



ಭಾರತ್ ಹೆವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್
भारत हेवी इलेक्ट्रिकल्स लिमिटेड
Bharat Heavy Electricals Ltd.,
(A Government of India undertaking)
Electronics Division

Page 1 of 8

CE: PR: 003- Rev 03

PB 2606 , Mysore Road Bangalore , 560026 INDIA

SPECIAL COMMERCIAL CONDITIONS OF CONTRACT

Reference is brought to BHEL's Instructions to Bidders (Document Ref: CE: PR: 001- Rev 05) and General Commercial Conditions for Contract (Document Ref: CE: PR: 002- Rev 04).

These two documents along with Special Conditions of Contract annexed to this RFQ will form an integral part of the contract as and when the RFQ culminates into a Purchase Order / Contract.

RFQ No. : ATLNIC0011
RFQ Date : As per E-procurement website
RFQ Due Date : As per E-procurement website
Customer : M/s GSECL/Kadana-HEP
Project : Pumped Storage operation
Item Description : **13.5**MW SFC System for 65 MW, 11 kV Motor

Kindly submit your quotation as **two part bid** (Pre-Qualification Criteria & Techno-Commercial bid-1st part & Price bid-2nd Part) in E-Procurement System portal: <https://eprocurebhel.co.in> within the Due- Date of ____ As per E-procurement website ____ before ____ As per E-procurement website ____ hours IST and note that tenders will be opened on the same day at ____ As per E-procurement website ____ hours IST.

Purchase Executives: Clarifications with regard to the tender shall be addressed to purchase officers whose e-mail IDs are given below:

sathishkumars@bhel.in or atulsood@bhel.in

Splitting of tendered quantity to MSE vendors for Purchase preference: Non-Splitable

Destination: a) For Indigenous scope of supply, items are to be directly despatched to BHEL site office/stores located at Kadana Hydro Electric Project, Diwada Colony, Taluka Kadana, Mahisagar, PIN 389250, State Gujarat. Detailed Consignee details will be issued by BHEL along with Despatch Clearance.

b) For Imported scope of supply: Customs duty is reimbursable by customer.

Terms of Delivery:

- **Indigenous scope of supply:** Ex-works, ____ <indicate station of dispatch> ____ (including Packing & Forwarding charges but excluding Taxes).

Bidder to indicate the BoM for Indigenous scope offered with delivery term as Ex-works:

- I. **Imported scope of supply** (for sea consignment on High-Sea sales): C.I.F. < Nhava-Sheva sea port, Mumbai > (including Packing, Forwarding, Handling, Ancillary charges, Export declaration, Country of Origin etc.). Detention free period (DFP) shall be 14 days.

Bidder to indicate the BoM for Import scope offered with delivery term as C.I.F. < Nhava-Sheva sea port, Mumbai and accordingly, indicate the corresponding dimension & weight details (approx.) of the total imported consignment, as the same is required for calculating air freight/Inland freight charges:

Under-mentioned details shall be provided against indigenous supplies & services:

- a. GSTIN of place of supply : _____
- b. HSN (Harmonized System of Nomenclature) code : _____
 Applicable tax and Rate : _____ & _____
- c. GSTIN of place of supply of service : _____
- d. SAC (Service Accounting Code) : _____
 Applicable tax and Rate : _____ & _____
- e. GeM Seller ID mandatorily required for PO placement: _____
- f. MSE vendor : Yes-MSE supporting documents enclosed/No
 (If MSE, supporting documents such as Udyam certificate to be enclosed)

I. Bidders to mandatorily provide confirmation/compliance for the under-mentioned terms:

SL NO.	TERMS	BHEL ACCEPTABLE TERM	BIDDER'S CONFIRMATION	REMARKS, if any
01	Reverse Auction (RA). Not applicable for this tender	BHEL shall be resorting to Reverse Auction (Guidelines as available on https://www.bhel.com/guidelines-reverse-auction-2024) for this tender. RA shall be conducted among all the techno-commercially qualified bidders. Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered as initial bids of bidders in RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking.	AGREE	Not applicable for this tender.
02	Delivery Period	Within 537 days from the date of placement of Purchase Order. Delay in contractual delivery will attract Penalty /Liquidated Damages(LD) as per GCC Clause no.:04.b.	AGREE	
03	Terms of Payment at the time of material supply	Refer Clause "F" of Instructions to Bidder for BHEL-EDN standard Payment terms and loading factors applicable for non-compliance against payment terms: A) Indigenous Procurement: i) Supply Only ii) <i>Supply with Service(s)</i> B) Import Procurement C) High Sea Sales Procurement Note: MSME vendors may opt to get payment through Trade Receivables electronic Discounting System (TReDS)	AGREE	
04	Declaration of local	'Local content' means the amount of value added in India which shall, unless otherwise prescribed by the	Percentage of local content:	

	content	Nodal Ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent. (Refer Clause 'A' Sl. No. 12 of Instructions to Bidders). The 'Class-I local supplier' shall be required to indicate percentage of local content and provide certification that the item offered meets the local content requirement for 'Class-I local supplier'.	_____% Details of the Location(s) at which the local value addition is made: _____	
--	----------------	--	--	--

II. Bidder to note that Deviations shall not be permitted for the below mentioned terms and are deemed to be complied. In case of non-compliance/deviation, offer shall be liable for rejection:

- (1) **a) Submission of Engineering documents post PO as indicated in Cl: 04 of GCC:** After award of contract, Successful bidder shall submit complete set of documents (like drawings, bill of materials, datasheets, catalogues, quality plan, etc. as called in tender specification) for approval, within **60** days from the date of award of contract. Buyer shall issue manufacturing clearance along with approved documents within **90** days after receipt of documents from seller. Any delay by buyer/consignee in providing approved documents beyond specified period shall be on the part of buyer and BHEL will extend the delivery period for such period of delay.
In case of any corrections in documents to be incorporated by seller for approval of document based on end-user/consultant/buyer comments, revised documents have to be submitted by seller incorporating the comments within **7** days from the date of receipt of the same.

Seller shall be required to commence manufacturing only after receipt of approved documents from BHEL.

b) Extension of Delivery Period: Refer **Cl.04 b) Extension of Delivery Period** of GCC.

- (2) **Validity:** The offer will be valid for a period of **90** days from the date of Part-I bid opening and in case of Negotiation/ Counter-offer/Reverse Auction, price validity will apply afresh for a period of **60** days from the date of according final price by bidder (or) up to original validity period, whichever is later.
- (3) **Warranty:** **18** months from the date of delivery of goods or **15** months from date of commissioning, whichever is earlier.
- (4) **a) Pre-dispatch inspection at Seller premises as indicated in Cl: 06 a) of GCC:** While bidding, the sellers should take into account **12** days for arranging inspection from the date of email offering the goods for inspection. Any delay in arranging inspection beyond the specified period due to reasons not attributable to seller, shall be on the part of buyer and BHEL will extend the delivery period for such period of delay.

b) Material despatch clearance certificate (MDCC): Seller should take into account **10** days for issuance of despatch clearance by BHEL from the date of successful inspection report. Any delay in issue of MDCC beyond the specified period shall be on the part of buyer and BHEL will extend the delivery period for such period of delay.
- (5) **Despatch Documents:** Complete set of despatch documents (original + 1 photocopy set) as per Purchase Order shall be forwarded to Purchase Executive/BHEL directly. Despatch documents shall include the following documents, as applicable, depending upon finalised delivery Incoterms:

Invoice (01 original and 01 copy with original sign & seal / digitally signed invoice), Lorry Receipt (L/R) (or) Bill of Lading, Country of Origin certificate, Copy of High Sea Sales (HSS) agreement, Packing List, NIL Short-Shipment Certificate, Warranty certificate, insurance intimation letter, E-way bill (Part-A & B), original POD (Proof of Delivery) on L/R etc.

The precise list of despatch documents needed for the project will be specified in the Purchase Order. One set of Invoice, Packing List, Lorry Receipt (or) AWB/BOL, E-way bill with part-B details shall be e-mailed immediately to BHEL-EDN at the time of despatch.

Note: Detailed Packing List should indicate package-wise content details and also Net & Gross weight of each package.

- (6) **Freight Charges (for indigenous scope of supply):** Freight charges shall be to vendor's account. Bidder to quote reasonable Freight charges along with applicable tax, in price bid.

Freight Charges (for imported scope of supply): Freight charges shall be to vendor's account. Bidder to arrange freight on behalf of buyer after customs clearance of item. Bidder to quote reasonable Freight charges along with applicable tax, in price bid.

Transit Insurance: Transit Insurance upto project site shall be to vendor's account.

- (7) **Evaluation criteria to determine L1 bidder:** Items will not be split on item-wise lowest offer. Evaluation of the lowest bidder will be done as a combined package basis. The Procuring Entity reserves its right to grant preferences to eligible Bidders under various Government Policies/ directives (policies relating to Make in India, MSME etc.)

- a. **Preference to Micro & Small Enterprises (MSEs):** Purchase preference will be given to MSEs as defined in *Public Procurement Policy* for Micro and Small Enterprises (MSEs) Order, 2012 dated 23.03.2012 issued by Ministry of MSME (and its subsequent Orders/Notifications issued by concerned Ministry) & the latest *Office Memorandum* issued by Department of Expenditure dt:18.05.2023.

If the bidder wants to avail the Purchase preference, the bidder must be the manufacturer of the offered product in case of bid for supply of goods. Traders are excluded from the purview of Public Procurement Policy for Micro and Small Enterprises. Relevant documentary evidence in this regard shall be uploaded along with the bid in respect of the offered product.

Bidder shall furnish the following declaration;

MSE declaration	Any Bidder falling under the MSE category shall furnish UDYAM Registration certificate in support of the same along with their techno-commercial offer. Note: If the bidder does not furnish the above in the tender, the offer shall be processed construing that the bidder does not fall under the MSE category.
MSE Category declaration	If the bidder belongs to any of the below MSE category, the bidder to mention Social Category and Gender in the REMARKS column and furnish UDYAM Registration certificate containing these details in support of the same along with their techno-commercial offer a. SC/ST Owned b. Women Owned Note: If the bidder does not furnish the above in the tender, the offer shall be processed construing that the bidder does not fall under the above category.

- b. **Preference to Make in India (MII) products:** Preference shall be given to Class 1 local supplier as defined in public procurement (Preference to Make in India) order 2017 as amended from time to time (and its subsequent Orders/Notifications issued by concerned Nodal Ministry for specific Goods/Products)

& the latest *Office Memorandum* issued by Department of Expenditure dt:18.05.2023 and Revision dt.19-07-2024.

{‘Class-I local supplier’ means a supplier or service provider, whose goods, services or works offered for procurement, has local content equal to or more than 50%, as defined under Public procurement order no. P-45021/2/2017-PP (BE-II) dt.: 16.09.2020 and Revision dt.19-07-2024.

‘Class-II local supplier’ means a supplier or service provider, whose goods, services or works offered for procurement, has local content more than 20% but less than 50%, as defined under Public procurement order no. P-45021/2/2017-PP (BE-II) dt.: 16.09.2020 and Revision dt.19-07-2024}.

In the event of any Nodal Ministry prescribing higher or lower margin of purchase preference and/or higher or lower percentage of local content in respect of this procurement, same shall be applicable.’}

If the bidder wants to avail the Purchase preference, the bidder must upload a certificate from the OEM regarding the percentage of the local content and the details of locations at which the local value addition is made along with their bid, failing which no purchase preference shall be granted.

Note: For this procurement, the local content to categorize a supplier as a Class I local supplier/ Class II local Supplier/ Non local supplier and purchase preference to Class I local supplier, is as defined in Public Procurement (Preference to Make in India), Order 2017 dated 19.07.2024 issued by DPIIT. In case of subsequent orders issued by the nodal ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of Part-II bids against this NIT.

Penal provisions for false self-declaration of MII, in case of Contract more than Rs.10Cr.

For contract valuing more than Rs.10 Crores, local content (in case of self-declaration certification submitted by bidders at the time of tendering), the contractor/ supplier shall be required to give local content certification duly certified by cost/chartered accountant in practice, within 120 days from the date of release of the Purchase order by BHEL. In case the contractor/ supplier does not meet the stipulated local content requirement and the category of the supplier changes from Class-I to Class-II/Non-local or from Class-II to Non-local, a penalty upto 10% of the contract value may be imposed. However, contract once awarded shall not be terminated on this account.

Default margin of purchase preference shall be 20% to local suppliers with default minimum local content of 50%.

Operation methodology of Purchase preference clause to MSE & MII bidders is as detailed under clause:4. c. b) in the Office Memorandum issued by Department of Expenditure dt:18.05.2023 (ref. Annexure-VIII of ITB).

Note: In case of negotiations, the margin of purchase preference (20% for Class-I Non-MSE or 15% for MSE) shall be based on pre-negotiated L1 price and the eligible Class-I & MSE local bidder will have to match the negotiated L1 price.

Note: Non-Local suppliers (with local content < 20%) are not eligible to participate in this tender.

- (8) **Performance security:** Performance of the contract, Performance Bank Guarantee (PBG) or Security Deposit (SD), hereafter referred as performance security has to be submitted by successful bidder for **05%** of the contract value.

CPBG has to be furnished within **05** Weeks after notification of the award and it should remain valid for a period of **60** days beyond the date of completion of all contractual obligations, including warranty obligations.

Refer Clause “H” of Instructions to Bidders. Also note that CPBG should be in the format specified in Annexure VII of ITB and no deviation to this format will be allowed.

Modes of deposit:

a) Performance security may be furnished in the following forms:

(i) Local cheques of Scheduled Banks (subject to realization)/ Pay Order/Demand Draft/ Electronic Fund Transfer in favour of BHEL.

(ii) Bank Guarantee from Scheduled Banks/Public Financial Institutions as defined in the Companies Act.

(iii) PBG should be in the format specified in Annexure VII of ITB and no deviation to this format will be allowed.

(iv) Fixed Deposit Receipt issued by Scheduled Banks/Public Financial Institutions as defined in the Companies Act (FDR should be in the name of the Contractor, a/c BHEL).

(iv) Securities available from Indian Post offices such as National Savings Certificates, Kisan Vikas Patras etc. (held in the name of Contractor furnishing the security and duly endorsed/hypothecated/pledged, as applicable, in favour of BHEL).

(v) Insurance Surety Bond.

(Note: BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith)

b) The Performance security will be forfeited and credited to BHEL’s account in the event of a breach of contract by the supplier.

c) Performance security shall be refunded to the supplier without interest, after duly performing and completing the contract in all respects but not later than 60 days of completion of all such obligations including the warranty under the contract.

d) The Performance security shall not carry any interest.

e) **CPBG/PBG should be mandatorily submitted along with SFMS (Structured Financial Messaging System).**

- (9) **Breach of Contract, Remedies & Termination:** In case of breach of contract (failure of supplier), wherever the value of Performance security available with BHEL against the said contract is at least 10% of the contract value, the same shall be encashed.

In case the value of the security instruments available is less than 10% of the contract value, the balance amount shall be recovered from other financial remedies (i.e. available bills of the contractor, retention amount, etc. with BHEL) or legal remedies be pursued.

Further, levy of liquidated damages, debarment, termination, de-scoping, short-closure, etc. shall be applied as per provisions of the contract.

(10) **Erection Supervision & Commissioning - Evaluation methodology:**

Range of procurement value	Minimum percentage of basic material value proposed for Erection Supervision & Commissioning charges
Up to Rs. 2.50 crs.	05%
Greater than Rs. 2.50 crs. and lesser than Rs. 10 crs.	03% (or) Rs.12.50 lakhs, whichever is higher.
Greater than Rs. 10 crs. and lesser than Rs. 20 crs.	02% (or) Rs.30 lakhs, whichever is higher.
Greater than Rs. 20 crs.	01.50% (or) Rs.40 lakhs, whichever is higher.

Depending on the material quotation value, the bidder will have to quote the corresponding Erection Supervision & Commissioning charges for the respective slab/range as per above table. In case the quoted total Erection Supervision & Commissioning value is less than above stipulated charges, BHEL shall evaluate Bidders offered Price deducting differential amount from main supply price (excluding commissioning spares, training charges) and apportioning towards Erection Supervision & Commissioning charges.

Payment terms for E&C charges: 100% payment (on per-diem basis), will be paid in 15 days from the date of submission of supplementary invoice/documents against proof of successful completion of installation & commissioning duly certified by Engineer-in-charge. Contractor's payment is subject to TDS, TCS as per applicable act of Govt.

Note: Wherever bidders doesn't agree for such apportioning, the differential charges shall be retained from main supply invoice and retention amount will be paid after successful completion of Erection & Commissioning.

(11) **Based on the under-mentioned declarations of Bidder as insisted under Rule 144(Xi) of General Financial Rules, 2017 amendment dt. 24.02.2023, eligibility of offer will be ascertained in the tender:**

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that our firm is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that our firm fulfils all requirements in this regard and is eligible to be considered."

Note: Wherever applicable, evidence of valid registration by the Competent Authority shall be attached.

Additional declaration by Bidder in the cases of specified Transfer of Technology (ToT):

"I have read the clause regarding restrictions on procurement from a bidder having Transfer of Technology (ToT) arrangement. I certify that our firm does not have any ToT arrangement requiring registration with the Competent Authority."

OR

"I have read the clause regarding restrictions on procurement from a bidder having Transfer of Technology (ToT) arrangement. I certify that our firm has valid registration to participate in this procurement."

(12) **Integrity Pact: Applicable**

Execution of Integrity Pact is applicable for this tender (Refer clause "K" of Instructions to Bidders). The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory who signs in the offer) along with techno-commercial 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.

(13) **EMD/Bid security:** Not Applicable

(14) Declaration regarding 'Conflict of Interest among Bidders/Agents' should be submitted as part of the tender as per attached format.

With this, we hereby confirm that all the terms & conditions as indicated in Instructions to Bidders (Document Ref: CE: PR: 001- Rev 05) & General Commercial Conditions for Contract (Document Ref: CE: PR: 002- Rev 04) are accepted without any deviation.

Vendor's Signature with Seal

On Bidder Letter Head

Date:

To,
M/s Bharat Heavy Electricals Ltd.
Electronics Division, Mysore Road,
Bangalore – 560026

Sub: Declaration regarding 'Conflict of Interest among Bidders/Agents'

Ref: BHEL Tender / RFQ / NIT Number

Bidders having a conflict of interest shall not be eligible to participate in the tender process. In this regard, following declaration regarding 'conflict of interest' should be signed by the authorized signatory of the bidder and submitted as part of the tender.

Treatment of cases regarding conflict of interest:

The bidder notes that a conflict of interest would said to have occurred in the tender process and execution of the resultant contract, in case of any of the following situations:

- i) If its personnel have a close personal, financial, or business relationship with any personnel of BHEL who are directly or indirectly related to the procurement or execution process of the contract, which can affect the decision of BHEL directly or indirectly;
- ii) The bidder (or his allied firm) provided services for the need assessment/ procurement planning of the tender process in which it is participating;
- iii) Procurement of goods directly from the manufacturers/suppliers shall be preferred. However, if the OEM/principal insists on engaging the services of an agent, such agent shall not be allowed to represent more than one manufacturer/supplier in the same tender. Moreover, either the agent could bid on behalf of the manufacturer/supplier or the manufacturer/supplier could bid directly but not both. In case bids are received from both manufacturer/supplier and the agent, bid received from the agent shall be ignored. However, this shall not debar more than one authorised distributor (with/ or without the OEM) from quoting equipment manufactured by an Original Equipment Manufacturer (OEM) in procurements under a Proprietary Article Certificate.
- iv) A bidder participates in more than one bid in this tender process. Participation in any capacity by a Bidder (including the participation of a Bidder as a partner/ JV member or sub-contractor in another bid or vice-versa) in more than one bid shall result in the disqualification of all bids in which he is a party. However, this does not limit the participation of an entity as a sub-contractor in more than one bid if he is not bidding independently in his own name or as a member of a JV.

The Bidder declares that they have read and understood the above aspects, and the bidder confirms that such conflict of interest does not exist and undertakes that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with the other Bidder(s), in this regard. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. **In case, the Bidder is found having indulged in above activities, the same will be considered as a violation of the tender conditions, and suitable action shall be taken by BHEL as per extant policies/guidelines.**

For M/s

Authorized Signatory

(with company seal & Name)



ಭಾರತ್ ಹೆವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್
भारत हेवी इलेक्ट्रिकल्स लिमिटेड

Bharat Heavy Electricals Ltd.,
(A Government of India undertaking)
Electronics Division

PB 2606 , Mysore Road, Bengaluru , 560 026, INDIA

CE:PR:001- Rev 05

INSTRUCTIONS TO BIDDERS

Bidder is requested to read the instructions carefully and submit their quotation taking into consideration of all the points:

A. GENERAL INSTRUCTIONS:

1. Any Purchase Order resulting from this enquiry shall be governed by the Instructions to Bidders (document reference: CE: PR: 001 – Rev 05), General Conditions of Contract (document reference: CE: PR: 002 - Rev 04) and Special Conditions of Contract, if any, of the enquiry.
2. Any deviations from or additions to the “General Conditions of Contract” or “Special Conditions of Contract” require BHEL’s express written consent. The general terms of business or sale of the bidder shall not apply to this tender.
3. Regret letter (either through post or by mail or by EPS) indicating reasons for not quoting must be submitted without fail, in case of non-participation in this tender.

Supplier shall be liable for removal as a registered vendor of BHEL when the supplier fails to quote against four consecutive tender enquiries for the same item or all enquiries in last two years for the same item, whichever is earlier.

4. Procurement directly from the manufacturers is preferred. However, if the OEM/ Principal insist on engaging the services of an agent, such agent shall not be allowed to represent more than one manufacturer/ supplier in the same tender.

Moreover, either the agent could bid on behalf of the manufacturer/ supplier or the manufacturer/ supplier could bid directly but not both. Agent/Representative authorized by the OEM/Principal in turn cannot further sub authorize any other firm for submitting the offer or for placement of order.

In case bids are received from the manufacturer/ supplier and his agent, bid received from the agent shall be ignored.

5. Consultant / firm (and any of its affiliates) shall not be eligible to participate in the tender/s for the related goods for the same project if they were engaged for consultancy services for the same project.
6. If an Indian representative/associate/liaison office quotes on behalf of a foreign based bidder, such representative shall furnish the following documents:
 - a. Authorization letter to quote and negotiate on behalf of such foreign-based bidder.
 - b. Undertaking from such foreign based bidder that such contract will be honored and executed according to agreed scope of supply and commercial terms and conditions.
 - c. Undertaking shall be furnished by the Indian representative stating that the co-ordination and smooth execution of the contract and settlement of shortages/damages/replacement/repair of imported scope

till the equipment is commissioned and handed over to customer will be the sole responsibility of the Indian representative/associates/agent/liaison office.

d. Refer **Annexure I** on “Guidelines for Indian Agents”.

7. In case of imported scope of supply, customs clearance & customs duty payment will be to BHEL account after the consignment is received at Indian Airport /Seaport. Bidders must provide all original documents required for completing the customs clearance along with the shipment.

Warehousing charges due to incomplete or missing documentation will be to supplier's account. All offers for imported scope of supply by air, must be made from any of the gateway ports (within the country) indicated **(Refer Annexure II)**.

8. The offers of the bidders who are on the banned list and also the offers of the bidders, who engage the services of the banned firms, shall be rejected. The list of the banned firms is available on BHEL website: http://www.bhel.com/vender_registration/vender.php
9. Business dealings with bidders will be suspended if they are found to have indulged in any malpractices/misconduct which are contrary to business ethics like bribery, corruption, fraud, pilferage, cartel formation, submission of fake/false/forged documents, certificates, information to BHEL or if they tamper with tendering procedure affecting the ordering process or fail to execute a contract, or rejection of 3 consecutive supplies or if their firms / works are under strike/lockout for a long period. Bidder may refer “Guidelines for Suspension of Business Dealings with Suppliers/ Contractors” available on <https://bhel.com/guidelines-suspension-business-dealings-supplierscontractors> for more details.

The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies / guidelines.

10. 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.edn.bhel.com> and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to your notice.
11. Offer is to be submitted in English language only.
12. For this procurement, the local content to categorize a supplier as a Class-I local supplier/ Class-II local supplier/ Non-local supplier and purchase preference to Class-I local supplier, is as defined in Public procurement (Preference to Make in India), Order 2017 dated 16.09.2020 issued by DPIIT.

In case of subsequent Orders issued by the Nodal Ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of price bids against this NIT. Default margin of purchase preference shall be 20% for Class-I local supplier only.

13. The Bidder shall mandatorily submit Declaration as mentioned under Rule 144(xi) of General Financial Rules, 2017 amendment dt 23.07.2020 issued by Ministry of Finance, Govt. of India. Where applicable, evidence of valid registration by the Competent Authority shall be attached.

The Competent Authority for the purpose of registration under this Order shall be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT). Refer Annexure-X for 'Restrictions under Rule 144(Xi) of General Financial Rules, 2017 amendment dt: 23.07.2020'.

B. GUIDELINES FOR PREPARATION OF OFFER:

1. Quotation shall be submitted in Single Part Bid, Two Part Bid or Three Part Bid, as called for in the tender:
 - **SINGLE PART BID:** Technical and Commercial Bid with prices along with price summary & filled in BHEL Standard Commercial terms and conditions in a single sealed envelope.
 - **TWO PART BID:** Unpriced offer i.e. "Techno-commercial Bid" with filled in BHEL Standard Commercial terms and conditions in a sealed envelope **along with the copy of the "Price Bid" without the prices** should be enclosed in one cover and the cover must be super scribed "**Techno-commercial offer**) and Priced offer i.e. "Price Bid "containing price summary in a separate sealed envelope and must be super scribed "**Price Bid**".

Both these envelopes shall be enclosed in a single sealed envelope superscribed with enquiry number, due date of tender and any other details as called for in the tender document.

- **THREE PART BID:** Pre-qualification Bid (Part-I), Techno Commercial Bid with filled in BHEL Standard Commercial terms and conditions (Part-II), and Price Bid (Part-III). All three envelopes shall be enclosed in a single sealed envelope superscribed with enquiry number, due date of tender and any other details as called for in the tender document.

If any of the offers (Part I, Part II or Part III) are not submitted before the due date and time of submission (or) if any part of the offer is incomplete, the entire offer of the bidder is liable for rejection.

2. Supplier shall ensure to superscribe each envelope with RFQ number, RFQ Date, RFQ Due date and time, Item Description and Project clearly & boldly. Also mention on the envelope whether it is "Techno Commercial Bid" or "Price Bid" or "Pre-Qualification Bid".

Please ensure complete address, department name and purchase executive name is mentioned on the envelope (before dropping in the tender box or handing over) so that the tender is available in time for bid opening.

3. BHEL standard Commercial Terms and Conditions (duly filled, signed & stamped) must accompany Technical-Commercial offer without fail and should be submitted in original only.

The above indicated submission of Offers in "sealed envelope/hard copy" as mentioned in points B.1-B.3 is applicable for tenders that are not floated through E-Procurement System (EPS).

4. Validity: Unless otherwise specified in SCC (special commercial conditions of contract), the offer will be valid for a period of 90 days from the date of Part-I bid opening and in case of Negotiation/Counter-offer/Reverse Auction, price validity will apply afresh for a period of 60 days from the date of according final price by bidder (or) up to original validity period, whichever is later.
5. Any of the terms and conditions not acceptable to supplier, shall be explicitly mentioned in the Techno-Commercial Bid.

If no deviations are brought out in the offer it will be treated as if all terms and conditions of this enquiry are accepted by the supplier without deviation.

6. Deviation to this specification/item description, if any, shall be brought out clearly indicating “DEVIATION TO BHEL SPECIFICATION” without fail, as a part of Techno-Commercial Bid.

If no deviations are brought out in the offer it will be treated as if the entire specification of this enquiry is accepted without deviation.

7. Suppliers shall submit one set of original catalogue, datasheets, bill of materials, dimensional drawings, mounting details and/or any other relevant documents called in purchase specification as part of Technical Bid.
8. “Price Bid” shall be complete in all respects containing price break-up of all components along with all applicable taxes and duties, freight charges (if applicable) etc. Once submitted no modification / addition / deletion will be allowed in the “Price Bid.” Bidders are advised to thoroughly check the unit price, total price to avoid any discrepancy.
9. In addition, bidder shall also quote for erection & commissioning charges/erection supervision & commissioning charges (E&C service charges), documentation charges, testing Charges (type & routine), training charges etc. if & as applicable along with corresponding tax. The price summary must indicate all the elements clearly.
10. Wherever applicable, bidders should indicate “Lumpsum” Erection and Commissioning (or) Erection Supervision and Commissioning charges, as applicable (including To & Fro Fare, Boarding, Lodging, Local Conveyance etc.) for carrying out E&C activity and further handing over to customer.
The quotation shall clearly indicate scope of work, likely duration of commissioning, pre-commissioning checklist (if any).
11. Wherever bidders require PAC (Project Authority Certificate)/applicable certificates for import of raw materials, components required for DECC, EPCG Power Projects, Export Projects or other similar projects wherein supplies are eligible for customs duty benefits, lists and quantities of such items and their values (CIF) has to be mentioned in the offer. Prices must be quoted taking into account of such benefits.
12. Prices should be indicated in both figures & words. Bid should be free from correction/overwriting, using corrective fluid, etc. Any interlineation, cutting, erasure or overwriting shall be valid only if they are attested under full signature(s) of person(s) signing the bid else bid shall be liable for rejection.
Any typographical error, totalling mistakes, currency mistake, multiplication mistake, summing mistakes etc. observed in the price bids will be evaluated as per **Annexure III** “Guidelines for dealing with Discrepancy in Words & Figures – quoted in price bid” and BHEL decision will be final.
13. Documents submitted with the offer shall be signed and stamped in each page by authorized representative of the bidder. However, this requirement is not mandatory for offers uploaded through E-Procurement System (EPS).

C. GUIDELINES FOR OFFER SUBMISSION:

The under-mentioned clauses 1, 2&3 will not be applicable for EPS tenders.

1. Offers / Quotations must be dropped in tender box before 13.00 Hrs. on or before due date mentioned in RFQ. The offers are to be dropped in the proper slot of the Tender Box kept in tender opening room near reception.

Tenders are opened on 3 days in a week (Monday/Wednesday/Friday).

2. E-Mail/ Internet/EDI offers received in time shall be considered only when such offers are complete in all respects. In case of offers received through E-mail, please send the offer to the email ID specified in the SCC document of the tender.

