

Project Engineering
Management

Bharat Heavy Electricals Limited

(A Govt. Of India Undertaking)



GLOBAL Tender Enquiry of GENERATOR CIRCUIT BREAKER as per Technical Specification No. PE-TS-412-510-E001 Rev00 for 2X660 MW ENNORE SEZ

ENQ. NO. PE/PG/EN1/E-5416/2016.

DATE: 28/12/2016

DUE DATE
19/01/2017
2:00 PM (IST)

Subject: GLOBAL Tender Enquiry of GENERATOR CIRCUIT BREAKER as per Technical Specification No. PE-TS-412-510-E001 Rev00 for 2X660 MW ENNORE SEZ

BHEL invites offer from reputed Vendors (Refer pre-qualifying requirements enclosed in the Tender Documents uploaded on our websites www.bhelpem.com, www.bhel.com & CPP portal (www.eprocure.gov.in)) for GENERATOR CIRCUIT BREAKER of 2X660 MW ENNORE SEZ. Detailed scope of work & equipment details shall be as per technical specification. PE-TS-412-510-E001 Rev00 & other details hosted on above indicated BHEL-websites.

Your offer shall be submitted in two parts strictly as per Clause-2.0 of the "Instructions to Bidders" of GCC, Rev. 06 in quintuplicate (5 sets), in sealed covers for the below mentioned equipment/system.

Item Description – GENERATOR CIRCUIT BREAKER	
Project	Technical Specification no.
2X660 MW ENNORE SEZ	PE-TS-412-510-E001 Rev00

Your best quotation/offer for the above requirement, in line with our terms and conditions (hosted on our website, as indicated above), should either be delivered in person or sent by COURIER/REGISTERED or SPEED POST, to the following address only:

Tender Room
Bharat Heavy Electricals Ltd.
Project Engineering Management
PPEI Building, HRD & ESI Complex,
Plot No. 25, Sector – 16A,
NOIDA – 201 301 (U.P.)

Attention: 1) Mr. AMIT MEENA, (PG-II-2, SR. ENGINEER)
2) Mr. ANUJ KUMAR, (SDGM/PG-II-2)

E-MAIL: amitmeena@bhelpem.co.in
Ph. No. 01204213613

It shall be the responsibility of the bidder to ensure that the tender is delivered on or before the due date by 2:00 PM (IST). The offer has to be deposited in tender box only. Part-I bids shall be opened at 3:00 PM (IST) on the due date in the presence of authorized representatives of the bidders, who may like to be present.

AMIT MEENA (PG-II-2, SR ENGINEER)
BHEL/PS-Project Engineering Management,
Power Project Engineering Institute,
Plot no. 25, Sector – 16A, Noida (UP) 201301, INDIA
(Ph. No.) 01204213613
(E-Mail.) amitmeena@bhelpem.co.in

Regd. Office
BHEL House Siri Fort
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Important Note to be considered by All Bidders:

The offers of the bidders who are on the banned list as also the offers of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL web site http://www.bhel.com/vender_registration/vender.php.

TERMS AND CONDITIONS:

1. Bidders are advised to go through the GCC Rev-06 (<http://bhelnem.com/Documents/GCC/GCC-Rev.06.pdf>) while submitting the offers.
2. **Bidders have to note that Integrity Pact is applicable for this tender. The Integrity pact shall be returned by the bidder along with their Techno-commercial Bid, duly filled & signed by the authorized signatory and will form part of the order. Only those vendors/bidders who enter into Integrity Pact with BHEL, would be qualified to participate in the bidding Process. (Refer Annexure-IX, as per GCC Rev-06).**
To oversee implementation of IP, Shri D.R.S Chaudhary, IAS (Retd.). has been appointed as IEM (Independent External Monitor) by BHEL.
3. **Pre-Qualifying Requirements:**
Bidders have to provide the required details as per TECHNICAL PRE-QUALIFICATION REQUIREMENT CRITERIA (enclosed as NIT Tender Documents) in their Techno-Commercial offer. Bids of only those bidders shall be evaluated who meet the Technical Pre-Qualifying requirements.
4. Bidders have to submit their offers in line with clause no. 2.0 of "Instructions to Bidders" of GCC Rev. 06.
5. Seller/ Contractor shall not dispatch any material before issue of MDCC by BHEL/ CUSTOMER. For details refer clause no. 15.0 of "General Commercial Terms & Conditions" of GCC Rev. 06.
6. Bidders have to note that TERMS AND CONDITIONS of the tender shall be as per Notice Inviting Tender (NIT) conditions, Special Conditions of Contract (SCC) of Project & General Conditions of Contracts (GCC, Rev. 06)

Order of precedence shall be as per clause NO. 35.0 of GCC Rev. 06 (GENERAL COMMERCIAL TERMS & CONDITIONS).
7. Bidders have to note that this is a conditional GLOBAL Tender enquiry. Price bid (Part-II) opening/RA participation of those bidders, who are not approved by end Customer, shall be subjected to approval of bidder by the customer. Same shall be taken up by BHEL with the customer based on the credentials/reference list being submitted by the bidder.
8. Bidders have to note that BHEL reserves the right to go for Reverse Auction (RA) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. For details refer clause no. 13.0 of "Instructions to Bidders" of GCC Rev. 06. Bidders to give their acceptance with the offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA.

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Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'Process compliance form' (to the designated service provider) as well as 'Online sealed bid' in the Reverse Auction. Non-submission of 'Process compliance form' or 'Online sealed bid' by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).

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

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

9. Delivery Schedule:

For Supply (including start-up, commissioning & O&M spares, Tools & Tackles): -

For Indian Bidders: 05 Months from approval of drawings/ documents in CAT I by BHEL/Customer.

For Foreign Bidders: 05 Months (FOB*) from approval of drawings/ documents in CAT I by BHEL/Customer.

Submission of all drg/docs, datasheets, QP etc. shall be within 03 weeks from the date of PO/LOI and every resubmission, if required, within 10 Days of receipt of comments incorporating all BHEL / Customer (TANGEDCO) comments. In case there are delays of submission of drg/doc beyond 21 days of PO/LOI and 10 days of comments, that much delay would be reduced from the delivery period.

Supervision of Erection, Testing & Commissioning: Service Engineer/ Supervisor shall be deployed by the bidder for supervision of Erection, testing & commissioning at project site within 30 Days of BHEL intimation. Start-up, commissioning & O&M spares, Tools & Tackles (if any) are to be delivered along with the last consignment of main supply within the contractual delivery period.

* Foreign bidder will have to quote on C&F (Cost & Freight) basis instead of FOB as per corporate material management circular no. 15 of 2015-16 ref. no. AA:MM:Logistics dtd. 14.09.2015 (refer pg. no 19-21).

10. CIF is available for the subject package

11. Prices shall remain firm.

12. Payment terms shall be as per GCC rev 06.

AMIT MEENA (PG-II-2, SR ENGINEER)

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Payment term for Training of Engineers shall be as follows:

"100% payment shall be released after completion of activity on BHEL / Customer (TANGEDCO) certification."

13. For Indigenous Supplies, Bidders have to quote freight charges in percentage of quoted Total Ex-works prices.
14. For Foreign Bidders, Insurance for evaluation purpose shall be @0.1% of quoted C&F price.
15. Evaluation will be done on overall L1 (Total cost to BHEL) basis with necessary loadings as applicable. Bidders have to refer SCC Rev 01 & GCC Rev 06.
16. Bidders to note that following forms the part of Tender Documents :
 - General Conditions of Contract (GCC) Rev. 06
 - Technical Specification No. . PE-TS-412-510-E001 Rev00
 - Price format
 - Special Conditions of Contract
 - Technical PQR, General PQR.
 - NIT CONDITIONS & other Enclosures

Bidders to note that offers shall be submitted strictly in accordance with the requirements of the above Tender Documents & all the above Tender Documents along with post-bid agreements/MoMs (during Techno-Commercial evaluation) shall automatically become the part of the Order/Contract after its finalisation.

17. Bidder has to note that Deviations from NIT are generally not acceptable. Deviations, if any, are to be listed out clearly, as per Annexure-II, of GCC Rev 06; in techno-commercial offer. Any deviation mentioned or shown separately or found hidden in offer, will not be taken cognizance of. In case of deviations from NIT, the bidder shall give the cost of withdrawal of such deviation in Sealed Cover as per Annexure-II, Deviation Sheet (Cost of Withdrawal), as per GCC Rev-06.
18. Foreign bidders quoting along with their Authorised Indian associates to comply with BHEL corporate circular AA:MM:AGENCY dated 06th August 2010 for the guidelines regarding dealings with Indian agents of Foreign bidders (as enclosed).
19. The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website <http://www.bhel.com> and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.
20. Online Registration Portal is operational in BHEL. Non-registered Vendors, who wish to apply may apply through Online Registration Portal available at www.bhelpem.com → vendor section → Online Supplier Registration. All credentials and/or documents duly signed and stamped related to registration has to be uploaded on the website and submit the application for registration. One set of hard copy of the filled-up SRF downloaded from Online Registration Portal duly signed and stamped has to be submitted'.

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21. All corrigenda, addenda, amendments, time extensions, clarifications, etc. to the tender will be hosted on BHEL website (www.bhel.com) & BHEL-PEM website (www.bhelpem.com) only. Bidders should regularly visit websites to keep themselves updated.
22. All correspondence thereof, shall be addressed to the undersigned by name & designation and sent at the following address :

AMIT MEENA ,(PG-II-2,SR.ENGINEER)
M/s. Bharat Heavy Electricals Ltd.,
Project Engineering Management,
Power Project Engineering Institute,
HRD & ESI Complex, Plot No 25,
Sector-16 A, Noida-201301,U.P.,INDIA
E-MAIL: amitmeena@bhelpem.co.in
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M/s. Bharat Heavy Electricals Ltd.,
Project Engineering Management,
Power Project Engineering Institute,
HRD & ESI Complex, Plot No 25,
Sector-16A,Noida-201301,U.P.,INDIA
E-MAIL: amitmeena@bhelpem.co.in
Ph. No. 0120-4368725

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

Thanking You.

