	MEASUREMENT	SAMPLE	BHEL DATA SHEET	BHEL DATA SHEET BEARING MANUF'S CATALOGUES	-DO-	3	-	2	
		3.SURFACE FINISH	MA	VISUAL	100%	-	FREE FROM VISUAL DEFECTS	-DO-	3	-	2	
1.11	SLIP RING (WHEREVER APPLICABLE)	1.SURFACE COND.	MA	VISUAL	100%	-	-DO-	-DO-	3	-	-	
		2.DIMENSIONS	MA	MEASUREMENT	SAMPLE	MANUF'S DRG	MANUF'S DRG	-DO-	3	-	-	
		3.TEMP.WITH-STAND CAPACITY	MA	ELECT.TEST	-DO-	MANUF'S SPEC./ BHEL SPEC.	MANUF'S SPEC./ BHEL SPEC.	-DO-	3	-	2	
		4.HV/IR	MA	-DO-	100%	-DO-	-DO-	-DO-	3	-	2	
1.12	OIL SEALS & GASKETS	1.MATERIAL OF GASKET	MA	VISUAL	100%	MANUF'S DRG/SPECS	MANUF'S DRG./ SPECS.	-DO-	3	-	-	
		2.SURFACE COND.	MA	VISUAL	100%	-	FREE FROM VISUAL DEFECTS	-DO-	3	-	-	
		3.DIMENSIONS	MA	MEASUREMENT	SAMPLE	MANUF'S DRG	MANUF'S DRG	-DO-	3	-	-	

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

	QUALITY PLAN		CUSTOMER :			PROJECT TITLE			SPECIFICATION : NUMBER :			
			BIDDER/ : VENDOR			QUALITY PLAN NUMBER PED-506-00-Q-007, REV-03			SPECIFICATION : TITLE			
	SHEET 5 OF 9		SYSTEM			ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV & MV)			SECTION			VOLUME III
SL. NO.	COMPONENT/OPERATION	CHARACTERISTIC 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
2.0	IN PROCESS											
2.1	STATOR FRAME WELDING (IN CASE OF FABRICATED STATOR)	1.WORKMANSHIP & CLEANNESS	MA	VISUAL	100%	-DO-	GOOD FINISH	LOG BOOK	3/2	2	-	
		2.DIMENSIONS	MA	MEASUREMENT	-DO-	MANUF'S DRG	MANUF'S DRG	-DO-	2	-	-	
2.2	MACHINING	1.FINISH	MA	VISUAL	100%	-DO-	GOOD FINISH	LOG BOOK	2	-	-	
		2.DIMENSIONS	MA	MEASUREMENT	-DO-	MANUF'S DRG	MANUF'S DRG	-DO-	2	-	-	
		3.SHAFT SURFACE FLOWS	MA	PT	-DO-	RELEVENT SPEC./ ASTM-E165	MANUFR'S SPEC./ BHEL SPEC./	-DO-	2	-	1	
2.3	PAINTING	1.SURFACE PREPARATION	MA	VISUAL	100%	MANFR'S SPEC/BHEL SPEC./ RELEVANT STAND	BHEL SPEC. SAME AS COL.7	LOG BOOK	2	-	-	
		2.PAINT THICKNESS (BOTH PRIMER & FINISH COAT)	MA	MEASUREMENT BY ELCOMETER	SAMPLE	-DO-	-DO-	-DO-	2	-	-	
		3.SHADE	MA	VISUAL	-DO-	-DO-	-DO-	Log Book	2	-	-	
		4.ADHESION	MA	CROSS CUTTING & TAPE TEST	-DO-	-DO-	-DO-	Log Book	2	-	-	

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

	QUALITY PLAN	CUSTOMER :	PROJECT TITLE	SPECIFICATION : NUMBER :	
		BIDDER/ : VENDOR	QUALITY PLAN NUMBER PED-506-00-Q-007, REV-03	SPECIFICATION : TITLE	
	SHEET 6 OF 9	SYSTEM	ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV & MV)	SECTION	VOLUME III

SL. NO.	COMPONENT/OPERATION	CHARACTERISTIC 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
2.4	SHEET STACKING	1.COMPLETENESS	MA	MEASUREMENT	SAMPLE	MANUFR'S SPEC.	MANUFR'S SPEC.	Log Book	2	-	-	
		2.COMPRESSION & TIGHTENING	MA	MEASUREMENT	100%	-DO-	-DO-	Log Book	2	-	-	
		3.CORE LOSS & HOTSPOT	MA	ELECT.TEST	-DO-	-DO-	-DO-	Log Book	2	1*	1	(FOR MOTORS OF 2MW AND ABOVE) * ON 10% RANDOM SAMPLE
2.5	WINDING	1.COMPLETENESS	CR	VISUAL	100%	MANUFR'S SPEC./BHEL SPEC.	MANUFR'S SPEC./BHEL SPEC.	Log Book	2	-	-	
		2.CLEANLINESS	CR	-DO-	-DO-	-DO-	-DO-	Log Book	2	-	-	
		3.IR-HV-IR	CR	ELECT. TEST	-DO-	-DO-	-DO-	Log Book	2	-	1	
		4.RESISTANCE	CR	-DO-	-DO-	-DO-	-DO-	Log Book	2	-	1	
		5.INTERTURN INSULATION	CR	-DO-	-DO-	-DO-	-DO-	Log Book	2	-	-	
		6.SURGE WITH STAND AND TAN. DELTA TEST	CR	-DO-	-DO-	-DO-	-DO-	Log Book	2	-	1	FOR MV MOTOR
2.6	IMPREGNATION	1.VISCOSCITY	MA	PHY. TEST	AT STARTING	-DO-	-DO-	Log Book	2	-	-	
		2.TEMP. PRESSURE VACCUM	MA	PROCESS CHECK	CONTINUOUS	-DO-	-DO-	Log Book	2	-	-	
		3.NO. OF DIPS	MA	-DO-	-DO-	-DO-	-DO-	Log Book	2	-	1	THREE DIPS TO BE GIVEN

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

	QUALITY PLAN		CUSTOMER :			PROJECT TITLE			SPECIFICATION : NUMBER :			
			BIDDER/ VENDOR :			QUALITY PLAN NUMBER PED-506-00-Q-007, REV-03			SPECIFICATION : TITLE			
	SHEET 7 OF 9		SYSTEM			ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV & MV)			SECTION			VOLUME III
SL. NO.	COMPONENT/OPERATION	CHARACTERISTIC CHECK	CAT.	TYPE/ METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY P	W	V	REMARKS
1	2	3	4	5	6	7	8	9	10			11
		4.DURATION	MA	-DO-	-DO-	-DO-	-DO-	Log Book	2	-	1	
2.7	COMPLETE STATOR ASSEMBLY	1.COMPACTNESS & CLEANLINESS	MA	VISUAL	100%	-DO-	-DO-	Log Book	2	-	-	
2.8	BRAZING/COMPRESSION JOINT	1.COMPLETENESS	CR	-DO-	-DO-	-DO-	-DO-	Log Book	2	-	-	
		2.SOUNDNESS	CR	MALLET TEST & UT	-DO-	-DO-	-DO-	Log Book	2		1	
		3.HV	MA	ELECT. TEST	-DO-	-DO-	-DO-	Log Book	2		1	
2.9	COMPLETE ROTOR ASSEMBLY	1.RESIDUAL UNBALANCE	CR	DYN. BALANCE	-DO-	MFG SPEC./ ISO 1940	MFG. DWG.	Log Book	2		1	VERIFICATION FOR MV MOTOR ONLY
		2.SOUNDNESS OF DIE CASTING	CR	ELECT. (GROWLER TEST)	-DO-	MFG. SPEC.	MFG. SPEC.	Log Book	2		1	
2.10	ASSEMBLY	1.ALIGNMENT	MA	MEAS.	-DO-	-DO-	-DO-	Log Book	2	-	-	
		2.WORKMANSHIP	MA	VISUAL	-DO-	-DO-	-DO-	Log Book	2	-	-	
		3.AXIAL PLAY	MA	MEAS.	-DO-	-DO-	-DO-	Log Book	2	-	1	
		4.DIMENSIONS	MA	-DO-	-DO-	MFG.DRG./ MFG SPEC.	MFG. DRG/ RELEVANT IS	Log Book	2	-	-	
		5.CORRECTNESS, COMPLETENESS TERMINATIONS/ MARKING/ COLOUR CODE	MA	VISUAL	100%	MFG SPEC. RELEVANT IS	MFG SPEC. RELEVANT IS	Log Book	2	-	-	
		6. RTD, BTD & SPACE HEATER MOUNTING.	MA	VISUAL	100%	MFG SPEC. RELEVANT IS	MFG SPEC. RELEVANT IS	Log Book	2		1	