3. Offers of Vendors who already have a valid Technical/Commercial MOU with BHEL-EDN for the items of the RFQ shall mention the relevant MOU reference no. and give only such other details not covered in the MOU.
4. In cases where tender documents are bulky, or due to some reasons tender documents are required to be submitted by hand or through posts/couriers, the offers are to be handed over either of the two purchase officers whose names are mentioned in the SCC document of tender RFQ.
5. Tenders will be opened on due date, time and venue as indicated in the RFQ in the presence of bidders at the venue indicated in the RFQ. For EPS tenders, e-mail notifications will be automatically generated and forwarded to registered e-mail ID/s of bidders during opening of tenders.
6. Bidder will be solely responsible:
 - a. for submission of offers before due date and time. Offers submitted after due date and time will be treated as "Late offers" and will be rejected.
 - b. for depositing offers in proper sealed condition in the tender box. If the bidder drops the tender in the wrong box (or) if the tender document is handed over to the wrong person, BHEL will not be responsible for any such delays.
 - c. for offers received through email etc., suppliers are fully responsible for lack of secrecy on information and ensuring timely receipt of such offers in the tender box before due date & time (This clause will not be applicable for EPS tenders).

The above indicated submission of Offers as mentioned in points 6.a-6.c is applicable for tenders that are not floated through online procurement portal considered by BHEL.

- d. In case of e-tender, all required documents should be uploaded before due date and time. Availability of power, internet connections, system/software requirements etc. will be the sole responsibility of the bidder.

Wherever assistance is needed for submission of e-tenders, help-line numbers as available in the website of service provider of BHEL may be contacted.

Purchase Executive/ BHEL shall not be responsible for any of the activities relating to submission of offer.

D. PROCESSING OF OFFERS RECEIVED:

1. Any discount/ revised offer submitted by the supplier on its own shall be accepted provided it is received on or before the due date and time of offer submission (i.e. Part-I bid).
The discount shall be applied on pro-rata basis to all items unless specified otherwise by the bidder.
2. Changes in offers or Revised offers given after Part-I bid opening shall not be considered as a part of the original offer unless such changes/revisions are requested by BHEL.
In case of withdrawal of any Technical/Commercial deviation(s) by the bidder before opening of price bids/conducting the Reverse Auction, revision of price/price impact bid, if any will not be accepted.
3. In case there is no change in the technical scope and/ or specifications and/ or commercial terms & conditions, the supplier will not be allowed to change their price bid after technical bids are opened (after the due date and time of tender opening).
4. In case of changes in scope and/ or technical specifications and/ or commercial terms & conditions by BHEL

and it accounts for price implications from bidders, all techno-commercially acceptable bidders shall be asked by BHEL (after freezing the scope, technical specifications and commercial terms & conditions) to submit the impact of such changes on their price bid.

Impact price will be applicable only for changes in technical specification / commercial conditions by BHEL. The impact price must be submitted on or before the cut-off date specified by BHEL and the original price bid and the price impact bid will be opened together at the time of price bid opening.

5. Un-opened bids (including price bids) will be returned to the respective bidders after release of Purchase order.

Regarding Offers for EPS tenders that get rejected on PQC/ techno-commercial grounds, the bids for the subsequent parts will not be opened i.e., both technical bid and price bid (Parts-II & III) will not be opened in case of rejection on PQC ground and price bid (Part-II/Part-III, as applicable) will not be opened in case of rejection on techno-commercial ground.

6. After receipt of Purchase Order, supplier should submit required documents viz., specified drawings, bill of materials, datasheets, catalogues, quality plan, test procedure, type test report, O & M Manuals and/or any other relevant documents as per Specification/Purchase Order, as and when required by BHEL/Customer.
7. Any deviation to the terms and conditions not mentioned in the quotation by supplier in response to this enquiry will not be considered, if put forth subsequently or after issue of Purchase Order, unless clarification is sought for by BHEL and agreed upon in the Purchase Order.
8. Evaluation shall be on the basis of delivered cost (i.e. "Total Cost to BHEL").

"Total Cost to BHEL" shall include total basic cost, packing & forwarding charges, taxes and/or duties (as applicable), freight charges, taxes on Services, customs clearance charges for imported items, any other cost indicated by bidder for execution of the contract and loading factors (for non-compliance to BHEL Standard Commercial Terms & Conditions).

Benefits arising out of Nil Import Duty on DEEC, EPCG, DFIA Projects, Physical Exports or such 100% exemptions (statutory benefits), project imports, customer reimbursements of statutory duties (like Basic Customs Duty and Cess on customs duty), Input tax credits as applicable will also be taken into account for arriving at the Total cost to BHEL (wherever applicable and as indicated in SCC document of tender).

For EPS tenders, it shall be noted that the prices (including discounts) vis-a-vis currency quoted in EPS portal only will be considered as Final for the purpose of evaluation of the lowest bidder.

Bidder shall ensure to indicate the applicable taxes against each line item in online portal, failing to which the same will be considered as inclusive/NIL.

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

In case more than one bidder happens to occupy the L-1 status even after soliciting discounts, the L-1 bidder shall be decided by a toss/draw of lots, in the presence of the respective L-1 bidder(s) or their representative(s).

Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding.

9. The evaluation currency for this tender shall be INR. For evaluation of offers in foreign currency, the exchange rate (TT selling rate of SBI) shall be taken as under:

Single part bids: Date of tender opening

Two/three part bids: Date of Part-I bid opening

Reverse Auction: Date of Part-I bid opening

In case of Performance Bank Guarantee (PBG) also, exchange rate will be considered as mentioned above for converting foreign currency to Indian currency and vice versa.

If the relevant day happens to be a bank holiday, then the exchange rate as on the previous working day of the bank (SBI) shall be taken.

10. Ranking (L-1, L-2 etc.) shall be done only for the techno-commercially acceptable offers.

E. INFORMATION ON PAYMENT TERMS:

1. All payments will be through Electronic Fund transfer (EFT). Vendor has to furnish necessary details as per BHEL standard format (**Refer Annexure IV**) for receiving all payments through NEFT. (Applicable for Indian vendors only).
2. In case of High Sea Sales transaction, customs clearance of the consignment landed on Indian Sea/Air ports will be done by BHEL based on the original HSS documents provided by vendors.

All warehousing charges due to delay in submission of complete and or correct HSS documents to BHEL will be to supplier's account only. Such recovery will be made out of any of the available bills (**Refer Annexure V**).

3. Statutory deductions, if any, will be made and the deduction certificate shall be issued.
 - A. In case vendor does not provide PAN details, the TDS deduction shall be at the maximum percentage stipulated as per the provisions of Income Tax Act.
In addition to the above, Foreign vendors shall also submit relevant details of their bankers like Swift Code, Banker's Name & Address etc.
 - B. TDS deduction as per section 51 of CGST Act, 2017 shall be applicable as per Gazette Notification No. 50/2018-Central Tax, Dated: 13th September 2018. TDS deduction is also applicable on purchase of goods as per the latest notification under section 194Q, and subsequent notification(s) as and when released by Govt. authorities.
4. Procurement of Goods/ Works/ Services/ Consultancy Services [under clause relating to "Income Tax and Corporate Tax" or "TDS" of Model ITBs]

a) Provision w.r.t. TDS on Purchase of Goods under section 194Q of Income Tax Act applicable from 01.07.2021 is as under:

- i. TDS as applicable will be deducted by BHEL under section 194Q of the Income Tax Act, 1961 on Purchases exceeds, the amount of Rupees. 50 Lakhs or limit defined therein from time to time during the financial year under the Indian Income Tax act 1961.
- ii. Since BHEL is liable to deduct Income Tax TDS under section 194Q, the provision of TCS as per section 206C(1H) of the Income Tax Act, 1961 shall not be applicable.

b) Higher rate of TDS for non-filers of ITR as per Section 206AB of Income Tax Act, 1961, in case of any vendor who does not filed their Income Tax Return for both of the two previous years preceding to current year and aggregate amount of TDS is more than or equal to Rs. 50,000/- in each of those previous two years (or limit defined by Govt. from time to time), then TDS will be deducted at the higher of following rates:

- (i) Twice the rate mentioned in relevant TDS section.

(ii) Twice the rate or rates in force

(iii) 5%

5. Incomplete documentation will not be accepted. Delayed submission of invoice / documents may result in corresponding delay in payment. In this connection, request to also refer clause: G (Refer Page.11) about invoicing & payment formalities under GST regime.

Applicable documents shall be submitted to the purchaser at the time of execution of supplies/services for availing GST input credits.

6. Bank charges of Seller's bank shall be to Seller's account and bank charges of Owner's bank other than Bill collection charges shall be to owner's account. Bill collection charges will be borne by Seller.

F. STANDARD PAYMENT TERMS OF BHEL-EDN:

<u>PURCHASE ORDERS FOR:</u>	<u>SUPPLY WITH SERVICE(S)</u>	<u>SUPPLY ONLY</u>
<u>INDIGENOUS PROCUREMENT</u>	<p>i. 100% payment of the basic price of Goods with 100% GST on the goods price will be paid in 45 days of Delivery of consignment or 15 days from the date of submission of complete set of documentation, whichever is later. (or)</p> <p>ii. 100% payment of the basic price of Goods with 100% GST on the goods price will be paid against Letter of Credit with usance period of 120 days from Delivery of consignment against submission of complete set of documents. LC processing charges viz., opening, amendment / discrepancy (if & as applicable) will be to supplier's account.</p> <p><u>Note:</u> In case PBG is not furnished, only 90% payment will be released against 100% claim without the consent of Vendor. This 10% basic amount withheld towards PBG will be paid either against submission of supplementary invoice & Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.</p>	<p>i.100% payment of the basic price of Goods with 100% GST on the goods price will be paid in 45 days of Delivery of consignment or 15 days from the date of submission of complete set of documentation, whichever is later. (or)</p> <p>ii.100% payment of the basic price of Goods with 100% GST on the goods price will be paid against Letter of Credit with usance period of 120 days from Delivery of consignment against submission of complete set of documents. LC processing charges viz., opening, amendment / discrepancy (if & as applicable) will be to supplier's account.</p>

<u>IMPORT PROCUREMENT</u>	<p>100% payment of the basic price of Goods will be paid against usance draft of 45 days from arrival of consignment at destination as per contractual INCOTERMS against submission of complete set of documents.</p> <p><u>Note:</u> In case PBG is not furnished, only 90% payment will be released against 100% claim without the consent of Vendor. This 10% basic amount withheld towards PBG will be paid either against submission of supplementary invoice & Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.</p>	<p>100% payment of the basic price of Goods will be paid against usance draft of 45 days from arrival of consignment at destination as per contractual INCOTERMS against submission of complete set of documents.</p>
<u>HIGH-SEA SALES PROCUREMENT</u>	<p>i) 100% payment of the basic price of Goods will be paid in 45 days from arrival of consignment at destination (in India as per contractual INCOTERMS) or 15 days from the date of submission of complete set of dispatch documents, whichever is later. (or)</p> <p>ii) 100% payment of the basic price of Goods with 100% GST on the goods price will be paid against Letter of Credit with usance period of 120 days from arrival of consignment at destination (in India as per contractual INCOTERMS) against submission of complete set of documents. LC processing charges viz., opening, amendment / discrepancy (if & as applicable) will be to supplier's account.</p> <p><u>Note:</u> In case PBG is not furnished, only 90% payment will be released against 100% claim without the consent of Vendor. This 10% basic amount withheld towards PBG will be paid either against submission of supplementary invoice & Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.</p>	<p>i) 100% payment of the basic price of Goods will be paid in 45 days from arrival of consignment at destination (in India as per contractual INCOTERMS) or 15 days from the date of submission of complete set of dispatch documents, whichever is later. (or)</p> <p>ii) 100% payment of the basic price of Goods with 100% GST on the goods price will be paid against Letter of Credit with usance period of 120 days from arrival of consignment at destination (in India as per contractual INCOTERMS) against submission of complete set of documents. LC processing charges viz., opening, amendment / discrepancy (if & as applicable) will be to supplier's account.</p>

1. **Erection and Commissioning:**

Evaluation methodology: Unless and otherwise specified in SCC, E&C charges should not be less than 10% of the main supply value. In case the quoted total E&C value is less than 10% of the main supply value, BHEL shall evaluate Bidders Price deducting differential amount from main supply price proportionally from all items and apportioning towards E&C charges.

Payment term: 100% E&C charges along with tax as applicable, will be paid in 15 days from the date of submission of supplementary invoice/documents against proof of completion of E&C.

2. Erection Supervision and Commissioning:

Evaluation methodology: Unless and otherwise specified in SCC, E,S&C charges should not be less than 5% of the main supply value. In case the quoted total E&C value is less than 5% of the main supply value, BHEL shall evaluate Bidders Price deducting differential amount from main supply price proportionally from all items and apportioning towards E,S&C charges.

Payment term: 100% E,S&C charges along with tax as applicable, will be paid in 15 days from the date of submission of supplementary invoice/documents against proof of completion of E,S&C.

3. Comprehensive Annual Maintenance Contract:

Evaluation methodology: Unless and otherwise specified in SCC, CAMC will be applicable for a period of 04 years from the date of expiry of warranty period (or) from the date of completion of commissioning of equipment, whichever is later and the total CAMC value should not be less than 20% of the main supply value. In case the quoted total CAMC value is less than 20% of the main supply value, BHEL shall evaluate Bidders Price deducting differential amount from main supply price proportionally from all items and apportioning towards CAMC charges.

Payment terms: 100% CAMC charges along with tax as applicable, will be paid in 15 days from the date of submission of supplementary invoice/documents against proof of completion of CAMC on yearly basis.

4. Terms of Payment for Training: 100% payment will be made in 45 days from the date of completion of Training or 15 days from the date of submission of complete set of invoice along with documentary evidence, whichever is later.

LOADING FACTORS FOR DEVIATION IN PAYMENT TERMS (APPLICABLE FOR IMPORT PROCUREMENT ONLY):

- 1) For offers received with Sight draft payment term in place of Usance draft, loading applicable will be 1.0% of basic value.
- 2) For offers received with Letter of Credit payment term with Usance of 45 days, loading applicable will be 2.5% of basic value.
Additional loading of 2% will be applicable for payment term as Letter of Credit at Sight.
5. Any payment term with credit period of less than 45 days for indigenous supply/HSS and any other variation of payment terms are liable for rejection.
6. Standard payment terms indicated in Clauses: F (a), (b), (c), (d), (e), (f), (g), (h), (i) & (j) will not attract any loading.

Note 1: Basic value of Purchase Order mentioned above will include all components of the purchase order and will exclude only taxes, duties, freight, training charges, E&C/E,S&C and AMC charges (wherever applicable). Wherever the Purchase Order is split into import portion and indigenous portion of supply, minimum % to be quoted for Services, wherever mentioned, will be of both purchase order values put together.

Note 2: In case of multiple packages/units in a power plant, payment of E&C/E,S&C charges will be processed on pro-rata basis.

Note 3: No deviation will be permitted from the duration of Guarantee/Warranty and/or Comprehensive Annual Maintenance Contract period specified in SCC.

Note 4: Indigenous bidder may opt to quote with payment through Letter of Credit with usance period of 120 days. Bank charges of seller's bank shall be to seller's account and bank charges of BHEL's bank other than bill collection charges shall be to BHEL's account. Bill collection charges will be borne by seller.

G. Terms & Conditions to be complied under GST regime:

1. All invoices to contain BHEL-EDN (buyer) GSTIN number: 29AAACB4146P1ZB. However for CGST +SGST/UGST billing outside the state of Karnataka, invoice has to be generated with BHEL's Nodal Agency GSTIN number. Address of Nodal Agency along with GSTIN number will be provided by BHEL at the time of issuing dispatch clearance.
2. The Bidder shall mention Bidder's GSTIN number in all quotations and Invoices submitted.
3. The Bidder shall also mention HSN (Harmonized System of Nomenclature) / SAC (Services Accounting Code) mandatorily in all quotations and invoices submitted.
4. Invoice submitted should be in the format as specified under GST Laws viz., all details as mentioned in Invoice Rules like GST registration number(GSTIN), invoice number with date of issue, quantity, rate, value, taxes with nomenclature – CGST, SGST, UGST, IGST mentioned separately, HSN Code / SAC Code etc. Invoice should be submitted in original for buyer plus duplicate for credit availment.
5. Payment of GST to Vendor will be made only if it is matching with data uploaded by the Vendor in GST portal.
6. For invoices paid on Reverse charge basis – “Tax payable on reverse charge basis” to be mentioned on the invoice.
7. In case GST credit is delayed/denied to BHEL due to non/delayed receipt of goods and/or tax invoice or expiry of timeline prescribed in GST law for availing such ITC, or any other reasons not attributable to BHEL, GST amount will be recoverable from vendor along with interest levied/ leviable on BHEL.
8. In case vendor delays declaring such invoice in his return and GST credit availed by BHEL is denied or reversed subsequently as per GST law, GST amount paid by BHEL towards such ITC reversal as per GST law will be recoverable from vendor/contractor along with interest levied/ leviable on BHEL.
9. Vendor should intimate BHEL immediately on the same date of invoicing without any delay.
10. In case of discrepancy in the data uploaded by supplier in the GSTN portal or in case of any shortages or rejection in the supply, then BHEL will not be able to avail the tax credit and will notify the supplier of the same. Supplier has to rectify the data discrepancy in the GSTN portal or issue credit note (details to be uploaded in GSTN portal) for the shortages or rejections in the supplies, within the calendar month notified by BHEL.
11. Bidders to note that Rules & Regulations pertaining to E-way bill system are to be strictly adhered to, as and when notified by Govt. authorities.
12. As per Notification 88/2020-Central Tax dated 10th November 2020 (applicable w.e.f. 01 January 2021), the turnover for applicability of E-invoicing provisions has been reduced from 500 crores to 100 crores. In other words, registered person [other than a SEZ unit and those referred in Rule 54(2), 54(3), 54(4) and 54(4A) of the CGST Rules], whose aggregate turnover in any preceding financial year from 2017-18 onwards exceeds 100 crores, is required to comply with the requirement of IRN and QR code in respect of supply of goods or services or both to a registered person or for exports.

H. Performance bank guarantee (PBG):

Performance bank guarantee (PBG) will be applicable as called in the tender documents. Unless otherwise specified in the SCC, the PBG against performance of the contract shall be valid for a period of 24 months from the date of delivery of goods + claim period of 03 months, for a value equal to 10 % of the basic value of the purchase order which will include all components of the purchase order and will exclude only taxes, duties, freight, training charges, E&C/E,S&C and AMC charges (wherever applicable).

1. The BG issued in Indian Rupees by Banks in India is to be executed on Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG was executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Vendor/Bank issuing the guarantee.
2. No deviation for the duration and value of PBG will be permitted.
3. PBG shall be from any of the BHEL consortium of bankers (**refer Annexure VI**).
4. PBGs from nationalized banks are also acceptable.
5. PBG should be sent directly by the bank to the dealing executive mentioned in the purchase order located at the address mentioned in the purchase order.
6. PBG should be in the format specified (**refer Annexure VII**). No deviation to this format will be allowed. However in case BHEL changes the PBG format, bidder shall honor the same.
7. Bank Guarantee should be enforceable in Bangalore.
8. 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 Bangalore.
 - b. From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor Country's Bank)
 - b.1 Please note 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 favor of the Indian Bank's (BHEL's Consortium Bank) branch in India. It shall be noted that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor.
 - 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 is 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).
9. Expired PBGs will be returned only after expiry of the claim period.
10. PBG shall not be applicable for spares.

I. PURCHASE PREFERENCE FOR MSE(MICRO AND SMALL ENTERPRISES) VENDORS:

Purchase preference will be given to MSEs as defined in Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012 dated 23.03.2012 issued by Ministry of Micro, Small and Medium Enterprises and its subsequent Orders/Notifications issued by concerned Ministry. If the bidder wants to avail the Purchase preference, the bidder must be the manufacturer of the offered product in case of bid for supply of goods.

Traders are excluded from the purview of Public Procurement Policy for Micro and Small Enterprises. Relevant documentary evidence in this regard shall be uploaded along with the bid in respect of the offered product. Purchase preference to Micro and Small Enterprises clause in the bid, the same will get precedence over this clause.

a. If tendered quantity is Splittable: In tender, participating MSEs quoting price within price band of L1+15 percent shall also be allowed to supply a portion of requirement by bringing down their price to L1 price in a situation where L1 price from someone other than a MSE and such MSE shall be allowed to supply at least 25% of total tendered value. In case of more than one such MSE, the supply shall be shared proportionately (to tendered quantity).

- 3% of the 25% will be earmarked for women owned MSEs.
- 25% of the 25% (i.e., 6.25% of the total enquired quantity) will be earmarked for SC/ST owned MSE firms.
- In case where no SC/ST category firms have not participated in the tender, the 6.25% of earmarked quantity for SC/ST owned MSE firms will be distributed among the other eligible MSE vendors who have participated in the tender.

b. If tendered quantity is Non-Splittable: If L-1 is not an MSE and MSE Seller (s) has/have quoted price within L-1+ 15% of margin of purchase preference /price band defined in relevant policy, such Seller shall be given opportunity to match L-1 price and contract will be awarded for 100% of total value.

J. INTEGRITY COMMITMENT IN THE TENDER PROCESS, AND EXECUTION OF CONTRACTS:

1. Commitment by BHEL: BHEL commits to take all measures necessary to prevent corruption in connection with the Tender process and execution of the Contract. BHEL will, during the tender process, treat all bidder / suppliers in a transparent and fair manner, and with equity.
2. Commitment by Bidder(s)/ Contractor(s):
 - a. The Bidder(s)/ Contractor(s) commit(s) to take all measures to prevent corruption and will not directly or indirectly try to influence any decision or benefit which he is not legally entitled to.
 - b. The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding or any actions to restrict competition.
 - c. The Bidder(s)/ Contractor(s) will not commit any offence under the relevant Acts. 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 BHEL as part of business relationship.
 - d. 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 and shall adhere to the relevant guidelines issued from time to time by Government of India/ BHEL.

If the Bidder(s) / Contractor(s), before award or during execution of the Contract commit(s) a transgression of the above or in any other manner such as to put his reliability or credibility in question, BHEL is entitled to disqualify the Bidder(s) / Contractor (s) from the tender process or terminate the contract and/ or take suitable action as deemed fit.

K. Integrity Pact (IP):

- a) IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner.

For details of Independent External Monitors (IEMs) on the present panel appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL, kindly refer BHEL website www.bhel.com

- b) The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/three part bid).
Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification.
- c) Please refer Section-8 of the IP for Role and Responsibilities of IEMs (Annexure IX). In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s).
All correspondence with the IEM/s shall be done through email only.

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

L. Conflict of Interest among Bidders/Agents:

*"A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. **The bidder found to have a conflict of interest shall be disqualified.** A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:*

- a) they have controlling partner (s) in common; **or***
- b) they receive **or** have received any direct or indirect subsidy/ financial stake from any of them; **or***
- c) they have the same legal representative/agent for purposes of this bid; **or***
- d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; **or***
- e) Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from one bidding manufacturer in more than one bid; **or***

- f) *In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorise only one agent/dealer. There can be only one bid from the following:*
1. *The principal manufacturer directly or through one Indian agent on his behalf; and*
 2. *Indian/foreign agent on behalf of only one principal;*
- or**
- g) *A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid; or*
- h) *In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business."*

Annexure-1

INTEGRITY PACT**Between**

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

and

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

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for Supply of 13.5 MW SFC system for 65 MW, 11 KV Motor of GSECL-Kadana HEP (hereinafter referred to as "Contract"). The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

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

Section 1- Commitments of the Principal

- 1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles: -
 - 1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - 1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
 - 1.1.3 The Principal will exclude from the process all known prejudiced persons.
- 1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

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

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

At the end

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

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

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

Section 4 - Compensation for Damages

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

Ath Soc

Section 5 - Previous Transgression

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 (three) years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- 5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason or action can be taken as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

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

- 6.1 The Principal will enter into Integrity Pacts with identical conditions as this Integrity Pact with all Bidders and Contractors.
- 6.2 In case of Sub-contracting, the Principal Contractor shall take the responsibility of the adoption of Integrity Pact by the Sub-contractor(s) and ensure that all Sub-contractors also sign the Integrity Pact.
- 6.3 The Principal will disqualify from the tender process all Bidders who do not sign this Integrity Pact or violate its provisions.

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

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

Section 8 -Independent External Monitor(s)

- 8.1 The Principal appoints competent and credible panel of Independent External Monitor (s) (IEMs) for this Integrity Pact. The task of the IEMs is to review independently and objectively, whether and to what extent the parties comply with the obligations under this Integrity Pact.
- 8.2 The IEMs are not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The IEMs shall be provided access to all documents/ records pertaining to the Contract, for which a complaint or issue is raised before them as and when warranted. However, the documents/records/information having National Security implications and those documents which have been classified as Secret/Top Secret are not to be disclosed.
- 8.4 The Principal will provide to the IEMs sufficient information about all meetings among the parties related to the Contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the IEMs the option to participate in such meetings.



- 8.5 The advisory role of IEMs is envisaged as that of a friend, philosopher and guide. The advice of IEMs would not be legally binding and it is restricted to resolving issues raised by a Bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some Bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.
- 8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process or during execution of Contract, the matter should be examined by the full panel of IEMs jointly, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.
- 8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to the CMD, BHEL at the earliest. They may also send their report directly to the CVO, in case of suspicion of serious irregularities requiring legal/ administrative action. Only in case of very serious issue having a specific, verifiable Vigilance angle, the matter should be reported directly to the Commission. IEMs will tender their advice on the complaints within 30 days.
- 8.8 The CMD, BHEL shall decide the compensation to be paid to the IEMs and its terms and conditions.
- 8.9 IEMs should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the Principal should be looked into by the CVO of the Principal.
- 8.10 If the IEMs have reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code / Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the IEMs may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
- 8.11 After award of work, the IEMs shall look into any issue relating to execution of Contract, if specifically raised before them. As an illustrative example, if a Contractor who has been awarded the Contract, during the execution of Contract, raises issue of delayed payment etc. before the IEMs, the same shall be examined by the panel of IEMs. Issues like warranty/ guarantee etc. shall be outside the purview of IEMs.
- 8.12 However, the IEMs may suggest systemic improvements to the management of the Principal, if considered necessary, to bring about transparency, equity and fairness in the system of procurement.
- 8.13 The word 'Monitor' would include both singular and plural.

Section 9 - Pact Duration

- 9.1 This Integrity Pact shall be operative from the date this Integrity Pact is signed by both the parties till the final completion of contract for successful Bidder, and for all other Bidders 6 months after the Contract has been awarded. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.
- 9.2 If any claim is made/ lodged during currency of this Integrity Pact, the same shall be binding and continue to be valid despite the lapse of this Pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

Atul S. C.

BHEL-IP

AA:SSP:IP:R03 dtd 01-04-2022

Section 10 - Other Provisions

- 10.1 This Integrity Pact is subject to Indian Laws and exclusive jurisdiction shall be of the competent Courts as indicated in the Tender or Contract, as the case may be.
- 10.2 Changes and supplements as well as termination notices need to be made in writing.
- 10.3 If the Bidder(s)/ Contractor(s) is a partnership or a consortium or a joint venture, this Integrity Pact shall be signed by all partners of the partnership or joint venture or all consortium members.
- 10.4 Should one or several provisions of this Integrity Pact turn out to be invalid, the remainder of this Integrity Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 10.5 Only those bidders / contractors who have entered into this Integrity Pact with the Principal would be competent to participate in the bidding. In other words, entering into this Integrity Pact would be a preliminary qualification.
- 10.6 In the event of any dispute between the Principal and Bidder(s)/ Contractor(s) relating to the Contract, in case, both the parties are agreeable, they may try to settle dispute through Mediation before the panel of IEMs in a time bound manner. In case, the dispute remains unresolved even after mediation by the panel of IEMs, either party may take further action as the terms & conditions of the Contract. The fees/expenses on dispute resolution through mediation shall be shared by both the parties. Further, the mediation proceedings shall be confidential in nature and the parties shall keep confidential all matters relating to the mediation proceedings including any settlement agreement arrived at between the parties as outcome of mediation. Any views expressed, suggestions, admissions or proposals etc. made by either party in the course of mediation shall not be relied upon or introduced as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the dispute that is the subject of mediation proceedings. Neither of the parties shall present IEMs as witness in any Alternative Dispute Resolution or judicial proceedings in respect of the dispute that was subject of mediation.

ಅತುಲ್ ಸೂದ, ಎಂ.ಎಂ.ಪಿ.ಸಿ.ಎಂ.-ಎಂ.ಎಂ.-ಪಿ.ಎಂ.

अतुल सूद, एम.एम.पी.सी.एम.-एम.-पी.एम.

ATUL SOOD, ENGINEER / CE-MM-PR

BHEL-EDN, MYSURU ROAD, BENGALURU-560026

For & On behalf of the Principal

(Office Seal)

Place BengaluruDate 12-08-25

Witness:

(Name & Address) ಎಂ. ಸತೀಶ್ ಕುಮಾರ್, ಎಂ.ಎಂ.ಪಿ.ಸಿ.ಎಂ.-ಎಂ.ಎಂ.-ಪಿ.ಎಂ.

एस. सतीश कुमार, सी. प्रबंधकी ई.-एम.एम.-पी.एम.

S. SATHISH KUMAR, SR. MANAGER / CE-MM-PR

BHEL-EDN, MYSURU ROAD, BENGALURU-560026

For & On behalf of the Bidder/ Contractor

(Office Seal)

Witness:

(Name & Address) _____

Clause on IP in the tender**“Integrity Pact (IP)”**

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

SI	IEM	Email
1.	Shri Arun Chandra Verma, IPS (Retd.)	acverma1@gmail.com
2.	Shri Virendra Bahadur Singh, IPS (Retd.)	vbsinghips@gmail.com

- (b) The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/ three part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification.
- (c) Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEMs shall be done through email only.

Note:

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

Details of contact person(s):

Name: Sathish Kumar S
 Dept.: CE-MM-PR
 Address: BHEL-EDN, Bangalore
 Phone: 9449869753
 Email: sathishkumars@bhel.in

Name: Atul Sood
 Dept.: CE-MM-PR
 Address: BHEL-EDN, Bangalore
 Phone: 7795367467
 Email: atulsood@bhel.in

Annexure

Annexure I
Guidelines for Indian Agents

- **Definition of Indian Agent:** An Indian Agent of foreign principal is an individual, a partnership, an association of persons, a private or public company, that carries out specific obligation(s) towards processing of BHEL tender or finalization or execution of BHEL's contract on behalf of the foreign supplier.