Yours faithfully,
For and on behalf of BHEL


28/12/16

AMIT MEENA (PG-II-2, SR ENGINEER)

Enclosures:

1. Technical Specification No. . PE-TS-412-510-E001 Rev00
2. Price format/schedule (Prices should be quoted strictly in this format only).
3. Special Conditions of Contract
4. Technical PQR & General PQR.
5. SRF (<http://www.bhelpem.com/Vendor%20Corner.aspx>)
6. BHEL corporate circular AA:MM: AGENCY dated 06th August 2010
7. GCC REV 06 Available on www.bhelpem.com
8. Technical & Commercial deviations(Annex-II) as per GCC Rev. 06

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ANNEXURE-II: DEVIATION SHEET (COST OF WITHDRAWAL)



PROJECT:-

PACKAGE:-

TENDER ENQUIRY REFERENCE:-

NAME OF VENDOR:-

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

COMMERCIAL DEVIATIONS

PARTICULARS OF BIDDERS/ AUTHORISED REPRESENTATIVE

NAME	DESIGNATIONS	SIGN & DATE	

NOTES:

- For self manufactured items of bidder, cost of withdrawal of deviation will be applicable on the basic price (i.e. excluding taxes, duties & freight) only.
- For directly dispatchable items, cost of withdrawal of deviation will be applicable on the basic price including taxes, duties & freight.
- All the bidders have to list out all their Technical & Commercial Deviations (if any) in detail in the above format.
- Any deviation not mentioned above and shown separately or found hidden in offer, will not be taken cognizance of.
- Bidder shall submit duly filled unpriced copy of above format indicating "quoted" in "cost of withdrawal of deviation" column of the schedule above along with their Techno-commercial offer, wherever applicable.
- Bidder shall furnish price copy of above format along with price bid.
- The final decision of acceptance/ rejection of the deviations quoted by the bidder shall be at discretion of the Purchaser.
- Bidders to note that any deviation (technical/commercial) not listed in above and asked after Part-I opening shall not be considered.
- For deviations w.r.t. Payment terms, Liquidated damages, Firm prices and submission of E1/ E2 forms before claiming 10% payment, if a bidder chooses not to give any cost of withdrawal of deviation loading as per Annexure-VIII of GCC, Rev-06 will apply. For any other deviation mentioned in un-priced copy of this format submitted with Part-I bid but not mentioned in priced copy of this format submitted with Priced bid, the cost of withdrawal of deviation shall be taken as NIL.
- Any deviation mentioned in priced copy of this format, but not mentioned in the un-priced copy, shall not be accepted.
- All techno-commercial terms and conditions of NIT shall be deemed to have been accepted by the bidder, other than those listed in unpriced copy of this format.
- Cost of withdrawal is to be given separately for each deviation. In no event bidder should club cost of withdrawal of more than one deviation else cost of withdrawal of such deviations which have been clubbed together shall be considered as NIL.
- In case nature of cost of withdrawal (positive/negative) is not specified it shall be assumed as positive.
- In case of discrepancy in the nature of impact (positive/ negative), positive will be considered for evaluation and negative for ordering.

**Corporate Materials Management
BHEL New Delhi**

AA:MM:Agency
Dt. 06.08.2010

Guidelines regarding dealings with Indian Agents of Foreign Suppliers

1. BHEL shall deal directly with the foreign original equipment manufacturers (OEM)/ Foreign Principal, for all its purchases which are imported.
2. Wherever the foreign OEM/ principal desires to avail the services of an Indian Agent, the dealings with Indian Agents are to be regulated. The guidelines of BHEL in this regard have been drafted as per CVC circular no. 007/VGL/033 dated 04.12.2007.

Definition of Indian Agent

3. 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.

Recommendations

4. All NITs shall have the following terms regarding Indian agents of foreign principals:
 - 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.

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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.

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Annexure-B

This format is applicable only to Indian Suppliers/ Agents supplying indigenous portion of Foreign Purchases.

* In all other cases, extant guidelines of SEARP, 2010 are to be followed.

SEARP (SRF) Clause No	Detail
	Name & address of the firm
1.0	Products/ Systems / Services being considered for
2.0	General Information
2.2	Name of Chief Executive
2.3	Details of authorized signatory
3.0	Ownership Information
3.1	Type of firm
3.2	Nature of Business • <i>Attach authorization letter and agency agreement from Principal (from whom capital equipment is procured)</i> • <i>Attach copy of declaration from Foreign Principal for total guarantee/ warranty of indigenous supplies</i>
3.3	Year of establishment
3.4	Year of commencement of business
4.0	Registration particulars
4.1	Permanent Account No.
4.2 / 4.3	Sales Tax / TIN no
4.6	Service tax no. (in case of E&C)
5.0	Organisational strength
6.0	Other particulars
6.1	If the company is already registered with other units
6.2	Directors/ Partners, if related to any BHEL Employee
6.9	If any Ex BHEL Personnel employed by the Company
6.12	Details of pending legal issues with BHEL
6.13	Bank Account information
9.0	Financial information
9.6	Sales/ Turnover details of last 3 years (or from the date of incorporation whichever is less)

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BHEL FRAUD PREVENTION POLICY

1.0 Introduction

BHEL, a public sector enterprise, is an integrated power plant equipment manufacturer and one of largest engineering and manufacturing company in India engaged in design, engineering, manufacturing, construction, testing, commissioning and servicing of a wide range of products and services for core sectors of the economy viz. Power, Transmission, Industry, Transportation, Renewable energy, Oil & Gas and Defense.

All organizations are subject to risks of fraud. Frauds negatively impact the reputation and brand value of organization. Vigilant handling of fraud cases within organisation sends clear signals to the public, stakeholders and regulators about the management attitude towards fraud risks and organisation's fraud risk tolerance.

All levels of management, staff, internal and external auditors have responsibility for dealing with fraud risk.

Section 143(3) (i) of the Company Act, 2013 requires auditors to report about the adequacy of internal Financial controls in the Company and the operating effectiveness of such controls. Further, as per General Direction issued by C&AG vide circular No. 294/CA-II/Cord/A/cs instructions/30-2008 dated 22.04.2010, auditors are required to comment on Risk of Frauds in their reports.

BHEL has already put in place various policies, systems and procedures to guide employees for undertaking various transactions within and outside organisation to conduct the same in a transparent & uniform manner e.g. Purchase Policy, Works Policy along with Delegation of Powers (DOP), HR Policy, Conduct, Discipline and Appeal Rules for employees, Standing Orders etc. Keeping in view the BHEL approach in following Corporate Governance principles proactively, it is appropriate that a Fraud Prevention Policy is formulated and implemented

2.0 Policy Objectives

2.1 Objective of the Policy is to provide a system for detection, prevention and reporting of a fraud detected or suspected; and handling of such matters pertaining to fraud.

2.2 The Policy is expected to ensure and provide for the following:

2.2.1 To ensure that management is aware of its responsibilities for detection and prevention of fraud and for establishing procedures for preventing fraud and/or detecting fraud when it occurs.

BHEL FRAUD PREVENTION POLICY

2.2.2 To provide a clear guidance to employees and others dealing with BHEL forbidding them from involvement in any fraudulent activity and the action to be taken by them where they suspect any fraudulent activity;

2.2.3 To conduct investigations into fraudulent or suspected fraudulent activities; and

2.2.4 To provide assurance that any and all suspected fraudulent activity/ activities will be fully investigated.

2.2.5 To provide training on fraud prevention and identification.

3.0 Scope of Policy

The policy applies to fraud or suspected fraud in connection with business transactions with BHEL committed by employees, ex-employees working as advisors/ consultants, persons engaged on adhoc / temporary/ contract basis, vendors, suppliers, contractors, customers, lenders, consultants, service providers, any outside agencies or their employees/ representatives, or any other parties.

4.0 What is Fraud?

4.1 Fraud is any intentional act or omission designed to deceive others, resulting in the victim suffering a loss and/or perpetrator achieving a gain.

4.2 As per Section.447(1) of The Companies Act, 2013 Fraud is defined as follows:

- **"fraud"** in relation to affairs of a company or anybody corporate, includes (a) any act, (b) omission, (c) concealment of any fact or (d) abuse of position committed by any person or any other person with the connivance in any manner -
 - with intent to deceive,
 - to gain undue advantage from, or
 - to injure the interests of the company or its shareholders or its creditors or any other person, whether or not there is any wrongful gain or wrongful loss
- **"Wrongful gain"** means the gain by unlawful means of property to which the person gaining is not legally entitled.
- **"Wrongful loss"** means the loss by unlawful means of property to which the person losing is legally entitled.

BHEL FRAUD PREVENTION POLICY

5.0 Actions Constituting Fraud

5.1 While fraudulent or suspected fraudulent activity could have a very wide range of coverage, the following are some of the act(s) which constitute fraud.

5.2 The list given below is only illustrative and not exhaustive:-

5.2.1 Forgery or unauthorised alteration of any document or account belonging to the Company

5.2.2 Forgery or unauthorised alteration of cheque, bank draft, E-banking transaction(s) or any other financial instrument etc.

5.2.3 Misappropriation of funds, securities, supplies or others assets by fraudulent means etc.

5.2.4 Falsification of records, submitting fake claims or claims with altered documents / supporting, removing the documents from the files and / or replacing it by a fraudulent one etc.

5.2.5 Wilful suppression of facts/deception in matters of appointment, placements, submission of reports, tender committee recommendations etc. as a result of which a wrongful gain(s) is/are made to one and wrongful loss(s) to the others.

5.2.6 Utilizing Company funds / assets for personal or other than official purposes.

5.2.7 Verification and authorization / certification of bills for payment (goods / services) without completion of supply / completion of works as per Purchase Order / Work Order.

5.2.8 Destruction, disposition, removal of records or any other assets of the Company with an ulterior motive to manipulate and misrepresent the facts so as to create suspicion/suppression/cheating as a result of which objective assessment/decision would not be arrived at.