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

	QUALITY PLAN		CUSTOMER :			PROJECT TITLE			SPECIFICATION : NUMBER :			
			BIDDER/ VENDOR :			QUALITY PLAN NUMBER PED-506-00-Q-007, REV-03			SPECIFICATION : TITLE			
	SHEET 8 OF 9		SYSTEM			ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV & MV)			SECTION			VOLUME III
SL. NO.	COMPONENT/OPERATION	CHARACTERISTIC 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
3.0	TESTS	1.TYPE TESTS INCLUDING SPECIAL TESTS AS PER BHEL SPEC.	MA	ELECT.TEST	1/TYPE/SIZE	IS-325/ BHEL SPEC./ DATA SHEET	IS-325/ BHEL SPEC./ DATA SHEET	TEST REPORT	2	1*	1	* NOTE - 1
		2.ROUTINE TESTS INCLUDING SPECIAL TEST AS PER BHEL SPEC.	MA	-DO-	100%	-DO-	-DO-	-DO-	2	1$	1	$ NOTE - 2
		3.VIBRATION & NOISE LEVEL	MA	-DO-	100%	IS-12075 & IS-12065	IS-12075 & IS-12065	-DO-	2	1$	1	$ NOTE - 2
		4.OVERALL DIMENSIONS AND ORIENTATION	MA	MEASUREMENT & VISUAL	100%	APPROVED DRG/DATA SHEET	APPROVED DRG/DATA SHEET & RELEVANT IS	INSPC. REPORT	2	1	-	
		5.DEGREE OF PROTECTION	MA	ELECT. & MECH. TEST	1/TYPE/ SIZE	RELEVANT IS	BHEL SPEC. AND DATA SHEET	TC	2	-	1	TC FROM AN INDEPENDENT LABORATORY, REFER NOTE-3
		6. MEASUREMENT OF RESISTANCE OF RTD & BTD	MA	-DO-	100%	-DO-	-DO-	-DO-	2	1$	1	$ NOTE - 2
		7. MEASUREMENT OF RESISTANCE, IR OF SPACE HEATER	MA	-DO-	100%	-DO-	-DO-	-DO-	2	1$	1	$ NOTE - 2
		8. NAMEPLATE DETAILS	MA	VISUAL	100%	IS-325 & DATA SHEET	IS-325 & DATA SHEET	INSPC. REPORT	2	1$	1	$ NOTE - 2
		9.EXPLOSION FLAME PROOF NESS (IF SPECIFIED)	MA	EXPLOSION FLAME PROOF TEST	1/TYPE	IS-3682 IS-8239 IS-8240	IS-3682 IS-8239 IS-8240	TC	2	-	1	TC FROM AN INDEPENDENT LABORATORY, REFER NOTE-3
		10. PAINT SHADE, THICKNESS & FINISH	MA	VISUAL & MEASUREMENT BY ELKOMETER	SAMPLE	BHEL SPEC. & DATA SHEET	BHEL SPEC. & DATA SHEET	TC	2	1$	1	SAMPLING PLAN TO BE DECIDED BY INSPECTION AGENCY $ NOTE - 2

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

	QUALITY PLAN	CUSTOMER :	PROJECT TITLE	SPECIFICATION : NUMBER :
		BIDDER/ : VENDOR	QUALITY PLAN NUMBER PED-506-00-Q-007, REV-03	SPECIFICATION : TITLE
	SHEET 9 OF 9	SYSTEM	ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV & MV)	SECTION VOLUME III

SL. NO.	COMPONENT/OPERATION	CHARACTERISTIC 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

NOTES:

1 DEPENDING UPON THE SIZE AND CRITICALLY, WITNESSING BY BHEL SHALL BE DECIDED.

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

3 IN CASE TEST CERTIFICATES FOR THESE TESTS ON SIMILAR TYPE, SIZE AND DESIGN OF MOTOR FROM INDEPENDENT LABORATORY ARE AVAILABLE, THESE TEST MAY NOT BE REPEATED.

4 WHEREVER CUSTOMER IS INVOLVED IN INSPECTION, AGENCY (1) SHALL MEAN BHEL AND CUSTOMERS BOTH TOGETHER.

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

ANNEXURE-II

CABLE SCHEDULE FORMAT

ANNEXURE III

UNITCABLENO	FROM	TO	PURPOSE	CABLE SCOPE (BHEL PEM/ VENDOR)	REMARKS	CABLESIZE	PATHCABLENO	TENTATIVE CABLE LENGTH

	DOCUMENT TITLE TECHNICAL SPECIFICATION FOR 1.1 kV XLPE POWER CABLES	SPECIFICATION NO. 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	

BHEL	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

	DOCUMENT TITLE **CONDUITS AND PIPES**	SPECIFICATION NO. PES-507-27	
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GENERAL TECHNICAL REQUIREMENTS
OF
CONDUITS AND PIPES
SPECIFICATION NO. PES-507-27
REV 0

	DOCUMENT TITLE **CONDUITS AND PIPES**	SPECIFICATION NO. PES-507-27	
		VOLUME II B	
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1.0 GENERAL

1.1 This specification covers the manufacture, inspection & testing at vendor's works and delivery to site of conduits, pipes and their fittings for electrical installation.

2.0 CODES AND STANDARDS

2.1 The material, constructional features and various processes involved in manufacture shall comply with currently applicable Indian Standards.

2.2 The following Indian Standards shall be applicable, in general. However if Data Sheet A specifies conformance to other international standards, the equivalent IEC/BS/other standards shall be considered.

a) IS:9537 (All Parts) Conduits for electrical installation.

b) IS:3480 Flexible steel conduits for electrical wiring.

c) IS:6946 Flexible non-metallic conduits for electrical installation.

d) IS:1239 Mild steel tubes, tubulars and other wrought steel fittings. (for size above 63mm dia of rigid conduits)

e) IS:2667 Fittings for rigid steel conduits for electrical wiring.

f) IS:3837 Accessories for rigid steel conduits for electrical wiring.

g) IS:3419 Fittings for rigid non-metallic conduits.

h) IS:6005 Code of practice for phostating iron & steel.

i) IS:2629 Recommended practice for hot dip galvanizing on iron and steel.

j) IS:4759 Specification for hot dip zinc coatings on structural steel and allied products.

k) IS:6745 Methods for determination of mass of zinc coating on zinc coated iron and steel articles.

3.0 DESIGN REQUIREMENTS AND CONSTRUCTIONAL FEATURES

The conduit and conduit accessories shall include conduit plugs & caps, gaskets and box cover etc in addition to any specific requirement given in Data Sheet A. The diameter of conduits and accessories shall be uniform throughout the length.

3.1 Rigid Conduits and Fittings

3.1.1 Rigid conduits shall generally conform to the requirements of IS:9537 (Part I & Part II). However conduits above 63mm diameter shall conform to the requirements of IS:1239. Unless specified otherwise in Data Sheet A, all conduits and pipes shall be of medium duty.

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3.1.2 The rigid conduits shall be hot dip galvanized inside and outside. Weight of zinc shall be as per IS:4759. Conduits shall be thoroughly cleaned and pretreated, conforming to IS:6005.

3.1.3 Conduits shall be supplied in approximate length as specified below

a) Rigid Conduits 5 metres

b) Flexible Conduits 10 - 30 metres

3.1.4 Each end of conduit length shall be threaded. The ends of conduits shall be sealed with protective caps to prevent damage to threaded portions and entrance of moisture and foreign material.

3.1.5 The inside surface of all conduits shall be smooth and suitable for pulling insulated cables and wires without damage.

3.1.6 Conduit fittings shall be made out of tube or cast to the shape as to match with corresponding conduit sizes and meet their purpose without any special adjustment.

3.1.7 All fittings shall be screwed type and hot dip galvanized inside and outside.

3.2 Flexible Metallic Conduits and Fittings

3.2.1 Flexible metallic conduits shall generally conform to the requirements of IS:3480.

3.2.2 Flexible conduits shall be made of strip steel which shall be of cold rolled mild steel. The strip shall be of uniform width and thickness throughout.

3.2.3 The strip shall be electro galvanized to a minimum thickness of 25 microns as specified in IS:3480. The surface of the strip shall be thoroughly cleaned before application of protective coating. Pretreatment, before galvanization, shall conform to IS:6005.

3.2.4 The strip for making flexible conduit shall be wound tightly and so overlapped in subsequent helicals that no openings are seen in normal position.

3.2.5 Flexible conduits shall be lead coated for application in high temperature zones, if specifically mentioned in Data Sheet A.

3.2.6 The conduit shall have uniform diameter throughout its length. The internal surface of all conduits shall be smooth and suitable for pulling insulated cables and wires without damage.

3.3 PVC Conduits

3.3.1 PVC conduits shall generally conform to the requirements of IS:9537(Part I & Part III).

4.0 INSPECTION

4.1 The following stages of manufacture shall be stage inspected by Purchaser or his duly authorized representative.

4.1.1 Inspection of manufacturing processes such as shearing, punching, bending, welding, galvanizing etc.

4.1.2 Inspection of packing material and procedure.

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4.1.3 Inspection of finished product.

4.2 The inspection will be carried out as per agreed quality plan.

5.0 TESTING

5.1 Rigid Conduits

a) Acceptance Tests - as per IS:9537 Part 1 & 2 upto 63mm OD
- as per IS:1239 above 63mm OD

i) Dimension checks

ii) Bending test (below 32mm OD)

iii) Compression test

b) Special Tests (as acceptance test) as applicable to galvanizing.

5.2 Flexible Steel Conduits

a) Acceptance Tests - as per IS:3480

i) Dimension checks

ii) Linear breaking test

iii) Test for flexibility

iv) Bend fracture test

v) crushing test

b) Special Tests (as acceptance test) as applicable to galvanizing.

5.3 PVC Conduits

a) Type Tests - as per IS : 9537 (Part 1 & 3)

i) Dimension checks

ii) Bending test

iii) Compression test

iv) Impact test

v) Collapse test

vi) Resistance test

vii) Resistance to burning

	DOCUMENT TITLE	SPECIFICATION NO. PES-507-27	
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viii) Electrical Characteristics

b) Acceptance tests - as per IS:9537 (Part 1 & 3)

i) Dimension checks

ii) Bending test

iii) Compression test

iv) Collapse test

v) Resistance to burning

vi) Electrical characteristics

5.4 Sampling for the tests shall be done as per applicable standards mentioned above.

5.5 The testing shall be carried out as per agreed quality plan.

6.0 PACKING

6.1 The material shall be packed as per manufacturer's standard. Packing procedure shall be to the purchaser's approval.

7.0 DRAWING, DATA AND DOCUMENTS REQUIRED

7.1 The following information shall be furnished within two weeks of award of contract, for purchaser's approval.

a) Manufacturing drawings/details.

b) Recommended Field quality plan covering site handling, storing, laying etc.

c) Final quality plan.

7.3 The following information shall be furnished after testing and inspection

Type Test, routine test and special test certificates in bound volume in requisite number.