In case of yes, vendor to note the following and reply accordingly:

- i. BHEL shall deal directly with foreign vendors, wherever required, for procurement of goods. However, if the foreign principal desires to avail of the services of an Indian agent, then the foreign principal should ensure compliance to regulatory guidelines - which require mandatory submission of an Agency Agreement.
- ii. It shall be incumbent on the Indian agent and the foreign principal to adhere to the relevant guidelines of Government of India, issued from time to time.
- iii. The Agency Agreement should specify the precise relationship between the foreign OEM / foreign principal and their Indian agent and their mutual interest in the business. All services to be rendered by agent/ associate, whether of general nature or in relation to the particular contract, must be clearly stated by the foreign supplier/ Indian agent. Any payment, which the agent or associate receives in India or abroad from the OEM, whether as commission or as a general retainer fee should be brought on record in the Agreement and be made explicit in order to ensure compliance to laws of the country.
- iv. Any agency commission to be paid by BHEL to the Indian agent shall be in Indian currency only.
- v. Tax deduction at source is applicable to the agency commission paid to the Indian agent as per the prevailing rules.
- vi. In the absence of any agency agreement, BHEL shall not deal with any Indian agent (authorized representatives / associate / consultant, or by whatever name called) and shall deal directly with the foreign principal only for all correspondence and business purposes.
- vii. The "Guidelines for Indian Agents of Foreign Suppliers" enclosed at annexure - 'A' shall apply in all such cases.

- viii. The supply and execution of the Purchase Order (including indigenous supplies/ service) shall be in the scope of the OEM/ foreign principal. The OEM/ foreign principal should submit their offer inclusive of all indigenous supplies/ services and evaluation will be based on 'total cost to BHEL'. In case OEM/ foreign principal recommends placement of order(s) towards indigenous portion of supplies/ services on Indian supplier(s)/ agent on their behalf, the credentials/ capacity/ capability of the Indian supplier(s)/ agent to make the supplies/ services shall be checked by BHEL as per the extant guidelines of Supplier Evaluation, Approval & Review Procedure (SEARP), before opening of price bids. In this regard, details may be checked as per Annexure-B (copy enclosed). It will be the responsibility of the OEM/ foreign principal to get acquainted with the evaluation requirements of Indian supplier/ agent as per SEARP available on www.bhel.com.

The responsibility for successful execution of the contract (including indigenous supplies/ services) lies with the OEM/ foreign principal. All bank guarantees to this effect shall be in the scope of the OEM/ foreign principal.

—X—

Vendor's Signature with Seal

Guidelines for Indian Agents of Foreign Suppliers

- 1.0 There shall be compulsory registration of agents for all Global (Open) Tender and Limited Tender. An agent who is not registered with BHEL shall apply for registration in the registration form in line with SEARP.
- 1.1 Registered agents will file an authenticated Photostat copy duly attested by a Notary Public/Original certificate of the Principal confirming the agency agreement and giving the status being enjoyed by the agent and the commission/ remuneration/ salary/ retainership being paid by the principal to the agent before the placement of order by BHEL.
- 1.2 Wherever the Indian representatives have communicated on behalf of their principals and the foreign parties have stated that they are not paying any commission to the Indian agents, and the Indian representative is working on the basis of salary or as retainer, a written declaration to this effect should be submitted by the party (i.e. Principal) before finalizing the order.
- 2.0 **Disclosure of particulars of agents/ representatives in India, if any.**
- 2.1 Tenderers of Foreign nationality shall furnish the following details in their offers:
 - 2.1.1 The Bidder(s)/ Contractor(s) of foreign origin shall disclose the name and address of the agents/ representatives in India if any and the extent of authorization and authority given to commit the Principals. In case the agent/ representative be a foreign Company, it shall be confirmed whether it is existing Company and details of the same shall be furnished.
 - 2.1.2 The amount of commission/ remuneration included in the quoted price(s) for such agents/ representatives in India.
 - 2.1.3 Confirmation of the Tenderer that the commission/ remuneration, if any, payable to his agents/ representatives in India, may be paid by BHEL in Indian Rupees only.
- 2.2 Tenderers of Indian Nationality shall furnish the following details in their offers:
 - 2.2.1 The Bidder(s)/ Contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any, indicating their nationality as well as their status, i.e. whether manufacturer or agents of manufacturer holding the Letter of Authority of the Principal specifically authorizing the agent to make an offer in India in response to tender either directly or through the agents/ representatives.
 - 2.2.2 The amount of commission/ remuneration included in the price (s) quoted by the Tenderer for himself.
 - 2.2.3 Confirmation of the foreign principals of the Tenderer that the commission/ remuneration, if any, reserved for the Tenderer in the quoted price(s), may be paid by BHEL in India in equivalent Indian Rupees on satisfactory completion of the Project or supplies of Stores and Spares in case of operation items.
- 2.3 In either case, in the event of contract materializing, the terms of payment will provide for payment of the commission/ remuneration, if any payable to the agents/ representatives in India in Indian Rupees on expiry of 90 days after the discharge of the obligations under the contract.
- 2.4 Failure to furnish correct and detailed information as called for in paragraph 2.0 above will render the concerned tender liable to rejection or in the event of a contract materializing, the same liable to termination by BHEL. Besides this there would be a penalty of banning business dealings with BHEL or damage or payment of a named sum.

ANNEXURE - II
LIST OF INTERNATIONAL GATEWAY AIRPORTS

For air based consignment, terms of delivery will be on FCA basis from following listed airports only. Vendors are requested to verify this list for use before submission of offer.

SCHEDULE NO	COUNTRY	CURRENCY CODE	AIRPORT
D01	UK	GBP	LONDON (HEATHROW)
D02	UK	GBP	NEW CASTLE
D03	UK	GBP	OXFORD. CHETLAM
D04	UK	GBP	BRISTOL. WELLINGBOROUGH
D05	UK	GBP	BIRMINGHAM
D06	UK	GBP	EAST MIDLANDS
D07	UK	GBP	MANCHESTER
D08	UK	GBP	LEEDS
D09	UK	GBP	GLASGOW
D10	FRANCE	EURO	PARIS (ROISSY) & LYON
D11	SWEDEN	EURO	STOCKHOLM
D12	SWEDEN	EURO	GOTHENBERG & MALMO
D13	ITALY	EURO	ROMA, MILAN
D14	ITALY	EURO	TURIN, BOLOGNA, FLORENCE
D15	NETHERLANDS	EURO	AMSTERDAM, ROTTERDAM
D16	AUSTRIA	EURO	VIENNA, LINZ, GRAZ
D17	BELGIUM	EURO	ANTWERP, BRUSSELS
D18	DENMARK	DKK	COPENHAGEN
D19	JAPAN	JPY	TOKYO, OSAKA
D20	SINGAPORE	SGD	SINGAPORE
D21	CANADA	CAD	TORONTO
D22	CANADA	CAD	MONTREAL
D23	USA	USD	NEW YORK, BOSTON
D24	USA	USD	CHICAGO
D25	USA	USD	SAN FRANCISCO, LOS ANGELES
D26	USA	USD	ALANTA, HOUSTON
D27	GERMANY	EURO	MUNICH, KOLN, DUSSELDORF, HANNOVER, HAMBURG, STUTTGART, DAMSTADT, MANIHIEM, NURUMBERG
D28	GERMANY	EURO	FRANKFURT
D29	GERMANY	EURO	BERLIN
D30	SWITZERLAND	SFR	BASLE, ZURICH, GENEVA
D31	SPAIN	EURO	BARCELONA
D32	AUSTRALIA	AUD	SYDNEY
D33	AUSTRALIA	AUD	MELBOURNE
D34	AUSTRALIA	AUD	PERTH
D35	CZECH	EURO	PRAGUE
D36	HONG KONG	HKD	HONG KONG
D37	NEW ZELAND	NZD	AUCKLAND
D38	RUSSIA	USD	MOSCOW
D39	SOUTH KOREA	USD	KIMPO INTERNATIONAL, INCHEON
D40	FINLAND	EURO	HELSINKI
D41	ROMANIA	EURO	BUCHAREST
D42	NORWAY	EURO	OSLO
D43	IRELAND	EURO	DUBLIN
D44	ISRAEL	USD	TEL AVIV
D45	UAE	USD	DUBAI
D46	OMAN	USD	MUSCAT
D47	EGYPT	USD	CAIRO
D48	TAIWAN	USD	TAIPEI
D49	UKRAINE	USD	KIEV
D50	CHINA	USD	SHANGHAI, SHENZHEN
D51	PHILIPINES	USD	MANILA
D52	MALAYSIA	USD	KUALALUMPUR, PE NANG
D53	CYPRUS	USD	LARNACA
D54	SOUTH AFRICA	USD	JOHANNESBERG, DURBAN
D55	SLOVAKIA	EURO	BARTISLOVA
D56	SAUDI ARABIA	SAR	RIYADH
D57	TURKEY	EURO	ISTANBUL
D58	THAILAND	USD	BANGKOK
D59	BRAZIL	USD	SAO PAULO, RIO DE JANEIRO

ANNEXURE – III

DISCREPANCY IN WORDS & FIGURES – QUOTED IN PRICE BID

Following guidelines will be followed in case of discrepancy in words & figures-quoted in price bid:

(a) If, in the price structure quoted for the required goods/services/works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of the purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.

(b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and

(c) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

(d) If there is such discrepancy in an offer, the same shall be conveyed to the bidder with target date upto which the bidder has to send his acceptance on the above lines and if the bidder does not agree to the decision of the purchaser, the bid is liable to be ignored.

ANNEXURE - IV
Electronic Funds Transfer (EFT) OR
Paylink Direct Credit Form

Please Fill up the form in **CAPITAL LETTERS** only.

TYPE OF REQUEST(Tick one): ☐ CREATE ☐ CHANGE

BHEL Vendor / Supplier Code:

Company Name :

Permanent Account Number(PAN):

Address

City:

PINCODE

STATE

Contact Person(s)

Telephone No:

Fax No:

e-mail id:

1 Bank Name:

2 Bank Address:

3 Bank Telephone No:

4 Bank Account No:

5 Account Type: Savings/Cash Credit

6 9 Digit Code Number of Bank and branch
appearing on MICR cheque issued by Bank

7 Bank IFSC Code(applicable for NEFT)

8 Bank IFSC code(applicable for RTGS)

(Indian Financial System Code)

- A I hereby certify that the particulars given above are true, correct and complete and that I, as a representative for the above named Company, hereby authorise BHEL, EDN, Bangalore to electronically deposit payments to the designated bank account.
- B If the transaction is delayed or not effected at all for reasons of incomplete or incorrect information, I would not hold BHEL / transferring Bank responsible.
- C This authority remains in full force until BHEL, EDN, Bangalore receives written notification requesting a change or cancellation.
- D I have read the contents of the covering letter and agree to discharge the responsibility expected of me as a participant under ECS / EFT.

Date:

Authorised Signatory:

Designation:

Telephone No. with STD Code

Company Seal

Bank Certificate

We certify that _____ has an Account No _____ with us and we confirm that the bank details given above are correct as per our records.

Date:

Place:

(.....)

Signature

Please return completed form along with a blank cancelled cheque or photocopy thereof to:

Bharath Heavy Electricals Ltd,

Attn:

Electronics Division, Mysore Road,

BANGALORE - 560 026

In case of any Query, please call concerned purchase executive.

ANNEXURE - V
PRESENT PROCEDURE FOR SALE IN TRANSIT (HIGH SEA SALES)

In case of High Sea Sales, vendor should submit following documents:

1. ORIGINAL HIGH SEA SALES AGREEMENT

- Sale agreement (on Rs. 200/- non-judicial stamp paper & notarised with 2 witnesses with identity) has to be signed between BHEL and the Party importing material. The date of the sale documents should be in between the date of House Air Way Bill / Bill of Lading and before landing of the goods in Indian origin.
- Following shall be included in the High Sea Sales Agreement:
"THE BUYER ALSO UNDERTAKE DISCHARGES, THE OBLIGATION AND FULFILLMENT OF CONDITIONS, IF ANY, ATTACHED TO THE IMPORTATION, ASSESSMENT AND CLEARANCE OF THE GOODS IN TERMS CUSTOMS TARIFF ACT 1975, THE CUSTOMS ACT 1962 & RULES & REGULATIONS MADE THERE UNDER AND OTHER RELEVANT ACTS, ORDERS, NOTIFICATIONS".

2. ORIGINAL INVOICES: INDIGENOUS RUPEE INVOICE & FOREIGN CURRENCY INVOICE

- Prices should be C.I.F., designated airport/seaport basis.
- I.E.C., C.S.T., K.S.T. Nos. to be mentioned.
- Description of item (Nomenclature), Unit & Quantity in both the Foreign Currency & the Indigenous Invoice in Rupee shall be exactly as per Purchase Order Description of item, Quantity and Unit. The Indigenous Invoice value shall be exactly as per Purchase Order value.
- Seller should give Foreign Currency Invoice from the original consignor. The Foreign Currency Invoice value should be at least 2% (two per cent) less than the Indigenous Rupee Invoice value in equivalent foreign currency.

4. ORIGINAL HOUSE AIR WAY BILL/ BILL OF LADING

- The sale agents should duly endorse House Air Way Bill (HAWB) for air shipments or original Bill of Lading (O.B.L.) for sea shipments and Foreign Currency Invoice in favour of BHEL-EDN.

5. ORIGINAL CARGO ARRIVAL NOTICE FROM FORWARDER.

6. ORIGINAL DELIVERY ORDER ISSUED IN NAME OF BHEL-EDN.

7. ORIGINAL PACKING LIST.

8. A LETTER TO THE COMMISSIONER OF CUSTOMS FOR EFFECTING ABOVE SALE.

9. A LETTER TO THE DEPUTY ASSESSOR (OCTROI) FOR EFFECTING ABOVE SALE IN FAVOUR OF BHEL.

REMARKS: In case vendor needs any clarifications on the above, the same may be sought in writing.

SI No	Name of Bank
1	State Bank of India
2	Canara Bank
3	IDBI Bank Limited
4	ICICI Bank Limited
5	HDFC Bank Limited
6	Axis Bank
7	IndusInd Bank Limited
8	Bank of Baroda
9	Exim Bank
10	Indian Bank
11	Punjab National Bank
12	Union Bank of India
13	Yes Bank Limited
14	RBL Bank Ltd.
15	Indian Overseas Bank
16	Kotak Mahindra Bank Limited
17	Federal Bank Limited
18	Hongkong and Shanghai Banking Corporation Ltd

BANK GUARANTEE FOR PERFORMANCE SECURITY

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of Bharat Heavy Electricals Limited (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 _____¹ through its Unit at.....(name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) with its registered office at _____² hereinafter referred to as the 'Vendor / Contractor / Supplier', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No.....dated³ valued at Rs.....⁴ (Rupees -----)/FC.....(in words.....) for⁵ (hereinafter called the 'Contract') and the Vendor / Contractor / Supplier having agreed to provide a Contract Performance Bank 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 any sum or sums upto a maximum amount of Rs -- -----⁶ (Rupees -----) without any demur, immediately on first demand from the Employer and without any reservation, protest, and recourse and without the Employer needing to prove or demonstrate reasons for its such demand.

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 Vendor / Contractor / Supplier in any suit or proceeding pending before any Court or Tribunal, Arbitrator or any other authority, 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 Vendor / Contractor / Supplier shall have no claim against us for making such payment.

We thebank 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/satisfactory completion of the performance guarantee period as per the terms of the 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.

WeBANK 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 Vendor / 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 Vendor / Contractor / Supplier and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Vendor / Contractor / Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Vendor / 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 Vendor / Contractor / Supplier and notwithstanding any security or other guarantee that the Employer may have in relation to the Vendor / Contractor / Supplier 's liabilities.

This Guarantee shall remain in force upto and including.....⁷ 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 Vendor / 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 the⁸we 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.....⁶
- b) This Guarantee shall be valid up to⁷
- c) Unless the Bank is served a written claim or demand on or before⁸ 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 CONTRACT VALUE

⁵ PROJECT/SUPPLY DETAILS

⁶ BG AMOUNT IN FIGURES AND WORDS

⁷ VALIDITY DATE

⁸ DATE OF EXPIRY OF CLAIM PERIOD

Note:

1. Units are advised that expiry of claim period may be kept 3-6 months after validity date. It may be ensured that the same is in line with the agreement/ contract entered with the Vendor.
2. The BG should be on Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG was executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Vendor/Contractor/Supplier /Bank issuing the guarantee.
3. In line with the GCC, SCC or contractual terms, Unit may carry out minor modifications in the Standard BG Formats. If required, such modifications may be carried out after taking up appropriately with the Unit/Region's Law Deptt.
4. 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's (BHEL's Consortium Bank) branch in India. 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). The BG Format provided to them should clearly specify the same.

Annexure-VIII

F. No. DPE/3(3)/10-Fin.
Government of India
Ministry of Finance
Department of Public Enterprises

Block No. 14, CGO Complex,
Lodi Road, New Delhi-110003
Dated the 29th May, 2023

To,

Chief Executives of all CPSEs

Subject:- Concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order, 2017 - regarding

Sir/Madam,

The undersigned is directed to forward herewith a copy of Department of Expenditure O.M. dated 18th May, 2023 on the subject mentioned above for information and strict compliance.

Encl : As stated


(Kailash Bhandari)
Deputy Director
Tel : 2436-6247

Copy to :- Shri Kanwalpreet, Director, Department of Expenditure, Room No. 264-C,
North Block, New Delhi.

No.F.1/4/2021-PPD
Government of India
Ministry of Finance
Department of Expenditure
Public Procurement Division

264-C, North Block, New Delhi.
18.05.2023.

OFFICE MEMORANDUM

Subject: Concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order, 2017.

The undersigned is directed to refer two Preferential Procurement Orders mandated for the Public Procurement in India, namely:

- i. Public Procurement Policy for Micro and Small Enterprises (MSEs) Order dated 23.03.2012 (PPP-MSE Order) issued by Ministry of Micro, Small and Medium Enterprises (MoMSME) in exercise of the powers conferred in Section 11 of the MSME Development Act, 2006. (Last revised on 09.11.2018)
 - ii. Public Procurement (Preference to Make in India) Order, 2017 (PPP-MII order), under Rule 153(iii) of the General Financial Rules (GFRs) 2017, approved by the Cabinet. Implementation of this PPP-MII order is monitored by Department for Promotion of Industry and Internal Trade (DPIIT). (Last revised on 16.09.2020.)
2. It has been brought to the notice of this Department that concurrent application of these two orders are creating confusion to the procuring entities and different procuring entities interpret them differently. In order to bring predictability both to the procuring entities as well as bidders, following guidelines are being issued.

Guidelines

3. The Class-I local suppliers, under PPP-MII Order, participating in any government tender, may or may not be MSEs, as defined under the MSME Act. Similarly, MSEs participating in any government tender, may or may not be Class-I local suppliers. Suppliers may be categorised in following four broad categories for consideration or applicability of purchase preference:

Category	Terminology
Supplier is both MSE & Class-I local supplier.	"MSE Class-I local supplier"
Supplier is MSE but not Class-I local supplier.	"MSE but non-Class-I local supplier"
Supplier is not MSE but is Class-I local supplier.	"Non-MSE but Class-I local supplier"
Supplier is neither MSE nor Class-I local.	"Non-MSE non-Class-I local supplier"

4. The applicability of PPP-MSE Order and PPP-MII Order in various scenarios, involving simultaneous purchase preference to MSEs and Class-I local suppliers under PPP-MSE Order and PPP-MII Order respectively, shall be as under:

a) *Items covered under Para 3(a) of PPP- MII Order, 2017 for which Nodal Ministry has notified sufficient local capacity and competition:* For these items, only Class-I local suppliers are eligible to bid irrespective of purchase value. Hence, Class-II local suppliers or Non-local suppliers, including MSEs which are Class-II local suppliers/ Non-local suppliers, are not eligible to bid. Possible scenarios can be as under:

- (i) L-1 is "MSE Class-I local supplier" - 100% of the tendered quantity is to be awarded to L-1.
- (ii) L-1 is "Non-MSE but Class-I local supplier" - Purchase preference is given to MSEs as per PPP-MSE Order. Balance quantity is to be awarded to the L-1 bidder.

b) *Items reserved exclusively for procurement from MSEs as per PPP-MSE Order:* These items are reserved exclusively for purchase from MSEs. Hence, non-MSEs are not eligible to bid for these items. Possible scenarios can be as under:

- (i) L-1 is "MSE Class-I local supplier" - 100% of the tendered quantity is to be awarded to L-1.
- (ii) L-1 is "MSE non-Class-I local supplier" - Purchase preference is to be given to Class-I local supplier as per PPP-MII Order. Balance quantity, is to be awarded to L-1 bidder.

c) *If items are neither notified for sufficient local capacity nor reserved for MSEs, then the process will be as follows:*

c (a) Items covered under Para 3A(b) of PPP-MII Order are divisible items and both MSEs as well as Class-I local suppliers are eligible for purchase preference. Possible scenarios can be as under:

- (i) L-1 is "MSE Class-I local supplier" - 100% of the tendered quantity is to be awarded to L-1.
- (ii) L-1 is "Non-MSE but Class-I local supplier" - Purchase preference is to be given to MSEs, if eligible, as per PPP-MSE Order. Balance quantity is to be awarded to L-1 bidder.
- (iii) L-1 is "MSE but non-Class-I local supplier" - Purchase preference is to be given to Class-I local suppliers, if eligible, as per PPP-MII Order. Balance quantity is to be awarded to L-1 bidder.
- (iv) L-1 is "Non-MSE non-Class-I local supplier" - Purchase preference is to be given to MSEs as per PPP-MSE Order. Thereafter, purchase preference is to be given to Class-I local suppliers for "50% of the tendered quantity minus quantity allotted to MSEs

above" as per PPP- MII Order. For the balance quantity, contract is to be awarded to L-1 bidder. (Kindly refer to the illustrative example in the annexure).

- c (b) Items covered under Para 3A(c) of PPP-MII Order, 2017 are non-divisible items and both MSEs as well as Class-I local suppliers are eligible for purchase preference. Possible scenarios can be as under:
- (i) L-1 is "MSE Class-I local supplier" - Contract is awarded to L-1.
 - (ii) L-1 is not "MSE Class-I local supplier" but the "MSE Class-I local supplier" falls within 15% margin of purchase preference - Purchase preference is to be given to lowest quoting "MSE Class-I local supplier". If lowest quoting "MSE Class-I local supplier" does not accept the L-1 rates, the next higher "MSE Class-I local supplier" falling within 15% margin of purchase preference is to be given purchase preference and so on.
 - (iii) If conditions mentioned in sub paras (i) and (ii) above are not met i.e. L-1 is neither "MSE Class-I local supplier" nor "MSE Class-I local supplier" is eligible to take benefit of purchase preference, the contract is to be awarded/ purchase preference to be given in different possible scenarios as under:
 - A. L1 is "MSE but non-Class-I local supplier" or "Non-MSE but Class-I local supplier" – Contract is awarded to L1.
 - B. L1 is "Non-MSE non-Class-I local supplier" - First purchase preference to be given to MSE as per PPP-MSE Order. If MSE not eligible/ does not accept - purchase preference to be given to Class- I Local supplier as per PPP-MII Order. If Class-I Local supplier also not eligible/ does not accept – contract to be awarded to L-1.
- d) *Items reserved for both MSEs and Class-I local suppliers:* These items are reserved exclusively for purchase from MSEs as well as Class-I local suppliers. Hence, only "MSE Class-I local supplier" are eligible to bid for these items. Non-MSEs/Class-II local suppliers/ Non-local suppliers cannot bid for these items. Hence the question of purchase preference does not arise.
- e) Non-local suppliers, including MSEs falling in the category of Non-local suppliers, shall be eligible to bid only against Global Tender Enquiry.

y
18/5/2023
(Kanwalpreet)
Director

Tel.: -223093811; email: - kanwal.irss@gov.in

To

1. Secretaries of all Central Government Ministries/ Departments.
2. Secretary Department of Public Enterprises with a request for issuing suitable instructions to all Central Public Sector Enterprises in this regard.

Example explaining applicability in scenario explained in para 4 c (a)(iv)

(Scenario: Divisible items, both MSEs as well as Class-I local suppliers eligible for purchase preference and L-1 is “Non-MSE non-Class-I local supplier”)

Item – Desktop computer

Qty – 50 Nos.

Details of bids received

Sr. No.	Name of bidder	Rates quoted	Price Ranking	Status of bidder
1.	A	100	L1	“Non-MSE non- Class-I local supplier”
2.	B	110	L2	“Non-MSE but Class-I local supplier”
3.	C	112	L3	“MSE but non- Class-I local supplier”
4.	D	115	L4	“Non-MSE but Class-I local supplier”
5.	E	118	L5	“MSE but non- Class-I local supplier”
6.	F	120	L6	“MSE Class-I local supplier”

1. In this case, first purchase preference is to be given to MSEs as per PPP-MSE Order for 25% of tendered quantity of 50 Nos. i.e. 12.5 Nos. (rounded off to the next whole number say 13 Nos). Accordingly, invite L3 (bidder C), whose quoted rates falls within 15% margin of purchase preference to match L1 price i.e. Rs. 100/- for quantity of 13 Nos. Bidder “E” and “F”, although MSEs, will not get purchase preference since their quoted rates don’t fall within 15% margin of purchase preference. Bidder C will be considered for order of 13 Nos. on confirmation of reduction of price.
2. For 50% of balance quantity of 37 number (tendered quantity of 50 – 13 awarded to bidder C; assuming bidder C has confirmed to accept L1 rates), purchase preference will be given to lowest Class-I local supplier as per PPP-MII Order. Accordingly, bidder B will be invited to match L-1 price for 50% of 37 Nos i.e. 18.5 (say 19 Nos of computers). If bidder “B” does not accept the L1 price i.e. price of Rs. 100/- per unit, next higher Class-I local supplier falling within 20% margin of purchase preference, i.e. bidder “D”, may be invited to match L-1 price for 19 Nos. of computers and so on.
3. For remaining quantity i.e. 18 Nos (50-13-19), the contract will be awarded to lowest quoting bidder i.e. Bidder “A”, who is L-1 in the example.

Annexure-X

Restrictions under Rule 144(xi) of General Financial Rules, 2017 amendment dt: 23.07.2020

- I. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority.
- II. "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.
- III. "Bidder from a country which shares a land border with India" for the purpose of this Order means :-
 - a. An entity incorporated, established or registered in such a country; or
 - b. A subsidiary of an entity incorporated, established or registered in such a country; or
 - c. An entity substantially controlled through entities incorporated, established or registered in such a country; or
 - d. An entity whose *beneficial owner* is situated in such a country; or
 - e. An Indian (or other) agent of such an entity; or
 - f. A natural person who is a citizen of such a country; or
 - g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above
- IV. The *beneficial owner* for the purpose of (iii) above will be as under:
 1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.

Explanation--

 - a. "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent of shares or capital or profits of the company;
 - b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;
 2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;

3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;
4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;
5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

V. An Agent is a person employed to do any act for another, or to represent another in dealings with third person.

(On Company Letter Head)

FORM NO. 10F

[See sub-rule (1) of rule 21AB]

Information to be provided under sub-section (5) of section 90 or sub-section (5) of section 90A of the Income-tax Act, 1961

I..... son/daughter of Mr in the capacity of.....
(Designation) do provide the following information, relevant to the previous year **2021-22** in case of for the purposes of sub-section (5) of section 90/section 90A:-

Sl.No.	Nature of information	Details
(i)	Status (individual; company, firm etc.) of the assessee	Company
(ii)	Permanent Account Number (PAN) of the assessee if allotted	
(iii)	Nationality (in the case of an individual) or Country or specified territory of incorporation or registration (in the case of others)
(iv)	Assessee's tax identification number in the country or specified territory of residence and if there is no such number, then, a unique number on the basis of which the person is identified by the Government of the country or the specified territory of which the assessee claims to be a resident

(v)	Period for which the residential status as mentioned in the certificate referred to in sub-section (4) of section 90 or sub-section (4) of section 90A is applicable	<u>2021-22</u>
(vi)	Address of the assessee in the country or territory outside India during the period for which the certificate, mentioned in (v) above, is applicable

I have obtained a certificate to in sub-section (4) of section 90 of sub-section (4) of section 90A from the Government of..... (name of country or specified territory outside India)

Signature:.....

Name:.....

Address:.....

Email ID:.....

Contact Number.....

Permanent Account Number:.....

Verification

I..... do hereby declare that to the best of my knowledge and belief what is stated above is correct complete and is truly stated. Verified today the..... day of.....

Signature of the person providing the information

Place:.....

(On Company Letter Head)

No Business Connection or Permanent Establishment Certificate

Date

To

Bharat Heavy Electricals Limited
Electronics Division, PB NO. 2606,
Mysore Road, Bangalore
India - 560026

Sir,

Sub: No Business Connection or Permanent Establishment declaration for FY **2021-22**

This is to certify that (Name of the supplier) is a company incorporated in(country) and does not have any business connection in India as per the provision of Section 9 of the Income Tax Act 1961 or any Permanent Establishment as defined in Article 5 of the India and(country) DTAA.

We hereby certify that we will notify BHEL in case of any change in the status as certified above.

For

Authorised Signatory

(Note – Please refer definition of the Business Connection on reverse and Permanent Establishment in the relevant DTAA)

"Business connection" as defined in Section 9 of the Income Tax Act shall include any business activity carried out through a person who, acting on behalf of the non-resident,—

- (a) has and habitually exercises in India, an authority to conclude contracts on behalf of the non-resident or habitually concludes contracts or habitually plays the principal role leading to conclusion of contracts by that non-resident and the contracts are—
 - (i) in the name of the non-resident; or
 - (ii) for the transfer of the ownership of, or for the granting of the right to use, property owned by that non-resident or that non-resident has the right to use; or
 - (iii) for the provision of services by the non-resident; or
- (b) has no such authority, but habitually maintains in India a stock of goods or merchandise from which he regularly delivers goods or merchandise on behalf of the non-resident; or
- (c) habitually secures orders in India, mainly or wholly for the non-resident or for that non-resident and other non-residents controlling, controlled by, or subject to the same common control, as that non-resident:

Provided that such business connection shall not include any business activity carried out through a broker, general commission agent or any other agent having an independent status, if such broker, general commission agent or any other agent having an independent status is acting in the ordinary course of his business :

Provided further that where such broker, general commission agent or any other agent works mainly or wholly on behalf of a non-resident (hereafter in this proviso referred to as the principal non-resident) or on behalf of such non-resident and other non-residents which are controlled by the principal non-resident or have a controlling interest in the principal non-resident or are subject to the same

common control as the principal non-resident, he shall not be deemed to be a broker, general commission agent or an agent of an independent status

For the removal of doubts, it is hereby clarified with explanation-2A, that the significant economic presence of a non-resident in India shall constitute "business connection" in India and "significant economic presence" for this purpose, shall mean—

- (a) transaction in respect of any goods, services or property carried out by a non-resident in India including provision of download of data or software in India, if the aggregate of payments arising from such transaction or transactions during the previous year exceeds such amount as may be prescribed; or
- (b) systematic and continuous soliciting of business activities or engaging in interaction with such number of users as may be prescribed, in India through digital means:

Provided that the transactions or activities shall constitute significant economic presence in India, whether or not,—

- (i) the agreement for such transactions or activities is entered in India; or
- (ii) the non-resident has a residence or place of business in India; or
- (iii) the non-resident renders services in India:

Thresholds for the purposes of significant economic presence.