5.2.9 Wilful delay in reporting recoveries / adjustments from suppliers / vendors bills.

5.2.10 Allowing / unauthorized use of Company assets by outsiders like vendors / suppliers / sub-contractors.

5.2.11 Any other act that falls under the gamut of fraudulent activity.

BHEL FRAUD PREVENTION POLICY

6.0 Responsibility for Fraud Prevention

6.1 Following personnel's are responsible to ensure that there is no fraudulent act committed by them while performing any business transaction(s) with BHEL:

- Every employee
- Ex-employee working as advisor / consultant
- Person engaged on adhoc/temporary/contract basis
- Vendor / supplier / contractor / bidder / service provider
- Customer / Consultant
- Lender
- Any outside agency / their representative / employee who have a business relationship with BHEL

6.2 As soon as it is learnt that a fraud or suspected fraud has taken or is likely to take place, same should immediately be reported to Nodal officer

7.0 Nodal Officers and their Responsibility

7.1 Nodal Officer

Nodal officers shall be notified by management. All Direct Reporting Officers (DROs) to Unit Head / Construction Managers to be designated as Nodal Officers. List of Nodal Officer(s) would be displayed at BHEL web site / Intranet.

7.2 Fraud Prevention and Detection

All Nodal Officers shall be responsible for implementing the Fraud Prevention Policy of the Company and prevention and detection of fraud as per this Policy. It is the responsibility of all Nodal Officers to ensure that complete mechanism in respect of Fraud Prevention Policy is in place within his administrative / functional area of control.

7.2.1 Fraud Prevention

7.2.1.1 Create an ethical and transparent environment by training and implementing policies, guidelines and procedures.

7.2.1.2 Familiarise each employee with the types of improprieties that might occur in their area.

7.2.1.3 Educate employees regarding the measures to be taken for prevention and detection of fraud.

BHEL FRAUD PREVENTION POLICY

7.2.1.4 Create a culture whereby employees are encouraged to report any fraud or suspected fraud which comes to their knowledge, without any fear of victimization.

7.2.1.5 Promote awareness among the employees of ethical principles subscribed to by the Company through CDA Rules/Standing orders.

7.2.1.6 Maintain record of complaints/cases received and submit annual report to Nodal Officer in Corporate Finance.

7.2.2 Fraud Detection

Ensure that along with preventive controls, Detective mechanism are also in place. Some examples of detective mechanism are segregation of duties, reconciliation, audits, independent reviews, physical inspection, periodic inventory check, surprise checks etc.

8.0 Reporting of Fraud

8.1 All employees of BHEL, representative of vendors, suppliers, contractors, consultants, service providers or any other agencies doing any type of business with BHEL as soon as he / she comes to know of any fraud or suspected fraud or any other fraudulent activity must report such incident. Such reporting shall be made to the designated Nodal Officers.

The reporting of the fraud normally should be in writing. In case the reporter is not willing to furnish a written statement of fraud but is in position to give sequential and specific transaction of fraud / suspected fraud, then the officer receiving the information/Nodal Officer should record such details in writing as narrated by the reporter and also maintain the details about the identity of the official/ employee / other person reporting such incident.

In case the reporter ask for protection, the protection available under Clause 5.0 of Whistle Blower Policy of Company notified vide Corporate HR Circular no. 024/LLX/2014 dated 16.09.2014 shall be extended to the reporter.

8.2 All reports of fraud or suspected fraud shall be handled with utmost speed and shall be coordinated by Nodal Officers

8.3 Officer receiving input about any suspected fraud / Nodal officers shall ensure that all relevant records, documents and other evidence are immediately taken into custody and protected from being tampered with, destroyed or removed by suspected perpetrators of fraud or by any other official under his influence.

BHEL FRAUD PREVENTION POLICY

9.0 Investigating Procedure

9.1 The "Nodal Officer" shall act as co-ordinator and refer the details of the fraud/suspected fraud to Unit head for intimating the same to the concerned Director. The Director after considering report of Nodal Office / Unit head may refer the case to Internal Auditor (IA) or Corporate Vigilance for further investigation.

9.2 This input would be in addition to the intelligence, information and investigation of cases of fraud being investigated by the Vigilance Deptt. on their own as part of their day to day functioning.

9.3 After completion of the investigation, appropriate action which could include administrative action, disciplinary action, civil or criminal action or closure of the matter if it is proved that fraud is not committed etc. depending upon the outcome of the investigation shall be undertaken.

9.4 Vigilance Department or IA shall report to concerned Director the result of the investigation undertaken by them to seek orders for further action.

10.0 Incorporation of Fraud Prevention Policy in Tenders /MOUs etc.

10.1 A clause may be added in all the NITs that

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

10.2 Fraud Prevention policy and List of Nodal Officers shall be hosted on BHEL web site, vendor portals of Units/ Regions intranet.

11.0 Administration and Review of the Policy

The Chairman and Managing Director, BHEL shall be the Appropriate Authority for administration and revision of this Policy.

**CORPORATE MATERIALS MANAGEMENT
BHEL NEW DELHI**

No. AA:MM:Logistics

Dated: 14.09.2015

(Circular No. 15 of 2015-16)

Sub: Decentralisation of shipping arrangements in respect of ocean transportation of cargoes under the control of Government/ Public sector undertaking reg.

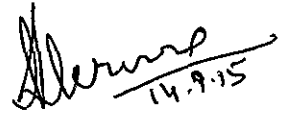
Pl. find attached the Office memorandum no SC-18013/1/2013-ASO-I dated 08.09.15 issued by Ministry of Shipping regarding decentralising of shipping arrangements in respect of ocean transportation of cargoes.

Accordingly, Units/ Regions are advised to import all items on C&F/CIF basis for which there is no need of obtaining NOC from the Ministry of Shipping/ TRANSCART.

Imports on FOB/FAS basis can only be on exception basis which shall be governed vide Ministry of Shipping OM no. SC-11011/1/94-ASO. II/ Vol. III dated 27th Feb, 1996 and OM no. SC-11021/3/99-ASO-I Vol. III dated 15th November, 2001 (copies attached) and in consultation with respective ROD.

This should be followed for all new tender enquiries. The existing contracts shall be dealt as per the prevalent practice in coordination with ROD Mumbai/ Chennai. For the enquiries under process and price bids not opened, units/ regions may look into the feasibility of changing the tender conditions (i.e. From FOB/FAS basis to C&F/CIF basis).

This issues with the approval of competent authority.


(N.K. Verma)
AGM/ MM

Encl.: as above

Distribution:

- All MM Heads of Units/ Regions
- All Heads of Units/ Regions
- GM(I)- ROD
- Corporate MM page on Corporate Office Intranet - <http://intranet.bhel.in>
- Director – Power/ Finance/ HR/ IS&P/ E, R&D IFor kind information pls
- SA to CMD

Shipping by title NOT by name
Telegram: "TRANSPORT"

नई दिल्ली-110001/ New Delhi-110001

No. SC-18013/1/2013-ASO-I

Dated: 6 September, 2015.

OFFICE MEMORANDUM

Subject: Decentralisation of shipping arrangements in respect of ocean transportation of cargoes under the control of Government/Public Sector Undertaking.

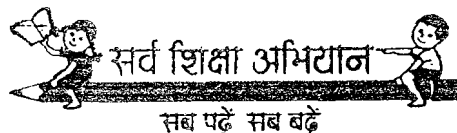
The undersigned is directed to say that as per the existing policy of the Government of India, all import contracts are to be finalized on FOB (Free on Board)/FAS (Free Alongside Ship) basis in respect of Government owned/controlled cargoes on behalf of Central Government Departments/State Government Departments and Public Sector Undertakings under them and in case of any departure therefrom, prior permission is required to be obtained from the Chartering Wing of the Ministry of Shipping on a case-to-case basis.

2. Based on the growing demand of various Government Departments/PSUs to allow them to organize their own shipping arrangements so as to take quick decisions in efficiently managing their cargo supply and logistics chain operations, it has now been decided by the Government that :

(a) All importing Government Departments/PSUs will make their own shipping arrangements without needing to route their requirements through Chartering Wing of Ministry of Shipping subject to the following:

(i) the import of bulk cargoes, both dry and liquid, will continue to be made on FOB/FAS basis by importing Government Departments/PSUs and shall remain subject to extant Government policy notified vide this Ministry's OM No. SC-11011/1/1994-ASO-II/Vol.III dated 27th February, 1996 (Annexure-I) and OM No. SC-11021/3/1999-ASO-I/Vol. III dated 15th November, 2001 (Annexure-II) and that in case of any departure therefrom, prior permission and No Objection Certificate will have to be obtained from the Ministry of Shipping on a case-to-case basis with the approval of the concerned administrative Ministry/Department.

Contd...../



(ii) the import of general liner cargoes (project cargoes, heavy lift, container, break bulk cargoes etc.) can now be made by Government Departments/PSUs on FOB (Free on Board)/FAS (Free Alongside Ship) or C&F (Cost & Freight)/CIF (Cost, Insurance & Freight) basis which shall otherwise remain subject to extant Government policy notified vide this Ministry's OM No. SC-11011/1/1994-ASO-II/Vol. III dated 27th February, 1996 (Annexure-I) and OM No. SC-11021/3/1999-ASO-I Vol. III dated 15th November, 2001 (Annexure-II). In case of C&F/CIF import, there is no need of obtaining NOC from the Ministry of Shipping.

3. Until the various Government Departments/PSUs organize their own chartering arrangements, the services of the Chartering Wing of the Ministry of Shipping will remain available during the transition period only until 31.12.2015.

4. It is requested that the above decision taken by the Government of India may kindly be brought to the notice of all the Public Sector Undertakings/projects/autonomous bodies/purchasing and selling organizations under the administrative control of Ministries and Departments concerned. Government Departments/PSUs may utilize the services of the Chartering Wing of the Ministry of Shipping till 31st December, 2015, if required.

5. A copy of the instructions issued may please be endorsed to this Ministry.

6. Hindi version is also enclosed.



(Barun Mitra)

Joint Secretary to the Government of India

Tele. No. +91-11-23356712

To,

- (1) All Ministries/Departments of Government of India.
- (2) The Chief Secretary to all the State Governments including the Union Territories.