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DATASHEET A

SPECIFIC TECHNICAL REQUIREMENTS

1.0	APPLICABLE STANDARDS:	IS:9537,IS: 1239, IS:3480
2.0	RIGID STEEL CONDUITS & STEEL PIPES	
a)	Material:	Cold rolled mild steel to IS:226
b)	Applicable standard	
	i) Upto 63mm OD:	IS:9537 Part I & II
	ii) Above 63mm OD:	IS:1239
c)	Surface treatment:	Hot dip galvanizing inside & outside as per IS:2629
d)	Wt. of zinc:	as per IS 4759
e)	Duty:	Medium
f)	Fittings:	Screw type as per IS:2667
3.0	FLEXIBLE CONDUITS:	
a)	Material:	Strip steel cold rolled and annealed
b)	Standard applicable:	IS: 3480
c)	Surface treatment:	Electro galvanized as per IS: 3480
d)	Whether lead coated:	YES
e)	Minimum thickness: of zinc coating	25 microns
4.0	PVC CONDUITS	
a)	Material:	PVC
b)	Applicable standard:	IS: 9537 (Part I & III)

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOIST	**SPECIFICATION No: PE-TS-RC-563-A002**
		VOLUME: III
		SECTION-III
		REV. 00 / **DATE: 15.01.19**
	DOCUMENTS TO BE SUBMITTED BY BIDDER	**SHEET :**

SECTION-III

DOCUMENTS TO BE SUBMITTED BY BIDDER

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

BHEL	**TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS** **DOCUMENTS TO BE SUBMITTED BY BIDDER**	**SPECIFICATION No: PE-TS-RC-563-A002** **VOLUME: III** **SECTION-III** **SUB-SECTION-IIIA** REV 00 DATE 15.01.19

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

BHEL	**TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS** **DOCUMENTS TO BE SUBMITTED BY BIDDER**	**SPECIFICATION No: PE-TS-RC-563-A002** **VOLUME: III** **SECTION-III** **SUB-SECTION-IIIA** REV 00 DATE 15.01.19

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.

BHEL	**TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS** **DOCUMENTS TO BE SUBMITTED BY BIDDER**	**SPECIFICATION No: PE-TS-RC-563-A002** **VOLUME: III** **SECTION-III** **SUB-SECTION-IIIB** REV 00 DATE 15.01.19

SUB SECTION-IIIB
COMPLIANCE CUM CONFIRMATION CERTIFICATE

PEM-6666-0

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS DOCUMENTS TO BE SUBMITTED BY BIDDER	SPECIFICATION No: PE-TS-RC-563-A002	
		VOLUME: III	
		SECTION-III	
		SUB-SECTION-IIIB	
		REV 00	DATE 15.01.19

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

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS DOCUMENTS TO BE SUBMITTED BY BIDDER	SPECIFICATION No: PE-TS-RC-563-A002	
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		SECTION-III	
		SUB-SECTION-IIIB	
		REV 00	DATE 15.01.19

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.

PEM-6666-0

	TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS **DOCUMENTS TO BE SUBMITTED BY BIDDER**	**SPECIFICATION No: PE-TS-RC-563-A002** **VOLUME: III** **SECTION-III** **SUB-SECTION-IIIC** REV 00 DATE 15.01.19

SUB SECTION-IIIC
ELECTRICAL LOAD DATA

LOAD TITLE	RATING (KW / A)		UNIT (U)/STN (S)	Nos.		VOLTAGE CODE*	FEEDER CODE**	EMER. LOAD (Y)	CONT.(C)/ INTT.(I)	STARTING TIME >5 SEC (Y)	LOCATION	BOARD NO.	CABLE		BLOCK CABLE DRG. No.	CONTROL CODE	REMARKS	LOAD No.
	NAME PLATE	MAX. CONT. DEMAND (MCR)		RUNNING	STANDBY								SIZE CODE	NOs				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1T CAPACITY ELECTRIC HOIST		1.75 kW	-	1	0	D	S	N	I	-								
2T CAPACITY ELECTRIC HOIST		3.5 kW	-	1	0	D	S	N	I	-								
3T CAPACITY ELECTRIC HOIST		5 kW	-	1	0	D	S	N	I	-								
5T CAPACITY ELECTRIC HOIST		8 kW	-	1	0	D	S	N	I	-								
8T CAPACITY ELECTRIC HOIST		13 kW	-	1	0	D	S	N	I	-								
10T CAPACITY ELECTRIC HOIST		17 kW	-	1	0	D	S	N	I	-								
12T CAPACITY ELECTRIC HOIST		19 kW	-	1	0	D	S	N	I	-								
15T CAPACITY ELECTRIC HOIST		23 kW	-	1	0	D	S	N	I	-								

NOTE:-Signed and stamped copy of this electrical load data shall be furnished by bidder along with bid. In event of ordering, above load data shall be considered as final and inputs for switchgear sizing shall be furnished to concerned electrical agency based on this electrical load data. Hence, no change in this load data shall be accommodated during detail engineering.

NOTES:
1. COLUMN 1 TO 12 & 18 SHALL BE FILLED BY THE REQUISITIONER (ORIGINATING AGENCY); REMAINING COLUMNS ARE TO BE FILLED UP BY PEM (ELECTRICAL)
2. ABBREVIATIONS : * VOLTAGE CODE (7):- (ac) A=11 KV, B=6.6 KV, C=3.3 KV, D=415 V, E=240 V (1 PH), F=110 V (cc): G=220 V, H=110 V, J=48 V, K=+24V, L=-24 V
: ** FEEDER CODE (8):- U=UNIDIRECTIONAL STARTER, B=BI-DIRECTIONAL STARTER, S=SUPPLY FEEDER, D=SUPPLY FEEDER (CONTACTER CONTROLLED)

भेल BHEL	LOAD DATA (ELECTRICAL)	JOB NO.	RC	ORIGINATING AGENCY	PEM (ELECTRICAL)
		PROJECT TITLE	RATE CONTRACT	NAME	DATA FILLED UP ON
		SYSTEM	ELECTRIC HOISTS	SIGN.	DATA ENTERED ON
		DEPTT. / SECTION	ELECTRICAL	SHEET 1 OF 1 REV. 00	DE'S SIGN. & DATE 15.01.2019

BHEL	**TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS** **DOCUMENTS TO BE SUBMITTED BY BIDDER**	**SPECIFICATION No: PE-TS-RC-563-A002** **VOLUME: III** **SECTION-III** **SUB-SECTION-IIID** REV 00 DATE 15.01.19

SUB SECTION-IIID
DEVIATION SCHEDULE

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

BHEL	**TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS** **DOCUMENTS TO BE SUBMITTED BY BIDDER**	**SPECIFICATION No: PE-TS-RC-563-A002** **VOLUME: III** **SECTION-III** **SUB-SECTION-IIIE** REV 00 DATE 15.01.19

SUB SECTION-IIIE
PRE BID CLARIFICATION SCHEDULE

PEM-6666-0

BHEL	**TECHNICAL SPECIFICATION FOR RATE CONTRACT OF ELECTRIC WIRE ROPE HOISTS** **DOCUMENTS TO BE SUBMITTED BY BIDDER**	**SPECIFICATION No: PE-TS-RC-563-A002** **VOLUME: III** **SECTION-III** **SUB-SECTION-IIIE** REV 00 DATE 15.01.19

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

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Clause Ref:	Existing Clause as:	Replaced/ New Clause as:
Clause No.4 of GCTC (General commercial terms and conditions)	**TAXES AND DUTIES** **4.1 EXCISE DUTY** 4.1.1 Seller/ Contractor is required to ensure that excise duty including cess, if any, is quoted as per the existing tariff on the date of the offer and all benefits as per existing rules have been considered. 4.1.2 Excise duty actually incurred by Seller/ Contractor on self-manufactured items alone shall be reimbursed against documentary evidence. Excise duty paid by Purchaser on inputs, bought out items, raw materials and components consigned directly to site from sources other than Seller/ Contractor's factory/ works shall be included by the bidder in the quoted basic price. 4.1.3 If excise duty is paid under protest or dispute, it shall not be reimbursed till the dispute is settled. If the Seller/ Contractor claims/ obtains any refund of the excise duty paid, the same shall be refunded to the Purchaser immediately 4.1.4 Invoice cum Excise duty gate pass (Excise Invoice) should contain the name of the ultimate consignee as per Order/ Contract/ Special Conditions of Contract. 4.1.5 If required by Purchaser, the Seller / Contractor will provide a certificate stating that CENVAT benefit has been availed of on the inputs and the same has been passed on to the Purchaser. 4.1.6 Excise duty shall be paid at actuals against documentary evidence but restricted to the amount and percentage indicated in the Order/ Contract. **4.2 SALES TAX / VALUE ADDED TAX (VAT)** 4.2.1 Central Sales Tax / Value Added Tax shall be reimbursed only if the same is paid by the Seller / Contractor to the respective Govt. authorities on direct sales by the Seller/ Contractor to the Purchaser, meeting all statutory requirements and availing all exemptions/ concessions under the respective Central Sales Tax / Value Added Tax Acts. The offer should clearly indicate CST/ VAT percentage and the total	**TAXES AND DUTIES** **4.1 CGST/SGST/UTGST/IGST** 4.1.1 Seller/ Contractor is required to ensure that CGST/SGST/UTGST/IGST (whichever is applicable) is quoted as per the existing tariff on the date of the offer and all benefits as per existing laws have been considered. 4.1.2 It is the responsibility of the seller/contractor to issue the Tax Invoice strictly as per the format prescribed under the relevant applicable GST law (CGST Act/SGST Act/UTGST Act/IGST Act). Vendor to indicate the proper GSTN Registration/ HSN code in their tax invoice. 4.1.3 The purchaser is registered in the State of Uttar Pradesh vide following GST registration number: **09AAACB4146P2ZC** 4.1.4 Seller/contractor is required to mention the above registration number in their tax invoice unless stated otherwise in NIT/SCC. 4.1.5 CGST/SGST/UTGST/IGST shall be paid at actuals against Tax Invoice but restricted to the amount and percentage in the order/contract