11UD. (1) For the purposes of clause (a) of Explanation 2A to clause (i) of sub-section (1) of section 9, the amount of aggregate of payments arising from transaction or transactions in respect of any goods, services or property carried out by a non-resident with any person in India, including provision of download of data or software in India during the previous year, shall be two crore rupees;

(2) For the purposes of clause (b) of Explanation 2A to clause (i) of sub-section (1) of section 9, the number of users with whom systematic and continuous business activities are solicited or who are engaged in interaction shall be three lakhs.

To,
M/s Bharat Heavy Electricals Ltd.,
Electronics Division P.B. No. 2606
Mysore Road, Bangalore –560 026
Ph. No.: 080 2699 8994

Ref –

Subject: Declaration as a Compliance of Restrictions under Rule 144 (xi) of GFR 2017 as per DOE Order (Public Procurement No.4) dated 23.02.2023 (as amended from time to time).

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that our firm is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that our firm fulfils all requirements in this regard and is eligible to be considered.

On Bidder Letter Head

Date:

To,

M/s Bharat Heavy Electricals Ltd.

Electronics Division, Mysore Road,'

Bangalore – 560026

Sub: Model Clause / Certificate as per clause 9 (a) of Revised Public Procurement (Preference to Make in India Order, 2017 of DPIIT dated 19.07.2024

Ref: BHEL Tender / RFQ / NIT Number

I (authorized signatory for M/s) a 'Class-I Local Supplier' / 'Class-II Local Supplier' at the time of tender, bidding or solicitation hereby confirm that the item meets the Local Content requirement for 'Class-I Local Supplier' / 'Class-II Local Supplier' .

Tick appropriate option & cut the other one:

1) We are the reseller/distributor of the quoted product and the Local Content percentage is
Break up of Local value addition to be furnished below (inclusive of Taxes):

a)

b)

c)

OEM certificate for country of origin to be submitted for above.

2) We are not the reseller/distributor of the quoted product and the Local Content percentage is
.....

The address is as below, where the local content / value addition is made:

[Factory Address]

For M/s

Authorized Signatory

(with company seal & Name)



ಭಾರತ್ ಹವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್
भारत हेवी इलेक्ट्रिकल्स लिमिटेड

Bharat Heavy Electricals Ltd.,
(A Government of India undertaking)
Electronics Division

PB 2606 , Mysore Road Bengaluru , 560026 INDIA

CE: PR: 002- Rev 04

GENERAL COMMERCIAL CONDITIONS FOR CONTRACT

These 'General Commercial Conditions for Contract for Purchase' herein after referred to as GCC apply to all enquiries, tenders, requests for quotations, orders, contracts and agreements concerning the supply of goods and the rendering of related services (hereinafter referred to as "deliveries") to Bharat Heavy Electricals Limited and any of its units, regions or divisions (hereinafter referred to as "BHEL" or the Purchaser) or its projects/ customers.

Any deviations from or additions to these GCC require BHEL's express written consent. The general terms of business or sale of the vendor shall not apply to BHEL. Acceptance, receipt of shipments or services or effecting payment shall not mean that the general terms of business or sale of the vendor have been accepted.

Orders, agreements and amendments thereto shall be binding if made or confirmed by BHEL in writing. Only the Purchasing department of BHEL is authorized to issue the Purchase Order or any amendment thereof.

Definitions: Throughout these conditions and in the specifications, the following terms shall have the meanings assigned to them, unless the subject matter or the context requires otherwise.

- 'The Purchaser' means Bharat Heavy Electricals Limited, Electronics division, Mysore road, Bengaluru 560 026, a Unit of Bharat Heavy Electricals Limited (A Govt. of India Undertaking) incorporated under the Companies Act having its registered office at BHEL House, Siri Fort, New Delhi-110049, India and shall be deemed to include its successors and assigns. It may also be referred to as BHEL.
- 'The vendor' means the person, firm, company or organization on whom the Purchase Order is placed and shall be deemed to include the vendor's successors, representative heirs, executors and administrator as the case may be. It may also be referred to as Seller, Contractor or Supplier.
- 'Contract' shall mean and include the Purchase Order incorporating various agreements, viz. tender/ RFQ, offer, letter of intent/acceptance/ award, the General Conditions of Contract and Special Conditions of Contract for Purchase, Specifications, Inspection/ Quality Plan, Schedule of Prices and Quantities, Drawings, if any enclosed or to be provided by BHEL or his authorized nominee and the samples or patterns if any to be provided under the provisions of the contract.
- 'Parties to the Contract' shall mean the 'The Vendor' and the Purchaser as named in the main body of the Purchase Order.

Order of Precedence:

In case of any inconsistency or contradiction between any of the documents, the order of precedence shall be Purchase Order, LOI / LOA, Special Conditions of Contract and General Conditions of Contract for commercial conditions; and specific agreement on technical conditions, RFQ/offer and specification for Technical Conditions.

Interpretation:

In the contract, except where the context requires otherwise:

- words indicating one gender include all genders;
- words indicating the singular also include the plural and words indicating the plural also include the singular;

- c) provisions including the word "agree", "agreed" or "agreement" require the agreement to be recorded in writing, and
- d) "Written" or "in writing" means hand-written, type-written, printed or electronically made, and resulting in a permanent record.

Applicable Conditions:

1. **Price Basis:** All prices shall be firm until the purchase order is executed / completed in all respects. No price variations / escalation shall be permitted. For any delay at BHEL end towards issuing clearance for supply of spares for reasons attributable to BHEL/Customer, Contractor shall honor the PO prices for additional 01 year period from the date of expiry of contractual schedule and delivery schedule will be extended for such period of delay at BHEL end.
2. **Ordering and confirmation of Order:** Vendor shall send the order acceptance on their company letter head/ through e-mail within a week from the date of receipt of Purchase Order or such other period as specified/ agreed by BHEL. BHEL reserves the right to revoke the order placed if the order confirmation differs from the original order placed. The acceptance of goods/services/supplies by BHEL as well as payments made in this regard shall not imply acceptance of any deviations.
The purchase order will be deemed to have been accepted if no communication to the contrary is received within one week (or the time limit as specified/agreed by BHEL) from the date of receipt of the purchase order.
3. **Documentation:** After receipt of Purchase Order, vendor should submit necessary documents (if & as applicable) like drawings specified, bill of materials, datasheets, catalogues, quality plan, test procedure, type test report , O & M Manuals and/or any other relevant documents as per Specification/Purchase Order, as and when required by BHEL/Customer.
At any stage within the contract period, the vendor shall notify of any error, fault or other defect found in BHEL's documents /specifications or any other items for reference. If and to the extent that (taking account of cost and time) any vendor exercising due care would have discovered the error, fault or other defect when examining the documents/specifications before submitting the tender, the time for completion shall not be extended. However if errors, omissions, ambiguities, inconsistencies, inadequacies or other defects are found in the vendor's documents, they shall be corrected at his cost, notwithstanding any consent or approval.
4. **Penalty:**
 - a. **Submission of Engineering documents as per PO:** After award of contract, Successful bidder shall submit complete set of documents (like drawings, bill of materials, datasheets, catalogues, quality plan, etc. as called in tender specification) for approval, within 14/21 days (as specified in SCC/Purchase Order) from the date of award of contract. Buyer shall issue manufacturing clearance along with approved documents within 60/75 days (as specified in SCC/Purchase Order) after receipt of documents from seller. Any delay by buyer/consignee in providing approved documents beyond specified period shall be on the part of buyer and BHEL will extend the delivery period for such period of delay.
In case of any corrections in documents to be incorporated by seller for approval of document based on end-user/consultant/buyer comments, revised documents have to be submitted by seller incorporating the comments within 07/14 days (as specified in SCC) from the date of receipt of the same.
Seller shall be required to commence manufacturing only after receipt of approved documents from BHEL.
 - b. **Liquidated Damages (LD):** Delivery will commence from the date of placement of Purchase Order. If the seller fails to deliver any or all of the Goods within the original/re-fixed delivery period(s) specified in the contract, the Buyer will be entitled to deduct/recover the Liquidated damages for the delay @ 0.5% of the contract value of delayed quantity per week or part of the week of delayed period as pre-estimated damages not exceeding 10% of the contract value of the delayed quantity without any controversy/dispute of any sort whatsoever. GST as applicable will be recovered along with LD amount.

Extension of Delivery Period: Buyer may, on request of the Seller or otherwise, extend the delivery date subject to Force Majeure conditions and/or also on the ground/reasons of delay attributable to the Buyer / Consignee.

5. Contract variations (Increase or decrease in the scope of supply): BHEL may vary the contracted scope as per requirements at site. If vendor is of the opinion that the variation has an effect on the agreed price or delivery period, BHEL shall be informed of this immediately in writing along with technical details. Where unit rates are available in the Contract, the same shall be the basis for such additional work. Vendor shall not perform additional work before BHEL has issued written instructions/ amendment to the Purchase Order to that effect. The work which the vendor should have or could have anticipated in terms of delivering the service(s) and functionality (i.e.) as described in this agreement, or which is considered to be the result of an attributable error on the vendor's part, shall not be considered additional work.
6. a. Pre-dispatch inspection at seller premises: Before dispatch, the goods will be inspected by Buyer/ Consignee or their Authorized Representative or by Nominated External Inspection Agency (independently or jointly with Buyer or Consignee as decided by the Buyer) at the seller premises (or at designated place for inspection as declared / communicated by the seller) for their compliance to the contract specification. For in-house testing, the sellers will provide necessary facilities free of cost. Seller shall notify the Buyer through e-mail about readiness of goods for pre-dispatch inspection and Buyer shall notify the Seller about the Authorized Representative / Nominated External Inspection Agency and the date of testing. Scope of inspection is limited to 'approved quality plan or QA checklist or Purchase Specification'. While bidding the sellers should take into account 12 days (unless otherwise specified in SCC) for arranging inspection from the date of email offering the goods for inspection. Any delay in arranging inspection beyond the specified period due to reasons not attributable to seller, shall be on the part of buyer and BHEL will extend the delivery period for such period of delay.
- b. Material Dispatch Clearance Certificate (MDCC): Seller should take into account 10 days (unless otherwise specified in SCC) for issuance of dispatch clearance by BHEL from the date of successful inspection report. Any delay in issue of MDCC beyond the specified period shall be on the part of buyer and BHEL will extend the delivery period of such period of delay.

BHEL reserves the right for conducting repeat test, if required. All costs related to inspections & re-inspections shall be borne by vendor. Whether the Contract provides for tests on the premises of the vendor or any of his Sub-contractor/s, vendor shall be responsible to provide such assistance, labour, materials, electricity, fuels, stores, apparatus, instruments as may be required and as may be reasonably demanded to carry out such tests efficiently. Cost of any type test or such other special tests shall be borne by BHEL only if specifically agreed to in the purchase order.

7. Transit Insurance: Transit insurance coverage between vendor's works and project site shall be to the account of BHEL, unless specifically agreed otherwise. However, vendor shall send intimation directly to insurance agency (as mentioned in dispatch instructions issued by BHEL) through fax/courier/e-mail, immediately on dispatch of goods for covering insurance. A copy of such intimation sent by vendor to insurance agency shall be given to BHEL along with dispatch documents. Dispatch documents will be treated as incomplete without such intimation copy. BHEL shall not be responsible for sending intimations to insurance agency on behalf of the vendor.
8. Mode of dispatch:
 Indigenous Scope: By road on Door Delivery Consignee Copy attached basis through your approved transporter (unless otherwise indicated in Dispatch Instructions), only on receipt of Despatch Clearance from BHEL.
 Imported Scope: By Air/Sea through BHEL approved Freight Forwarder/supplier approved Consolidator respectively as per agreed contractual terms, only on receipt of Dispatch Clearance from BHEL.
9. Changes in Statutory levies:
 If any rates of Tax are increased or decreased, a new Tax is introduced, an existing Tax is abolished, or any change in interpretation or application of any Tax occurs in the course of the execution of Contract, which was or will be assessed on the bidder in connection with performance of the Contract, an equitable

adjustment of the Contract Price shall be made to fully take into account any such change by addition to the Contract Price or deduction there from, as the case may be. However, these adjustments would be restricted to direct transactions between BHEL and the bidder /agent of foreign bidder (if applicable). These adjustments shall not be applicable on procurement of raw materials, intermediary components etc. by the bidder /agent.

10. Availing duty/tax exemption benefits by bidder, wherever applicable: BHEL shall issue the required Certificate/s, as per relevant policies of the Govt. of India, to facilitate the bidders to avail any such benefits under the Contract. In case of failure of the bidders to receive the benefits partly or fully from the Govt. of India and/or in case of any delay in receipt of such benefits, BHEL shall neither be liable nor responsible in any manner whatsoever.
11. Taxes against sub-vendor dispatches: All taxes/levies, as applicable in respect of all components, equipments and material to be despatched directly from the sub-vendor's works to Site irrespective of the fact whether such taxes and levies are assessable and chargeable on Vendor or the BHEL, shall be to the vendor's account and no separate claim in this regard will be entertained by BHEL.
12. High Sea Sales (HSS): Customs clearance of the consignment landed on Indian Sea/Air ports will be done by BHEL based on the original HSS documents provided by vendors.
Any delay in submission of complete/correct HSS documents to BHEL may incur demurrage charges. All demurrage charges on account of incomplete /incorrect HSS documents submission by vendor will be to vendor's account and all such charges will be recovered from any of the available vendor bills with BHEL.
13. Packaging and dispatch: The Seller shall package the goods safely and carefully and pack them suitably in all respects considering the peculiarity of the material for normal safe transport by Sea/ Air / Rail/ Road to its destination suitably protected against loss, damage, corrosion in transit and the effect of tropical salt laden atmosphere. The packages shall be provided with fixtures/ hooks and sling marks as may be required for easy and safe handling. If any consignment needs special handling instruction, the same shall be clearly marked with standard symbols / instructions. Hazardous material should be notified as such and their packing, transportation and other protection must conform to relevant regulations.
The packing, shipping, storage and processing of the goods must comply with the prevailing legislation and regulations concerning safety, the environment and working conditions. Any Imported/Physical Exports items packed with raw/ solid wood packing material should be treated as per ISPM – 15 (fumigation) and accompanied by Phytosanitary/ Fumigation certificate. If safety information sheets (MSDS – Material Safety Data Sheet) exist for an item or the packaging, vendor must provide this information without fail along with the consignment.
Each package must be marked with Consignee name, Purchase order number, Package number, Gross weight and net weight, dimensions (LxBxH) and Seller's name. Packing list of goods inside each package with PO item number and quantity must also be fixed securely outside the box to indicate the contents of each box. Total number of packages in the consignment must also be indicated in the packing list.
Separate packing & identification of items should be as follows.
 1. Main Scope - All items must be tagged with part no. & item description.
 2. Commissioning accessories/spares - All items must be tagged with part no. & item description.
 3. Mandatory spares - All items must be tagged with part no. & item description.
 Nevertheless, vendor shall adhere to dispatch & packing instructions issued by BHEL at the time of dispatch.
14. Assignment of Rights & Obligations; Subcontracting: Vendor is not permitted to subcontract the delivery or any part thereof to third party or to assign the rights and obligations resulting from this agreement in whole or in part to third parties without prior written permission from BHEL. Any permission or approval given by the BHEL shall, however, not absolve the vendor of the responsibility of his obligations under the Contract.
15. Progress report: Vendor shall render such report as to the progress of work and in such form as may be called for by the concerned purchase officer from time to time. The submission and acceptance of such reports shall not prejudice the rights of BHEL in any manner.

16. Non-disclosure and Information Obligations: Vendor shall provide with all necessary information pertaining to the goods as it could be of importance to BHEL. Vendor shall not reveal any specified confidential information that may be divulged by BHEL to Vendor's employees not involved with the tender/ contract & its execution and delivery or to third parties, unless BHEL has agreed to this in writing beforehand. Vendor shall not be entitled to use the BHEL name in advertisements and other commercial publications without prior written permission from BHEL.
17. Cancellation /Termination of contract: BHEL shall have the right to completely or partially terminate the agreement by means of written notice to that effect. Termination of the Contract, for whatever reason, shall be without prejudice to the rights of the parties accrued under the Contract up to the time of termination. BHEL shall have the right to cancel/foreclose the Order/ Contract, wholly or in part, in case it is constrained to do so on account of any decline, diminution, curtailment or stoppage of the business.
18. Risk Purchase Clause: In case of failure of supplier, BHEL at its discretion may make purchase of the materials / services not supplied / rendered in time at the RISK & COST of the supplier. Under such situation, the supplier who fails to supply the goods in time shall be wholly liable to make good to BHEL any loss due to risk purchase.
In case of items demanding services at site like erection and commissioning, vendor should send his servicemen/representatives within 7 days from the service call. In case a vendor fails to attend to the service call, BHEL at its discretion may also make arrangements to attend such service by other parties at the **RISK & COST** of the supplier. Under such situation the supplier who fails to attend the service shall be wholly liable to make good to BHEL any loss due to risk purchase/service including additional handling charges due to the change.
19. Shortages: In the event of shortage on receipt of goods and/or on opening of packages at site, all such shortages, caused by supplier's act or omission, shall be made good at the cost of seller within a reasonable time that BHEL may allow from such intimation.
Transit Damages: In the event of receipt of goods in damaged condition or having found them so upon opening of packages at site, supplier shall make good of all such damages within a reasonable time from such intimation by BHEL. In case BHEL raises an insurance claim, the cost of material limited to insurance settled amount less handling charges will be reimbursed to supplier.
20. Remedial work: Notwithstanding any previous test or certification, BHEL may instruct the vendor to remove and replace materials/goods or remove and re-execute works/services which are not in accordance with the purchase order. Similarly, BHEL may ask the vendor to supply materials or to execute any services which are urgently required for any safety reasons, whether arising out of or because of an accident, unforeseeable event or otherwise. In such an event, Vendor shall provide such services within a reasonable time as specified by BHEL.
21. Indemnity Clause: Vendor shall comply with all applicable safety regulations and take care for the safety of all persons involved. Vendor is fully responsible for the safety of its personnel or that of his subcontractor's men / property, during execution of the Purchase Order and related services. All statutory payments including PF, ESI or other related charges have to be borne by the vendor. Vendor is fully responsible for ensuring that all legal compliances are followed in course of such employment. Vendor shall fully indemnify and keep indemnified BHEL against all claims of whatsoever nature arising during the course and out of execution of this Order/Contract.
22. Product Information, Drawings and Documents: All specified drawings, technical documents or other technical information received by Vendor from BHEL or vice versa shall not, without the consent of the other party, be used for any other purpose than that for which they were provided. They may not, without the consent of the Disclosing party, otherwise be used or copied, reproduced, transmitted or communicated to third parties. All information and data contained in general product documentation, whether in electronic or any other form, are binding only to the extent that they are by reference expressly included in the contract. Vendor, as per agreed date/s but not later than the date of delivery, provide free of charge information and drawings which are necessary to permit and enable BHEL to erect, commission, operate and maintain the product. Such information and drawings shall be supplied in as many numbers of copies as may be agreed upon.

All intellectual properties, including designs, drawings and product information etc. exchanged during the formation and execution of the Contract shall continue to be the property of the disclosing party.

23. Intellectual Property Rights, Licenses: If any Patent, design, Trade mark or any other intellectual property rights apply to the delivery (goods/related service) or accompanying documentation shall be the exclusive property of the Vendor and BHEL shall be entitled to the legal use thereof free of charge by means of a non-exclusive, worldwide, perpetual license. All intellectual property rights that arise during the execution of the Purchase Order/ contract for delivery by vendor and/or by its employees or third parties involved by the vendor for performance of the agreement shall belong to BHEL. Vendor shall perform everything necessary to obtain or establish the above mentioned rights. The Vendor guarantees that the delivery does not infringe on any of the intellectual property rights of third parties. The Vendor shall do everything necessary to obtain or establish the alternate acceptable arrangement pending resolution of any (alleged) claims by third parties. The Vendor shall indemnify BHEL against any (alleged) claims by third parties in this regard and shall reimburse BHEL for any damages suffered as a result thereof.

24. Force Majeure: If at any time during the continuance of the contract, the performance in whole or in part by either party of any obligation under this Contract shall be prevented or delayed by the reasons of any war, hostility, acts of the public enemy, epidemics, civil commotion, sabotage, fires, floods, explosion, quarantine restrictions, strikes, lockouts or act of God provided notice of happening of such event duly evidenced with documents is given by one party to the other within 10 days from the date of occurrence thereof, neither party shall be by reasons of such event, be entitled to terminate the contract not shall either party have any claim for damages against the other in respect of such non-performance after such event has come to an end or ceased to exist and the decision of the Buyer as to whether the deliveries have been so resumed or not, shall be final and conclusive.
If force majeure applies, dates by which performance obligations are scheduled to be met will be extended for a period of time equal to the time lost due to any delay so caused.
Notwithstanding above provisions, in an event of Force Majeure, BHEL reserves for itself the right to cancel the order/ contract, wholly or partly, in order to meet the overall project schedule and make alternative arrangements for completion of deliveries and other schedules.

25. Warranty:
Wherever required, and so provided in the specifications/ Purchaser Order, the Seller shall ensure that the goods supplied shall comply with the specifications laid down, for materials, workmanship and performance.
Unless otherwise specified in SCC, warranty period shall be applicable for a period of 24 months from the date of delivery of goods or 18 months from the date of commissioning of goods, whichever is earlier.
The warranty period as described above shall apply afresh to replaced, repaired or re-executed parts of a delivery. Unless otherwise specifically provided in the Purchase Order, Vendor's liability shall be co terminus with the expiration of the applicable warranty period.

26. Limitation of Liability: Vendor's liability towards this contract is limited to a maximum of 100% of the contract value and consequential damages are excluded. However the limits of liability will have no effect in cases of criminal negligence or wilful misconduct.
The total liability of Vendor for all claims arising out of or relating to the performance or breach of the Contract or use of any Products or Services or any order shall not exceed the total Contract price.

27. Liability during warranty: Vendor shall arrange replacement / repair of all the defective materials / services under its obligation during the warranty period. The rejected goods shall be taken away by vendor and replaced / repaired. In the event of the vendor's failure to comply, BHEL may take appropriate action including disposal of rejections and replenishment by any other sources at the cost and risk of the vendor. In case, defects attributable to vendor are detected during Warranty period or where the commissioning call is issued within the warranty period, vendor shall be responsible for replacement/ repair of the goods as required by BHEL at vendor's cost even after expiry of warranty period.
Further if the equipment or any part thereof cannot be used by reason of such defect and/or making good of such defect, the warranty period of the equipment or such part, as the case may be, shall be extended by a period equal to the period during which the equipment or such part cannot be used by BHEL because of any of the aforesaid reasons. Upon correction of the defects in the facilities or any part thereof by

repair/replacement, such repair/replacement shall have the warranty period for a period of twelve (12) months from the time such replacement/repair of the equipment or any part thereof has been completed.

28. Liability after warranty period: At the end of the warranty, the Vendor's liability ceases except for latent defects. For the purpose of this clause, latent defects shall be the defects inherently lying within the material or arising out of design deficiency which do not manifest themselves during the warranty Period, but later. The Contractor's liability for latent defects warranty for the equipment including spares shall be limited to a period of six months from the end of the warranty period of the respective equipment including spares or first time commissioning, whichever is later but not later than one (01) year from the date of expiry of warranty period.
29. Compliance with Laws: Vendor shall, in performing the contract, comply with all applicable laws. The vendor shall make all remittances, give all notices, pay all taxes, duties and fees, and obtain all permits, licences and approvals, as required by the laws in relation to the execution and completion of the contract and for remedying of any defects; and the Contractor shall indemnify and hold BHEL harmless against and from the consequences of any failure to do so.
30. Settlement of Disputes: Except as otherwise specifically provided in the Purchase Order, decision of BHEL shall be binding on the vendor with respect to all questions relating to the interpretation or meaning of the terms and conditions and instructions herein before mentioned and as to the completion of supplies/work/services, other questions, claim, right, matter or things whatsoever in any way arising out of or relating to the contract, instructions, orders or these conditions or otherwise concerning the supply or the execution or failure to execute the order, whether arising during the schedule of supply/work or after the completion or abandonment thereof. Any disputes or differences among the parties shall to the extent possible be settled amicably between the parties thereto, failing which the disputed issues shall be settled through arbitration. Vendor shall continue to perform the contract, pending settlement of dispute(s).
31. Arbitration Clause in case of Contract with vendors other than Public Sector Enterprise (PSE) or a Government Department:

Arbitration & Conciliation:

The parties shall attempt to settle any disputes or difference arising out of the formation, breach, termination, validity or execution of the Contract; or, the respective rights and liabilities of the parties; or, in relation to interpretation of any provision of the Contract; or, in any manner touching upon the Contract, or in connection with this contract through friendly discussions. In case no amicable settlement can be reached between the parties through such discussions, in respect of any dispute; then, either Party may, by a notice in writing to the other Party refer such dispute or difference to the sole arbitration of an arbitrator appointed by Head of the BHEL-EDN. Such Sole Arbitrator appointed, shall conduct the arbitration in English language.

The Arbitrator shall pass a reasoned award and the award of the Arbitration shall be final and binding upon the Parties.

Subject as aforesaid, the provisions of Arbitration and Conciliation Act 1996 (India) or statutory modifications or re-enactments thereof and the rules made thereunder and for the time being in force shall apply to the arbitration proceedings under this clause. The seat of arbitration shall be Bengaluru.

The cost of arbitration shall be borne as decided by the Arbitrator upon him entering the reference.

Subject to the Arbitration Clause as above, the Courts at Bengaluru alone shall have exclusive jurisdiction over any matter arising out of or in connection with this Contract.

Notwithstanding the existence or any dispute or differences and/or reference for the arbitration, the parties shall proceed with and continue without hindrance the performance of its obligations under this Contract with due diligence and efficiency in a professional manner except where the Contract has been terminated by either Party in terms of this Contract.

Arbitration Clause in case of Contract with a Public Sector Enterprise (PSE) or a Government Department:

In the event of any dispute or difference relating to the interpretation and application of the provisions of the Contract, such dispute or difference shall be referred by either party for Arbitration to the Sole

Arbitrator in the Department of Public Enterprises to be nominated by the Secretary to the Government of India in-charge of the Department of Public Enterprises. The Arbitration and Conciliation Act, 1996 shall not be applicable to arbitration under this clause. The award of the Arbitrator shall be binding upon the parties to the dispute, provided, however, any Party aggrieved by such Award may make further reference for setting aside or revision of the Award to the Law Secretary, Department of Legal Affairs, Ministry of Law and Justice, Government of India. Upon such reference the dispute shall be decided by the Law Secretary or the Special Secretary or Additional Secretary when so authorized by the Law Secretary, whose decision shall bind the Parties hereto finally and conclusively. The Parties to the dispute will share equally the cost of arbitration as intimated by the Arbitrator.'

32. Applicable Laws and Jurisdiction of Courts: Prevailing Indian laws both substantive and procedural, including modifications thereto, shall govern the Contract. Subject to the conditions as aforesaid, the competent courts in Bengaluru alone shall have jurisdiction to consider over any matters touching upon this contract.
33. General Terms: That any non-exercise, forbearance or omission of any of the powers conferred on BHEL and /or any of its authorities will not in any manner constitute waiver of the conditions hereto contained in these presents.
That the headings used in this agreement are for convenience of reference only.
That all notices etc., to be given under the Purchase order shall be in writing, type script or printed and if sent by registered post or by courier service to the address given in this document shall be deemed to have been served on the date when in the ordinary course, they would have been delivered to the addressee.
34. Clause reserved.
35. NO CLAIM FOR INTEREST OR DAMAGE:
 - 1) Interest on Money due to the Seller/Supplier/Vendor: Vendor shall not be entitled to any interest or damage in case of any delay on the part of the BHEL to pay the amount due upon measurement or as per Contract or otherwise. Vendor shall also not be entitled to interest upon any guarantee / security / retention money or payments in arrears or upon any balance which may on the final settlement of his account be due to him.
 - 2) No Claim for Interest or Damage: No claim for interest or damage will be entertained or be payable by BHEL in interest of any amount or balance which may be lying with BHEL or may become due upon settlement/adjudication of any dispute, difference or misunderstanding between the parties by way of arbitration or court proceedings or otherwise or in respect of any delay or omission on the part of the Employer in making intermediate or final payment or in respect of any amount / damage which may be claimed through arbitration or court proceedings or in any other respect whatsoever.

Pre-Qualification Criteria

PS/445/3040/PQC

1. The bidder shall be an Original Equipment Manufacturer (OEM). Subsidiaries/affiliates (or) authorized representatives which are registered in India and having manufacturing facilities or establishment towards providing services in India are allowed to participate in this tender, subject to meeting the local content provisions as per the MII clause enclosed with the tender. Such entities can participate either on the basis of their credentials or on the basis of the credentials of their parent/ affiliate company, as per the PQC requirements applicable for this tender. If credentials of parent/affiliate are sought to be relied upon, then the Indian subsidiary/ representative must meet the other PQC.

Relevant document from OEM indicating the agreement with Indian entity along with the agreement's validity, to be furnished.

In case the parent/affiliate company is from a country which shares a land border with India, then the subsidiary/affiliate (or) authorized representative will be eligible to bid in this tender only if the parent/affiliate company is registered with the Competent authority constituted by the Department for Promotion of Industry and Internal Trade (DPIIT).

2. Original Equipment (SFC) Manufacturers based outside India, shall have presence in India to render support related to Documentation, Erection, Commissioning & post commissioning(AMC) services. The Indian representative should have the team of service engineers with ample experience in commissioning SFC.

SFC OEM shall furnish an undertaking that in case of change in Indian representative / agent / System Integrator, OEM shall continue to support supplies made by previous representative/ system Integrator/ agent w.r.t to field service and supply of spare parts.

3. OEM should have already designed, engineered, type-tested, supplied and commissioned or supervised commissioning of at least one (1) number of similar equipment of rating minimum 3MW (complete SFC/LCI) or higher rating, which is in successful operation for a period of at least one (1) year as on September,2025.

Necessary supporting document(s) from client/ end-user shall be provided along with complete address of the client, phone no., e-mail, name of contact person(s) etc.

4. The Reference List of SFC/LCI supplies made indicating the ratings, application, details of the customers, year of supply and status of commissioning to be provided along with the offer.
5. The OEM or their authorized service representatives shall have trained engineers for commissioning & service of the offered equipment and shall be in a position to provide prompt after-sales service and spares support for at least 15 years from the date of supply. This service network shall necessarily be available in India. Bidder to furnish Service organogram.