1. The Directorate General of Shipping, 9th Floor Beta Building, 1 Think Techno Campus, Kanjurmarg (East), Mumbai – 400042.
2. Chairman, Mumbai Port Trust.
3. Chairman, Kolkata port Trust.
4. Chairman, Chennai Port Trust.
5. Chairman, Visakhapatnam Port Trust.
6. Chairman, Cochin Port Trust.
7. Chairman, Kandla Port Trust.
8. Chairman, Mormugao Port Trust.
9. Chairman, Paradip Port Trust.
10. Chairman Tuticorin Port Trust.
11. Chairman, New Mangalore Port Trust.
12. Chairman, Jawaharlal Nehru Port Trust.
13. The Chairman cum Managing Director, Kamarjar Port Ltd., 23, Raja Salai, Chennai-1.
14. The Managing Director, Central inland Water Transport Corporation Ltd., 4, Fairlie Place, Kolkata-700001.
15. The Chairman & Managing Director, Cochin Shipyard Ltd., Cochin.
16. The Chairman, Dredging Corporation of India Ltd. LTC Building, Visakhapatnam-530004.
17. The Directorate General of Lighthouses & Lightships, A-13, Sector-24, Noida-20131 (UP).
18. The Chairman & Managing Director, Inland Water Authority, NOIDA, Ghaziabad, U.P.
19. The Chairman-cum-Managing Director, Shipping Corporation of India, Shipping House, 245, Madame Cama Road, Mumbai.
20. The President INSA, Mumbai.

contd...../

- 21 Reserve Bank of India, Foreign Exchange Control Department,
RBI Building, Fort, Mumbai.
- 22 Ports Wing (05 copies)
- 23 Shipping Wing (05 copies)



(Barun Mitra)

Joint Secretary to the Government of India
Tele. No. : +91-11-2335 6712

Copy also forwarded to :

1. Cabinet Secretariat, Rashtrapati Bhawan, New Delhi.
2. Principal Director Audit, IP Estate, New Delhi.
3. C&AG, New Delhi

सं. एससी-18013/1/2013-एसओ-1

दिनांक 08 सितंबर, 2015

कार्यालय ज्ञापन

विषय: सरकारी/सार्वजनिक क्षेत्र के उपक्रमों के नियंत्रण में कार्गो के समुद्री परिवहन के संबंध में नौवहन व्यवस्थाओं का विकेंद्रीकरण।

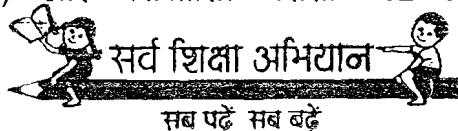
अधोहस्ताक्षरी को यह कहने का निदेश हुआ है कि भारत सरकार की मौजूदा नीति के अनुसार केंद्र सरकारी विभागों/ राज्य सरकारी विभागों और सार्वजनिक क्षेत्र के उपक्रमों के अंतर्गत और उनकी ओर से सरकार के अपने /नियंत्रित कार्गो के संबंध में सभी आयात संविदाओं को एफओबी (फ्री ऑन बोर्ड)। एफएस (फ्री अलांगसाइड शिप) आधार पर अंतिम रूप दिया जाना है और उनसे किसी प्रस्थान के मामले में मामला दर मामला आधार पर पोत परिवहन मंत्रालय के चार्टरिंग स्कंध से पूर्व अनुमति प्राप्त की जानी अपेक्षित है।

2. विभिन्न सरकारी विभागों/ सार्वजनिक क्षेत्र के उपक्रमों की बढ़ती हुई मांग के आधार पर उनके कार्गो आपूर्ति और लॉजिस्टिक चेन प्रचालनों के कुशल प्रबंधन के लिए त्वरित निर्णय लेने के लिए उन्हें अपनी नौवहन व्यवस्थाएं किए जाने की अनुमति देने के लिए सरकार द्वारा यह निर्णय लिया गया है वह हैं कि:

(क) सभी आयात करने वाले सरकारी विभागों/ पीएसयू पोत परिवहन मंत्रालय के चार्टरिंग स्कंध के माध्यम से अपनी अपेक्षाओं को रूट न करने की आवश्यकता के बिना स्वयं अपनी नौवहन व्यवस्थाएं करेंगे बशर्ते उनके पास निम्नलिखित हों :

I. आयात करने वाले सरकारी विभागों/ पीएसयू द्वारा बल्क कार्गो, दोनों शुष्क एवं लिक्विड का आयात एफओबी/एफएस आधार पर जारी रहेगा और इस मंत्रालय के का.जा.सं. एससी-11011/1/1994-एसओ-11 को खण्ड-111 दिनांक 27.2.1996 (अनुबंध-1) और का.जा.सं.-एससी-11021/3/1999-एसओ-11 खण्ड-111 दिनांक 15.11.2001 (अनुबंध-11) द्वारा अधिसूचित की गई मौजूदा सरकारी नीति के अधीन रहेगा और उनसे किए गए किसी प्रस्थान के मामले में संबंधित प्रशासनिक मंत्रालय/ विभाग के अनुमोदन से मामला-दर-मामला आधार पर पोत परिवहन मंत्रालय से पूर्व अनुमति और अनापत्ति प्रमाण पत्र लिया जाना होगा।

II. सरकारी विभागों पीएसयू जनरल लाइनर कार्गो (परियोजना कार्गो, हैवी लिफ्ट, कंटेनर, ब्रेक बल्क कार्गो इत्यादि) का आयात एफओबी (फ्री ऑन बोर्ड)/ एफएस (फ्री अलांग साइड शिप) अथवा सी एंड एफ (कास्ट एंड फ्रेट/ सीआईएफ (कास्ट, इंश्योरेंस एंड फ्रेट) आधार पर कर सकते हैं जो अन्यथा इस मंत्रालय के का.जा.सं. एससी-11011/1/1994-एसओ-11/खण्ड-111 दिनांक 27.2.1996 अनुबंध (1) और का.जा.सं. एससी-11021/3/1999-एसओ-11 खण्ड-111 दिनांक



कार्य को प्रभावित नहीं है।

3. जब तक विभिन्न सरकारी विभाग/पीएसयू अपनी चार्टरिंग व्यवस्थाएं नहीं करते हैं तब तक पोत परिवहन मंत्रालय के चार्टरिंग स्कंध की सेवाएं 31.12.2015 तक केवल पारवहन अवधि के दौरान उपलब्ध रहेगी।
4. अतः यह अनुरोध किया जाता है कि सरकार द्वारा लिए गए उपर्युक्त निर्णय को मंत्रालय और विभागों के प्रशासनिक नियंत्रणाधीन/ सार्वजनिक क्षेत्र के उपक्रमों/परियोजनाओं/स्वायत्त निकायों/खरीदने तथा बेचने वाले संगठनों के ध्यान में लाया जाए। सरकारी विभाग/ पीएसयू पोत परिवहन मंत्रालय के चार्टरिंग स्कंध की सेवाएं 31 दिसंबर, 2015 तक ले सकते हैं, यदि अपेक्षित हो।
5. जारी किए गए अनुदेशों की एक प्रति इस मंत्रालय को कृपया अग्रेषित की जाए।

वरुण मित्रा

(वरुण मित्रा)

संयुक्त सचिव, भारत सरकार

दूरभाष +91-11-23356712

सेवा में,

1. भारत सरकार के सभी मंत्रालय / विभाग
2. संघ शासित क्षेत्रों सहित सभी राज्य सरकारों के प्रधान सचिव

2. अध्यक्ष, मुंबई पत्तन न्यास
3. अध्यक्ष, कोलकाता पत्तन न्यास
4. अध्यक्ष, चैन्नई पत्तन न्यास
5. अध्यक्ष, विशाखापट्टणम पत्तन न्यास
6. अध्यक्ष, कोचीन पत्तन न्यास
7. अध्यक्ष, कंडला पत्तन न्यास
8. अध्यक्ष, मुरगांव पत्तन न्यास
9. अध्यक्ष, पारादीप पत्तन न्यास
10. अध्यक्ष, तूतीकोरिन पत्तन न्यास
11. अध्यक्ष, नव मंगलूर पत्तन न्यास
12. अध्यक्ष, जवाहरलाल नेहरू पत्तन न्यास
13. अध्यक्ष एवं प्रबंध निदेशक, कामराजार पत्तन लिमिटेड, 23, राजा सलाई, चैन्नई-1
14. प्रबंध निदेशक, केन्द्रीय अंतर्देशीय जलमार्ग परिवहन निगम लिमिटेड - 4 फेयरली प्लेस कोलकाता - 700001
15. अध्यक्ष एवं प्रबंध निदेशक, कोचीन शिपयार्ड लिमिटेड, कोचीन
16. अध्यक्ष, ट्रेजिंग कॉर्पोरेशन ऑफ इंडिया लिमिटेड, एलटीसी बिल्डिंग, विशाखापट्टणम - 530004
17. दीप पोत एवं दीपस्तंभ महानिदेशालय, ए-13, सेक्टर - 24, नोएडा-201301 (उत्तर प्रदेश)
18. अध्यक्ष एवं प्रबंध निदेशक, अंतर्देशीय जलमार्ग प्राधिकरण, नोएडा, गाजियाबाद, उत्तर प्रदेश
19. अध्यक्ष एवं प्रबंध निदेशक, भारतीय नौवहन निगम लिमिटेड, शिपिंग हाउस -245, मैडम कामा रोड, मुंबई।
20. अध्यक्ष, आईएनएसए, मुंबई ।
21. रिजर्व बैंक ऑफ इंडिया, फौरन एक्सचेंज कन्ट्रोल डिपार्टमेंट, आर बी आई बिल्डिंग, फोर्ट, मुंबई ।
22. पत्तन स्कंध (5 प्रतियां)
23. नौवहन स्कंध (5 प्रतियां)

(बरुण मित्रा)

(बरुण मित्रा)

संयुक्त सचिव, भारत सरकार,

दूरभाष - +91-11-23356712

प्रति अग्रेषित

1. मंत्रिमंडल सचिवालय, राष्ट्रपति भवन, नई दिल्ली ।
2. प्रधान निदेशक, लेखापरीक्षा, आई पी एस्टेट, नई दिल्ली ।
3. सी एण्ड एजी, नई दिल्ली ।

SECRET

File No. SC-18013/1/2013-ASO-1

Ministry of Shipping

Annexure-I

TELEGRAM: TRANSCHART
FLEX: VAHAN IN 31-61157/
31-61158/31-61159
AX: 3718614
TELEPHONE: 3710356/3710039/
3718390/3719480

Government of India
Ministry of Surface Transport
(Chartering Wing)

SC-11011/1/94-ASO.II/Vol.III New Delhi, the 27th February, 1996

OFFICE MEMORANDUM

Subject: Ocean transportation of cargo under the control of Government/Public Sector Undertakings - review of the policy regarding.