	amount along with concessional form(s), if any. 4.2.2 Purchaser is registered in NOIDA, U.P. vide following Registration Numbers: Central Sales Tax Registration No. : ND – 5341151 w.e.f. 01-07-2006 UP Trade Tax Registration No. : ND – 0345307 w.e.f. 01-07-2006 UP TIN No. : 09765702874 4.2.3 Central Sales Tax/ Value Added Tax shall be reimbursed, as per tariff applicable, but restricted to the percentage and amount shown in the Order/ Contract. If it is shown as included in the quoted price/ not applicable, it will not be reimbursed by the Purchaser. 4.2.4 Purchaser proposes to make sale-in-transit under section 6 (2) (b) of Central Sales Tax Act where goods movement is inter-state. Form-C shall be issued and exchanged against Form-E1/E2 based on quarterly transactions. Seller/Contractor is required to submit his request in the format enclosed at Annexure-VI within 30 days from end of the Quarter, giving State-wise invoice details. 4.2.5 VAT invoices, in format prescribed by the respective State Sales Tax Act, have to be submitted in the name of Nodal Agency specified in Special Conditions of Contract. **4.3 SERVICE TAX** 4.3.1 Service Tax paid by the Service Provider /contractor to the Government authorities directly shall only be reimbursed at actuals against documentary evidence, but restricted to the rate and amount mentioned in the order/contract. The offer should clearly indicate the percentage and the total amount of service tax. 4.3.2 Service provider/Contractor to ensure their registration for "Intended Service" to be provided, before claiming Service tax under the "intended category". Decision of BHEL shall be final w.r.t. the "Intended category" in which the service will be falling. 4.3.3 If required by the Purchaser, the Service Provider/Contractor will provide a certificate stating that "CENVAT Benefit has been availed of on the input and the	**4.2 OTHER TAXES & LEVIES** 4.2.1 All taxes/duties/Cess other than CGST/SGST/UTGST/IGST shall be deemed to be included in the Ex-Works prices unless specified otherwise by the bidder in the price bid. No variation in other taxes and duties shall be payable by Purchaser. **4.3 CUSTOMS DUTY**

	same has been passed on to the purchaser" or "CENVAT Benefit has not been availed of on the inputs". **4.4 OTHER TAXES & LEVIES** All taxes and duties other than Excise Duty, Sales Tax/ VAT, Service Tax shall be deemed to be included in the Ex-Works prices unless specified otherwise by the bidder in the price bid. No variation in other taxes and duties shall be payable by Purchaser. However, statutory variation in Octroi will be payable extra against documentary evidence. **4.5 CUSTOMS DUTY** 4.5.1 Customs Duty element for imported items as per Special Conditions of Contract shall be included in the Ex-Works prices. No variation in customs duty and exchange rate for imported items shall be payable by Purchaser. 4.5.2 Seller/ Contractor shall arrange for his own import license, if required, since Purchaser will not provide any import license. Therefore, Seller/ Contractor alone shall be responsible for any delay in getting import license or non-availability of the same or completion of other related formalities. Purchaser shall not be responsible for any financial liability, whatsoever, on this account. 4.5.3 Essentiality Certificate or Project Authority Certificate (PAC) as per Import Policy, if required to avail concessional customs duty, shall be clearly specified in the offer. Import content (CIF value in rupees) with list of items, quantity, foreign currency, country of origin etc., shall be submitted by the bidder as part of Price bid. **4.6 DIRECT TAX** 4.6.1 Purchaser shall not be liable towards income tax of whatever nature including variations thereof, arising out of this Order/ Contract, as well as tax liability of the Seller/ Contractor and his personnel.	4.3.1 Customs Duty/IGST/Goods and Services compensation cess under Goods and Services Tax (Compensation to States) Act, 2017 element for imported items as per Special Conditions of Contract shall be included in the Ex-Works prices. 4.3.2 Seller/ Contractor shall arrange for his own import license, if required, since Purchaser will not provide any import license. Therefore, Seller/ Contractor alone shall be responsible for any delay in getting import license or non-availability of the same or completion of other related formalities. Purchaser shall not be responsible for any financial liability, whatsoever, on this account. 4.3.3 Essentiality Certificate or Project Authority Certificate (PAC) as per Import Policy, if required to avail concessional customs duty, shall be clearly specified in the offer. Import content (CIF value in rupees) with list of items, quantity, foreign currency, Country of origin etc., shall be submitted by the bidder as part of Price bid. **4.4 DIRECT TAXES** 4.4.1 Purchaser shall not be liable towards income tax of whatever nature including variations thereof, arising out of this Order/ Contract, as well as tax liability of the Seller/ Contractor and his personnel. 4.4.2 Deductions of Tax at source at the prevailing rates shall be effected by the Purchaser before release of payment, as a statutory obligation, if applicable. TDS certificate will be issued by the Purchaser as per statutory provisions

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	4.6.2 Deductions of Tax at source at the prevailing rates shall be effected by the Purchaser before release of payment, as a statutory obligation, if applicable. TDS certificate will be issued by the Purchaser as per statutory provisions.	
	5.0 STATUTORY VARIATION 5.1 If the rates for taxes and duties in respect of the quoted materials and/ or services assumed by the Seller/ Contractor are less than the tariff prevailing at the time of tendering, Seller/ Contractor will be responsible for such under quotations. However, if the rates assumed are higher than the correct rates prevailing at the time of tendering, the difference will be to the credit of the Purchaser. 5.2 Statutory Variations in Excise Duty, Service Tax and Central Sales Tax/ Value Added Tax only on self-manufactured items/ services rendered by vendor himself on the rates prevailing at the time of delivery/ completion in comparison to the date of offer, will be to the account of the Purchaser. No other variations such as on customs duty, exchange rate, minimum wages, prices of controlled commodities, any other input etc. shall be payable by the Purchaser. 5.3 Notwithstanding the above, where the actual completion of the supply occurs beyond the period stipulated in the Order/ Contract or any extension thereof, variations referred to above, will be limited to the rates prevailing on the dates of such agreed completion periods only. For variations after the agreed completion periods, the Seller/ Contractor alone shall bear the impact for the upward revisions and for downward revisions; purchaser shall be given the benefit of reduction in taxes/ duties. This will be without prejudice to the levy of penalty for delay in delivery/ completion schedule. 5.4 Any new tax structure (like Goods & Services Tax) as and when implemented by the Government shall become applicable in addition to or in lieu of existing tax structure.	**5.0 STATUTORY VARIATION** 5.1 Statutory variation for CGST/SGST/UGST/IGST is available provided the actual completion of supply does not occur beyond the period stipulated in the order/contract or any extension (without levy of penalty). 5.2 For variation after the agreed completion periods, the seller/contractor alone shall bear the impact for the upwards revisions and adjust the price in their basic price in such a manner that total price with tax matches with the ex-works with taxes of Purchase Order/Contract. For downward revisions, purchaser shall be given the benefit of reduction in CGST/SGST/UGST/IGST. This will be without prejudice to the levy of penalty for delay in delivery/completion schedule. 5.4 No other variations such as on Custom Duty, exchange rate, minimum wages, prices of controlled commodities, any other input etc. shall be payable by the purchaser.

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Clause 8	**8.0 TRANSPORTATION & FREIGHT CHARGES** 8.1 All dispatches shall be through road carriers approved by Purchaser/ Bank, on freight pre-paid basis. 8.2 Road permit/ entry permit, if required as per law of the State, shall be arranged by Purchaser. 8.3 Freight charges (including Service Tax) shall be payable after delivery of the goods at the project site, on receipt of MRC or receipted LR on pro-rata basis.	8**.0 TRANSPORTATION & FREIGHT CHARGES** 8.1 All dispatches shall be through road carriers approved by Purchaser/ Bank, on freight pre-paid basis. 8.2 Road Permit/E-way bill, if required, will be arranged by Supplier.
	9.0 TERMS OF PAYMENT **9.1 SUPPLY PACKAGES** 9.1.1 Ninety percent (90%) of basic price of materials supplied, as per PO, along with 100% taxes and duties (as applicable), shall be paid against receipt of material at site on pro-rata basis. 9.1.2 Ten percent (10%) of basic price of materials supplied will be released on pro-rata basis after receipt of Material Receipt Certificate (MRC) from project site engineer of Owner/ Purchaser, on submission of all final documents for the packages as detailed below, duly certified by Engg. Deptt. of purchaser, and submission of Form E1/ E2 against Form-C, if applicable. List of packages with required final documents is as per Annexure-X. **9.2 SUPPLY PACKAGES WITH PERFORMANCE GUARANTEE / DEMONSTRATION** **TEST AT SITE IN VENDOR'S SCOPE** 9.2.1 Eighty Five percent (85%) of basic price of materials supplied, as per PO / approved billing schedule, along with 100% taxes and duties (as applicable), shall be paid against receipt of material at site on pro-rata basis. 9.2.2 Ten percent (10%) of basic price of materials supplied will be released on pro-rata basis after receipt of Material Receipt Certificate (MRC) from project site engineer of Owner/ Purchaser and submission of Form E1/ E2 against Form-C, if applicable. 9.2.3 Five percent (5%) of the total basic price of materials and PG/ Demonstration test charges shall be released after submission of all final documents as per Technical	**9.0 TERMS OF PAYMENT** **9.1 SUPPLY PACKAGES** Payment of basic price of materials supplied alongwith freight and taxes and duties (as applicable), shall be paid against receipt of material 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 after receipt of Material Receipt Certificate (MRC) from project site engineer of owner/purchaser on submission of all the final documents for the packages as detailed below, duly certified by engineering department of purchaser. List of packages with required final documents is as per Annexure-X. **9.2 Supply packages with performance guarantee/demonstration test at site in vendor's scope** Payment of basic price of materials supplied, as per PO/ as per approved billing schedule, along with freight and taxes and duties (as applicable), shall be paid against receipt of material at site on pro-rate basis. 15% of basic price of materials supplied will be retained as security deposit which will be released on pro – rata basis as details below: a) 10% will be released after receipt of Material Receipt Certificate (MRC) from project site engineer of owner/purchaser.