Note:

- a. Vendor must furnish all necessary supporting documents as required, along with the bid to satisfy Pre-Qualification criteria as specified above, for evaluation by BHEL.
- b. Fulfilling the requirements of Pre-Qualification criteria is a mandate and the techno-commercial bids will be evaluated only when the Pre-Qualification criteria is met.

BHEL reserves the right of getting the document(s) cross verified from the document issuing authority.

- c. Technical clarification/deviations w.r.t specifications (if any) shall be discussed with only those suppliers who quote for this tender. If Bidder incurs any additional cost for the withdrawal of any deviation, the same shall be borne by the bidder without any cost implication to BHEL.

Checklist for Pre-Qualification Criteria

Sl. No.	Vendor Confirmation to the points above	Reference of Supporting document/s attached
1	Yes/No	
2	Yes/No	
3	Yes/No	
4	Yes/No	
5	Yes/No	



A4 – 12

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 01 OF 19

REVISION HISTORY SHEET

REV. NO.	DATE	NATURE OF CHANGE	PREPARED BY	CHECKED BY	APPROVED BY
00	15-07-2025	FIRST ISSUE	G MOUNISH	GITESH DAS	L SUBBALAKSHMI

REVISION 00

APPROVED BY
L SUBBALAKSHMI

PREPARED BY

G MOUNISH

ISSUED BY

CE-Drives

DATE

15-07-2025

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.



A4 – 10

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 02 OF 19

TECHNICAL SPECIFICATION OF STATIC FREQUENCY CONVERTER (THYRISTOR BASED LCI) FOR STARTING OF SYNCHRONOUS MOTOR DRIVEN PUMP

1. Project Details

Sl. No.	Parameter	Specification
1	Project Location	Kadana Hydro Electric Project, Kadana Taluka, Mahisagar District, Gujarat, India
2	Project Title	Renovation & Modernization of one unit (i.e. unit#1) of Kadana pumped hydro power plant for Pump mode operation
3	Customer	GSECL
4	User	Kadana PSS (4x65 MW)

2. Environment Specifications

Sl. No.	Parameter	Specification
1	Maximum Ambient Temperature	42°C
2	Minimum Ambient Temperature	20°C
3	Equipment Design Temperature (IS-9676)	40°C
4	Altitude	The SFCs shall be placed in an underground pump house
5	Location of SFC Panels	Indoor (in a Room with Air Conditioning)
6	Seismic Zone	Zone III [peak ground acceleration (PGA) =0.16g]

REVISION 00

APPROVED BY
L SUBBALAKSHMI

PREPARED BY

G MOUNISH

CHECKED BY

GITESH DAS

DATE

15-07-2025

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO.: PS/445/3040

REV. NO: 00

PAGE 03 OF 19

3. Input and Output Transformer Data (Please refer Annexure-10 for more details):

Sl. No.	Parameter	Specification
1	System Voltage / Frequency / Phase	11kV / 50Hz / 3 ph. 3 wire
2	Voltage Variation	+/- 5%
3	Frequency Variation	+/- 2%
4	Combined Voltage and Frequency Variation	+/- 5%
5	Fault Level at 11kV line side	26.4 kA for 3 sec. (as indicated in SLD)
6	Input & Output Transformer Type	Oil Filled, mounted in open air (ONAN)
7	Cables from Step-Down Transformer to SFC Input and SFC Output to Output Transformer (in BHEL scope)	3 Runs/Phase of 6.6kV (E) 1C x 630 sqmm Al conductor, XLPE insulated Armoured power Cable. HT cable glands shall be in bidder's scope.
8	Design of Input Transformer	Shall be suitable for 12 Pulse SFC. General Specification and special requirements to be provided by Vendor in Technical Offer. This should contain HV (Primary) and LV (Secondary) MVA, number of LV windings, LV voltages, vector group, impedance %, special features required etc. Calculations for Step-down Transformer Ratings shall be provided in the Offer.
9	Design of Output Transformer	I/p of Transformer to be suitable for 12 Pulse SFC. General Specification and special requirements to be provided by Vendor in Technical Offer. This should contain LV and HV MVA, number of LV windings, LV voltages, vector group, % impedance, special features required etc. Calculations for Step-up Transformer Ratings shall be provided in the Offer.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 04 OF 19

4. Motor Parameters / Machine and Pump Data

Sl. No.	Parameter	Specification
1	Type	Deriaz (Dragon flow) reversible type Pump turbine
2	Rated Output Power	Refer attached Annexure-1 for details
3	Rated Voltage	
4	Total Inertia T-m ² GD ²	
5	Duty Class	As per attached Annexure-2 i.e. Torque-Speed Curve.
6	Starting Time	250s (90% rated speed to be achieved in 250sec.)

5. Scope details:

Sl. No.	Scope of Supply	Description
a)	Fully Assembled Unit of SFC Panels (Thyristor based) consisting of Source Bridge (Thyristor), Load Bridge (Thyristor) and Control panel with Air Cooling arrangement.	The vendor shall be responsible for total engineering and functioning of the complete SFC system, meeting the intent and requirement of this specification. This shall include but not be limited to Converter sizing, inverter sizing, transformer sizing, transformer impedance selection, breaker selection, Harmonic filter selection & sizing, o/p choke, o/p filters, HT cable selection etc. All necessary interlocks as required for safe and reliable operation of SFC system with associated equipment shall be provided in the SFC system. The synchronization to the grid should be bumpless from SFC.
b)	DC-link Reactor	
c)	Any special cable other than power and control cables from SFC to other equipment.	
d)	PLC based Common Interlocking Panel for SFC and Pump selection (Output Circuit Breaker operation). PLC must have redundant power supply modules. CPU memory shall be provided with non-volatile type (EEPROM/FEPRM) memory.	SFC shall be suitable to start the pump-motors smoothly with pump runner churning in water and without inrush current. The motor must be soft started and must reach 90% of the speed in less than 250 sec. The SFC shall be suitable to start one pump at a time, either from local panel or from remote control panel/ HMI panel.
e)	Output VCB panels including 11kV Soft-starter AI bus (Common for 04 pumps)	Common logics, Interlocks required for the operation of SFCs will be in Vendor scope. Provision must be kept for additional I/Os {20% spare (over and above overall system I/Os after factoring in provisions for U#2,3&4 Pumps) for all types of modules; Faults, alarms, protection interfaces both in SFC and PLC} from various systems (not part of specification) which are necessary for smooth operation of pump are to be included during detailed engineering stage or as per site requirement during commissioning. All other control and protections not included in customer's scope but required for SFC system shall be in bidder's scope.
f)	11kV soft-starter bus isolator (Motorised) for U#1 pump	

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 05 OF 19

6. SFC Specifications:

	Parameter	Specification
1	Drive	To start Synchronous Motor for Pump mode operation
2	SFC Rating	13.5 MW with 12 Pulse configurations at input and output
3	Input Voltage to SFC	Bidder may decide SFC voltage from Input transformer
4	Power/Torque vs Speed	As per attached Annexure-2
5	Single Line Diagram	As per attached Annexure-3.
6	Output Voltage of SFC	0 to xkV (V/f = Constant) 'x' to be decided by the SFC manufacturer.
7	Output Current of SFC	xA at 40°C (Design Ambient) – 'x' to be decided by the SFC manufacturer for the 13.5 MW SFC.
8	Output Frequency	0 to 50Hz
9	Drive Control	V/f Control
10	Braking Operation	Not Applicable
11	SFC Panel Construction	<p>a) Protection Class: IP31(minimum)</p> <p>b) Panel: Free standing, floor mounting type, comprising of rigid welded structural frames with Cold Rolled Sheet Steel enclosure of thickness not less than 2 mm (minimum). All doors and removable covers shall have neoprene gaskets. Ventilating louvers shall have easily removable and washable dust filters.</p> <p>c) Cooling: Air Cooled. Cooling system shall include well dimensioned panel, adequate cooling airflow path and module cooling fan. Vendor shall ensure that the panel dimensions and flow paths have been designed for continuous running at the specified ambient without overheating. Suitable thermal switch / differential pressure switch for exit air temperature monitoring shall also be incorporated.</p> <p>d) Busbar Material – Electrolytic grade Copper, colour coded. Sleaving/shrouding for safety purposes shall be done.</p> <p>e) Earth Bus – minimum 50*6 mm Copper; Soft starter Bus –Aluminium (Bus bar sizing has to be done by bidder)</p>



A4 – 11

PURCHASE SPECIFICATION

GROUP: T&PD/ ENGG- COE

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 06 OF 19

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

Sl. No.	Parameter	Specification
11	SFC Panel Construction	<p>f) Door Interlock: The SFC shall have a door interlock for safety. This interlock system should ensure that none of the power cabinets can be opened until the main source of power is disconnected and the DC link reactors are discharged. Additionally, the same interlock system should ensure that power cannot be initialized to the drive unless the doors are closed.</p> <p>g) Painting: 2 Coats of Primer and 2 Coats of Finish (anti-corrosion) paint to be given for all surfaces of enclosure. Paint shall be Epoxy Based with Powder Coated Finish. Paint Thickness: 60 Microns (minimum); Paint Shade: RAL7035</p> <p>h) Power and Control Wiring shall be done with PVC FRLS cables.</p> <p>i) Height of the terminal from cable gland plate shall be adequate to take care of the cable sizes and quantities. Minimum space for the power cable termination shall be 600mm clear from the cable gland plate. Cable entry will be from bottom only. Gland Plates shall be blank (undrilled) – to be drilled at site. Gland Plates shall be minimum 6 mm thick Aluminium (steel is not allowed).</p> <p>j) All electronic modules and components shall be accessible from front of panel only. Modular assemblies for both the system control electronic equipment and power electronic equipments shall be used.</p> <p>k) All low voltage compartment and cabling shall be electrically and physically separated from the high voltage compartment.</p> <p>l) #HT Power Cable sizes of Al FRLS cables to be terminated in the input / output termination panels, shall have to be recommended by bidder. Suitable gland plate to be provided for above terminations.</p>

#Calculation for cable sizes to be furnished during detailed engineering.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 07 OF 19

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

Sl. No.	Parameter	Specification
12	Noise Level	Shall be less than 85dB at a distance of 1 metre from the outline of SFC Panels at a height of 1.5 metres from the floor with all the fans running in the SFC Panels.
13	Vibration	According to IEC 60255
14	Interference	According to IEC 61800-3 Category C4 <u>Immunity</u> : The panels shall be designed so as to have low Radio Frequency Interference (RFI) and Electromagnetic Interference (EMI).
15	SFC Efficiency	Shall be > 95%. Exact value to be specified by the bidder.
16	Duty Cycle	15 min. ON, 45 min. OFF (limited to 03 starts per hour)
17	SFC Requirements	a) Door Mounted Local Start/Stop Push Button to be provided. In case if it is not possible to provide due to bidder's standard design limitation, then same can be implemented in panel HMI. b) Door Mounted Lockable Push-Button to be provided with 2NO + 2 NC contact for Emergency Stop. One normally open contact to be wired to Terminal Block for external Interlocking / Annunciation. EPB shall be shrouded in order to prevent accidental energization. c) Control Panel shall be provided with covered LED illumination Lamp with limit switch. Space heater shall be provided in panel with switch fuse and variable setting thermostat. 240V power socket with MCB shall be provided. In case bidder is importing SFC, power socket shall have to be replaced by supplier at site according to IS requirements. d) Auxiliary Power supply requirements and UPS rating (for Electronic Control Supply) for complete SFC package must be intimated in the offer. e) Drive configuration tool for programming I/Os and logics. f) The expected life time of the drive system shall be minimum 20 years. The system including all individual components forming part of the system shall have an availability of minimum 0.997 and a minimum MTBF of 4 years.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 08 OF 19

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

Sl. No.	Parameter	Specification
18	SFC Features	<p>a) Soft Start</p> <p>b) Selectable reverse run prohibition</p> <p>c) Field adjustable Torque limits and acceleration ramps</p> <p>d) Accelerate Times to be specifiable.</p> <p>e) The packing should be Sea-worthy (for imported consignment) and suitable to protect equipment from heavy rains and high ambient temperatures.</p> <p>f) Vendor shall certify readiness of system fit for commissioning. Vendor's scope shall also include supply of all the required specialized tools and tackles.</p> <p>g) SFCs shall be installed in Air-conditioned environment however it shall be suitable for operation in the event of failure of air conditioning.</p> <p>h) Equipment earthing is in scope of GSECL. However, earthing scheme should be provided by the supplier.</p> <p>i) Any special cable other than power and control cables required to connect SFC to other equipment shall be in supplier scope.</p> <p>j) Any cable specific to manufacturer design viz. requirement of PE cable etc. shall be in supplier scope.</p>
19	Source Bridge and Motor Bridge	<p>a) Thyristors – Adequate number in series with Voltage safety margin and Current safety margin.</p> <p>b) RC snubber across Thyristor.</p> <p>c) Gate Circuit – Connection to Pulse generation modules through fibre optic or Copper connections.</p> <p>d) Thyristor pulse monitoring and display.</p> <p>e) Maximum peak to peak voltage and max. dv/dt to be specified.</p> <p>Thyristor sizing Calculations to be provided during detailed engineering stage.</p>
20	DC-link Reactor	<p>Mounted inside panels and connected by Busbars/Cables to the Source and Motor bridges.</p> <p>Iron cored/ Air cored as per vendor standard/ type-tested design.</p> <p>Inductance value to be provided in the offer. Calculation method followed to be provided during detailed engineering stage.</p>



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 09 OF 19

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

Sl. No.	Parameter	Specification
21	Controls and monitoring	<p>a) SFC shall be with an interactive and user-friendly door mounted digital operator interface with LCD display and sealed membrane type keypad.</p> <p>b) The operator interface shall be used for drive programming, drive monitoring and drive trouble-shooting. The operator interface must also be able to start and stop the SFC, reset SFC faults and manually adjust the SFC's speed reference.</p> <p>c) The operator interface shall have LED indicators for SFC Fault, SFC Run, SFC Ready, SFC Alarm etc.</p> <p>d) The operator interface shall allow monitoring of SFC operating conditions including speed, current, voltage, torque, power etc.</p> <p>e) Messages shall be alphanumeric in nature. All the fault messages shall be in English.</p> <p>f) Provision shall be made available for remote operation and control by Auto Sequencer Controller (ASC) system when speed reaches 90% of rated speed.</p> <p>g) The operator interface shall be able to display all real time operating variables and all drive programming parameters.</p> <p>h) The operator interface shall be capable of displaying a specific user selected parameter on power-up. This power-up parameter would typically be a parameter that is important to the operator such as motor speed or motor load.</p> <p>i) The following Controls/ Control signals must be provided:</p> <ol style="list-style-type: none">1) Local/remote selection2) Emergency stop3) Control of Input & Output Circuit breakers <p>These are indicative. Vendor to suggest the interlocking scheme with the above-specified ones and other outputs as felt required for the system during detailed engineering stage.</p> <p>j) All SFC operating parameter shall be stored in non-volatile memory.</p>



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 10 OF 19

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

Sl. No.	Parameter	Specification
21	Controls and Monitoring	<p>k) The Converter/marshalling panel (PLC) shall have built in monitoring of following parameters as minimum on its digital operator interface and these parameters shall also be displayed at Plant DCS through Profibus/Profinet/Modbus link (either RTU or TCP/IP):</p> <ul style="list-style-type: none">i) Output Currentii) Motor Speediii) Output Voltageiv) Digital Input Statusv) Digital Output Statusvi) Analog Input Status <p>l) Necessary transducer shall be provided with 4-20 mA output for indicating Motor Speed and Motor Current in the DCS. Transducers shall be capable of driving 500 ohms load.</p> <p>m) The following indications shall be provided on the SFC Panel Door/HMI (or) PLC interface panel:</p> <ul style="list-style-type: none">i) Pump selected for Runningii) Motor Stopped/Trippediii) AC Mains ONiv) Auxiliary Control Supply Healthyv) SFC Readyvi) SFC ONvii) Synchronisation in progressviii) Motor Healthyix) Synchronous transfer completedx) Input Breaker ONxi) Output Breaker ON.xii) Minimum speed reached <p>The Excitation system is supplied by BHEL. Control of Excitation shall be provided through SFC Outputs.</p> <p>Brief description of SFC excitation system write up is attached (ref. Annexure-4). No changes are possible in BHEL Excitation system. Vendor shall do the required changes in SFC only, depending on BHEL Excitation and control philosophy.</p>



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 11 OF 19

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

Sl. No.	Parameter	Specification
21	Controls and Monitoring	<p>n) The SFC shall store fault logs of minimum last 10 faults in memory.</p> <p>o) The interface details of SFC shall be incorporated as required for data communication with DCS system with serial interfaces with RS485 data links. Necessary hardware shall be included in the scope and the interface protocol (to be finalized during detailed engineering) shall be provided.</p> <p>p) Since each SFC is capable to start any of the 04 pumps, bidder to explore the feasibility of storing the motor parameters of all the pumps in their control card so that each time fresh tuning of Motor parameters will not be required.</p>
22	Protection	<p>Following protections shall be built-in within the inverter and any other protection as required:</p> <p>a) Instantaneous Over current.</p> <p>b) Ground Fault Protection.</p> <p>c) Over Voltage/Under Voltage - SFC shall be able to withstand upto 20% dip in supply voltage for 2 secs without damage to semiconductors or fuses.</p> <p>d) Output Phase Loss.</p> <p>e) Phase Sequence Protection</p> <p>f) Input Phase Loss/Single Phasing Preventer</p> <p>g) Over Speed/Over frequency of motor</p> <p>h) Heat sink over temperature / SFC Panel Temperature</p> <p>i) Loss of Cooling Fans</p> <p>j) Incoming Line surge protection</p> <p>k) No Motor Field at Start</p> <p>l) DC Reactor Alarm/Fault</p> <p>m) SFC fault</p> <p>n) The system shall be designed to deliver the motor input current and torque for the complete speed torque characteristics of the driven equipment, with input supply variation of +/-5% and frequency variation of +/-2%</p> <p>o) Fault diagnostic shall be built into the system to supervise the operation and failure of the system. The information regarding failure of any of the system including shut down of the system shall be available for a period of minimum 4 days after a shut down even though no supply is available.</p>



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 12 OF 19

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

Sl. No.	Parameter	Specification
23.	PLC panel (PLC panel shall be supplied either directly from OEM or through their approved channel partner. Technical requirements of PLC and the contractual binding clauses of Guarantee/ Warranty etc. which are part of tender, shall be complied by OEM or their approved channel partner, as applicable.)	<p>a) PLC based Common Interlocking Panel for SFC and Pump selection (Output VCB operation). Redundant PLC is not envisaged.</p> <p>b) Redundancy is envisaged only in power supply modules. CPU memory shall be provided with non-volatile type (EEPROM/FEPRM) memory.</p> <p>c) Contact interrogation voltage for field contacts (digital input modules) to be limited to 24V dc.</p> <p>d) Fused terminals shall be provided for all DI/DOs.</p> <p>e) Galvanic isolation shall be provided for all AI/AO signals.</p> <p>f) There shall be 02 no. Login – one for Operator & the other for maintenance activity.</p> <p>In operator mode, no change of settings shall be allowed. The maintenance mode shall be password protected and settings change shall be allowed. Login to maintenance mode shall be logged in the memory.</p> <p>g) It shall be possible to force the DI/DO signals from either laptop (loaded with PLC software)/PLC HMI in maintenance mode for testing purpose. All signals shown for U#1 shall be same for upcoming U#2,3&4.</p> <p>h) Provision shall be kept in PLC panel for following:</p> <p>i. Termination of cables for control of U#2,3&4 pumps in future</p> <p>ii. DI/DO/AI&AO signals pertaining to pumps of U#2,3&4 (ASC-2,3&4) shall be wired upto terminal boards</p> <p>iii. Display of Alarm & Faults of signals for U#2,3&4 in future. It shall have adequate memory for storage of faults.</p> <p>iv. Logic building for U#2,3&4 pumps, etc.</p> <p>i) PLC shall be a free-standing panel with provision for front-side operation. Bidder to mention dimensions of PLC panel (considering future provisions of U#2,3&4) in the offer.</p> <p>j) Redundant fan shall be provided in PLC panel for cooling.</p> <p><u>Note:</u> The SFC supplier should arrange PLC supplier for mobilisation of appropriate resources (manpower, spares, tools/ tackles, testing equipment etc.) during commissioning and up to the expiry of warranty period.</p> <p>In case PLC panel is sourced from authorized channel partner of OEM, following shall be applicable:</p> <p>i. Authorized channel partner shall provide back to back support letter from their respective OEM during detailed engineering stage.</p> <p>ii. Channel partner shall have adequate skilled manpower and experience in handling OEM's equipment including adequate testing facility.</p> <p>iii. All the PLC commissioning spares mentioned in specification shall be available with channel partner and shall supply along with PLC without any additional time implication.</p>



A4 – 11

PURCHASE SPECIFICATION**GROUP: CE-Drives**

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 13 OF 19

COPYRIGHT AND CONFIDENTIAL
 The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
 It must not be used directly or indirectly in anyway detrimental to the interest of the company.

Sl. No.	Parameter	Specification	
24	Harmonic Limitations – Source	Bidder to confirm that the harmonic distortion produced by soft starters during motor starting is usually within the limits specified by IEEE 519, especially when considering the short duration of their operation.	
25	Auxiliary Supply (Feeders in BHEL/ customer scope)	a) UPS feeder is provided with a voltage of 240V AC. kVA Rating is to be given by the Vendor. Power supply for electronic modules to be derived from the UPS. b) Auxiliary Supply – 415V, 3 ϕ , 50Hz – Feeder Power rating to be specified by the Vendor. c) Other Supply Feeder details are as indicated in the enclosed SLD. d) Other supplies if required by the SFC system to be generated internally within the SFC system.	
26	Commissioning Spares (To be supplied alongwith Main equipment)	Supplier should provide item-wise list of spares along with the Technical Offer. List should include items prone to fail and also long-lead items which are anticipated to be utilized during commissioning. Quantity of items consumed during commissioning shall have to be replenished by bidder within a reasonable time frame without any cost implication to BHEL/ end-user.	
S.No.	Equipment	Description	Qty.
1	SFC	i) MCB, Relay ii) Pulse Interface Module iii) Power Supply Unit iv) HMI	i) 01 set of each rating & type ii) 01 no. of each type iii) 01 no. of each type iv) 01 no. of each type
2.	Transformer	i) MOG ii) Winding Temp. Dial Gauge with sensor iii) Oil-Temp. Dial Gauge with sensor	i),ii) & iii) - 01 no. of each type
3	PLC panel	i) PLC controller ii) IO Modules iii) Power supply Units	i), ii) 01 no. of each type iii) 01 no. of each rating & type
4	VCB	i) Closing coil ii) Shunt trip coil iii) Control fuses / MCB iv) Indicating lamps	i) 01 no. of each type ii) 01 no. of each type iii) 01 no. of each rating & type iv) 01 no. of each colour



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 14 OF 19

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

Sl. no.	Parameter	Specification
27	Testing and Quality Plan	<p>a) Routine Tests shall be carried out on all equipments (SFC, PLC, VCB & Transformer) as per relevant IEC standards.</p> <p>b) Type Test Certificates (performed with in the last 10 years) for similar or higher rating equipments (SFC, Transformer, VCB & Isolator) supplied by the bidder shall be submitted along with offer.</p> <p>c) Test Protocol and Quality Assurance Plan shall be submitted along with the Technical Offer. These documents shall explicitly list out all final tests done on the fully assembled SFC, PLC, Transformer & VCB Panels at respective manufacturer's works.</p>
28	Inspection, Training and Commissioning Support	<p>a) <u>Final Inspection</u>: BHEL / Customer representative will be present at respective manufacturer's works in India for witness of FAT. This is to be incorporated in the Quality Plan. No charges shall be applicable for witnessing of final tests. Boarding, Lodging, To and fro travel charges are not in supplier scope. Inspection call has to be raised 02 weeks in advance. In this regard, Annexure-8 may also be referred on Scope wrt. TPIA towards carrying out inspection for complete SFC package.</p> <p>b) <u>Training</u>: Training of Customer officials for a maximum period of 03 man-days at project site (only Boarding & Lodging is in GSECL scope). To and fro travel charges are in supplier scope. Content of training programme is to be provided by the supplier during detailed engineering phase.</p> <p>c) <u>Commissioning</u>: Commissioning of SFC System at site shall be in the scope of supplier. SFC supplier shall arrange for deputation of service representatives of other major equipments to carry out commissioning of respective equipments at site. Final Acceptance shall be based on successful completion of the wet run of the U#1 pump. To and fro travel charges are in supplier scope. Only Boarding & Lodging is in GSECL scope.</p> <ul style="list-style-type: none">• Any replacement of failed/damaged items during commissioning shall be exclusively at supplier's cost.• Supplier is required to supply necessary commissioning spares to facilitate trouble free commissioning.
29	Software for SFC/PLC Interface	<p>1 no of Laptop shall be supplied. Drive(SFC) & PLC Software must be loaded in this Laptop. This software should be an easy to use commissioning tool for SFC and shall be provided along with the system. Permission (like passwords for different security levels) for parameter tuning shall be provided.</p>



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 15 OF 19

Sl. No.	Parameter	Specification
29	Software for SFC/PLC Interface	<p>Laptop shall be of Dell/HP/Lenovo/equivalent make. It shall be configured with the latest gen. processor (13th gen. Intel i7 (or) better), 16GB RAM etc. An additional 1TB SSD shall be provided to store the logs of PLC panel alongwith Laptop.</p> <p>It shall be possible to change the PLC logic (if required during commissioning) at site. Laptop being supplied shall be complete in all respects in terms of communication hardwares & adapters, communication cables, power supply adapter etc.</p>
30	Maintenance	The procedure for regular maintenance of SFC panels and the schedule thereof shall be mentioned in the offer.
31	Type of Control	The drive shall have programmable V/f patterns along with user definable custom V/f patterns for starting of Synchronous motors.

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 16 OF 19

7. Documentation

Sl. No.	Parameter	Specification
1	Attached Documents	<ul style="list-style-type: none">a) Annexure-1: Motor Datab) Annexure-2: Torque/Speed curvesc) Annexure- 3: Single Line Diagramd) Annexure-4: Excitation system brief write upe) Annexure-5: SFC system configuration/Pump starting equipmentf) Annexure-6: Technical write up on SFCg) Annexure-7: Operation philosophyh) Annexure-8: Scope of TPIA for complete SFC packagei) Annexure-9: Distance between various related equipmentsj) Annexure-10: ONAN Transformersk) Annexure-11: Output Circuit Breakersl) Annexure-12: 11kV soft-starter bus isolator for U#1 pump
2	Technical Information required along with Offer	<ul style="list-style-type: none">a) Dimensional Drawing of Panels along with minimum clearance to be maintained for effective cooling; Weight of the panelsb) Technical Catalogue of SFC; Make of Transformer, PLC, VCB & Isolator being offeredc) Reference list for similar/higher rating SFC, Transformer, VCBs furnishing the following: Model number, Application, Rating, Year of supply, location of installation etc.d) Confirmation / Clarification / Information / Deviation List to technical specification.e) Sizing calculation for SFC, Input and Output Transformers, Output VCB, Isolator.f) Feeder Requirementsg) Losses at Rated Load (including Cooling Fans)h) Test Protocol and Quality Plani) Performance certificates from Customers (SFCs of similar rating supplied earlier- min. 1 system)
3	Information / Confirmations required along with offer	<ul style="list-style-type: none">a) Supply of the SFC & Transformer shall be from OEM works only. The name of the country from which the drive is sourced and the location of the manufacturing plant should be mentioned in the offer.b) Address of the Sales and Service Representatives in India with complete contact details viz. Name/Telephone/Email to be provided along with the Offer.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 17 OF 19

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

Sl. No.	Parameter	Specification
3	Information / Confirmations required along with offer	c) Prior to phasing out the product/spares, supplier shall give a notice period of at least 1 year to the end user of the equipment /BHEL to enable the end user for placement of order for spares and/or services.
4	Information required for Customer Approval	i. Single-Line Diagram & Operation Philosophy ii. OGA drawing of SFC & PLC iii. OGA drawing of Transformer, o/p VCB & 11kV soft-starter bus isolator for U#1 Motor iv. Datasheet & Schematic diagram of SFC along with sizing calculation v. Datasheet & Schematic diagram of Transformer along with Sizing calculation vi. Datasheet & Schematic diagram of VCB (SFC output side) & Isolator (Motor side) along with Sizing calculation vii. a. OGA & Schematic diagram of PLC b. PLC ladder logic diagram c. PLC logic diagram (with AND, OR, NOT etc. gates) d. PLC HMI schematic pictures viii. Quality Plan of SFC & PLC ix. Quality Plan of Transformer, o/p VCB & Motor isolator x. BoM of Commissioning spares xi. O&M manual for major equipments of SFC package xii. Cable Schedule & Interconnection diagram
5	Information required along with Supply - Maintenance Manuals and Documentation.	a) Erection, Commissioning and Maintenance Manuals along with Final Drawings and Documentation – 2 Copies b) 2 numbers CD consisting of the afore- mentioned at sl.no.5.a). c) Test Certificate and Guarantee/ Warranty Certificates. d) Complete Bill of Material (item-wise) for the equipment supplied.

Exclusion from bidder scope

1. Excitation System
2. Synchronisation (Auto Sequencer Controller/ASC) System.
3. Pump control System.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 18 OF 19

Certain Operation insights of SFC

- 1) There shall be isolation for cables in SFC panel on input side and output side
- 2) The SFC cable termination box shall be able to accommodate the selected Al, XLPE cables in each termination box. Suitable holes for cable entry shall be made in the gland plates for proper termination of these cables at site.
- 3) Synchronizing circuit breaker closing time will vary from 73ms to 125ms. SFC shall be suitable for this closing time of the breaker.
- 4) SFC firing pulses shall be blocked only after receiving the 'ON' feedback of the synchronizing circuit breaker (MTCB). This is required so that the motor gets uninterrupted power supply after synchronization.
- 5) Maximum peak to peak voltage (rms) and maximum di/dt for SFC to be indicated in the offer.
- 6) SFC shall be capable of operating in local and remote mode.
- 7) Excitation panel selection/ motor selection shall be made available in SFC PLC.
- 8) SFC shall be able to control Input and Output Circuit breakers.
- 9) All interlocks for circuit breakers shall be made in SFC PLC.
- 10) Bidder may consider taking Actual speed directly from speed sensors mounted on the motor. Output of speed sensor is pulse type signal.
- 11) PLC to SFC communication shall be hardwired.