...

The undersigned is directed to say that as per the existing policy of Government of India all import contracts are to be finalised on FOB (Free on Board/FAS (Free Alongside Ship) basis and those for exports on C&F (Cost and Freight)/CIF (Cost, Insurance, Freight) basis in respect of Government owned/controlled cargoes on behalf of Central Government Departments/State Government Departments and Public Sector Undertakings under them and in case of any departure therefrom, prior permission is required to be obtained from the Chartering Wing of the Ministry of Surface Transport on a case to case basis. The shipping arrangements are centralised in the Ministry of Surface Transport. These instructions about FOB/FAS purchases and C&F/CIF sales and entering into contracts where the element of foreign exchange expenditure is minimum already stand incorporated in the General Financial Rules of the Government.

2. Based on the difficulties/problems, as intimated by certain Government Departments/Public Sector Undertakings in the changed context of economic liberalisation, the thrust on performance improvement and competitiveness of Public Sector Undertakings, decanalisation of certain cargoes, Government has undertaken a through review of the above policy at various levels and it has now been decided by the Government that:-

- (i) Government policy for import contracts to be finalised on FOB/FAS basis and for exports on CIF basis in respect of Government owned/controlled cargoes on behalf of Central Government Departments/State Government Departments and Public Sector Undertakings under them and centralised shipping arrangements through the Ministry of Surface Transport (Chartering Wing) in

association with the concerned Ministry/Department/PSU may continue.

- (ii) Prior permission is required to be obtained from Ministry of Surface Transport on a case to case basis in case of any departure from the above policy. However, Ministry of Surface Transport shall ensure disposal of such requests within four working days on receipt of the complete information/request from the concerned Ministry/PSU.
- (iii) Ministry of Surface Transport, Chartering Wing (to ensure full utilisation of suitable Indian vessels in case they are able to meet the indenter's requirements at competitive rates and are able to maintain the time schedule.
- (iv) In case of import of bulk quantities like fertilisers, coal, foodgrains etc. where freight element is substantial, a representative from Ministry of Surface Transport may be invited to participate in the discussions for advising on the shipping aspects of import/export contracts.
- (v) Ministry of Surface Transport should make all out efforts to finalise vessels, Indian or foreign, at the most competitive rates and before fixing the vessels, prior approval of the indenting department/PSU should be obtained.
- (vi) In order to make imports and exports cost-effective and for judicious use of foreign exchange, Ministries/Departments should ensure imports on FOB/FA8 and exports on CIF basis failing which necessary No Objection Certificate (NOC) should be obtained from Ministry of Surface Transport (Chartering Wing), while applying for release of necessary foreign exchange for the purpose of chartering foreign vessels and for making freight payment in foreign currency.
- (vii) The tendering system to be followed by Ministries/Departments/PSUs will be standardised. The Cabinet secretariat will initiate appropriate action in this regard.

3. It is requested that above decision taken by the Government of India may kindly be brought to the notice of all the Public Sector Undertakings/Projects/Autonomous Bodies/Purchasing & Selling Organisations under the administrative control of Ministries and Departments concerned and they may be advised to follow the prescribed procedure for arranging shipment of their cargoes through Chartering Wing (popularly known by its Cable Address "TRANSHART" in the shipping circle, the world over) of this Ministry and incorporating the prescribed Shipping Clauses in the purchase orders/contracts. They may also be instructed to

and two copies each of the contracts in respect of both exports as well as imports, alongwith cargo particulars like weight, volume, loading port, discharging port, loading rate, discharging rate, period of shipment, parcel size and any other specific condition relating to shipment of cargoes etc. to this Ministry as soon as the same are finalised, for taking further necessary action with regard to the shipping arrangements.

4. A copy of the instructions issued may please also be endorsed of this Ministry.

(T.V. SHANBHAG)
(T.V. SHANBHAG)

Chief Controller of Chartering

To:-

- (1) All Ministries/Departments of Government of India 2 copies
- (2) The Chief Secretary to all the State Governments including the Union Territories.

Copy forwarded for information and necessary action to:-

1. The Directorate General of Shipping, Jahaz Bhavan, Walchand Hirachand Marg, Fort, Bombay-400001.
2. Chairman, Bombay Port Trust
3. Chairman, Calcutta Port Trust
4. Chairman, Madras Port Trust
5. Chairman, Visakhapatnam Port Trust
6. Chairman, Cochin Port Trust
7. Chairman, Kandla Port Trust
8. Chairman, Mormugao Port Trust
9. Chairman, Paradip Port Trust
10. Chairman, Tuticorin Port Trust
11. Chairman, New Mangalore Port Trust
12. Chairman, Jawaharlal Nehru Port Trust
13. The Chairman & Managing Director, Hindustan Shipyard Ltd., Visakhapatnam.

Ministry of Shipping

The Managing Director, Central Inland Water Transport Corporation Ltd., 4, Fair View Place, Calcutta-700024.

The Chairman & Managing Director, Cochin Shipyard Ltd., Cochin.

The Chairman, Dredging Corporation of India Ltd., LIC Building, Visakhapatnam-530004.

The Director General of Lighthouses & Lightships, Department of Lighthouses & Lightships, B.K. Puram, New Delhi.

The Chairman & Managing Director, Inland Water Authority, NOIDA, Gaziabad, U.P.

The Secretary (BRDB), B-Wing, Sans Bhawan, New Delhi.

The Chairman-cum-Managing Director, Shipping Corporation of India, Shipping House, 245, Madame Cama Road, Bombay.

The President INSA, Bombay.

The Reserve Bank of India, Foreign Exchange Control Department, RBI Building, Fort, Bombay.

Roads Wing (5 copies)

Ports Wing (5 copies)

Shipping Wing (5 copies)

(I.V. SHAMBHAG)

Chief Controller of Chartering

also forwarded to:-

Cabinet Secretariat, Rashtrapati Bhavan, New Delhi.

Principal Director Audit, IP Estate, New Delhi.

C&AG, New Delhi.

TELEGRAM:
TELEX:

TRANSCHART
VAHN IN 31-61157/
31-61158/31-61159

FAX NO:
TELEPHONE:

3718614/3352726
3710356/3710039/
3718390/3719480

GOVERNMENT OF INDIA
MINISTRY OF SHIPPING
CHARTERING WING

No.SC-11021/3/99-ASO-I VOL.III

Dated: the 15th November, 2001

OFFICE MEMORANDUM

Subject: Ocean Transportation of cargo under the control of Government/
Public Sector Undertakings review of -The policy regarding.

.....

The undersigned is directed to say that as per the existing policy of Government of India all import contracts are to be finalised on FOB (free on Board)/FAS (Free alongside Ship) basis and those for exports on C&F (Cost and Freight)/CIF (Cost Insurance, freight) basis in respect of Government owned/controlled cargoes on behalf of Central Government Departments/State Government Departments and Public Sector Undertakings under them. In case of any departure therefrom, prior permission is required to be obtained from the Chartering Wing of the Ministry of Shipping. These instructions about FOB/FAS purchases and C&F/CIF sales and entering into contracts where the element of foreign exchange expenditure is minimum already stand incorporated in the General Financial Rules of the Government.

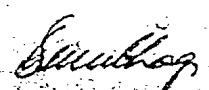
2. Based on the difficulties/problems, intimated by certain Government Departments/Public Sector Undertakings for exporting their cargoes in the changed context of economic liberalization, Government has undertaken a thorough review of the above policy at various levels. It has now been decided by the Government that:-

Contd...

- (i) The present policy for placing import contract on FOB/FAS basis and Centralised shipping arrangements through Ministry of Shipping(Chartering Wing) notified vide this Ministry's O.M. No.SC-11011/1/94-ASO.II/VoL.III dated 27th February, 1996 in respect of government owned/controlled cargoes on behalf of Central Government Departments/State Government Departments and Public Sector Undertakings under them will continue.
- (ii) The policy of centralized shipping arrangements through Chartering wing has been relaxed in case of exports. Government Departments/PSUs are free to finalize export contracts on FOB/FAS basis without seeking prior clearance from Ministry of Shipping(Chartering Wing).

3. It is requested that above decision taken by the Government of India may kindly be brought to the notice of all the Public Sector Undertakings/Projects/ Autonomous Bodies/ Purchasing & Selling Organisations under the administrative control of Ministries and Departments concerned and they may be advised to follow the prescribed procedure described above. They may also be instructed to send two copies of Import contracts alongwith cargo particulars like weight, volume, loading port, discharging port, loading rate, discharging rate, period of shipments, parcel size and any other specific condition relating to shipment of cargoes etc. to this Ministry as soon as the same are finalised for taking further necessary action with regard to the shipping arrangements in respect of import cargoes.

4. A copy of the instructions issued may please be endorsed to this Ministry.
5. Hindi version is also enclosed.


(T.V.SHANBHAG)

CHIEF CONTROLLER OF CHARTERING

To

- (1) All Ministries /Departments of Government of India
- (2) The Chief Secretary to all the State Governments including the Union Territories.