	Specifications and successful completion of the Performance Guarantee (PG)/ Demonstration Test at site. Note: If the Performance Guarantee/ Demonstration Test is not conducted up to 24 months from supply completion for reasons not attributable to the vendor, then last 5% payment will be released against Bank Guarantee of an equivalent amount, valid for 12 months. This bank guarantee will be in addition to Contract Performance Bank Guarantee for 10% of the contract value (excluding taxes, duties and freight). **9.3 SUPPLY PAYMENT FOR TURNKEY PACKAGES (E&C IN VENDOR'S SCOPE)** 9.3.1 Eighty Five percent (85%) of basic price of materials supplied, as per approved billing schedule, along with 100% taxes and duties (as applicable), shall be paid against receipt of material at site on pro-rata basis. OR i) Five percent (5%) lump sum payment of total basic price (excluding taxes, duties & freight) against approval of design documents and quality plan as certified by Engineering. Design documents and quality plan shall be as defined in the Technical Specifications. ii) Eighty percent (80%) of basic price of materials supplied, as per approved billing schedule, along with 100% taxes and duties (as applicable), shall be paid against receipt of material at site on pro-rata basis. 9.3.2 Five percent (5%) of basic price of materials supplied along with freight, if applicable, will be released on pro-rata basis after submission of Material Receipt Certificate (MRC) from project site engineer of Owner/ Purchaser and submission of Form E1/ E2 against Form-C, if applicable. Collection of Material Receipt Certificate from Site/ Owner and its submission for claiming the payment shall be the responsibility of the Seller/ Contractor. 9.3.3 Ten percent (10%) of the total basic price shall be released after i) submission of all final documents as per Technical Specifications and ii) successful completion of	b) 5% will be released after submission of final documents as per technical specification and successful completion of the performance guarantee (PG)/ Demonstration test at site. Note: If the Performance Guarantee/ Demonstration Test is not conducted up to 24 months from supply completion for reasons not attributable to the vendor, then 5% security deposit will be released against Bank Guarantee of an equivalent amount, valid for 12 months. This bank guarantee will be in addition to Contract Performance Bank Guarantee for 10% of the contract value (excluding taxes, duties and freight). **9.3 SUPPLY PAYMENT FOR TURNKEY PACKAGES (E&C IN VENDOR'S SCOPE)** 9.3.1 Payment of basic price of materials supplied, as per approved billing schedule, along with freight, taxes and duties (as applicable), shall be paid against receipt of material at site on pro-rata basis. 15% of basic price of materials supplied will be retained as security deposit which will be released on pro – rata basis as details below: a) 5% will be released on pro-rata basis after submission of Material Receipt Certificate (MRC) from project site engineer of owner/purchaser. Collection of Material Receipt Certificate from site/owner and its submission for claiming the payment shall be the responsibility of the Seller/Contractor. b) 10% will be released after i) submission of all final documents as per Technical Specifications and ii) successful completion of Performance Guarantee (PG)/ Demonstration Test and handing over of the system/ package, if applicable, as per Order/ Contract

	Performance Guarantee (PG)/ Demonstration Test and handing over of the system/ package, if applicable, as per Order/ Contract. **9.4 ERECTION & COMMISSIONING PAYMENT FOR TURNKEY PACKAGES** 9.4.1 Eighty percent (80%) payment on pro-rata basis for the work completed, as per approved billing schedule, shall be released by Site authorities/ Region on submission of protocols, duly signed by BHEL Site/ Owner. 9.4.2 Ten percent (10%) of the total value shall be released by Site authorities/ Region on successful commissioning of the complete system/ package. 9.4.3 Ten percent (10%) of the total value shall be released by Site authorities/ Region on successful completion of PG/ Demonstration test(s) and handing over system/ package to the Owner, as applicable. **9.5 PG TEST, INSTALLATION CHECK, SUPERVISION OF ERECTION /** **COMMISSIONING CHARGES** 100% payment shall be released after successful completion of the activity, on Site certification. **9.6 Vendors shall submit documents for payment directly to BHEL. Payment will** **be released within 60 days after receipt of complete documents as per order/** **contract (45 days for vendors qualified and registered as Micro or Small as per** **MSMED Act).** To be eligible for payment as Micro and Small category, vendors shall submit annual certification for validation from designated authority under MSMED Act or Chartered Accountant within first quarter of every financial year. . **Note:** 1) For indigenous suppliers, if the documents are routed through Bank, then all bank charges will be to vendor's account. 2) Foreign bidders can opt for payment (less agency commission, if applicable) through irrevocable and unconfirmed letter of credit. In that case for	**9.4 ERECTION & COMMISSIONING PAYMENT FOR TURNKEY PACKAGES** 9.4.1 Eighty percent (80%) payment on pro-rata basis for the work completed, as per approved billing schedule, shall be released by Site authorities/ Region on submission of protocols, duly signed by BHEL Site/ Owner. 9.4.2 Ten percent (10%) of the total value shall be released by Site authorities/ Region on successful commissioning of the complete system/ package. 9.4.3 Ten percent (10%) of the total value shall be released by Site authorities/ Region on successful completion of PG/ Demonstration test(s) and handing over system/ package to the Owner, as applicable. **9.5 PG TEST, INSTALLATION CHECK, SUPERVISION OF ERECTION / COMMISSIONING CHARGES** 100% payment shall be released after successful completion of the activity, on Site certification. **9.6 Vendors shall submit documents for payment directly to BHEL. Payment will be released within 60 days after receipt of complete documents as per order/ contract (45 days for vendors qualified and registered as Micro or Small as per MSMED Act).** **Note:** 1) Vendors are required to issue Tax Invoice inclusive of PVC value (if applicable) wherever indices are available. 2) For indigenous suppliers, if the documents are routed through Bank,

	evaluation purpose, prices of foreign bidders will be loaded on account of payment through LC, equal to loading specified against 'Payment through Bank' in Annexure-VIII. No loading will be done if foreign vendors agree for 90 days usance LC or submit the documents on collection basis for payment within 90 days of submission of complete documents. 3) LC opening/ negotiation/ confirmation charges will be to vendor's account. 4) Form C/ E1/E2 are not applicable for foreign bidders. 5) In extreme case of vendors not agreeing to link 10% payment with submission of Form E1/ E2 against Form-C as above, their prices will be loaded as per Annexure-VIII. 6) Any negative PVC, if not adjusted in earlier payments, will be adjusted at the time of MRC payment. **7)** Payment terms for mandatory spares shall be as per clause 9.1.	then all bank charges will be to vendor's account. 3) Foreign bidders can opt for payment (less agency commission, if applicable) through irrevocable and unconfirmed letter of credit. In that case for evaluation purpose, prices of foreign bidders will be loaded on account of payment through LC, equal to loading specified against 'Payment through Bank' in Annexure-VIII. No loading will be done if foreign vendors agree for 90 days usance LC or submit the documents on collection basis for payment within 90 days of submission of complete documents. 4) LC opening/ negotiation/ confirmation charges will be to vendor's account. **5)** Payment terms for mandatory spares shall be as per clause 9.1. 9.7 The applicable TDS under CGST/SGST/UGST/IGST/ Goods and Services (Compensation to States) Act will be deducted from the payments. **9.8 Other clauses** 1. Vendor/Supplier will intimate & upload the Tax invoice along with LR/RR(as applicable) on web portal & intimate BHEL immediately on removal of goods from vendor/supplier works. In case of Services, Vendor is required to upload the Tax invoice on Web Portal immediately after raising the invoice. BHEL will issue the delivery order/instruction to dispatch the material to the customer as indicated in SCC. 2. All payments against Tax Invoice to vendors/contractors shall be released only after:

		a) Vendor/contractor declaring such invoice in GSTR-1 within the prescribed timeline as per the relevant Act. b) The tax component charged by the vendor in the invoice should be matched with the details uploaded by vendor in GSTR-1. c) Confirmation of payment of GST thereon by vendor on GSTN portal 3. In case, any GST credit is delayed/denied to BHEL due to non/delayed receipt of goods and/or tax invoice or expiry to timeline prescribed in the relevant Act for availing such ITC, or any other reasons not attributable to BHEL, tax amount shall be recoverable from the vendor/contractor along with interest levied/leviable on BHEL. 4. Wherein GST liability arises on BHEL under reverse charge, any interest levied/leviable due to any reasons not attributable to BHEL shall be recovered from the vendor/contractor.
Clause 9	**9.7 DOCUMENTS TO BE SUBMITTED BY VENDOR** **9.7.1 For Recognition of Dispatch** Copy of the following documents by e-mail/ fax immediately on despatch: a. Invoice b. LR along with Delivery Order c. Packing List d. Insurance Intimation e. Dispatch Clearance 9.7.2 For Claiming Payments (under clause 9.1.1, 9.2.1, 9.3.1): a. Invoice – original+1 copy b. Receipted LR (signed & stamped)/ confirmation from site regarding receipt of packages/ Boxes original/ copy	9.7 All same a. to be replaced with “GST compliant invoice” in 9.7.1, 9.7.2, 9.7.3 Modification in the clause **Duty drawback documents** “As per applicable law” (original+1 copy.)

	c. Delivery order- 2 copies d. Packing List - clearly showing number of packages, gross weight and net weight. - original+1 copy e. MDCC from BHEL/ Customer – as per SCC – 2 copies f. Guarantee Certificate – Original + 1 copy g. Insurance Intimation - 2 copies CQIR / Inspection Reports – Original+1 copy i. PVC Calculation and copy of all applicable indices, if PVC applicable. – 2 copies j. Duty drawback documents (original excise invoice, original disclaimer certificate, original certificate from excise authority for payment of excise duty), if applicable. – original + 1copy 9.7.3 For Claiming Freight Payment a. Invoice – Original + 1 copy b. Receipted LR (signed & stamped)/ confirmation from site regarding receipt of packages/ Boxes original/ copy c. Transporter's document indicating the freight amount. Original money receipt to be submitted if required as per SCC. 9.7.4 For Claiming MRC Payment a. Invoice – Original + 1 copy b. Copy of MRC 9.7.5 For Claiming Payment for Services involving Service Tax a. Invoice as per rule 4A of Service Tax Act – Original + 1 copy b. Copy of Service Tax registration certificate c. Copy of challan for Service Tax payment	
Clause 3.0 Instruction to bidders	Total **erection & commissioning charges** including service tax should be minimum 20% (or as specified in NIT) of the total quoted package price (excluding mandatory spares but including all taxes and freight), failing which the break-up of prices shall be adjusted accordingly for ordering.	Total **erection & commissioning charges** including applicable tax but excluding freight along with GST should be minimum 20% (or as specified in NIT) of the total quoted package price (excluding mandatory spares but including all taxes and freight), failing which the break-up of prices shall be adjusted accordingly for ordering.