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

**A4 – 11****PURCHASE SPECIFICATION****GROUP: CE-Drives**

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 19 OF 19

BoM: Technical (unpriced) and Commercial (priced) Bids – For Evaluation
Consolidated Scope of Supply and Services

Sl. No.	Item description	Quantity / UoM
1	Fully Assembled 13.5MW SFC Panels - Air Cooled	2 No.
2	ONAN Transformers (SFC I/p side)	2 No.
3	ONAN Transformers (SFC O/p side)	2 No.
4	11kV Switchboard- consisting of 2 nos. VCBs with common soft-starter Aluminium bus (for motor of each of the 04 units) & Breaker Earthing Truck	1 Set
5	PLC panel	1 No.
6	Cable Accessories for complete project (All HT cable glands are in bidder's scope of supply)	1 Set
7	Laptop loaded with Drive software	1 No.
8	*Commissioning Spares for complete SFC system	1 Lot
9**	a. Erection Supervision & Commissioning of SFC system for pump of U#1 (Bidder to quote E&C charges for 63 man-days)	1 Activity Unit
	b. Erection Supervision & Commissioning of SFC system for pumps of U#2-4 (Bidder to quote E&C charges for 90 man-days, which shall be considered for bid evaluation) - Optional for ordering	3 Activity Unit
10	Training Charges for 3 man-days at site (Payment shall be made limited to actual mandays consumed, with per manday charges calculated on pro-rata basis).	1 Activity Unit
11	11kV soft-starter bus isolator for U#1 Motor	1 Set

*Unpriced List of quoted Spares shall be provided in the Technical Offer. L1 bidder to submit item-wise unit-prices after opening of price-bid(s). BHEL reserves the option of deleting or changing the quantity of the items as per the customer/site requirement. Unit Prices shall remain firm irrespective of the change.

**Commissioning and successful handing-over of the complete system to end-user is supplier's responsibility. Bidder is thereby requested to quote the "LUMPSUM" amount only which will include travelling, boarding and lodging expenses. Total Man-Days for commissioning 4 pumps will be 153 Man-days (considering 63 Man-days for U#1, 30 Man-days each for U#2,3&4). As customer has awarded contract to BHEL for running U#1 in pump mode operation wherein redundant SFC system is to be designed as common for all 04 unit motors, finalised charges for E&C of Units#2,3&4 will be considered as 'Optional for ordering' facilitating conversion of optional prices to firm PO as and when order is received from customer for running U#2,3&4 in pump mode. Such Optional Price shall bear validity till expiry of warranty period. Minimum percentage of basic material value to be quoted for total Erecton Supervision & Commissioning charges for U#1-4 shall be 01.50% of basic material value (or) 40 lakhs, whichever is higher. Payment shall be made based on actual mandays consumed at Site with per manday charges calculated on the basis of charges quoted above. There shall be no limitation on the number of service visits. However any adjustment (i.e, increase/decrease) to the number of man-days will be calculated proportionally based on the finalised E&C charges.

H.G.E. B.H.E.L. HARDWAR	No.:HG/FE/006	Section: 01
	TECHNICAL DATA OF GENERATOR / MOTOR	Dated :25-05-95
	AND ITS ACCESSORIES	Rev.No.: 00 Page :01 of 03

1.0 MECHANICAL DATA OF GENERATOR /MOTOR AND ITS ACCESSORIES

1.1 VERTICAL SYNCHRONOUS HYDRO GENERATOR /MOTOR OF THE TYPE SV 820/165-42. :-

1.1.1 GENERATOR OPERATION :

Apparent Power	75,000 KVA
Active Power	60,000 KW
Power Factor	0.8 Lag
Rated Voltage	11,000 V \pm 10 %
Frequency	50 Hz.
Rated Current	3940 A
Rated/ Runaway Speed	142.8/ 283 RPM
Moment of Inertia (GD ²)	9400 TM ²
Winding Connection	Star
No. of Main Terminals	3
No. of Neutral Terminals	6
Reactive Power:	
-Underexcited State	58,000 KVAR
-Overexcited State	45,000 KVAR

1.1.2 MOTOR OPERATION :

Active Power	65,000 KW
Apparent Input Voltage	11,000 V \pm 10 %
Power Factor	0.97 Lead
Rated Current	3,600 A

1.1.3 REACTANCES, TIME CONSTANTS ETC.:

$X'd = 32 \% \pm 15 \%$	$X''d = 20\%$
$X_d = 97 \%$	
$X''q = 22 \%$	$X_q = 61\%$
$X_2 = 21 \%$	$X_0 = 9\%$
Short Circuit Ratio	1.18 \pm 15%
Stator Leakage Reactance	15.3 %
Resistance of Stator Wdg.at 20°C (per phase)	0.00485ohm
Resistance of Rotor Wdg.at 20°C	0.1381 ohm
Capacitance of Stator Wdg.	0.57 micro farad
$t'd_0 = 8.05$ sec.	$t'd = 2.46$ sec.
Maximum permanent allowable assymetrical load.	12%
$I_2^2 \cdot t$	30

1.1.4 EXCITATION REQUIREMENTS :

1.1.4.1 GENERATOR :

No Load :-	
Current (I_0) =	566 A
Voltage (V_0)=79V	

H.G.E. B.H.E.L. HARDWAR	No.:HG/FE/006	Section: 01
	TECHNICAL DATA OF GENERATOR / MOTOR	Dated :25-05-95
	AND	Rev.No.: 00
	ITS ACCESSORIES	Page :02 of 03

Full Load :-

Current (I_z) = 1,120 A

Voltage (V_z)=214V

For the range of control + 10 %

$I_{110\%} = 1280$ A

1.1.4.2 SYNCHRONOUS CONDENSER OPERATION :

Underexcited Current (I_{kk})

55 A

Overexcited Current (I_{ki})

1120 A

1.1.4.3 MOTOR :

Current (I_z)

875 A

1.1.5 EFFICIENCIES :

1.1.5.1 GENERATOR :

LOAD	100 %	75 %	50 %
Efficiency (at P.F. 0.8)	97.4 %	97.2 %	96.55 %

The efficiencies as given are to be understood as including the excitation losses and the bearing losses. The efficiency tolerances are according to the appropriate CSN.

1.1.5.2 MOTOR :

LOAD	100 %
Efficiency (at P.F. 0.97)	97.85 %

1.2 START TO THE MOTORING OPERATION :

The start to the motoring operation will be performed by an asynchronous starting alternator through the starting reactor. The pump turbine runner will be watered during operation. The churning losses of the runner as determined at the rated speed are 8200 KW.

Each Reactor phase exhibits the following values :
 $x_f = 0.082 - 0.164 - 0.246$ ohm

It is assumed that the start will be performed at the branch 0.164 ohm. The start time is about 60 seconds.

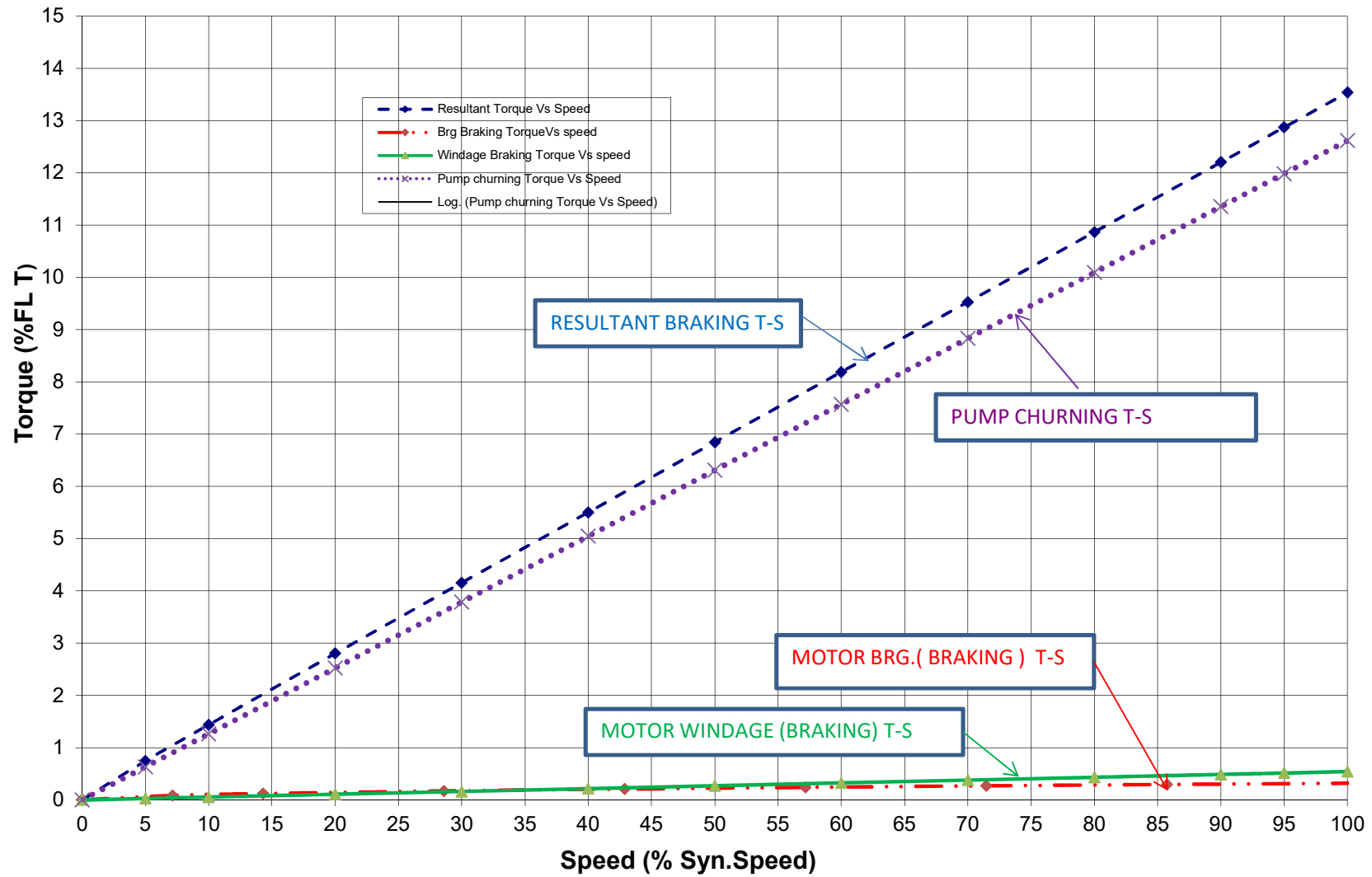
Each start is to be followed by a 15 minute interval in which the motor will be cooled.

The assumed starting voltage is $0.45 U_n$ i.e. 4950 V.

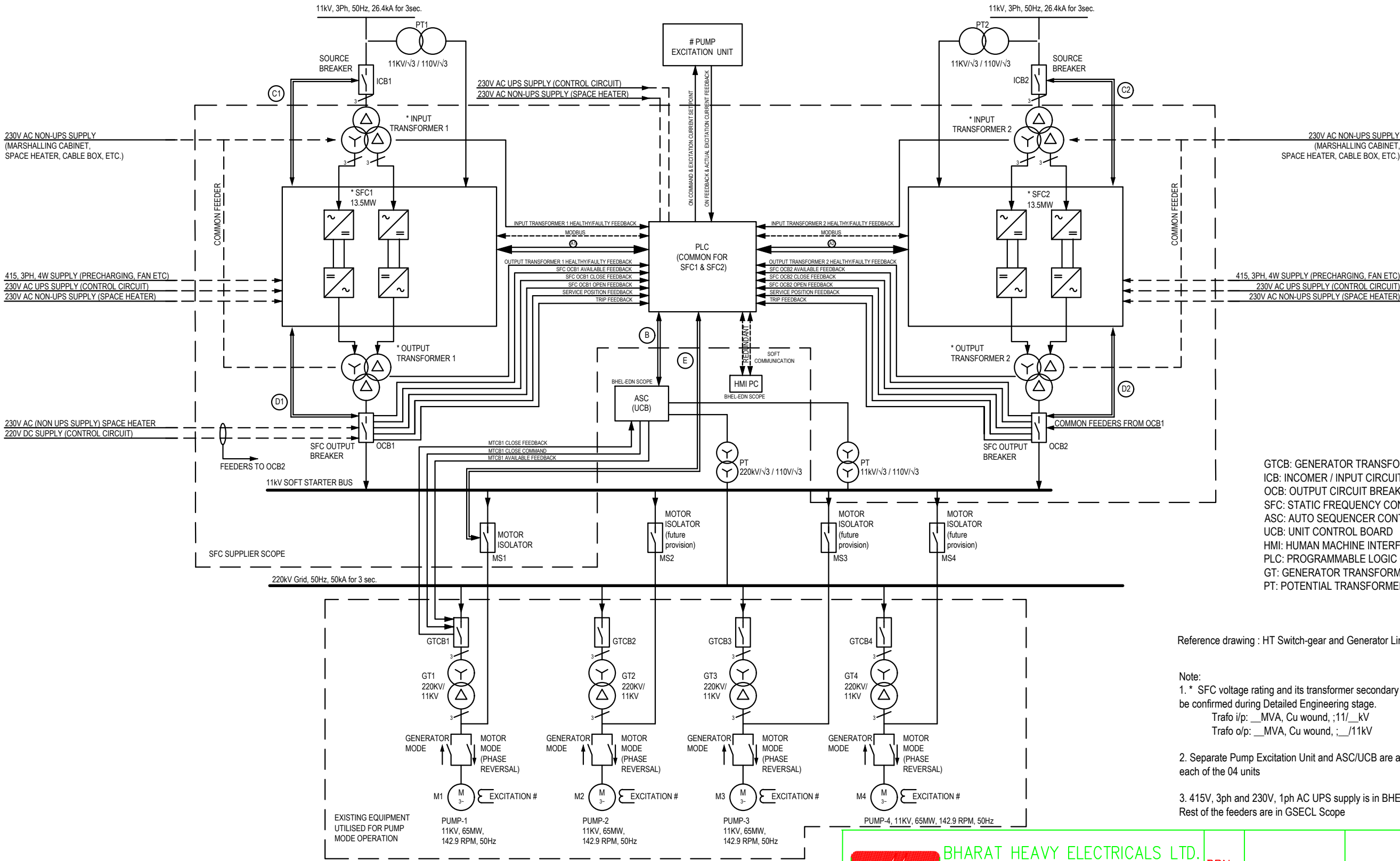
The starting current during the start period will be about 2.25 i.e. 8100 A.

The starting motor moment is 0.08 Nw, i.e. 37,300 Kpm.

KADANA PSP (T-S CURVE)



GSECL KADANA PSS - SINGLE LINE DIAGRAM FOR SFC



GTCB: GENERATOR TRANSFORMER CIRCUIT BREAKER
ICB: INCOMER / INPUT CIRCUIT BREAKER
OCB: OUTPUT CIRCUIT BREAKER
SFC: STATIC FREQUENCY CONVERTER
ASC: AUTO SEQUENCER CONTROLLER
UCB: UNIT CONTROL BOARD
HMI: HUMAN MACHINE INTERFACE
PLC: PROGRAMMABLE LOGIC CONTROLLER
GT: GENERATOR TRANSFORMER
PT: POTENTIAL TRANSFORMER

Reference drawing : HT Switch-gear and Generator Line Diagram no. 53635a

- Note:
- * SFC voltage rating and its transformer secondary windings will be confirmed during Detailed Engineering stage.
Trafo i/p: __MVA, Cu wound, ;11/___kV
Trafo o/p: __MVA, Cu wound, ;_/11kV
 - Separate Pump Excitation Unit and ASC/UCB are applicable for each of the 04 units
 - 415V, 3ph and 230V, 1ph AC UPS supply is in BHEL Scope.
Rest of the feeders are in GSECL Scope



BHARAT HEAVY ELECTRICALS LTD.
ELECTRONICS DIVISION
BANGALORE

DRN.	GM	-SD-	23.05.25	VAR.
CHD.	GD	-SD-	23.05.25	NA
APPD.	LSL	-SD-	23.05.25	

REV.	DATE	ALTERED	GM	REV.	DATE	ALTERED	GM
01	12.07.25	CHD/APPD	GD/LSL	02	21.07.25	CHD/APPD	GD/LSL

DEPT. CE DRIVES	UNTOL. DIMS. GR. P/M/Ø	SCALE NTS	WEIGHT (KG) NA	REF. TO ASSY. DRG. NA	ITEM NO. NA	NO.OF ITEMS NA
CODE 441	TITLE SINGLE LINE DIAGRAM OF STATIC FREQUENCY CONVERTER					REV. 02
DRAWING NO. SHT. No 1				NO. OF SHT. 1		

Following are the preliminary interfacing details representating A1,A2,B,C1,C2,D1,D2 & E indicated in SLD for U#1 pump

'A1' resembles interfacing between SFC1 and PLC (common)

From equipment	Signal name/description	To equipment
SFC1	Healthy / faulty feedback	PLC
SFC1	Ready feedback	PLC
PLC	Start command	SFC1
SFC1	ON feedback	PLC
PLC	Actual excitation current feedback	SFC1
PLC	Voltage increase, Voltage decrease, Frequency increase,Frequency decrease signals	SFC1
SFC1	Current feedback (4-20mA)	PLC
SFC1	Voltage feedback (4-20mA)	PLC
PLC	OFF command	SFC1
SFC1	OFF feedback	PLC

'A2' resembles interfacing between SFC2 and PLC (common)

From equipment	Signal name/description	To equipment
SFC2	Healthy / faulty feedback	PLC
SFC2	Ready feedback	PLC
PLC	ON command	SFC2
SFC2	ON feedback	PLC
PLC	Actual excitation current feedback	SFC2
PLC	Voltage increase, Voltage decrease, Frequency increase,Frequency decrease signals	SFC2
SFC2	Current feedback (4-20mA)	PLC
SFC2	Voltage feedback (4-20mA)	PLC
PLC	OFF command	SFC2
SFC2	OFF feedback	PLC

'B' resembles interfacing between ASC1 and PLC (common)

From equipment	Signal name/description	To equipment
PLC	Healthy/faulty status of SFC-1 & SFC-2, ICB-1 & ICB-2, OCB-1 & OCB-2, Motor Isolator-1	ASC1
ASC1	SFC-1 select command	PLC
PLC	Motor Isolator-1 close permit	ASC1
ASC1	Motor Isolator-1 close command	PLC
PLC	Motor Isolator-1 close feedback	ASC1
PLC	SFC-1 ready to start pump-1	ASC1
ASC1	Pump-1 start command	PLC
ASC1	Voltage increase, Voltage decrease, Frequency increase,Frequency decrease correction signals	PLC
ASC1	Synchronization achieved	PLC
ASC1	GTCB-1 close feedback	PLC

'C1' resembles interfacing between SFC1 and ICB1 (Source breaker)

From equipment	Signal name/description	To equipment
ICB1	VCB available (trip circuit healthy+ spring charged+ relay 86 not operated+ breaker in service) feedback	SFC1
ICB1	VCB in Test Position	SFC1
ICB1	VCB in Remote	SFC1
ICB1	VCB Fault	SFC1
SFC1	ON command	ICB1
ICB1	ON feedback	SFC1
SFC1	Open command	ICB1
ICB1	Open feedback	SFC1

'C2' resembles interfacing between SFC2 and ICB2 (Source breaker)

From equipment	Signal name/description	To equipment
ICB2	VCB available (trip circuit healthy+ spring charged+ relay 86 not operated+ breaker in service) feedback	SFC2
ICB2	VCB in Test Position	SFC2
ICB2	VCB in Remote	SFC2
ICB2	VCB Fault	SFC2
SFC2	ON command	ICB2
ICB2	ON feedback	SFC2
SFC2	Open command	ICB2
ICB2	Open feedback	SFC2

Note: I/O list of PLC as indicated here is wrt. U#1. Same shall be applicable for other U#2,3&4.

'D1' resembles interfacing between SFC1 and SFC O/p Breaker1

From equipment	Signal name/description	To equipment
SFC1	ON(Close) command	SFC OCB1
SFC OCB1	ON(Close) feedback	SFC1
SFC1	Open command	SFC OCB1
SFC OCB1	Open feedback	SFC1

Following standard interfaces are applicable between excitation unit (of each unit pump) and *PLC (common)		
From equipment	Signal name/description	To equipment
Pump-1/2/3/4 Excitation unit	Excitation Ready feedback	PLC
Pump-1/2/3/4 Excitation unit	Excitation On feedback	PLC
Pump-1/2/3/4 Excitation unit	Excitation Trip feedback	PLC
Pump-1/2/3/4 Excitation unit	Motor actual excitation current feedback	PLC
PLC	Fault Acknowledge	Pump-1/2/3/4 Excitation unit
PLC	Excitation current set point	Pump-1/2/3/4 Excitation unit

'D2' resembles interfacing between SFC2 and SFC O/p Breaker2

From equipment	Signal name/description	To equipment
SFC2	ON(Close) command	SFC OCB2
SFC OCB2	ON(Close) feedback	SFC2
SFC2	Open command	SFC OCB2
SFC OCB2	Open feedback	SFC2

Following standard protections are provided for Transformers (Input/Output) and interfaced with *PLC (common)		
From equipment	Signal name/description	To equipment
Transformer	Buchholz relay trip	PLC
Transformer	PRV trip	PLC
Transformer	MOG trip	PLC
Transformer	OTI alarm/ trip	PLC
Transformer	WTI alarm/ trip	PLC
Transformer	Buchholz alarm	PLC

E' resembles interfacing between *PLC (Common) and Motor/Pump Isolator1

From equipment	Signal name/description	To equipment
Motor Isolator1	Available feedback	PLC
PLC	Close Command	Motor Isolator1
Motor Isolator1	Close Feedback	PLC
PLC	Open Command	Motor Isolator1
Motor Isolator1	Open Feedback	PLC

Following standard interfaces are applicable between synchronisation device (of each unit pump) and *PLC (common)		
From equipment	Signal name/description	To equipment
Pump-1/2/3/4 synchronisation device	synchronisation achieved command	PLC
Pump-1/2/3/4 synchronisation device	synchronisation alarm	PLC
Pump-1/2/3/4 synchronisation device	synchronisation blocked	PLC
Pump-1/2/3/4 synchronisation device	synchronisation running	PLC
Pump-1/2/3/4 synchronisation device	Voltage increase command	PLC
Pump-1/2/3/4 synchronisation device	Voltage decrease command	PLC
Pump-1/2/3/4 synchronisation device	Frequency increase command	PLC
Pump-1/2/3/4 synchronisation device	Frequency decrease command	PLC

*I/O list of PLC as indicated above is wrt. U#1. Same shall be applicable for other U#2,3&4.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO:PS/445/3040/ANX4

REV. NO: 00

PAGE 1 OF 1

Annexure 4: **SFC EXCITATION SYSTEM**

Initial Excitation power required for SFC starting is switched on before start of SFC system. Constant excitation which is 80% of no load excitation value is given up to minimum speed i.e. 30Hz. After minimum speed is reached, a command from SFC is given to excitation system for enabling V/F ratio up to 90% nominal speed.

Auto Sequencer (unit control board-UCB) will take over control when machine reaches 90% speed. Controls of Speed Raise / Speed Lower is done by the Auto Sequencer (unit control board-UCB) until machine reaches 50 Hz rated speed.

Synchronization is done by Auto Sequencer in auto sequence system (UCB) by matching machine voltage and frequency with Grid voltage and frequency. Motor synchronized Command from UCB is given for switching off SFC system by tripping the SFC source breaker and output breaker.

Main Excitation system will take over from the initial excitation system after the synchronization of machine. Change over power contactors are provided for switch over from initial to main excitation.

Both Excitation System and Auto Sequencer control system, including the system of selecting the *Pump and SFC* combination is manufactured and supplied by BHEL Electronics Division, Bangalore.

Signals from Excitation system to SFC

1. Excitation ON contact

Signals from SFC to Excitation system

1. Minimum speed reached contact for enabling V/F ratio.

Signal from SFC to UCB

1. 90% speed reached contact for speed control (raise/lower)



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO.PS/445/3040/ANX5

REV. NO: 00

PAGE 1 OF 3

Annexure-5: PUMPS STARTING EQUIPMENT

GENERAL:

This section describes the details of pump starting equipment, manufacturing standards and tests to be conducted at manufacturer's works, at project site, erection, testing & commissioning requirements of equipment at site.

DETAILS OF EQUIPMENT:

The pumps starting equipment to be procured shall include SFC (Static Frequency Converter) equipment, SFC breaker's cubicles, along with associated equipment including 11kV soft-starter AI bus (common for all 04 pumps).

Two (2) sets of Static Frequency Converter (SFC) systems are included in scope of supply, to have redundancy of starting equipment as this starting equipment is common for all 04 Pump-Motors. These SFCs shall be suitable to start the pump-motors smoothly in watered condition and without inrush current. The motor shall be soft started and reach 90% of rated speed within 250 sec. It shall include the necessary transformers and all the control equipment required, as indicated in SLD.

The starting equipment offered shall be of proven design and shall be robust and shall withstand no. of starts in a day. Each start is to be followed by a 15-minute time interval in which the motor will be cooled (Max. 03 successive starts with a time gap of 15 minutes). All the control equipment for selection of the *pump to be started* and interlocks, indications, alarm and/or annunciation circuits as applicable, shall be included.

All the protection and control circuits of starting equipment shall be incorporated in the system. The system shall be suitable to start one pump at a time, either from local panel or from remote control panel / HMI panel in the control room.

The power circuits of panels (11kV system) starting system shall be designed so that it can withstand system fault currents during starting of pumps.

The high voltage equipment of the starting equipment shall be type tested. All the routine tests shall be conducted as per IEC standards. Bidder shall hereby specify the list of tests that shall be conducted as part of FAT in the offer.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO.PS/445/3040/ANX5

REV. NO: 00

PAGE 2 OF 3

SFC System Configuration

SFC shall be combination of Thyristor bridges with an intermediate dc link reactor. It shall include first bridge named Network Bridge (NB) connected with a source transformer, and the Second Bridge named Machine Bridge (MB) that connects to the motor stator terminals through necessary switchgear and step up transformers.

The first bridge shall be operated as rectifier and power frequency supply is converted to DC. This DC contains ripples which are filtered by the link reactor.

MB shall be operated as an inverter, producing three-phase alternating current, the frequency of which is varied from a very low value, up to the nominal value (i.e about 50Hz). Thyristors firing angle in the NB & MB are set by a controller with various feedback loops.

The power converter can be configured as either a "high-high" type or a 12/12-pulse type; two converters are connected by a DC reactor which is necessary for the current source type SFC.

The thyristor converters shall be identical and are to be connected in three-phase bridge connection to form the power converter.

Control Unit

The control, protection and monitoring functions are integrated in the controller panel and shall be grouped into two main parts. One is power cubicle, consisting of thyristors and snubber circuits. The second part is the CPU with other electronic control circuitry and feedback circuits and acts very fast in a 'μ'sec range during short circuit test sequence.

A human machine interface system shall be provided for step by step control also.

Breakers/ Isolators

The SFC system is equipped with input breakers (existing) and output breakers (in bidder scope).

Transformers

SFC system shall consist of Transformers at the input and output of the frequency converter to match the network voltage and motor voltage to the permitted converter voltages. They reduce the harmonics injected into the network, limit the fault current inside the frequency converter



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO.PS/445/3040/ANX5

REV. NO: 00

PAGE 3 OF 3

and provide the required phase shifting in case of 12- pulse configurations. The design of these transformers shall be suitable to be adapted to the parameters and requirements of the entire starting system. For starting system, these transformers can be designed with a duty cycle (limited to 03 starts per hour i.e, Ton=15 min. & Toff=45 min.) in order to reduce the size and investment costs for these components.

The following protections to be provided :

a) Internal Protection:

- Instantaneous over current
- Bridge differential current
- Generator over voltage
- Source bridge under voltage and overvoltage
- Ground fault
- Bridge coolant over temperature, low resistivity, low pressure, high or low level
- Shorted thyristor
- No generator field at start

b) External Protection:

- Faults on cable or bus ducts and switchgear connecting the static starter to the Motor
- Generator neutral dc fault protection
- Volts / Hertz
- Short circuit and ground faults

These protections are to be coordinated with motor protection relays.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO.PS/445/3040/ANX6

REV. NO: 00

PAGE 1 OF 4

Annexure-6

TECHNICAL WRITE-UP ON STATIC FREQUENCY CONVERTER

In synchronous (line) starting with high load torque, a very high starting torque is required. This high value of starting torque is achieved with a very high value of starting current, e.g, five times full load current may be required. In Synchronous starting using SFC, the required starting torque can be obtained at relatively low value of current i.e.1.5 times full load value. The acceleration starts from zero speed and the stator frequency is gradually increased so that rotor is always in synchronism with the stator field. The voltage dips on the mains are automatically eliminated.

➤ SYSTEM DESCRIPTION:

Static Frequency Converter is a system for starting and accelerating large synchronous machines. SFC takes power from the supply grid at constant voltage and constant frequency, and converts it into power of variable voltage and frequency in order to start and accelerate the synchronous machine. The machine is then synchronized to the supply grid and SFC gets disconnected. Since this is made of solid state devices and has no moving parts for power conversion, it is also called Static Starter.

The power converter function is accomplished using thyristor cells built in to bridge circuits. The SFC system consists of line commutated converter called Source Bridge, and load commutated converter called Load Bridge. These bridges are interconnected through DC link reactor.

The Source Bridge is a thyristor bridge circuit that converts incoming power to DC power of controlled voltage. By controlling the sequence of firing (providing the gate signals) the thyristors, the bridge circuit allows only the AC phase that is of the same polarity as the desired DC to conduct. Simultaneously the time of each thyristor firing is controlled to determine what portion of sine wave is allowed to conduct, thus controlling the voltage on the DC circuit.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO.PS/445/3040/ANX6

REV. NO: 00

PAGE 2 OF 4

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

The Load Bridge is also of the similar construction, but converts the DC voltage back to AC power. By controlling the timing and sequence of firing the thyristors, the power that appears on AC output is alternating three-phase power, although not a smooth sine wave.

The SFC uses both source and load bridge to go from 50 Hz power at line voltage to variable voltage and variable frequency power. The source converter converts the 50 Hz AC power to variable voltage DC power. A DC link reactor (DC circuit is called the "link" between the two bridges) smooth out the DC power, which is then converted to variable frequency AC power by load bridge.