.....2 copies

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Copy forwarded for information and necessary action to:-

1. The Directorate General of Shipping, Jahaz Bhavan, Walchand Hirachand Marg, port, Mumbai- 400001.
2. Chairman, Mumbai Port Trust.
3. Chairman, Kolkatta Port Trust.
4. Chairman, Chennai Port Trust.
5. Chairman, Vishakapatnam Port Trust.
6. Chairman, Cochin Port Trust.
7. Chairman, Kandla Port Trust.
8. Chairman, Mormugao Port Trust.
9. Chairman, Paradip Port Trust.
10. Chairman, Tuticorin Port Trust.
11. Chairman, New Mangalore Port Trust.
12. Chairman, Jawaharlal Nehru Port Trust.
13. The Chairman & Managing Director, Hindustan Shipyard Ltd. Vishakapatnam.
14. The Managing Director, Central Water Transport Corpn. Ltd. 4, Fairlie Place, Kolkatta-70001.
15. The Chairman & Managing Director Cochin Shipyard Ltd. Cochin.
16. The Chairman, Dredging Corporation of India Ltd., LIC Building Vishakapatnam -530004.
17. The Director General of Lighthouses & Lightships, Department of Light-Houses & Lightships, R.K.Puram, New Delhi.

Ministry of Shipping

-4-

18. The Chairman & Managing Director, Inland Water Authority, NOIDA, Ghaziabad, U.P.
19. The Chairman -cum- Managing Director, Shipping Corporation of India Ltd, Shipping House, 245, Madam Cama Road, Mumbai.
20. The President, INSA, Mumbai.
21. The Reserve Bank of India, Foreign Exchange Control Department, RBI Building, Fort, Mumbai.
22. Ports Wing (5 Copies).
23. Shipping Wing (5 Copies).

(Signature)

(T.V. SHANBHAG)

CHIEF CONTROLLER OF CHARTERING

Copy also forwarded to:-

1. Cabinet Secretariat, Rashpati Bhavan, New Delhi.
2. Principal Director Audit, IP Estate, New Delhi.
3. C&AG, New Delhi.

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APPLICABLE FOR FOREIGN BIDDERS						
2 X 660 MW ENNORE STPS						
BOQ-CUM-PRICE SCHEDULE OF GENERATOR CIRCUIT BREAKER						
ANNEXURE-A						
A. PRICE SCHEDULE FOR MAIN SUPPLY						
SL. NO.	ITEM CODE	MAIN ITEM DESCRIPTION	UNIT	QTY.	Total Cost on C&F (Cost & Freight Basis) (.....(Currency)) (At Indian Port.....)	REMARKS
A.1	510-11003-A	GENERATOR CIRCUIT BREAKER INCLUDING ALL ASSOCIATED SERIES ISOLATOR, EARTH-SWITCHES, SHORT CIRCUITING CONNECTION LINK, SURGE CAPACITORS AND CONTROL PANEL ALONGWITH ITEMS AT S.NO. A.1(a)	SET	2		
A.1(a)		CONTINUOUS ONLINE MONITORING SYSTEM FOR GCB	SETS	2		BIDDER TO INDICATE UNIT PRICE
A.2	510-11007-A	START-UP AND COMMISSIONING SPARES	LOT	1		BIDDER TO FURNISH THE LIST
A.3	510-11006-A	O&M SPARES (FOR 3 YEARS OPERATION) ##	LOT	1		BIDDER TO FURNISH THE LIST
A.4	510-11011-A	SPECIAL TOOLS AND TACKLES	LOT	1		BIDDER TO FURNISH THE LIST
TOTAL COST FOR (A=A.1+A.2+A.3+A.4)						
B. PRICE SCHEDULE FOR SUPERVISION OF ERECTION, TESTING & COMMISSIONING AND TRAINING OF ENGINEERS						
SL. NO.	ITEM CODE	ITEM DESCRIPTION	UNIT	QTY.		REMARKS
B.1	510-11008-A	SUPERVISION OF ERECTION, TESTING AND COMMISSIONING				
B.1(a)		CHARGES PER VISIT	VISIT	2		REFER NOTE-1 & 2
B.1(b)		MANDAYS CHARGES	DAYS	8		REFER NOTE-1 & 2
B.2	510-11012-A	TRAINING OF 6 Nos. ENGINEERS	SET	1		FOR OPERATION, TROUBLESHOOT AND MAINTENANCE AS PER CLAUSE 10.00.00 (SECTION-II, VOLUME-II). ALSO REFER NOTE 4.
TOTAL COST FOR (B=B.1+B.2)						
TOTAL COST OF PACKAGE (A+B)			(Currency)			
NOTES						
1	FOR EACH GCB 1(ONE) VISIT AND 4(FOUR) MANDAYS TO BE CONSIDERED. THE PRICES SHALL BE INCLUSIVE OF CHARGES OF AIRFARE(TO & FRO), BOARDING, LODGING, VISA, MEDICAL, INSURANCE ETC.					
2	AMOUNT PAYABLE PER VISIT = VISIT CHARGES AS PER SL. NO. B.1(a) ABOVE (+) UNIT PRICE FOR MANDAYS CHARGES AS PER SL. NO. B.1(b) ABOVE (x) NO. OF DAYS AT SITE (TO BE CERTIFIED BY BHEL SITE)					
3	WHEREEVER SET IS INDICATED ABOVE, IT MEANS THE TOTAL PARTS/ACCESSORIES REQUIRED TO REPLACE THE PARTICULAR ITEM FOR A GIVEN EQUIPMENT.					
4	COST OF AIRFARE (TO & FRO), BOARDING, LODGING, VISA, MEDICAL, INSURANCE SHALL BE BORNE BY PURCHASER.					
##	O&M SPARES, STARTUP & COMMISSIONING SPARES AND SPARES FOR TESTING SHALL BE PROVIDED AS PER THE LIST FURNISHED IN ANNEXURE-A OF TECHNICAL SPECIFICATION.					

**TAMIL NADU GENERATION AND DISTRIBUTION CORPORATION
(TANGEDCO)**

2x660MW (UNIT #1 &2)
ENNORE SUPER-CRITICAL TPP
(AT ASH DYKE OF NORTH CHENNAI TPS, KATTUPALLI)

VOLUME – II

TECHNICAL SPECIFICATION FOR
GENERATOR CIRCUIT BREAKER (GCB)

BHEL DOCUMENT NO. : PE-TS-412-510-E001
REV-0



BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA-201301, UTTAR PRADESH, INDIA

**TECHNICAL SPECIFICATION FOR
GENERATOR CIRCUIT BREAKER****2 X 660 MW ENNORE STPS****SPECIFICATION NO. PE-TS-412-510-E001****VOLUME II****CONTENTS SHEET****REVISION 0 | DATE: 05.12.2016****SHEET 1 OF 1****CONTENTS**

<u>S. NO.</u>	<u>CONTENTS</u>	<u>NO. OF SHEETS</u>
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	ATTACHMENT-I (SINGLE LINE CONF.OF GCB)	(01)
	ATTACHMENT-II (GEN., GT, UT, ST- IF APPLICABLE, SYSTEM DATA)	(04)
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	ATTACHMENT-IV (DOCUMENTS REQUIRED AFTER AWARD OF LOI)	(01)
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	DATA SHEET-B	(07)
	DATA SHEET-C	(07)
02	SECTION - 'II'	
	GENERAL TECHNICAL REQUIRMENTS	08
03	ANNEXURE-A (SPARE LIST)	01

TOTAL NUMBER OF SHEETS: 49



**TECHNICAL SPECIFICATION FOR
GENERATOR CIRCUIT BREAKER**

2 X 660 MW ENNORE STPS

SPECIFICATION NO. PE-TS-412-510-E001

VOLUME II

SECTION - I

REVISION 0 DATE: 05.12.2016

SHEET 1 OF 39

SECTION – 'I'

SPECIFIC TECHNICAL REQUIREMENTS



TECHNICAL SPECIFICATION FOR GENERATOR CIRCUIT BREAKER

2 X 660 MW ENNORE STPS

SPECIFICATION NO. PE-TS-412-510-E001

VOLUME II

SECTION - I

REVISION 0

DATE: 05.12.2016

SHEET 2 OF 39

1.0 SCOPE OF ENQUIRY

- 1.1 This specification covers design, manufacture, assembly, inspection & testing at manufacturer's works, proper packing, delivery and supervision of E&C of Generator Circuit Breaker (GCB) as mentioned in different sections of this specification, complete with all accessories for efficient and trouble-free operation.
- 1.2 It is not the intent to specify completely herein all details of the design and manufacture. However, the equipment shall conform in all respects to high standards of design engineering and workmanship and shall be capable of performing in continuous commercial operation up to bidder's guarantee.
- 1.3 Standard technical requirements of the GCB are indicated in Section-II. Project specific requirements/changes are listed in Section-I.
- 1.4 The requirements of Section-I shall prevail and govern in case of conflict between the corresponding requirements of Section-I and Section-II.
- 1.5 The documents shall be in English language and MKS system of units.

2.0 BILL OF QUANTITIES:

- 2.1 Quantity requirements shall be as per BOQ-cum-price schedule as part of NIT.

3.0 SPECIFIC TECHNICAL REQUIREMENTS

<u>S.No.</u>	<u>Reference Clause No. of Section- II</u>	<u>Specific Requirement/ Change</u>
	-NIL-	

4.0 DOCUMENTATION

- 4.1 Documents required along with technical offer shall be as per attachment-III.
- 4.2 Documents required after award of LOI shall be as per attachment-IV.

GENERATOR CIRCUIT BREAKER (GCB)

1.00.00 CODES AND STANDARDS

All equipment and materials furnished under this specification shall conform to the latest revisions of the applicable IEC- ISO- and IEEE-Standards. In particular the following Standards shall apply:

1. General	
IEC 60694	Common Clauses for High-Voltage Switchgear and Control gear Standards
IEC 62271-100	High voltage switchgear and control gear
IEC 60529	Degree of protection provided for enclosures
IEC 61166-2	Guide for seismic qualification
DIN EN ISO 12944	Corrosion protection of steel structures by protective paint systems
2. Generator Circuit-Breaker	
IEC/IEEE 62271-37-013	IEEE Standard for AC High-Voltage Generator Circuit-Breakers Rated on a Symmetrical Current Basis.
3. Disconnecter	
IEC 62271-102	Alternating Current Disconnectors (Isolators) and Earthing Switches Earthing Switch
4. Instrument Transformers, Surge arresters & surge capacitors.	
IEC 60044-1	Current Transformers
IEC 60044-2	Voltage Transformers Surge Protection Equipment
IEC 60099-4	Metal-Oxide Surge Arresters without Gaps for A.C.-Systems
IEC 60358	Coupling Capacitors and Capacitor Dividers.