GST related Corrigendum to GCC Rev 06

Clause 16.0 Instruction to bidder	For deviations w.r.t. Payment terms, Liquidated damages, Firm prices and submission of E1/ E2 forms before claiming 10% payment, if a bidder chooses not to give any cost of withdrawl of deviation loading as per Annexure-VIII will apply.	For deviations w.r.t. Payment terms, Liquidated damages, Firm prices before claiming 10% payment, if a bidder chooses not to give any cost of withdrawl of deviation loading as per Annexure-VIII will apply.
Clause 16.0 of GCTC	Purchaser reserves the right to recover from the Seller/ Contractor, as agreed liquidated damages and not by way of penalty, a sum equivalent to half (½) percent of the total contract price per week or part thereof, subject to a maximum of ten (10) percent of the total contract price excluding elements of taxes, duties and freight, if the Seller/ Contractor fails to deliver any part of the ordered stores within the period stipulated in the Order/ Contract. For Turnkey packages (Supply and E&C in vendor's scope), Liquidated Damages shall be levied on the total contract value of both Supply and E&C orders (excluding taxes, duties and freight) if E&C completion of the package is delayed beyond the contractual completion date or extension thereof. Liquidated Damages will not be withheld from supply payment. LR/ GR/ RR date for indigenous supplies and AWB/ BL date for FOB contracts shall be treated as the date of dispatch for levying LD as per Clause 16. However, for indigenous supply if receipted LR date is beyond three months from the date of LR, such excess period shall also be considered for LD purpose. 2. In case of any amendment/ revision, LD shall be linked to the amended/ revised contract value and delivery date(s)	Purchaser reserves the right to recover from the Seller/ Contractor, as agreed liquidated damages and not by way of penalty, a sum equivalent to half (½) percent plus applicable GST of the total contract price per week or part thereof, subject to a maximum of ten (10) percent of the total contract price excluding elements of taxes, duties and freight, if the Seller/ Contractor fails to deliver any part of the ordered stores within the period stipulated in the Order/ Contract. For Turnkey packages (Supply and E&C in vendor's scope), Liquidated Damages shall be levied on the total contract value of both Supply and E&C orders (excluding taxes, duties and freight) if E&C completion of the package is delayed beyond the contractual completion date or extension thereof. Liquidated Damages will not be withheld from supply payment. LR/ GR/ RR/ eway bill date for indigenous supplies and AWB/ BL date for C&F contracts shall be treated as the date of dispatch for levying LD as per Clause 16. However, for indigenous supply if receipted LR/eway bill date is beyond three months from the date of LR/e-way bill, such excess period shall also be considered for LD purpose. 2. In case of any amendment/ revision, LD shall be linked to the amended/ revised contract value and delivery date(s)

GST related Corrigendum to GCC Rev 06

Deviation sheet- Cost of Withdrawal	Point no-9 For deviations w.r.t. Payment terms, Liquidated damages, Firm prices and submission of E1/ E2 forms before claiming 10% payment, if a bidder chooses not to give any cost of withdrawl of deviation loading as per Annexure-VIII of GCC, Rev-06 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.	For deviations w.r.t. Payment terms, Liquidated damages, Firm prices before claiming 10% payment, if a bidder chooses not to give any cost of withdrawal of deviation loading as per Annexure-VIII of GCC, Rev-06 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 withdrawal of deviation shall be taken as NIL.
Annexure-VI		Deleted
Annexure-VIII		Following changes in annexure-8, (remaining portion of annex-8 is same): C) LIQUIDATED DAMAGES If maximum limit asked for is 10% or 5% of Undelivered Portion – 10% value of the total quoted price including GST & freight. If maximum limit asked is less than 10 % of contract value loading shall be to the extent to which not agreed by bidder (at offered value) . ~~E) DEVIATION TO SUBMISSION OF FORM-E1/ E2 BEFORE CLAIMING 10% PAYMENT~~ ~~10% of Ex-Works supply value.~~

New clauses:

a) In case of discrepancy in CGST/SGST/UTGST/IGST rate corresponding to HSN ;code and quotes rates, the evaluation shall be done on quoted price and correct CGST/SGST/UTGST/IGST rate shall be considered for ordering (limited to quoted FOR Site Price)
b) The bidder should have been registered with the appropriate authority under relevant GST laws.
c) The bidder to specify in their offer (part 1 bid) the category of registration under GST i.e. registered dealer and composite dealer
d) No CGST/SGST/UTGST/IGST will be reimbursed to composite dealer. In the event of any GST quoted by composite dealer, the same shall be considered for evaluation purpose. However, the ordering will be done without considering the tax.
e) In the event of any change in the status of vendor from composite to regular dealer after the submission of the bid but before the supply, no reimbursement of CGST/SGST/UTGST/IGST will be made. However, the vendor has to raise the invoice strictly, as per the law, by adjusting their ex-works price.

ANNEX-IX TO NIT REF NO-PE/PG/RTC/E-6157/2018, DTD-22.03.2019

BANK GUARANTEE FOR PERFORMANCE SECURITY

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of the Bharat Heavy Electricals Limited [1] (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____ through its Unit at.....(name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) having its registered office at_____[2] hereinafter referred to as the 'Contractor/Supplier', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No.....dated .....[3] valued at Rs.....[4] (Rupees ----------)/FC.....(in words.....) for .....[5] (hereinafter called the 'Contract') and the Contractor having agreed to provide a Contract Performance Guarantee, equivalent to .....% (.... Percent) of the said value of the Contract to the Employer for the faithful performance of the Contract,

we, ..., (hereinafter referred to as the Bank), having registered/Head office at ..... and inter alia a branch at ..... being the Guarantor under this Guarantee, hereby, irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer a maximum amount Rs ---------- (Rupees ----------) without any demur, immediately on a demand from the Employer, .
Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____ _____.

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Contractor/ Supplier in any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment thereunder and the contractors/supplier shall have no claim against us for making such payment.

We the .....bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged.

We ..... BANK further agree with the Employer that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time of performance by the said Contractor/Supplier from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Contractor/Supplier and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor/Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Contractor/Supplier or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's liabilities.

This Guarantee shall remain in force upto and including..... [6] and shall be extended from time to time for such period as may be desired by Employer.
This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Contractor/Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof.

Unless a demand or claim under this guarantee is made on us in writing on or before the .....[7]we shall be discharged from all liabilities under this guarantee thereafter.

We, ... BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.
Notwithstanding anything to the contrary contained hereinabove:

a) The liability of the Bank under this Guarantee shall not exceed..... [8]
b) This Guarantee shall be valid up to .....[9]
c) Unless the Bank is served a written claim or demand on or before _____[10] all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

We, _____ Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

For and on behalf of
(Name of the Bank)

Dated.....

Place of Issue.....

[1] *NAME AND ADDRESS OF EMPLOYER I.e Bharat Heavy Electricals Limited*

[2] *NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.*

[3] *DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE*

[4] *PROJECT/SUPPLY DETAILS*

[5] *BG AMOUNT IN FIGURES AND WORDS*

[6] *VALIDITY DATE*

[7] *DATE OF EXPIRY OF CLAIM PERIOD*

[8] *BG AMOUNT IN FIGURES AND WORDS.*

[9] *VALIDITY DATE*

[10] *DATE OF EXPIRY OF CLAIM PERIOD*

Note:

1. **Units are advised that expiry of claim period may be kept 2/3 months after validity date.**

2. **In Case of Bank Guarantees submitted by Foreign Vendors-**

   a. **From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India)** can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.

   b. **From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)**

   b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks only** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank (BHEL's Consortium Bank). It is advisable that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.

   b.2 **In case, Foreign Vendors intend to provide BG from** Overseas Branch of our Consortium Bank (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at **sl.no. b.1** will required to be followed.

   b.3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). In case, of Foreign Vendors, the BG Format provided to them should clearly specify the same.

   b.4 The BG should clearly specify that the demand or other document can be presented in electronic form.

Annexure-X

ANNEXURE TO MODEL CONCILIATION CLAUSE FOR CONDUCT OF CONCILIATION UNDER THE BHEL CONCILIATION SCHEME, 2018

BRIEF PROCEDURE FOR CONDUCT OF CONCILIATION PROCEEDINGS

1. The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as provided herein:

2. The party desirous of resorting to Conciliation shall send an invitation/notice in writing to the other party to conciliate specifying all points of Disputes with details of the amount claimed. The party concerned shall not raise any new issue thereafter. Parties shall also not claim any interest on claims/counter-claims from the date of notice invoking Conciliation till the conclusion of the Conciliation proceedings. If BHEL is to initiate Conciliation, then, the invitation to Conciliate shall be extended to the concerned Stakeholder in **Format 7** hereto. Where the stakeholder is to initiate the Conciliation, the notice for initiation of Conciliation shall be sent in **Format-8** hereto.