For starting the synchronous machine, the SFC applies power of fixed frequency and fixed current until the motor starts to rotate. Once the machine is started, the firing of the load bridge thyristor follows the sequence to generate three-phase AC waveform. In operation the machine tells the controller by virtue of the stator voltage, what frequency power is required. The Load Bridge is controlled to follow the machine frequency, with the current to the machine controlled to regulate the machine torque and subsequently the speed. As the torque changes, the speed will change, as will the frequency of required stator power. The Load Bridge follows the frequency of the stator power. The Load Bridge follows the frequency of the stator voltage as the speed changes. At the same time, load bridge is following the stator frequency and controlling the drive torque (current), the source bridge is controlling the dc voltage to be proportional to drive speed. This ultimately controls the AC voltage the machine sees and results in constant voltage/hertz at the terminals.

Because the Load Bridge follows the frequency of the machine stator, the machine always sees synchronous operation. This completely eliminates the thermal, electrical and mechanical stresses associated with starting.

➤ DESCRIPTION OF OPERATION:

One of the applications of the SFC is starting of higher capacity motors used in pumps of Pump Storage projects. The pumps are started and accelerated to near full speed and synchronized to supply grid. A simplified one-line diagram is given below.



A4 – 11

PURCHASE SPECIFICATION

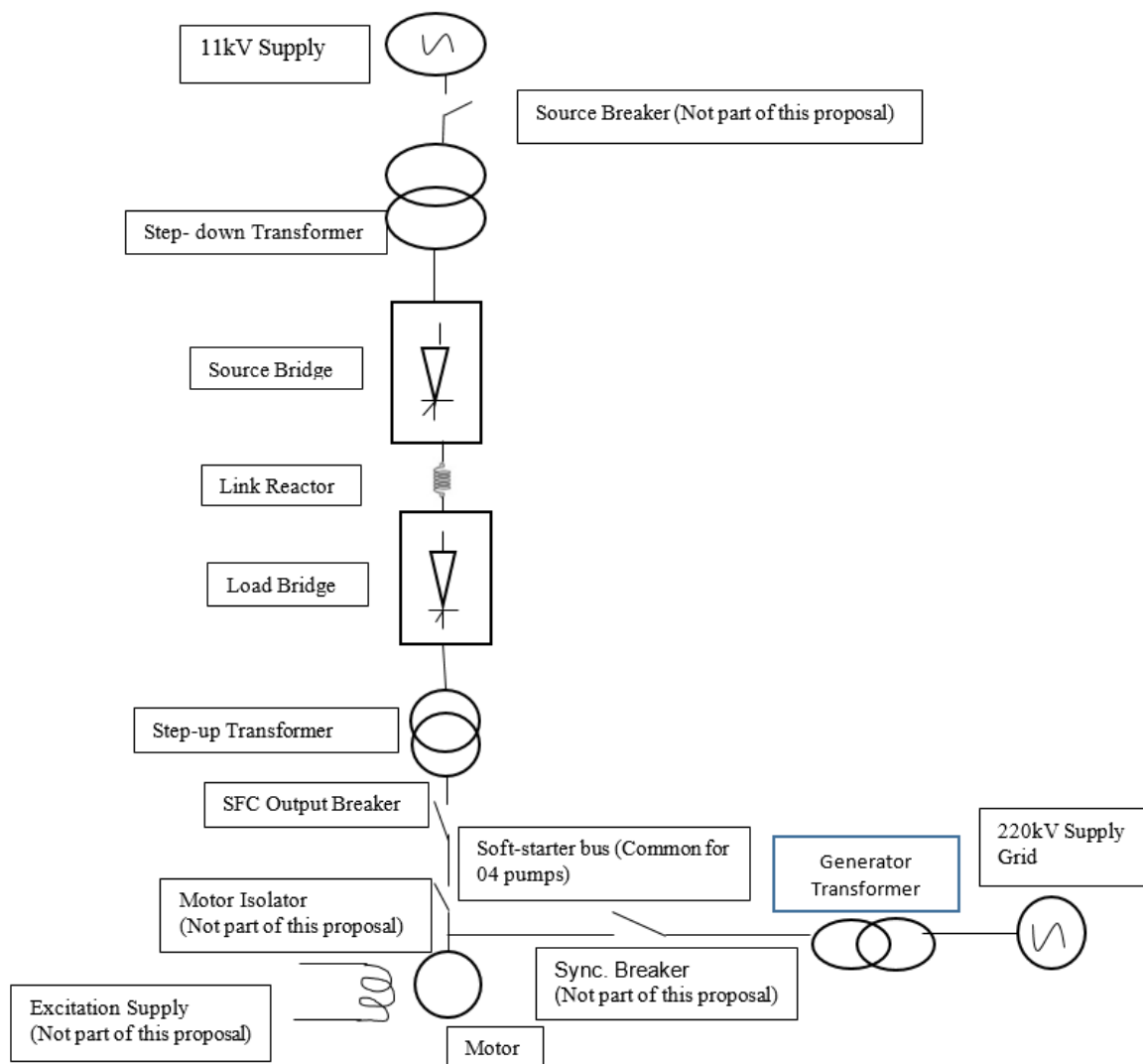
GROUP: CE-Drives

P.S NO.PS/445/3040/ANX6

REV. NO: 00

PAGE 3 OF 4

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.



Simplified One Line Diagram

Two *primary functions* of SFC are:

- 1) Convert the 50Hz fixed voltage power from the supply grid to variable frequency variable voltage power.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO.PS/445/3040/ANX6

REV. NO: 00

PAGE 4 OF 4

2) To accelerate the motor up to base speed (90%) and regulate the speed of the motor as required by auto-synchronizer controls (ASC).

As a result, a SFC takes the power from supply grid and provides controlled speed operation of the motor in response to the process control signal.

The supply grid voltage is stepped down through a transformer to such a voltage that can be handled by the Source and load bridges. The source converter bridge along with load converter bridge, converts the constant frequency power at constant voltage to variable frequency, variable voltage power. The Source Bridge converts the incoming 50Hz AC power to controlled voltage DC power. A link reactor smooths out DC powers which then is converted to AC power of variable frequency by the inverter bridge.

The SFC continue to accelerate the motor and the speed of the motor is raised up to base speed (90%). Then the speed control is transferred to auto-synchronizer control (ASC) to synchronize the motor to supply grid.

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO.PS/445/3040/ANX7

REV. NO: 00

PAGE 1 OF 4

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

Annexure-7

SFC Startup Converter Control/Operation Philosophy

- A. If 'LOCAL/REMOTE' Selector switch on PLC Panel door kept in 'REMOTE' mode, following sequence of operation takes place wherein selection of Pump and SFC shall be from UCB/ASC:**
1. PLC sends status of SFC-1 and SFC-2 to ASC-1.
 2. PLC sends status of SFC-1 and SFC-2 Source breaker (ICB1 and ICB2) to ASC-1
 3. PLC sends status of SFC-1 and SFC-2 output breaker (OCB1 and OCB2) to ASC-1
 4. PLC sends status of Motor isolator-1 (MS1) to ASC-1
 5. ASC-1 sends SFC-1 select command to PLC
 6. PLC sends Motor isolator-1 (MS1) Close Permit to ASC-1
 7. ASC-1 sends Motor isolator-1 (MS1) Close command to PLC
 8. PLC sends Close Command to Motor isolator-1 (MS1)
 9. PLC receives Close Feedback from Motor isolator-1 (MS1)
 10. PLC sends Motor isolator-1 (MS1) Close Feedback to ASC-1
 11. PLC checks status of SFC, Motor isolator (MS), Source Breaker (ICB), Output Breaker (OCB), Step-Down Transformer & Step-Up Transformer.
 12. Based upon the status of equipment indicated in above step, PLC sends 'SFC-1 ready to start Pump-1' signal to ASC-1
 13. PLC receives 'Pump-1 Start command' from ASC-1
 14. PLC Sends ON Command to SFC-1
 15. SFC-1 sends ON Command to SFC-1 output Breaker (OCB1)
 16. SFC-1 receives SFC-1 output Breaker (OCB1) ON Feedback
 17. SFC-1 sends ON Command to SFC-1 Source Breaker (ICB1)
 18. SFC-1 receives SFC-1 Source Breaker (ICB1) ON Feedback



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO.PS/445/3040/ANX7

REV. NO: 00

PAGE 2 OF 4

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

19. PLC sends 'Excitation current set point' to Pump-1 Excitation unit
20. PLC Receives actual excitation current feedback from Excitation unit.
21. PLC Sends actual excitation current feedback to SFC-1
22. SFC-1 enables Line Side Converter (LSC) and Motor Side Converter (MSC) and ramps up the motor to 90% speed
- If Synchronization 'AUTO/MANUAL' Selection from UCB-1 panel is in 'AUTO' mode, following sequence of operation takes place:**
23. Upon reaching 90% Speed, ASC-1 Panel sends back Voltage Increase, Voltage Decrease, Frequency Increase, Frequency Decrease correction signal to PLC.
24. Continue with step 27
- If Synchronization 'AUTO/MANUAL' Selection from UCB-1 panel is in 'MANUAL' mode, following sequence of operation takes place:**
25. SFC-1 output Voltage, Frequency and Phase angle compared with that of Grid with the help of meters and synchronoscope in UCB-1
26. Operator provides Voltage Increase/ Decrease, Frequency Increase/ decrease command to PLC by pressing respective push buttons from ASC-1.
27. PLC sends these signals to SFC-1 and SFC-1 performs corrective action
28. PLC receives Synchronization Achieved signal from ASC-1. At the same time, ASC-1 sends Close Command to Motor-1 synchronization breaker (MTCB1).
29. PLC sends OFF Command to SFC-1.
30. PLC receives Motor-1 synch. breaker (MTCB1) Close feedback from ASC-1
31. SFC-1 Sends Open Command to its Output Breaker (OCB1).
32. SFC-1 receives Open feedback from its Output Breaker (OCB1).
33. SFC-1 sends Open Command to its Source Breaker (ICB1).
34. SFC-1 receives Open feedback from its Source Breaker (ICB1).
35. PLC sends Open command to Motor isolator-1 (MS1)
36. PLC receives Open feedback from Motor isolator-1 (MS1)

Note:

- ASC-1 → U#1 ; ASC-2 → U#2 ; ASC-3 → U#3 ; ASC-4 → U#4
- PLC sends same signal to ASC-1, ASC-2.... ASC-4. When any ASC for e.g. ASC-1 issues commands to PLC, other ASCs are disabled by ASC SCADA.
- Above operating sequence indicates demonstration of ASC-1, same sequence is applicable for ASC-2 to ASC-4.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-DRIVES

P.S NO.PS/445/3040/ANX7

REV. NO: 00

PAGE 3 OF 4

- In step 5 if SFC-2 is selected by ASC, SFC-1 will be replaced by SFC-2 in steps 6 to 36.

B. If 'LOCAL/REMOTE' Selector switch on PLC Panel is kept in 'LOCAL' mode, following sequence of operation takes place:

1. Pump-1 is selected by operator from PLC Panel HMI
2. SFC-1 is selected by operator from PLC Panel.
3. PLC sends Close Command to Motor isolator-1 (MS1)
4. PLC receives Close Feedback from Motor isolator-1 (MS1)
5. PLC checks status of SFC, Motor isolator (MS1), Source Breaker (ICB1), Output Breaker (OCB1), Step-Down Transformer & Step-Up Transformer.
6. Based upon the status of equipment indicated in above step, PLC displays 'SFC-1 ready to start Pump-1' signal on PLC HMI
7. Operator gives start command from START PUSH button on PLC Panel door
8. PLC Sends ON Command to SFC-1
9. SFC-1 sends ON Command to SFC-1 output Breaker (OCB1)
10. SFC-1 receives SFC-1 output Breaker (OCB1) ON Feedback
11. SFC-1 sends ON Command to SFC-1 Source Breaker (ICB1)
12. SFC-1 receives SFC-1 Source Breaker (ICB1) ON Feedback
13. PLC sends 'Excitation current set point' to Pump-1 Excitation unit
14. PLC actual excitation current feedback from Excitation unit.
15. PLC sends actual excitation current feedback to SFC-1
16. SFC-1 enables Line Side Converter (LSC) and Motor Side Converter (MSC) and ramps up the motor to 90% speed

If Synchronization 'AUTO/MANUAL' Selection from UCB-1 panel is in 'AUTO' mode, following sequence of operation takes place

17. Upon reaching 90% Speed, Auto Synch. Panel sends back Voltage Increase, Voltage Decrease, Frequency Increase, Frequency Decrease correction signal to PLC
18. Continue with step 21

If Synchronization AUTO/MANUAL Selection from UCB-1 panel is in 'MANUAL' mode following sequence of operation takes place

19. SFC-1 output Voltage, Frequency and Phase angle compared with that of Grid with the help of meters and synchroscope
20. Operator provides Voltage Increase/ Decrease, Frequency Increase/ Decrease command to PLC by pressing respective push buttons from ASC-1.
21. PLC sends these signals to SFC-1 and SFC-1 performs corrective action



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO.PS/445/3040/ANX7

REV. NO: 00

PAGE 4 OF 4

22. PLC receives Synchronization Achieved signal from ASC-1. At the same time, ASC-1 sends Close Command to Motor-1 synchronization breaker (MTCB1).
23. PLC sends OFF Command to SFC-1.
24. PLC receives Motor-1 synch. breaker (MTCB1) Close feedback from ASC-1
25. SFC-1 Sends Open Command to its Output Breaker (OCB1).
26. SFC-1 receives Open feedback from its Output Breaker (OCB1).
27. SFC-1 sends Open Command to its Source Breaker (ICB1).
28. SFC-1 receives Open feedback from its Source Breaker (ICB1).
29. PLC sends Open command to Motor isolator-1 (MS1)
30. PLC receives Open feedback from Motor isolator-1 MS1)

Note:

- Above operating sequence indicates demonstration of Pump-1, same sequence is applicable for Pump-2 to Pump-4.
- In step 2 if SFC-2 is selected by Operator, SFC-1 will be replaced by SFC-2 in steps 3 to 30.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX8

REV. NO: 00

PAGE 1 OF 1

Annexure-8

Scope wrt. TPIA for SFC package

TPI and/or BHEL / Customer representative will be present at manufacturer's works for witnessing of final testing. This is to be incorporated in the Quality Plan.

Equipments shall be inspected and tested by any Third Party Inspection Agency (TPIA) out of the following:

- i. M/s ABS Industrial Verification (India) Pvt. Ltd.
- ii. M/s Bureau Veritas (India) Pvt. Ltd.
- iii. M/s Certification Engineers International Ltd. (CEIL)
- iv. M/s International Certification Services Pvt. Ltd.
- v. M/s Projects and Development India Ltd. (PDIL)
- vi. M/s SGS India Pvt Ltd.
- vii. M/s Tata Projects Ltd.
- viii. M/s IRCLASS Systems and Solutions Private Ltd.
- ix. M/s VCS Quality Services Private Ltd.
- x. M/s TUV India Pvt. Ltd.
- xi. M/s TUV Rheinland India Pvt. Ltd.
- xii. M/s Apave Assessment India Pvt. Ltd.
- xiii. M/s Intertek India Pvt. Ltd.
- xiv. M/s Lloyds Register Marine and Inspection
- xv. M/s Meenaar Global Consultants LLP
- xvi. M/s Quality Evaluation and system team Pvt. Ltd.

Charges for hiring of Third Party Inspector (TPI) shall be in Bidder's scope and same shall be built into the price. TPI hiring shall include all charges like visa charges, to-and-fro travelling, boarding, lodging, etc. if & as applicable.

Following shall be noted:

- i) Certification of final documents wherever applicable, shall be carried out by Inspection Authority issuing the final inspection certificate.
- ii) The Inspection Release Note (IRN) issued by the Third Party Inspection agency/TPIA shall clearly stipulate that materials/equipment/spares have been inspected as per approved drawings, QAP as applicable.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX9

REV. NO: 00

PAGE 1 OF 1

Annexure-9

Distance between various related equipments

Sl. no.	Description		Type of conductor	Distance (not-to-exceed) in mtrs.
	From	To	Cable/ Busduct	
a.	220/11 kV Station Transformer	Line Side Circuit Breaker	Cable	115
b.	Line Side Circuit Breaker	Step Down Transformer	Cable	400
c.	Step Down Transformer	SFC (Farthest SFC incase of multiple SFC)	Cable	275
d.	SFC (Farthest SFC incase of multiple SFC)	Step Up Transformer	Cable	200
e.	Step Up Transformer	SFC O/p Circuit Breaker (11kVsoft-starter bus)	Cable	160
f.	Motor Side Isolator (11kVsoft-starter bus)	Farthest Motor Unit	Cable	90
g.	Farthest Motor Unit	11/220 kV Motor transformer	Busduct	165
h.	11/220 kV Motor transformer	Motor breaker /GIS	Cable	500
i.	Control cubicle (PLC)	Excitation panel	Cable	50

Note: Distance between 02 SFCs is nearly 22 mtrs.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX10

REV. NO: 00

PAGE 1 OF 16

Annexure 10 ONAN Transformers (02 no. each at I/p & O/p side)

SPECIFICATION FOR ONAN CONVERTER TRANSFORMERS FOR LCI BASED STATIC FREQUENCY CONVERTER

EQUIPMENT: SFC TRANSFORMER FOR SYNCHRONOUS MOTOR OF PUMP STORAGE PLANT

The vendor shall have supplied converter duty transformers that are at least 50% the rating of the transformer being offered for the current project. Transformer shall be sourced directly from OEM.

S.NO	PARAMETER	INPUT T/F	OUTPUT T/F
1	POWER RATING	TO BE DECIDED BY BIDDER	TO BE DECIDED BY BIDDER
2	HV	11KV	11KV
3	LV	TO BE DECIDED BY BIDDER	TO BE DECIDED BY BIDDER
4	IMPEDANCE	TO BE DECIDED BY BIDDER (TOL. +10%,-0%)	TO BE DECIDED BY BIDDER (TOL. +0%,-10%)
5	QUANTITY	2	2
6	VECTOR GROUP	Dd0yn11	Dd0yn11

1. Type of cooling : ONAN; Mineral oil filled
2. Number of phases : 3
3. Frequency : 50Hz \pm 2%
4. Combined volt & freq. : \pm 5% (Absolute sum) variation
5. Number of winding : 3 (1 Primary + 2 Secondaries) / shall be decided by supplier based on manufacturer construction for min.12 pulse design.
6. Voltage/ freq. ratio : Shall be designed for 1.1 continous.
7. Installation : Outdoor (Under direct sunlight)
8. Screening between Primary and Secondary windings to be provided and Screen Terminals to be brought out for connection to Earth.
9. Ambient temp. : 40°C
10. Duty : Rectifier duty (shall be designed with a duty cycle limited to 03 starts per hour)



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX10

REV. NO: 00

PAGE 2 OF 16

11. Temperature rise

- (a) Design ambient temp. : 40°C
- (b) Temp. rise at the top oil (by thermometer) : 50°C.
- (c) Temp. rise of wdg. : 55° C
(by resistance measurement method)

12. Limiting Dimensions (LxB) of Transformer foundation : 10x10 sq.ft. (Offer/s of Bidder/s offering Transformers beyond the Limiting Dimensions are liable for rejection)

13. Short Ckt. level on HV Side : To be decided by bidder based on short-circuit capability at SFC output side for O/p transformer. For I/p transformer, it shall be based on short-circuit level of Input bus.

14. Suitability to withstand vacuum ckt. breaker switching : Required

15. a) Material of winding : Copper – Electrolytic Grade

b) Core : Not to exceed 1.9 Wb/m² at any tap position with $\pm 10\%$ voltage variation from voltage corresponding to the tap.
The laminated core shall be of high grade cold rolled grain oriented silicon steel.

c) Tank : Tank shall be of welded construction and fabricated from tested low carbon steel.
It shall be designed for a continuous internal pressure of 0.35 Kg/sq.cm over normal hydrostatic pressure of oil.
The tank cover shall be sloped to prevent retention of rain water and shall have suitable lifting arrangement.
All bolted connections shall be fitted with weather proof hot oil resistant neoprene gasket, in between for complete oil tightness.
Calculation for pressure test shall be submitted.

Bi – directional skids, rollers, jacking pads(four nos), lifting lugs shall be provided.

d) Hardware : All nuts and bolts exposed to weather shall be hot dip galvanised or cadmium plated or zinc passivated steel.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX10

REV. NO: 00

PAGE 3 OF 16

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

- e) Foundation materials : Foundation bolts, including nuts and washers, are essential for securely anchoring transformers to their concrete bases. Bidder to provide the same.
16. Noise : Not to exceed values specified in NEMA TR-1
17. Insulating oil : Fresh oil (before pouring into transformer) should be per IS 335, without inhibitor. 10% extra oil shall be supplied for topping in non returnable containers in sealed drums.
Volume of oil between the highest and lowest level in conservator shall be as per CBIP publication no.295 on transformer.
18. Terminal arrangement : Termination kits shall be procured by BHEL separately. Make and model shall be shared DDE.
19. Cable size details
11kV supply feeder to I/p transformer : 2 Runs/Phase of 11KV (E) 1C x500sqmm Al conductor, XLPE insulated Armoured power Cable
I/p transformer to SFC cubicle : 3 Runs/Phase of 6.6KV (E) 1C x 630 sqmm Al conductor, XLPE insulated Armoured power Cable
SFC cubicle to O/p Transformer : 3 Runs/Phase of 6.6KV (E) 1C x 630 sqmm Al conductor, XLPE insulated Armoured power Cable
O/p transformer to O/p VCB : 2 Runs/Phase of 11KV (UE) 1C x500sqmm Al conductor , XLPE insulated Armoured power Cable
20. Tap changer : OFF circuit tap changer with padlocking facility as per IS 2026 with warning plate "SWITCH TO BE OPERATED WITH TRANSFORMER DE-ENERGISED"
21. Taps : Taps +/- 5 % in steps of +/- 2.5 %(total 5no.)
22. Painting (Transformer and accessories) : Epoxy.
23. Paint Shade : RAL7035
24. Fittings and accessories : As per Annexure-A
25. Standards : IS 2026, IEC60076,IEC 61378-1, IEC 61378-3, CBIP publication no. 295 transformer manual.
26. Testing (Routine Tests) : Tests to be performed on all Transformers as per IS 2026 (with latest amendments). The same shall be included in the Quality Plan.
Final FAT shall be conducted as per Customer approved Quality Plan.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX10

REV. NO: 00

PAGE 4 OF 16

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

27. Quality plan

: Supplier should submit Quality Plan for Customer approval in their standard format. Quality Plan shall include the sub-vendor list.

All customer requirements will have to be adhered to during design/ manufacture/ material procurement/ testing/ dispatch.

28. Type Tests

: Type test certificates (inclusive of Temperature rise test & Lightning Impulse test/BIL) for converter duty transformer of similar or higher rating, shall be submitted.

29. No load loss & Load loss -valid for all transformers (GUARANTEED)

: Guaranteed maximum values without any positive tolerance shall be given with the offer.
An amount of Rs. 15000/- per KW of differential copper loss and Rs.60,000/- per KW of differential iron loss will be levied on the manufacturer, if these losses exceed the guaranteed losses quoted (ref. sl.no.12 of datasheet)

30. DATA SHEET

: DATA SHEET (ANNEXURE-B) is enclosed with this specification. The same is to be filled up and submitted along with the technical offer.
The DATA SHEETS shall be completed fully and all guaranteed figures must be without any tolerance.
Supplier must very clearly mention if any deviation is taken on the specification.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX10

REV. NO: 00

PAGE 5 OF 16

ANNEXURE - A

All accessories shall be provided confirming to IS 3639 & IS 2026

The following fittings and accessories shall be provided in each Transformer:

<u>SL.NO</u>	<u>DESCRIPTION</u>	<u>QTY</u>
01.	Oil filling hole with cover	1 No.
02.	Conservator with Aircell (or flexible separator) along with sump & drain valve with plug/cover plate. The Breather shall be mounted at a height less than 1600 mm from the ground. Breather shall be maintenance free type of Easun MR/ equivalent.	1 No.
03.	a) Magnetic Oil level gauge(Dial type) with minimum and maximum filling level markings. It should have two independent electrically insulated low level alarm contacts suitable for 220 V DC.The oil level at 30°C shall be marked on the gauge. Contact suitable for 220 V DC.	1 No.
	b) Prismatic oil level gauge	1 No.
04.	Thermometer pockets	1 No.
05.	Air release plug on tank cover	1 No.
06.	Lifting lugs	1 Set
07.	Top filter valve	1 No.
08.	Dehydrating breather with Silicagel and oil seal	1 No.
09.	Off circuit tap changing switch on tank cover with tap position indicator, locks and handle.	1 No.
10.	Rating and terminal marking stainless steel/anodised aluminum plate, with details etched in MKS & SI units. Two separate rating plates, one having inscription in Hindi & the other having inscription in English shall be provided.	1 No. in each language



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX10

REV. NO: 00

PAGE 6 OF 16

<u>SL.NO</u>	<u>DESCRIPTION</u>	<u>QTY</u>
11.	Earthing terminals without lugs suitable for connecting 50x6 mm galvanized mild steel flat.	2 Nos.
12.	Rating,winding connection Diagram plate, Valve schedule plate	1 No. each
13.	Drain cum bottom filter valve	1 No.
14.	Base channel with towing holes/lugs	2 Nos.
15.	Double diaphragm explosion vent with sight glasses and equaliser pipe connection to conservator.	1 No.
16.	Four Jacking Pads to enable transformer with oil to be raised or lowered using hydraulic or screw jacks.	1 SET
17.	Manufacture's name plate (stainless steel)	1 No.
18.	Bi-directional flanged rollers + Bi-directional skids	1 SET
19.	Detachable radiator with bottom drain plug,top air release plug and top & bottom shut off valve.	1 SET
20.	Buchholz relay should be of double float type with testing & sampling cocks, alarm and trip contacts and two isolating valves, one on conservator side and the other one on the tank side.	1 SET
21.	150mm dial type oil temp. Indicator and winding temp. Indicators with max. pointer with alarm and trip contacts. Contacts suitable for 220V DC.Indicator accuracy $\pm 2\%$. Alarm and trip points to be adjustable. Full scale temp. 240°C. Least count 2°C. Oil / Winding temp. Indicators should be provided with resetting device.	1 SET
22.	Cable glands & lugs Bimetallic cable lugs, specifically those designed for crimping, shall be used to connect stranded aluminum conductor cables to copper busbars or terminals Cable glands will be of double compression type.	1 SET

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX10

REV. NO: 00

PAGE 7 OF 16

SL.NO

DESCRIPTION

QTY

- | | | |
|-----|--|------------|
| 23. | Pressure Relief Valve on Tank side wall with Alarm and Trip contacts.
Location of this valve will be such that the hot oil discharge shall not fall on the transformer or any of its parts. | 2 Nos |
| 24. | Marshalling box (protection class IP55 with conopy and IS 2147) epoxy painted. Should be vermin, weather, dust proof. Terminal connector of control cable should be DOWELL make or equivalent. 20% extra spare terminals reqd. All TBs to be complete with insulating barriers, clip on type terminals suitable to 2.5 sq mm stranded copper wire. The marshaling box and temperature indicators shall not be mounted at a height greater than 1600 mm from the ground level. The box shall be tank mounted with sloping roof. All incoming cables shall enter from bottom. Sheet steel to be 1.6 mm thick. Thermostatically Controlled space heaters shall be provided. | 1 No |
| 25. | Inspection openings on tank with handles | 2 Nos |
| 26. | Remote WTI & Remote OTI- For Remote Control Panel 4-20mA Output. Output shall be capable of driving an external load of 500 ohms. This remote WTI & remote OTI shall not be a repeater dial of Local WTI & Local OTI. | 1 No. each |
| 27. | Ladder | 1 No. each |
| 28. | Lightning arrestor | 1 No. |

- NOTE :** 1) Contacts of all temp indicators, Buccholz relays and auxiliary devices shall be suitable for 220V DC supply. All alarm and trip contacts shall also be suitable for 220V DC circuits. External power supply will not be provided.
- 2) Nuts and bolts exposed to weather to be hot dipped galvanized or cadmium plated or zinc passivated steel.
- 3) Control wiring to be done with 1100V grade PVC wire, 2.5 mm stranded copper wire.
- 4) Cable glands and lugs shall be supplied loose along with transformer. Cable glands will be double compression nickel plated brass. Cable lugs will be installed with fixing hardware in the cable box.
- 5) Bidder to provide harmonic spectrum of SFC and accordingly transformer to be designed. Relevant calculations shall be provided during detailed engineering.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX10

REV. NO: 00

PAGE 8 OF 16

ANNEXURE - B

DATA SHEET

- 1) Manufacturer's Name and address :
- 2) Service Class / kVA rating :
- 3) Rated Voltage /current
 - a) HV Winding voltage :
 - b) HV winding current :
 - c) LV Winding voltage :
 - d) LV winding current :
- 4) Rated frequency :
- 5) Number of phases :
- 6) Connections
 - a) HV Winding :
 - b) LV Winding :
- 7) Connection symbol :
- 8) Type of cooling :
- 9) Tap changing equipment
 - a) Manufacturer :
 - b) Type :
 - c) No of steps :
 - d) Tap range % to % :
- 10) Guaranteed positive sequence impedance at 75°C with 100% rating
 - a) Principal tap :
 - b) Maximum tap (Approx) :
 - c) Minimum tap (Approx) :

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX10

REV. NO: 00

PAGE 9 OF 16

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

11) Temp. rise over an ambient of 40°C

a) Top oil : °C

b) Winding(by resistance measurement method) : °C

12) Guaranteed losses at rated voltage on principal

tap and at rated current rated frequency:

a) No load loss KW : kW (max)

b) Copper loss at full
load and 75° C KW : kW(max)

**NOTE : LOSS FIGURES TO BE GIVEN WITHOUT ANY POSITIVE TOLERANCE.
THESE FIGURES SHALL BE USED FOR GUARANTEED LOSS FIGURES.
ALSO REFER PT.29 OF SPECIFICATION.**

13) Withstand time for three phase :
short circuit at terminals (sec.)