2.00.00 SCOPE OF SUPPLY AND SERVICES

2.01.00 EQUIPMENT AND COMPONENTS TO BE SUPPLIED

The basic supply of the GCB to be provided by the Contractor shall include, but not necessarily be limited to, the following items and components:

- Two triple pole circuit breaker, comprising three(3) single phase enclosures, all fully assembled on a common frame with operating mechanism
- One triple pole mechanically-ganged motorized disconnect for series isolation, on GT side of the GCB and with a triple pole earth switch, mechanically and electrically interlocked with the disconnect position. The disconnect shall be operable only with open position of the GCB
- Three(3) Heavy duty station class surge arresters _____ and with surge capacitors, suitable for (18-27) kV rated generator
- One(1) three phase short-circuiting and grounding device between the GCB and series disconnect , for performing pre-commissioning tests on generator and protection system
- One (1) Local control panel/cabinet, common to all three phases, for control of GCB and associated disconnectors/earth switches, suitable for receiving commands from and transmitting status information to remote control panel/DCS
- Miscellaneous bolting and gasket material required for all equipment and panels
- Primer painting of external surfaces and corrosion protection of internal surfaces
- Miscellaneous items for field erection, testing, pre-commissioning and performance testing
- Continuous online monitoring device for GCB.
- Temporary elements, if required, for field erection and testing

on each side

- Spare parts for start-up and testing, until Provisional Acceptance
- Special tools for erection and maintenance
- One(1) set of spare parts recommended for 3 years normal operation

3.00.00 GCB DESIGN AND CONSTRUCTIONAL FEATURE

3.00.01 General

- i. The circuit-breaker shall use SF6-gas as insulating- and interrupting medium. For current interruption the self-blast interrupting principle shall be applied. The arc voltage of the circuit-breaker shall be high enough to ensure current zeros in case of generator-source short-circuit currents with delayed current zeros.
- ii. The circuit-breaker shall have two separate contact systems, one for load current carrying and one for arc interruption. The circuit-breaker shall be capable of interrupting currents under out-of-phase conditions with out-of-phase angles up to 180 degrees.
- iii. The completely assembled circuit-breaker, including drive linkages and all other parts, shall have ample mechanical strength to withstand without damage all stresses incident to operation within the rated short-circuit current or the related required capabilities of the circuit-breaker, as well as stresses resulting from mounting, moving or maintaining the circuit-breaker in a proper manner.
- iv. The time between the first and last pole to open or close shall not exceed 2 ms. The circuit-breaker shall be electrical trip-free and prevent pumping.

3.00.02 Operating mechanism

_____ The design of the operating mechanism shall be

co-ordinated with the circuit-breaker design to ensure positive opening of the circuit-breaker and circuit interruption, whether the tripping impulse is received in the fully closed or any partially closed positions.

- iii. For purposes of inspection and adjustment, means shall be provided to permit local operation of the circuit-breaker. In addition an emergency operating lever shall be supplied to allow manual opening and closing of the circuit-breaker.

3.00.03 SF6 supervision

A SF6 gas density monitor shall be supplied for monitoring the three phases of the circuit-breaker. The gas density monitor shall be equipped with a temperature compensated density switch. One contact of the density switch shall be provided to indicate that the gas density has reached a level where refilling the gas volume is necessary. Two additional contacts shall be provided, connected to each trip circuit, to prevent tripping of the circuit-breaker when gas density falls below the critical level.

3.00.04 Circuit-breaker control

For each circuit-breaker two trip coils shall be provided. Upon loss of drive energy, control power supply or SF6-gas, the breaker shall remain in the fully closed or open position.

3.00.05 Accessories

Each circuit-breaker shall be equipped with

- an operation counter
- a SF6 density monitor
- a reliable, mechanical position indicator to indicate the open or closed position of the circuit-breaker
- a manual operation device for maintenance purpose

3.00.06 Insulation

The circuit-breaker with contacts open and insulating gas at atmospheric pressure must be capable of withstanding 3 times the phase to ground voltage. This requirement is to assure that the circuit breaker in the open position is capable of withstanding voltages under conditions when the two systems are out-of-phase. All parts of the insulation structure, including those between phases to earth and across the open contacts, shall be of an inherently stable nature with a minimum susceptibility to dielectric tracking.

3.00.07 Control cubicle

The control cubicle shall accommodate all the necessary equipment for local/remote changeover facilities, control, monitoring, supervision and interlocking of the system. A degree of protection of IP54 shall apply (IEC 60529).

3.00.08 Conventional (wired) control equipment

- i. The control cubicle shall be provided with conventional, hard wired control and supervisory equipment. Clamp type terminals, halogen free cables and wires, rated at 120° Celsius with cross section 1.5mm² for internal wiring, 2.5mm² for motor circuits, internal wiring of instrumentation transformers and 6mm² for instrument transformers, conventional apparatuses. Terminal marking with connection designation of maximum 3 digits. An active mimic diagram with position indicators integrated in the lighted (LED's) push-button switches for the circuit-breaker, disconnect, earthing switch (es). In absence of electrically operated semaphore indicators, lamp indication may be provided.
- ii. The control cubicle shall accommodate all the necessary equipment for local/remote changeover facilities, control, monitoring, supervision and interlocking of the system.

All spare auxiliary contacts on the proposed equipment shall be wired to terminal blocks. All terminals and control wires shall be identified in a proper manner. Installation of control cabinet shall be next to the breaker.

3.00.09 Nameplate

An anodized aluminium nameplate, black anodized and laser engraved, shall be attached to the generator switchgear. The nameplate shall be placed on the control cabinet.

3.00.10 Painting

All surfaces of the circuit-breaker, operating mechanism and other parts exposed to possible corrosion shall be designed to prevent accumulation of moisture. The paint treatment shall be according with manufacturer's instructions. The circuit breaker shall

be executed and must fulfil the following corrosion requirements. For indoor installation DIN EN ISO 12944 C4 long or for indoor installation DIN EN ISO 12944 C5-I long/C5-M long.

3.00.11 Conductors of active parts

- i. Conductors shall be of highly-conductive copper. All bus joints shall have silver-to-silver contact surfaces. Insulating supports shall meet the dielectric strength requirements specified, and shall be capable of withstanding the mechanical forces imposed by closing and opening operations and by the currents specified.
- ii. All connections of the current path shall be made with bolted, flexible connectors, to be supplied by the isolated phase bus manufacturer. The generator switchgear manufacturer shall furnish to the isolated phase bus duct manufacturer all pertinent details including forces transmitted to the bus during circuit-breaker operations and the terminal configuration required for the design of the connections.

3.00.12 Generator circuit-breaker system enclosure

- i. The GCB system enclosure shall be designed for welded connections to the isolated phase bus enclosures. Each single phase enclosure shall be made out of aluminium and capable of carrying the induced sheath current equal to the current ratings specified. The phase enclosures shall have Degree of protection IP 65.
- ii. In order to avoid pollution due to ingress of dust and moisture, the enclosure shall be designed to allow air tightness and to withstand a slight internal overpressure. Inspection windows shall be provided in each single phase enclosure to allow visual checks of the individual assemblies' positions.

3.00.13 Earthing

For earthing of GCB, suitable provision shall be made and fasteners shall be provided.

3.01.00 DISCONNECTOR

3.01.01 General

- i. A disconnector shall be provided on **GT side** in series with the circuit-breaker. The disconnector shall be of a telescopic unit with a sliding tubular contact, with an operating mechanism which operates through a mechanical linkage all three poles. The isolating gap of the disconnector shall be in air of atmospheric pressure and a window shall be provided in the GCB-system enclosure to allow visual checking of its position.
- ii. The control of the disconnector including the interlocking circuit shall be accommodated in the GCB-system control cubicle. A local/remote switch and push-buttons for local control shall be provided.

3.01.02 Operating mechanism

- i. The operating mechanism, operated by a 3-phase motor, shall be of a heavy duty construction type and shall be designed to complete its normal travel to either “open” or “close” position, once started, without holding the control switch continuously in that position. Stopping the travel between fully open and closed position is not acceptable.
- ii. A key interlocking shall be available to allow different modes of operation to be selected. Mechanically driven semaphore shall be provided for signaling close/open-position. A crank handle shall be provided for manual operation in case of emergency.

3.02.00 EARTHING SWITCHES

3.02.01 General

- i. Earthing switches shall be provided on both sides of the circuit-breaker. These shall be of blade type, air insulated, gang operated with motor drive, with their hinge point connected to earth and shall be integrated together with the circuit-breaker and disconnector into each of the single phase tubular aluminium enclosure, forming a straight section in the run of the isolated phase bus. Making- or breaking capability is not required for the earthing switches. The earthing switches operation shall be interlocked with the circuit-breaker and disconnector.

- ii. The control of the earthing switches including the interlocking circuits shall be accommodated in the GCB-system control cubicle. A local/remote switch and push-buttons for local control shall be provided.

3.02.02 Operating mechanism

The operating mechanism, operated by a 3-phase motor, shall be of a heavy duty construction type and shall be designed to complete its normal travel to either “open” or “close” position, once started, without holding the control switch continuously in that position. Stopping the travel between fully open and closed position is not acceptable. A key interlocking shall be available to allow different modes of operation to be selected. Mechanically driven semaphore shall be provided for signaling close/open-position. A crank handle shall be provided for manual operation in case of emergency. The contractor may propose any other type of operative mechanism.