3. The party receiving the invitation/notice for Conciliation shall within 30 days of receipt of the notice of Conciliation intimate its consent for Conciliation along with its counter-claims, if any.

4. The Conciliation in a matter involving claim or counter-claim (whichever is higher) up to Rs 5 crores shall be carried out by sole Conciliator nominated by BHEL while in a matter involving claim or counter-claim (whichever is higher) of more than Rs 5 crores Conciliation shall be carried out by 3 Conciliators nominated by BHEL. The appointment of Conciliator(s) shall be completed and communicated by the concerned Department/Group of BHEL Unit/Division/Region/Business Group to the other party and the Conciliator(s) within 30 days from the date of acceptance of the invitation to conciliate by the concerned party in the **Format-9**. The details of the Claim, and counter-claim, if any, shall be intimated to the Conciliator(s) simultaneously in **Format-5**.

5. The Parties shall be represented by only their duly authorized in-house executives/officers and neither Party shall be represented by a Lawyer.

6. The first meeting of the IEC shall be convened by the IEC by sending appropriate communication/notice to both the parties as soon as possible but not later than 30 days from the date of his/their appointment. The hearings in the Conciliation proceeding shall ordinarily be concluded within two (2) months and, in exceptional cases where parties have expressed willingness to settle the matter or there exists possibility of settlement in the matter, the

proceedings may be extended by the IEC by a maximum of further 2 months with the consent of the Parties subject to cogent reasons being recorded in writing.

7. The IEC shall thereafter formulate recommendations for settlement of the Disputes supported by reasons at the earliest but in any case within 15 days from the date of conclusion of the last hearing. The recommendations so formulated along with the reasons shall be furnished by the IEC to both the Parties at the earliest but in any case within 1 month from the date of conclusion of the last hearing.

8. Response/modifications/suggestions of the Parties on the recommendations of the IEC are to be submitted to the IEC within time limit stipulated by the IEC but not more than 15 days from the date of receipt of the recommendations from the IEC.

9. In the event, upon consideration, further review of the recommendations is considered necessary, whether by BHEL or by the other Party, then, the matter can be remitted back to the IEC with request to reconsider the same in light of the issues projected by either/both the Parties and to submit its recommendations thereon within the following 15 days from the date of remitting of the case by either of the Parties.

10. Upon the recommendations by the Parties, with or without modifications, as considered necessary, the IEC shall be called upon to draw up the Draft Settlement Agreement in terms of the recommendations.

11. When a consensus can be arrived at between the parties only in regard to any one or some of the issues referred for Conciliation the draft Settlement Agreement shall be accordingly formulated in regard to the said Issue(s), and the said Settlement Agreement, if signed, by the parties, shall be valid only for the said issues. As regards the balance issues not settled, the parties may seek to resolve them further as per terms and conditions provided in the contract.

12. In case no settlement can be reached between the parties, the IEC shall by a written declaration, pronounce that the Conciliation between the parties has failed and is accordingly terminated.

13. Unless the Conciliation proceedings are terminated in terms of para 22 (b), (c) & (d) herein below, the IEC shall forward his/its recommendations as to possible terms of settlement within one (1) month from the date of last hearing. The date of first hearing of Conciliation shall be the starting date for calculating the period of 2 months.

14. In case of 3 members IEC, 2 members of IEC present will constitute a valid quorum for IEC and meeting can take place to proceed in the matter after seeking consent from the member who is not available. If necessary, videoconferencing may be arranged for facilitating participation of the members. However, the IEC recommendations will be signed by all members. Where there is more than one (1) Conciliator, as a general rule they shall act jointly. In the event of differences between the Members of IEC, the decision/recommendations of the majority of the Members of IEC shall prevail and be construed as the recommendation of the IEC.

15. The Draft Settlement Agreement prepared by the IEC in terms of the consensus arrived at during the Conciliation proceedings between the Parties shall be given by the IEC to both the parties for putting up for approval of their respective Competent Authority.

16. Before submitting the draft settlement agreement to BHEL's Competent Authority viz. the Board Level Committee on Alternative Dispute Resolution (BLCADR) for approval, concurrence of the other party's Competent Authority to the draft settlement agreement shall be obtained by the other party and informed to BHEL within 15 days of receipt of the final draft settlement agreement by it. Upon approval by the Competent Authority, the Settlement Agreement would thereafter be signed by the authorized representatives of both the Parties and authenticated by the members of the IEC.

17. In case the Draft Settlement Agreement is rejected by the Competent Authority of BHEL or the other Party, the Conciliation proceedings would stand terminated.

18. A Settlement Agreement shall contain a statement to the effect that each of the person(s) signing thereto (i) is fully authorized by the respective Party(ies) he/she represents, (ii) has fully understood the contents of the same and (iii) is signing on the same out of complete freewill and consent, without any pressure, undue influence.

19. The Settlement Agreement shall thereafter have the same legal status and effect as an arbitration award on agreed terms on the substance of the dispute rendered by an arbitral tribunal passed under section 30 of the Arbitration and Conciliation Act, 1996.

20. Acceptance of the Draft Settlement Agreement/recommendations of the Conciliator and/or signing of the Settlement Agreement by BHEL shall however, be subject to withdrawal/closure of any arbitral and/or judicial proceedings initiated by the concerned Party in regard to such settled issues.

21. Unless otherwise provided for in the agreement, contract or the Memorandum of Understanding, as the case may be, in the event of likelihood of prolonged absence of the Conciliator or any member of IEC, for any reason/incapacity, the Competent Authority/Head of Unit/Division/Region/Business Group of BHEL may substitute the Conciliator or such member at any stage of the proceedings. Upon appointment of the substitute Conciliator(s), such reconstituted IEC may, with the consent of the Parties, proceed with further Conciliation into the matter either de-novo or from the stage already reached by the previous IEC before the substitution.

22. The proceedings of Conciliation under this Scheme may be terminated as follows:

a. On the date of signing of the Settlement agreement by the Parties; or,

b. By a written declaration of the IEC, after consultation with the parties, to the effect that further efforts at conciliation are no longer justified, on the date of the declaration; or,

c. By a written declaration of the Parties addressed to the IEC to the effect that the Conciliation proceedings are terminated, on the date of the declaration; or,

d. By a written declaration of a Party to the other Party and the IEC, if appointed, to the effect that the Conciliation proceedings are terminated, on the date of the declaration; or,

e. On rejection of the Draft Settlement Agreement by the Competent Authority of BHEL or the other Party.

23. The Conciliator(s) shall be entitled to following fees and facilities:

Sl No	**Particulars**	**Amount**
1	Sitting fees	Each Member shall be paid a Lump Sum fee of Rs 75,000/- for the whole case payable in terms of paragraph No. 27 herein below.
2	Towards drafting of settlement agreement	In cases involving claim and/or counter-claim of up to Rs 5crores. Rs 50,000/- (Sole Conciliator) In cases involving claim and/or counter-claim of exceeding Rs 5 crores but less than Rs 10 crores.

Sl No	Particulars	Amount
		Rs 75,000 (per Conciliator) In cases involving claim and/or counter-claim of more than Rs 10 crores. Rs 1,00,000/- (per Conciliator) Note: The aforesaid fees for the drafting of the Settlement Agreement shall be paid on the, Signing of the Settlement Agreement after approval of the Competent Authority or Rejection of the proposed Settlement Agreement by the Competent Authority of BHEL.
3	Secretarial expenses	Rs 10,000/- (one time) for the whole case for Conciliation by a Sole Member IEC. Where Conciliation is by multi member Conciliators –Rs 30,000/- (one time)- to be paid to the IEC
4	Travel and transportation and stay at outstation Retired Senior Officials of other Public Sector Undertakings (pay scale wise equivalent to or more than E-8 level of BHEL)	As per entitlement of the equivalent officer (pay scale wise) in BHEL.
	Others	As per the extant entitlement of whole time Functional Directors in BHEL. Ordinarily, the IEC Member(s) would be entitled to travel by air Economy Class.
5	Venue for meeting	Unless otherwise agreed in the agreement, contract or the Memorandum of Understanding, as the case may be, the venue/seat of proceedings shall be the location of the

Sl No	Particulars	Amount
		concerned Unit / Division / Region / Business Group of BHEL. Without prejudice to the seat/venue of the Conciliation being at the location of concerned BHEL Unit / Division / Region / Business Group, the IEC after consulting the Parties may decide to hold the proceedings at any other place/venue to facilitate the proceedings. Unless, Parties agree to conduct Conciliation at BHEL premises, the venue is to be arranged by either Party alternately.

24. The parties will bear their own costs including cost of presenting their cases/evidence/witness(es)/expert(s) on their behalf. The parties agree to rely upon documentary evidence in support of their claims and not to bring any oral evidence in IEC proceedings.

25. If any witness(es) or expert(s) is/are, with the consent of the parties, called upon to appear at the instance of the IEC in connection with the matter, then, the costs towards such witness(es)/expert(s) shall be determined by the IEC with the consent of the Parties and the cost so determined shall be borne equally by the Parties.

26. The other expenditures/costs in connection with the Conciliation proceedings as well as the IEC's fees and expenses shall be shared by the Parties equally.

27. Out of the lump sum fees of Rs 75,000/- for Sitting Fees, 50% shall be payable after the first meeting of the IEC and the remaining 50% of the Sitting Fees shall be payable only after termination of the conciliation proceedings in terms of para 22 hereinabove.