14) No load current at rated voltage and rated :
frequency (Amps) (Approx)

15) Insulation level

a) Separate source power frequency voltage withstand

i) HV Winding (KV rms) :

ii) LV Winding (KV rms) :

iii) HV Bushing :

iv) LV Bushing :

v) Neutral Bushing :

b) Induced over voltage withstand

i) HV Winding (KV rms) :

ii) LV Winding (KV rms) :

c) Full wave lightning impulse withstand

i) HV Winding (KV) :

ii) LV Winding (KV) :

iii) HV Bushing :

iv) LV Bushing :



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX10

REV. NO: 00

PAGE 10 OF 16

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

- v) Neutral Bushing :
- d) Switch impulse withstand voltage
- i) HV Winding (kV) :
- ii) LV Winding (kV) :
- iii) HV Bushing :
- 16) Regulation at full load at wdg. Temp.of 75° C
- a) At unity power factor (percent) :
- b) At 0.8 power factor lagging (percent) :
- 17) Terminal arrangement
- a) High Voltage :
- b) Low Voltage :
- c) LV Neutral :
- d) HV Neutral :
- 18) Over excitation withstand time (sec)
- a) 110% of rated voltage :
- b) 125% of rated voltage :
- c) 150% of rated voltage :
- 19) Bushing
- Reference Standard : IS2099
- a) High Voltage
- i) Manufacturer :
- ii) Type :
- iii) Minimum creepage distance(mm) :
- iv) weight of bushing (if above 100 kgs) :
- v) short time current rating :
- as per IS 2099



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX10

REV. NO: 00

PAGE 11 OF 16

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

b) Low Voltage

- i) Manufacturer :
- ii) Type :
- iii) Minimum creepage distance(mm) :
- iv) weight of bushing (if above 100 kgs) :
- v) short time current rating as per IS 2099 :

c) Neutral

- i) Manufacturer :
- ii) Type :
- iii) Minimum creepage distance(mm) :
- iv) weight of bushing (if above 100 kgs) :
- v) short time current rating as per IS 2099 :

- d) The neutral terminal for Dyn transformers : YES/ NO
will be given as the fourth terminal in LV cable box,
insulated to full line voltage with clearances as
in the case of line terminals.No separate cable box
shall be provided for the LV neutral terminal and
no external cable connections will be taken from it.
Please Confirm.

20) Proposed method of transformer shipment :

21) Total quantity of oil (litres) required for first filling :

22) If vacuum filling is required, :
state absolute pressure

23) Efficiency at wdg. Temp. of 75° C at unity power factor

- a) At full load (percent) :
- b) At 3/4 full load (percent) :
- c) At 1/2 full load (percent) :

24) Approximate dimensions

- a) Tank enclosure (mm) L x B x H
:



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX10

REV. NO: 00

PAGE 12 OF 16

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

- b) Overall L x B x H (mm)
- 25) Untanking height (mm)
- 26) Approximate weight
- a) Core and winding (Kg) :
- b) Tank cover (Kg) :
- c) Tank fitting (Kg) :
- d) Oil (Kg) :
- e) Total weight (Kg) :
- 27) Despatch details (Kg)
- a) Approximate mass of heaviest package (Kg) :
- b) Approximate dimensions of largest package
- i) Length (mm) :
- ii) Breadth (mm) :
- iii) Height (mm) :
- 28) Reference standards :
- 29) Type of Construction (Core/Shell) :
- 30) Thermal time constant (Hours) :
- 31) Magnetizing inrush current (Amps) :
- 32) No load current at rated frequency and at(Approx)
- i) 90% voltage (Amps) :
- ii) 100% voltage (Amps) :
- iii) 110% voltage (Amps) :
- iv) 150% voltage (Amps) :
- 33) Dimensions of Transformer foundation (in ft.) :



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX10

REV. NO: 00

PAGE 13 OF 16

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

- 34) Power factor of no load current :
- 35) Zero sequence impedance at principle tap :
- 36) Capacitance between winding and to earth (micro farads) :
- 37) Percentage reactance at rated current and frequency and at
- i) Principal tap :
 - ii) Maximum tap :
 - iii) Minimum tap :
- 38) Off circuit tap changer details
- Ratings
- i) Rated voltage :
 - ii) Rated current :
 - iii) Step voltage :
 - iv) Numbers of steps :
 - v) Max.short circuit current withstand: capability& time :
- 39) Radiator
- i) Overall dimensions lxbxh (mm) :
 - ii) Total weight with oil (Kg) :
 - iii) Total weight without oil (Kg) :
 - iv) Type of mounting :
 - v) Thickness of Radiator tube(approx) radiator sheet steel (approx) :
- 40) Shipping details
- a) Weight of heaviest package (Kg) :



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX10

REV. NO: 00

PAGE 14 OF 16

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

b) Total shipping weight (Kg)(approx) :

c) No. of packages :

d) Dimensions of largest package (mm) l x b x h :

e) Parts detached for transport: conservator tank, :
radiator, extension pipe, explosion vent etc.

41) Indicate top & bottom filter valve opening size in mm:
(This is required for deciding size of filter hose)

42) Core

a) Form of core / material :

b) Net core area (mm²) :

c) Type of joint between core and yoke :

d) Thickness of stamping (mm) :

e) Percentage silicon content (percent) :

f) Maximum flux density in core at
rated frequency and at

i) 90% voltage (Wb/m²) :

ii) 100% voltage (Wb/m²) :

iii) 110% voltage (Wb/m²) :

g) Type of core binding :

h) thickness of insulation :

43) Winding

a) Type of winding

i) HV :

ii) LV :

b) Current density at rated load

i) HV (A/mm²) :

ii) LV (A/mm²) :



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX10

REV. NO: 00

PAGE 15 OF 16

COPYRIGHT AND CONFIDENTIAL
 The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
 It must not be used directly or indirectly in anyway detrimental to the interest of the company.

c) Conductor area

i) HV (A/mm²) :ii) LV (A/mm²) :

d) Maximum current density under short circuit

i) HV (A/mm²) :ii) LV (A/mm²) :

44) Clearances: Shall be as per CBIP manual publication no. 295

a) Minimum clearance between phases HV LV

i) In oil (mm) :

ii) In air (mm) :

b) minimum clearance between Phase to Earth (mm): HV LV

c) Minimum clearance of HV winding to tank/enclosure (in oil, if applicable) (in mm) :

d) Minimum clearance of HV winding to earth (In oil, if applicable) (in mm) :

e) Clearance between core and coil (mm) :

f) Clearance between coils (mm) :

45) Tank/enclosure details

i) Side (mm) :

ii) Bottom (mm) :

iii) Cover (mm) :

46) Insulation levels

	HV	*LV	
	11 kV	Sec. wdg.1	Sec. wdg.2
i) Power Frequency			
ii) Lightning Impulse			



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX10

REV. NO: 00

PAGE 16 OF 16

47) Bushings

	HV	*LV	
	11 kV	Sec. wdg.1	Sec. wdg.2
i) Type			
ii) Rated Voltage			
iii) Lightning Impulse			
iv) Creepage distance (minimum 31mm/kV)			
v) Power Frequency			

* Secondary voltage levels of I/p & O/p Transformers to be decided by Supplier as per design standard.

48) Magnetic Oil Level Gauge :
(Dial type) Size

49) List of deviations (if any) enclosed : YES / NO
with offer. If no deviations please mention
the same here.

Output Transformer Additional Requirements:

- 1) Recommended electrical phase angle between all the secondary windings: 30 deg.C
- 2) Accuracy of the phase shift: <0.5
- 3) Operating Frequency: 0 to 50Hz
- 4) Maximum permissible coupling between the secondary windings: 10% (Standard requirement)
- 5) Maximum magnetizing DC current component 1% of the $I_{sec.}$, Trans. (Atleast 4A) (Standard Requirement)
- 6) Maximum Secondary current harmonics distortion: 25% of the rated (Standard Required)

Input Transformer Additional Requirements:

- 7) Recommended electrical phase angle between all the secondary windings: 30 deg.C
- 8) Accuracy of the phase shift: <0.5
- 9) Maximum permissible coupling between the secondary windings: 10% (Standard requirement)
- 10) Maximum magnetizing DC current component 1% of the $I_{sec.}$, Trans. (Atleast 4A) (Standard Requirement)
- 11) Maximum Secondary current harmonica distortion: 25% of the rated (Standard Required)



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX11

REV. NO: 00

PAGE 1 OF 12

Annexure-11: Specification of SFC Output Circuit Breakers

Scope of supply includes Output VCBs (OCB1 & OCB2) which are connected at the output of Static Frequency Converter (SFC) as shown in SLD of SFC System. VCB shall be sourced either directly from OEM or through their approved channel partner. Technical requirements of switchgear and the contractual binding clauses of Guarantee/ Warranty etc. which are part of tender, shall be complied by OEM or their approved channel partner, as applicable.

Design: HV switchboard shall be designed for minimum life duration of 20 years. Switchgear shall be suitable for indoor installation with typical dusty and humid atmosphere.

i. The switchgear and bus bar assemblies shall be rated to withstand the short-circuit fault current with peak make and RMS break values compliant with the standards.

Design shall ensure that proper selectivity is provided in case of electric fault, abnormal operation or mis-operation.

All components and equipment operation shall be consistent with these characteristics including:

- Dielectric strength
- Electrodynamic stresses
- Circuit breaker peak make, RMS break and DC offset capability

Cubicles shall be equipped with relays and circuits to comply with operation and/or process requirements.

ii. Switchgear cubicles shall be prefabricated cold rolled, sheet steel units/aluzinc, withdrawable type, free standing, and floor mounting, flush fronted construction. Appropriate base frames to provide a substantial foundation for switchgear installation, together with holding down bolts, nuts and washers, rails, etc. shall be included.

The thickness of sheet steel shall be as indicated below:

- For load bearing members – 2 mm
- For cable gland plates – 3 mm (min.)
- For others – 1.6mm

Access to breakers, control compartments, and control cable terminations shall be from the front, while rear access is required for power cable terminations.

iii. Also considering soft-starting of U#2,3&4 Motors, Switchgear and bus bars shall be arranged to permit future extension at either end. This is to include pre-drilled bus bars and a removable plate for bus extension. Panels at extreme ends shall have openings, which shall be covered with plates screwed to each panel.

However during assembly, the predrilled holes provided for bus bar extension shall be plugged with suitable bolts and nuts to fill voids. Details of drilled holes in bus bar and panel opening provided for future extension to be clearly shown in the manufacturer



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 2 OF 12

drawings.

iv. The service condition of the circuit breaker cubicles shall be LSC-2B. The switchgear shall be IAC type AFLR minimum, tested as per IS/IEC 62271-200 for internal arc up to the switchgear rated short-circuit current for duration of 0.1 sec. minimum. For the duration of 0.1 sec., gas-duct arrangement may not be required. In case it is necessitated, suitable absorbers shall be provided so that gases produced are not required to be expelled outside.

An internal arc detection system of optical type shall be installed either alone or in combination with a current relay. The arc detectors shall mandatorily be installed in Bus bar compartments and cable compartments. Detection shall sectionalize the bus bar and trip respective incomer.

v. The switchgear should have facility for LOTO in isolating position. LOTO arrangement shall include provision for the following:

- Provision for hooking lockout devices by multiple lock arrangement to prevent opening of panel door and racking in of circuit breaker.
- Provision for attaching tag-out device for warning against energization and to provide information regarding date of isolation, agency working on the equipment etc.
- Provision for hasp such that the same shall be put in and closed in the locking arrangement of the breaker/switch and panel door.

vi. Partitioning shall be PM class i.e. with metal shutters between live parts and open compartment.

Shutters shall be automatically and mechanically operated by the mobile part and cover the openings of the HV contacts when mobile unit is withdrawn, providing physical separation of energized parts. When the mobile unit is inserted, shutters shall be automatically raised to release the openings of the HV contacts. The same philosophy shall apply to withdrawable voltage transformers.

vii. Bus-bars shall be insulated by using heat-shrinkable PVC sleeves. The sleeves shall be rated to withstand the system line-to-line voltage for 1 minute. Effect of provision of sleeves shall be considered in sizing of bus bars. All bus bar joints/tap-off points shall be provided with removable FRP shrouds. 4 nos. non-hygroscopic phase barriers and shrouds shall be provided at uncovered portion of bus-bars. All breakers and cable compartment shall have phase barriers (4 nos. each).

viii. Switching devices shall preferably be of the Vacuum type. When vacuum technology is



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 3 OF 12

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

used, adequate protection such as surge arresters and/or high frequency filters shall have to be installed to cope for vacuum switching devices re-striking effects.

Switching devices shall be fitted in withdrawable trucks with the following positions:

- Inserted
- Withdrawn, in test(isolated) position,
- Removed for maintenance

Both cassette type and truck mounted breakers are acceptable. In case cassette type breakers are being offered, separate trolley shall be supplied along with panel.

Each circuit breaker shall clearly have display on the fascia of the switchgear for the positions.

ix. Circuit breakers shall be class E2 for electrical endurance. Mechanical endurance shall be as following:

- Class M1 mechanical endurance for distribution feeders/incomers,
- Class M2 mechanical endurance for motor feeder application.

Each breaker shall be equipped with an anti-pump operating mechanism. It shall be possible to open and close the breakers manually and to "slow close" the breaker for maintenance purposes.

An indicator shall be provided to show when the mechanism is charged. The mechanism shall automatically discharge when the breaker is withdrawn from the cubicle. Mechanical closing facilities shall be locked off in service position.

The closing mechanism of the circuit breaker shall be of motor wound (universal motor operable on AC or DC control supply), spring charged stored energy type with a provision of manual spring charging. Closing of circuit breakers shall be prevented unless the spring is fully charged.

The closing spring shall get automatically re-charged (for subsequent closing) soon after a closing shot and prior to breaker tripping. Also, closing operation shall be completed once the closing impulse is given and the first device in the control scheme has responded even though the control switch/push button is released, provided no counter trip impulse is present.

x. CTs in HT switchgear shall have class B insulation and shall have a partial discharge value of less than 20pC.

xi. In the case of separate earthing truck, suitable trolleys for bus side and cable side earthing shall be supplied. After withdrawing the circuit breaker, this can be inserted to facilitate earthing of cables and bus bars. Each earthing truck shall be complete with voltage transformer and voltmeter, giving audio-visual indication and solenoid interlock to prevent



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 4 OF 12

closing of earthing truck on live system.

xii. Control relays shall comply with IEC60947-5-1. Control relays shall operate correctly between 85% and 110% supply voltage, measured at the bus bars. Control relays shall remain energized without chatter at 75% supply voltage, measured at the bus bars. The dropout voltage shall not be lower than 10% supply voltage.

xiii. Auxiliary wiring shall be fire self-extinguishable, insulated with black PVC 1100V grade, flame retardant, copper cables with the following min. cross-sections:

- 1.5 sq.mm. for control circuit
- 2.5 sq.mm. for current, voltage and power circuits

Cross ferruling shall be used for easy identification and shall not take more than 02 no. loops for each circuit. Colour codes must be followed for Metering and Protection circuits.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX11

REV. NO: 00

PAGE 5 OF 12

A. Technical parameters

Sl. No.	Parameter	Specification
1	Rated / Max. continuous operating Voltage	11/12 kV
2	Rated Current	1250A
3a	Rated Short Time Current Rating	26.4kA RMS for 3 Second
3b	IAC Rating	Bidder to decide short-circuit rating considering time-duration of 0.1 sec.
4	Power frequency Withstand / Impulse Withstand voltage	28kV (rms) / 75kV peak
5	Type of Circuit Breaker	Air insulated type. Truck mounted withdrawable type with wheels. 3-pole version with individual vacuum interrupter for each phase. If cassette type VCBs are being offered, then breaker transport trolleys shall be supplied. 01 no. Earthing trolley is also required at both the bus side and cable side.
6	Closing/Opening Mechanism	Through spring charged electric motor mechanism; manual charging spring through crank handle to be provided as standby. Provision for closing and tripping circuit breaker from remote through contacts and from local by Trip-Neutral-Close (T-N-C) switch to be provided. Lockable Local/Remote Switch and Emergency Push Button shall be provided. Closing Coil, tripping coil and Spring Charging Motor are with 220V DC supply. Mechanism shall be trip free type. Anti-Pumping circuit/mechanism shall be incorporated. 1 no. 230V AC non-UPS supply shall be provided by Customer for Space Heater, etc. Customer shall provide common 220V DC supply and 230V AC supply feeders for the output breaker of both the SFC.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX11

REV. NO: 00

PAGE 6 OF 12

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

7	VCB Panel Construction	<ul style="list-style-type: none">❖ Continuous current rating of all bus bar links within a circuit breaker panel shall be at least equal to the in-panel rating of the installed circuit breaker, irrespective of the CT rating. <p>Bidder to provide bus bar calculation during detailed engineering.</p> <ul style="list-style-type: none">❖ Cutout to be given on door with toughened glass with beading to view breaker contacts from the outside.❖ A separate metering chamber with partitions shall be provided to house protective relays, meters, indicating lamps, switches, transducers etc.❖ Neoprene rubber gaskets will be used as seals on bolt-on covers, doors, cable gland plates and all other places wherever found necessary, to prevent leaks and ensure a tight seal.❖ Height of metal clad enclosure must be at least 2300 mm from the finished floor.❖ In cases where a Vacuum Circuit Breaker (VCB) truck needs to be pulled from a panel that is elevated above the finished floor level due to the panel's base frame, a suitable ramp should be provided with the panel to facilitate this process.
8	Class of Protection	<p>Degree of Protection of Circuit Breaker panels shall be IP42 (minimum) as per IEC:60529.</p> <p>The exposed parts inside the switchboard shall be IP20. All panels shall be vermin proof.</p>



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX11

REV. NO: 00

PAGE 7 OF 12

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

9	Termination Arrangement (O/p transformer to O/p VCB: 2 Runs/Phase of 11KV (UE) 1C x500sqmm Al conductor, XLPE insulated Armoured power Cable); Motor isolator to Generator/Motor : 2 Runs/Phase of 11KV (UE) 1C x500sqmm Al conductor , XLPE insulated Armoured power Cable)	All Incoming and Outgoing cable entries for Power and Control cables shall be from Bottom only. The power terminals shall be at least 600 mm from the cable gland plate to facilitate termination. Bidder to provide their proposed panel arrangement. For Power Cables and control cables, undrilled, detachable gland plates of sufficient size & thickness (3 mm minimum) Aluminium gland plate to be provided. Gland plate shall be of sufficient strength to handle all the cables. Double Compression type, Nickel plated brass cable glands (flameproof) to be supplied by the vendor for Incoming and Outgoing cables.
10	Cable Accessories	Cable Glands for all HT cable terminations are in bidder scope of supply and shall be supplied along with the VCB Panels.
11	Painting	2 Coats of Primer and 2 Coats of Finish Paint to be given for all surfaces of enclosure. Paint shall be Epoxy Based with Powder Coated Finish. Paint colour: RAL-7035 as per IS-5. Paint Thickness: 60 Microns (minimum).
12	Main Bus bars	Electrolytic grade tinned copper
13	Earth Bus bars (minimum size)	50*6mm Electrolytic Grade Tinned Copper. Facility for external earthing at 2 places to be provided.
14	Identification of Panel	a) An Identification Plate has to be fixed on the front and rear of the Panel. The rear side identification plate shall be fixed on the panel frame and not on removable covers. Inscription details will be SFC1 Output Breaker (OCB1) and SFC2 Output Breaker (OCB2). b) Cable Identification plates screwed at edge of cable gland plate indicating the source and destination of incoming and outgoing cables to be provided. Details will be provided during detailed engineering.
15	Routine & Type Tests	All routine tests shall be conducted and applicable type test reports (including Temp. rise test) of similar or higher rating VCB shall be submitted. Only type tested VCB panel to be offered for this project.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX11

REV. NO: 00

PAGE 8 OF 12

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

16	Features	<p>a) All hardware shall be corrosion-resistant. All joints and connections of the panel members shall be made by zinc-passivated or cadmium plated, high quality steel bolts, nuts and washers, secured against loosening.</p> <p>b) Facility for locking of VCB panel doors shall be provided.</p> <p>c) All components are to be of standard reputed make.</p> <p>d) Elmex type TBs CATDM4 to be provided to facilitate testing of CT circuits, allowing for the connection and disconnection of conductors without the need for complex wiring changes.</p> <p>e) Detachable type Operating Handle.</p> <p>f) Mechanical ON/OFF Position indicator on enclosure front and rear side.</p> <p>g) The breakers shall have minimum of 8 Normally Open (NO) and 8 normally closed (NC) spare auxiliary contacts for purchaser's use. If these are not available, auxiliary relays shall be used to multiply the auxiliary contacts of the breakers.</p> <p>h) Padlocking arrangement shall be provided for VCB panels.</p> <p>i) Breaker ON/OFF & breaker in-service indication shall be provided in the rear door.</p> <p>j) Provision shall be provided in the rear side so that rear door can't be opened when breaker is in service.</p> <p>k) Following shall be provided as accessories:</p> <p>i. Plugs and Sockets for low voltage wiring.</p> <p>ii. Manual Spring charging port with indicator.</p> <p>iii. Draw out Lever</p> <p>iv. Interlock Lever</p>
17	Quality Plan	<p>Vendor should submit ITP for BHEL / Customer approval.</p> <p>Approved Quality Plan / Requirements will have to be adhered to during design / manufacture / material procurement / testing and dispatch.</p>



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX11

REV. NO: 00

PAGE 9 OF 12

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

18	Safety Interlocks	<p>The following minimum safety interlocks are to be provided.</p> <ol style="list-style-type: none">The truck cannot be moved from either Test to Service position or vice versa, when Circuit Breaker is "ON".The Circuit Breaker cannot be switched "ON" when truck is in any position between Test and Service positions.The front part of the VCB shall have a locking facility.There shall be no approach to high voltage points when the front door is open and Circuit Breaker is in "SERVICE" position.There shall be no approach to high voltage points when the front door is open and Circuit Breaker is in "SERVICE" position.Safety interlock shall be provided for rear door such that when panel is energized, the door cannot be opened. <p>Any other safety interlocks as may be required shall be provided for safe operation and maintenance.</p>
19	Accessories	<p>a) Dual Core Resin Cast Current Transformer with bar primary. The bar primary shall be capable of carrying 26.4kA for 3 sec. during fault. Working Voltage: 12kV, Insulation Class: B Core 1: 15VA, Class 1.0 Metering, **/5A Core 2: 15VA, Class 5P20 Protection, **/5A (**Bidder to decide based on SFC output current)</p> <p>b) All CT connections to be taken through Elmex make TBs with links – Type CATDM4.</p> <p>c) 3 phase draw-out Cast Resin Potential Transformer with Fuses, Insulation Class: B.</p> <p>Vector Group to be selected based on bus PT vector group. Primary 12kV L-L RMS; Secondary 110V/V3 L-N RMS, Rating 50VA minimum.</p> <p>Fuses to be integral with PT. Accuracy Class 1.0. The LV neutral of PT needs to be insulated to withstand the full line voltage, not just the LV voltage, to ensure safety and prevent damage in the event of a fault. PT secondary R, Y, B, n connections to be brought out to external terminals for remote measurements.</p>



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX11

REV. NO: 00

PAGE 10 OF 12

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

19	Accessories	<p>d) Digital Ammeter (flush mounted). Input 0-1A fed from Core 1 of CTs above. Accuracy Class: 1.0, Item 1 →Scale 0-**A. Auxiliary Supply: 220V DC (**to be decided by bidder).</p> <p>e) Digital Voltmeter (flush mounted). Scale 0-12000V. Input 0-110V fed from PTs above. Accuracy Class: 0.5, Auxiliary Supply: 220V DC</p> <p>f) Ammeter Selector Switch (4 position).</p> <p>g) Voltmeter Selector Switch (4 position).</p> <p>h) High Speed Tripping Relay – VAJH23. Coil Voltage 220VDC. Flag– Hand Reset, Flush mounting withdrawable type.</p> <p>i) Trip Circuit Supervision Relay – VAX31, Contacts 1NO+2NC, 220V DC supply. 1NO+2NC Contacts to be wired to TBs for external signaling. Flush mounting withdrawable type.</p> <p>j) “Trip-Neutral-Close” Switch – 6 pole</p> <p>k) Each Circuit breaker will be provided with following indicating lamps: Indicating Lamp "ON" - Red, Indicating Lamp "OFF" - Green, Indicating Lamp “SPRING CHARGED” - Blue, Indicating Lamp – Phase Indication “R”, “Y”, “B” - Red, Yellow, Blue, Indicating Lamp “TRIP CKT HEALTHY” - White, Indicating Lamp “SPARE” - Amber</p> <p>Details of connection and wiring will be discussed and finalized during detailed engineering. All Indicating Lamps shall be of high intensity clustered LED type. The LED shall have a low glow voltage protection and shall not glow on voltage leakage.</p> <p>l) “Local-Remote” Switch – 8 pole lockable</p> <p>m) “Emergency Trip” –2NO+2NC</p> <p>n) Limit Switch for Door Interlock to be provided. Contacts to be wired to TBs.</p> <p>o) Auxiliary Contactor for contact multiplication and interlocking 4NO+4NC, 220V DC coil Interlocking Scheme to be finalized during detailed engineering</p> <p>p) Space Heater with thermostat, MCB for space heater. Rating: 230V AC (Reputed Make)</p>
----	-------------	---



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX11

REV. NO: 00

PAGE 11 OF 12

19	Accessories	q) Covered CFL illumination lamp with ON/OFF switch & MCB, Rating: 230V AC r) Switch socket unit for each panel s) Dual O/P transducer for 4-20 mA Current feedback to i) DCS; ii) Spare t) One set of accessories consisting 1 no. each of slow closing handle, spring charging handle & Wedge shaped platform, shall be supplied loose along with switchboard.
----	-------------	---

Note:

1. VCB manufacturer should decide VA rating of PT during detail engineering.
2. CTs and PTs shall be suitable for variable frequency operation.

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

R.NO. PS/445/3040/ANX11

REV. NO: 00

PAGE 12 OF 12

B. Bill of Material for Switchboard:

S.No	Item	SFC1 O/P (OCB1)	SFC2 O/P (OCB2)	Bus PT Section
1	12kV VCB	1	1	-
2	CT – **/5A – dual core (**to be decided by bidder if & as applicable)	3	3	-
3	Ammeter 0 - **A with ASS (**to be decided by bidder if & as applicable)	1	1	-
4	PT 12kV/110V/ $\sqrt{3}$ L-N with applicable Fuse(s) for Outgoing bus	-	-	1
5	Voltmeter 0-12000V with VSS	-	-	1
6	Indicating Lamps and Push Buttons (*)	1 Set	1 Set	-
7	High Speed Tripping Relay VAJH23	1	1	-
8	Trip Circuit Supervision Relay VAX31	1	1	-
9	Auxiliary Contactor 4NO+4NC (*)	8*	8*	-
10	T-N-C Switch – 6 Pole – ODS	1	1	-
11	Emergency Trip – 2NO+2NC	1	1	-
12	Limit Switch	1	1	-
13	Local-Remote Switch – 8 Pole	1	1	-
14	Space Heater	1	1	-
15	Surge Arrestors	1 set	1 set	-
16	Switch socket	1	1	-
17	Dual O/P transducer	1	1	-
18	Numerical Relay (O/C & E/F)	#	#	-
19	Breaker Earthing Truck	1 each at Cable side & Bus side		
20	Breaker Handling trolley (only for Cassette type Breaker and if applicable, bidder to quote as inclusive of Switchboard price)	1		

Note:

*, # - as per requirement. Bidder to consider the same as per logic requirement during detailed engineering stage, without any additional price implication to BHEL.

Only major relays, meters and controls are indicated in BOM. Any other auxiliary relays, timers, switches, contactors, indications etc. as required while implementing the control schematics or felt necessary for safe operation, even if they are not specifically defined/mentioned in purchase specification, shall have to be supplied by bidder without any additional time and cost implication to BHEL/end-user.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 1 OF 2

Annexure-12

Isolator (Off-load) for 11kV Soft-starter bus of U#1 pump

SFC bidder to supply Isolator Panel (Motorised) for connection at the 11kV soft-starter bus output and shall be suitable for variable frequency operation. Same is required for isolating the SFC starter bus (common for 04 pumps) post synchronisation.

The selection of Motorised Isolator Panel shall be governed by SFC manufacturer's operational requirements. Adequate provision shall be provided for closing from remote mode through contacts and from local mode by switch provided on panel door.

- a) Rated Voltage = 11 kV
- b) Rated Current = Shall be designed to carry 110% of SFC output breaker current. Isolator shall be suitable for overload requirements of the VFD.
- c) Rated short time current rating = 26.4kA for 3 Sec.
- d) Input and Output Termination shall be suitable for termination of HT Cable (2 Runs/Phase of 11kV (UE) 1C x500sqmm Al conductor, XLPE insulated Armoured power Cable).
- e) Cable entry shall be from bottom only.
- f) Aux. supply = 230 V AC UPS supply (to be derived from the VFD panel UPS supply)
- g) Sheet Steel thickness = 1.6mm for doors and covers and 2mm for load bearing members and instrument panel (if any).
- h) Degree of Protection = IP42
- i) Paint shade and thickness = RAL 7035;60 Microns (min)
- j) Busbars = Electrolytic grade Tinned Copper
- k) ON/OFF indications shall be provided on panel door. All indicators shall be LED type.
- l) All components shall be accessible from front side for easy maintenance.



A4 – 11

PURCHASE SPECIFICATION

GROUP: CE-Drives

P.S NO. : PS/445/3040

REV. NO: 00

PAGE 2 OF 2

COPYRIGHT AND CONFIDENTIAL
 The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
 It must not be used directly or indirectly in anyway detrimental to the interest of the company.

- m) Panel space heater shall be provided with Thermostat.
- n) Facility for padlocking of panel doors shall be provided.
- o) Provision shall be provided for manual closing of Isolator ensuring necessary interlocks.
- p) Safety interlocks shall be provided in the panel such that panel cannot be opened when current is flowing in this circuit.
- q) Supplier to provide auxiliary contacts (Normally Open/Normally Closed) as per operational logic.
- r) Emergency Stop Push Button shall be provided on the panel door and contacts of the same shall be used in the remote closing circuit.
- s) Isolator panel shall be sourced from the following Sources:
A. Bond Strand / Driescher Panicker / reputed make
- t) Following type test reports shall be submitted for the Isolator panels:
 - 1) Temperature Rise test
 - 2) Degree of Protection for Enclosure
 - 3) Dielectric tests (Lightning Impulse voltage and Dry Power frequency withstand test)
 - 4) Resistance Measurement of main circuit
 - 5) Short time withstand current and peak withstand current test
 - 6) Mechanical endurance test

Clarifications & Deviations:

SFC (including PLC), Transformer, VCB & Isolator	Confirmations/ Deviations to Specification	Point-wise confirmation to this specification to be given along with offer. Deviations, if any, shall be indicated separately. If there are no deviations to the specifications, supplier shall mention the same explicitly. A reply from vendor stating that "Equipment will generally meet the specifications" will not be accepted by BHEL. Clause-wise Confirmation / Clarifications of all clauses in the Purchase Specification shall be explicitly furnished in the format below. Deviations mentioned elsewhere will not be considered by BHEL.		
Page No.	Point No.	Confirmation / Clarification / Information / Deviation	Details	Remarks, if any

Note: A. No charges shall be applicable for witnessing of final tests. Customer will be present for witnessing of inspection at Indian manufacturers works.

B. No deviation is allowed in the design ambient temperature (40 deg.C)

C. Deviations furnished as per above format will ONLY be reviewed by BHEL. Deviation(s) mentioned elsewhere may not be reviewed and hence, does not stand valid.