28. The travelling, transportation and stay at outstation shall be arranged by concerned Unit as per entitlements as per Serial No. 4 of the Table at para 23 above, and in case such arrangements are not made by the BHEL Unit, the same shall be reimbursed to the IEC on actuals limited to their entitlement as per Serial No. 4 of the Table at Para 23 above against supporting documents. The IEC Member(s) shall submit necessary invoice for claiming the fees/reimbursements.

29. The Parties shall keep confidential all matters relating to the conciliation proceedings. Confidentiality shall extend also to the settlement agreement, except where its disclosure is necessary for purposes of its implementation and enforcement or as required by or under a law or as per directions of a Court/Governmental authority/ regulatory body, as the case may be.

30. The Parties shall not rely upon or introduce as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the Disputes that is the subject of the Conciliation proceedings:

a. Views expressed or suggestions made by the other party in respect of a possible settlement of the Disputes;

b. admissions made by the other party in the course of the Conciliator proceedings;

c. proposals made by the Conciliator;

d. The fact that the other Party had indicated his willingness to accept a proposal for settlement made by the Conciliator.

31. The Parties shall not present the Conciliator(s) as witness in any Alternative Dispute Resolution or Judicial proceedings in respect of a Disputes that is/was the subject of that particular Conciliation proceeding.

32. None of the Conciliators shall act as an arbitrator or as a representative or counsel of a Party in any arbitral or judicial proceeding in respect of a Disputes that is/was the subject of that particular Conciliation proceeding.

33. The Parties shall not initiate, during the Conciliation proceedings, any arbitral or judicial proceedings in respect of a Disputes that is the subject matter of the Conciliation proceedings except that a Party may initiate arbitral or judicial proceedings where, in his opinion, such proceedings are necessary for preserving his rights including for preventing expiry of period of limitation. Unless terminated as per the provisions of this Scheme, the Conciliation proceedings shall continue notwithstanding the commencement of the arbitral or judicial proceedings and the arbitral or judicial proceedings shall be primarily for the purpose of preserving rights including preventing expiry of period of limitation.

34. The official language of Conciliation proceedings under this Scheme shall be English unless the Parties agree to some other language.

Format 5 to BHEL Conciliation Scheme, 2018

STATEMENT OF CLAIMS/COUNTER CLAIMS TO BE SUBMITTED TO THE IEC BY BOTH THE PARTIES

1. Chronology of the Disputes

2. Brief of the Contract/MoU/Agreement/LOI/LOA

3. Brief history of the Disputes:

4. Issues:

5. Details of Clam(s)/Counter Claim(s):

Sl. No.	**Description of claim(s)/Counter Claim**	**Amount (in INR)Or currency applicable in the contract**	**Relevant contract clause**

6. Basis/Ground of claim(s)/counter claim(s) (along with relevant clause of contract)

Note– *The Statement of Claims/Counter Claims may ideally be restricted to maximum limit of 20 pages. Relevant documents may be compiled and submitted along with the statement of Claims/Counter Claims. The statement of Claims/Counter Claims is to be submitted to all IEC members and to the other party by post as well as by email.*

FORMAT-7

FORMAT FOR NOTICE INVOKING CONCILIATION CLAUSE BY BHEL FOR REFERRING THE DISPUTES TO CONCILIATION THROUGH IEC

To,

M/s. (Stakeholder's name)

Subject: **NOTICE FOR INVOCATION OF THE CONCILIATION CLAUSE OF THE CONTRACT BY BHEL**

Ref: Contract No/MoU/Agreement/LOI/LOA& date _____.

Dear Sir/Madam,

As you are aware, with reference to above referred Contract/MoU/Agreement/LOI/LOA, certain disputes have arisen, which, in-spite of several rounds of mutual discussions and various correspondences have remained unresolved. The brief particulars of our claims which arise out of the above- referred Contract/MoU/Agreement/LOI/LOA are reproduced hereunder:

Sl. No.	Claim description	Amount involved

As you are aware, there is a provision in the captioned Contract/MoU/Agreement/LOI/ LOA for referring disputes to conciliation.

In terms of Clause ---------of Procedure i.e., Annexure ------ to the Contract/MoU /Agreement / LOI / LOA, we hereby seek your consent to refer the matter to Conciliation by Independent Experts Committee to be appointed by BHEL. You are invited to provide your consent in writing to proceed with conciliation into the above mentioned disputes within a period of 30 days from the date of this letter along with details of counter-claims, if any, which you might have with regard to the subject Contract/ MoU/ Agreement/ LOI/ LOA.

Please note that upon receipt of your consent in writing within 30 days of the date of receipt of this letter by you, BHEL shall appoint suitable person(s) from the BHEL Panel of Conciliators.

This letter is being issued without prejudice to our rights and contentions available under the contract and law.

Thanking you
Yours faithfully

Representative of BHEL

Note: The Format may be suitably modified, as required, based on facts and circumstances of the case.

FORMAT-8

FORMAT FOR NOTICE INVOKING CONCILIATION CLAUSE BY A STAKEHOLDER FOR REFERRING THE DISPUTES TO CONCILIATION THROUGH IEC

To,
BHEL (Head of the Unit/Division/Region/Business Group)

Subject: **NOTICE FOR INVOCATION OF THE CONCILIATION CLAUSE OF THE CONTRACT BY A STAKEHOLDER**

Ref: Contract No/MoU/Agreement/LOI/LOA& date _____.

Dear Sir/Madam,

As you are aware, with reference to above referred Contract/MoU/Agreement/LOI/LOA, certain disputes have arisen, which, in-spite of several rounds of mutual discussions and various correspondences have remained unresolved. The brief particulars of our claims which have arisen out of the above-referred Contract/MoU/Agreement/LOI/LOA are enumerated hereunder:

Sl. No.	Claim description	Amount involved

As you are aware, there is a provision in the captioned Contract/MoU/Agreement/LOI/ LOA for referring inter-se disputes of the Parties to conciliation.

We wish to refer the above-said disputes to Conciliation as per the said Clause of the captioned Contract/MoU/Agreement/LOI/ LOA. In terms of Clause ---------of Procedure i.e., Annexure ------ to the Contract/MoU /Agreement / LOI / LOA, we hereby invite BHEL to provide its consent in writing to proceed with conciliation into the above mentioned disputes within a period of 30 days from the date of this letter along with details of counter-claims, if any, which it might have with regard to the subject Contract/ MoU/ Agreement/ LOI/ LOA and to appoint suitable person(s) as Conciliator(s) from the BHEL Panel of Conciliators.

This letter is being issued without prejudice to our rights and contentions available under the contract and law.

Thanking you
Yours faithfully

Representative of the Stakeholder

Note: The Format may be suitably modified, as required, based on facts and circumstances of the case.

FORMAT-9

FORMAT FOR INTIMATION TO THE STAKEHOLDER ABOUT APPOINTMENT OF CONCILIATOR/IEC

To,

M/s. (Stakeholder's name)

Subject: **INTIMATION BY BHEL TO THE STAKEHOLDER AND CONCILIATOR(S) ABOUT APPOINTMENT OF CONCILIATOR/IEC**

Ref: Contract No/MoU/Agreement/LOI/LOA& date _____.

Sir,

This is with reference to letter dated ---------- regarding reference of the disputes arising in connection with the subject Contract No /MoU/Agreement/LOI/LOA to conciliation and appointment of Conciliator(s).

In pursuance of the said letter, the said disputes are assigned to conciliation and the following persons are nominated as Conciliator(s) for conciliating and assisting the Parties to amicably resolve the disputes in terms of the Arbitration & Conciliation Act, 1996 and the Procedure ---- to the subject Contract ...../MoU/Agreement/LOI/LOA, if possible.

Name and contact details of Conciliator(s)

a) .....

b) .....

c) .....

You are requested to submit the Statement of Claims or Counter-Claims (strike off whichever is inapplicable) before the Conciliator(s) in Format 5 (enclosed herewith) as per the time limit as prescribed by the Conciliator(s).

Yours faithfully,

Representative of BHEL

CC: To Conciliator(s)… for Kind Information please.
Encl: As above

Note: The Format may be suitably modified, as required, based on facts and circumstances of the case.

Annexure-XI

INTEGRITY PACT

Between

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

and

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

Preamble

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

_____

_____

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

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

Section 1- Commitments of the Principal

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Section 4 - Compensation for Damages

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

4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to

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

Section 5 - Previous Transgression

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

5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

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

6.1 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors. In case of sub-contracting, the Principal contractor shall be responsible for the adoption of IP by his sub-contractors and shall continue to remain responsible for any default by his sub-contractors.

6.2 The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

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

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

Section 8 - Independent External Monitor(s)

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

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

8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality in line with Non- disclosure agreement.

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

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

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

8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to CMD, BHEL, at the earliest. They may also send their report directly to the CVO and the Commission, in case of suspicion of serious irregularities requiring legal/ administrative action. IEMs will tender their advice on the complaints within 10 days as far as possible.

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

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

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

8.11 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.

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

Section 9 - Pact Duration

9.1 This Pact shall be operative from the date IP is signed by both the parties till the final completion of contract for successful bidder and for all other bidders 6 months after the contract has been awarded. Issues like warranty / guarantee etc. should be outside the purview of IEMs.

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

Section 10 - Other Provisions

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

10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

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

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

For & On behalf of the Principal

(Office Seal)

For & On behalf of the Bidder/ Contractor

(Office Seal)

Place----------

Date----------

Witness:_____

(Name & Address) _____

_____

Witness:_____

(Name & Address) _____

_____

	PRE-QUALIFICATION REQUIREMENT	PE-PQ-RC-563-A002	
	(TECHNICAL)	DATE	11/03/2019
	PROJECT: RATE CONTRACT	REV NO	00
	PACKAGE : - ELECTRIC HOISTS		

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	Minimum one (1) no. Purchase order shall be submitted which should not be more than seven (7) years old as on date of bid submission, for establishing continuity in business. This is over and above the requirement of PO mentioned of PQR clause at S. No. 2.0 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.