3.04.00 SURGE PROTECTION EQUIPMENT**3.04.01 Surge arresters**

Metal-oxide surge arresters with polymer housings and sheds of silicone shall be fitted at the transformer side in each phase of the GCB-system to provide protection against over voltages for the equipment connected to the generator busbar.

3.04.02 Surge capacitors

Surge capacitors shall be of a metal-housed-type and use synthetic aromatic oil as dielectric. The surge capacitors shall be mounted on the generator- and transformer-side in each phase of the generator circuit-breaker to provide additional protection for the equipment connected to the generator busbar against over voltages and to limit the rate-of-rise of the transient recovery voltage.

3.05.00 SHORT-CIRCUITING SWITCH FOR RELAY SETTING**3.05.01 General**

- i. The short-circuiting connection with switch shall facilitate an unearthed three phase short-circuit on generator side of the GCB-system unit.
- ii. A short-circuit bar shall be installed manually between the interrupter and line disconnect switch. By closing the breaker a three-phase short-circuit can be established.

3.05.02 Adjustment of protection

- i. The short-circuiting connection with switch shall help to expedite the testing and adjustment of the power plant protection system.
- ii. Complete and detailed information required for preventive maintenance shall be furnished, including recommended maintenance intervals, required tests and inspections. A step-by-step description of the disassembly and re-assembly of the equipment shall be included, listing any precaution or critical adjustments or settings that are to be performed. A list of tools, test equipment or other equipment required for the proper repair and maintenance of the supplied equipment shall be included.
- iii. A complete parts list identifying all parts which are expected to need replacement on a periodic basis and the quantities of each part shall be included. The

information of part no., part designation, quantity, etc., required by the manufacturer to supply spare parts shall be listed accordingly

3.06.00 General Technical Particulars For Generator Circuit Breaker

I. GENERAL		
i.	Quantity	Two (2) Nos.
ii.	Location	INDOOR Installation
iii.	Degree Of Protection. Of GCB Enclosure	IP 65
iv.	Degree Of Protection Of Local Control Panel	IP 54
v.	Auxiliary Voltage	220 V DC, 415 V AC 3 Ph 50 Hz
vi.	Power Connection - Type - Interphase With IPBD	Isolated Phase Busduct (IPBD) Enclosure Through flanges and Busbar Through Flexible Connections
vii.	Max. Ambient Temp	50°C
	Max. Temp. Of Busbar Connections considering silver plated joints	105°C
viii.	Max. Temp. Of Enclosure Connections	80°C
ix.	Noise Level	As Per Relevant IEEE Standard
x.	Electro-magnetic Compatibility	As Per Relevant IEEE Standard

II. GENERATOR CIRCUIT BREAKER

xvi.	Interrupting Time (Tripping Command Till Arc Extinction)	as per IEC/IEEE 62271-37-013
xvii.	Opening Time (Tripping Command Till Contact Separation)	as per IEC/IEEE 62271-37-013
xviii.	Closing Time (Closing Command Till Contact Touch)	*
xix.	Simultaneity Of Poles (Closing Or Opening)	within 2 ms
xx.	Transient Recovery Voltage (For Generator Source Faults)	2.2 Kv/Micro Sec
xxi.	Transient Recovery Voltage (For System Source Faults)	5.5 KV/Micro Sec

4.00.00 LIST OF TESTS TO BE CONDUCTED

Tests shall be performed in the presence of Owner's representative if so desired by the Owner.

4.01.00 TYPE TESTS

The type tests shall be in accordance with the relevant standard.

4.02.00 ROUTINE TESTS

1. Gas receiver tests;
2. Pressure tests;
3. Nameplate check;
4. Leakage tests;
5. Resistor, heater, and coil check tests;
6. Control and secondary wiring check tests;
7. Clearance and mechanical adjustment check tests;
8. Mechanical operation tests;
9. Timing tests;
10. Stored energy system tests;
11. Electrical resistance of current path tests;
12. Power frequency withstand voltage tests on major insulation components;
13. Power frequency withstand voltage tests on control and secondary wiring;

4.03.00 TESTS AFTER DELIVERY / SITE TESTS

Site tests shall be performed on the GCB-system to confirm that the equipment was not damaged during shipping and to check the operation of the GCB-system under actual conditions at site. The manufacturer shall furnish technical support to review the commissioning procedures and a list of tests to be performed at site.

1. Leakage tests;

2. Gauge tests;
3. Stored energy system test;
4. Electrical resistance of current path tests;
5. Clearance and mechanical adjustment check tests;
6. Timing tests;
7. Power frequencies withstand voltage tests.



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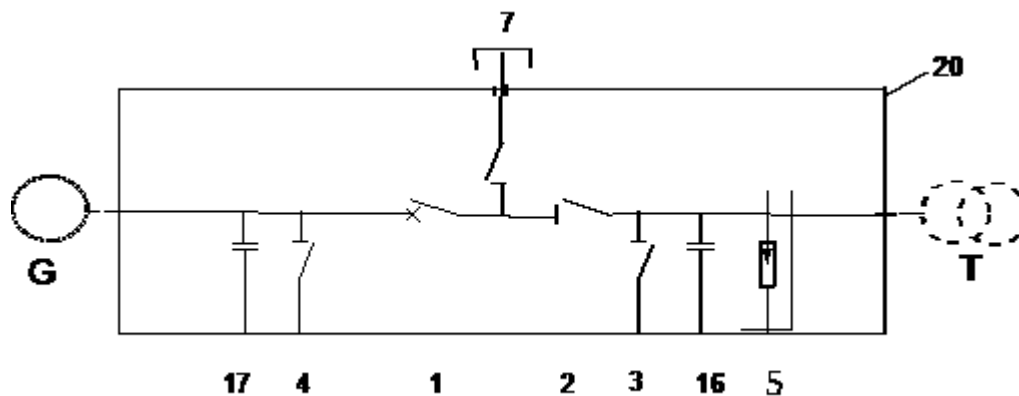
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ATTACHMENT – I



- | | | | |
|------|-------------------|--------|---------------------------------|
| 1 | Circuit-breaker | 7 | Short-circuiting/braking switch |
| 2 | Dis-connector | 16, 17 | Surge capacitors |
| 3, 4 | Earthing switches | 20 | System enclosure |
| 5 | Surge Arrester | | |

REFERENCE SINGLE LINE CONFIGURATION OF GENERATOR CIRCUIT BREAKER



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ATTACHMENT – II **GENERATOR, IPBD, GT, UT, ST, SYSTEM AND MOTOR DATA**

SL. NO.	DESCRIPTION	UNIT	VALUE
A	GENERATOR PARAMETERS		
1	RATED POWER	MVA MW	777
	POWER UNDER VWO CONDITION	MVA MW	816
2	RATED FREQUENCY	Hz	50
3	RATED VOLTAGE	KV	21
4	VOLTAGE VARIATION	%	5
5	RATED POWER FACTOR		0.85(lag)
6	REACTANCE VALUE (SATURATED):		
7	SYNCHRONOUS REACTANCE, DIRECT AXIS, X_d	pu	1.94
8	TRANSIENT REACTANCE, DIRECT AXIS, X_d'	pu	0.302
9	SUB TRANSIENT REACTANCE, DIRECT AXIS, X_d''	pu	0.2
10	SYNCHRONOUS REACTANCE, QUADRATURE AXIS, X_q	pu	2.31 (unsat.)
11	TRANSIENT REACTANCE, QUADRATURE AXIS, X_q'	pu	0.86 (unsat.)
12	SUB TRANSIENT REACTANCE, QUADRATURE AXIS, X_q''	pu	0.22
13	ZERO SEQUENCE REACTANCE	pu	0.106
14	NEGATIVE SEQUENCE REACTANCE	%	20
15	TOLERANCE IN GENERATOR REACTANCES	%	15
16	STATOR RESISTANCE (R_a)	OHMS	0.0011136(@75 deg cel)
17	FIELD CURRENT AT GENERATOR RATED VOLTAGE AND POWER FACTOR	AMPS	115
18	GENERATOR NEUTRAL EARTHING		High Resistance (Through Transformer loaded with Resistance on secondary)
20	TIME CONSTANTS (SHORT CIRCUIT TIME CONSTANTS):		
21	TRANSIENT TIME CONSTANT, DIRECT AXIS, T_d'	s	0.855
22	SUB TRANSIENT TIME CONSTANT, DIRECT AXIS, T_d''	s	0.0291
23	TRANSIENT TIME CONSTANT, QUADRATURE AXIS, T_q'	s	---



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24	SUB TRANSIENT TIME CONSTANT, QUADRATURE AXIS, T_q''	s	0.07
25	ARMATURE TIME CONSTANT	s	0.326
26	SPEED	rpm	3000
B	GENERATOR ISOLATED PHASE BUS DUCT (IPBD) DETAILS [GCB to comply to these requirements]		
1	Type		Isolated phase bus duct
2	Overall diameter of enclosure (Inside)	mm	LATER
3	Thickness of enclosure	mm	LATER
4	Phase-phase spacing	mm	LATER
5	Enclosure material		Al. alloy
6	Conductor material		Al. alloy
7	Conductor profile		Round
8	Cooling of IPBD		Natural
9	Pressurization System provided	Yes/No	Yes
10	Pressure of air inside the enclosure	mm of water col.mn	100 mm water column
11	Maximum temperature of enclosure at 50°C	°C	LATER
12	Maximum temperature of silver plated conductor joints at 50°C	°C	LATER
C	GENERATOR TRANSFORMER PARAMETERS		
1	RATED MVA	MVA	275 (3 single phase units)
2	HV SIDE VOLTAGE	KV	420
3	MAXIMUM HV VOLTAGE	KV	420
4	MINIMUM HV VOLTAGE	KV	380
5	LV VOLTAGE	KV	21
6	FREQUENCY	HZ	50
7	X/R RATIO		50
8	SHORT CIRCUIT IMPEDANCE	P.U.	0.15
9	TOLERANCE IN SHORT CIRCUIT IMPEDANCE	%	5
D	UNIT TRANSFORMER PARAMETERS (UT#1)		
1	RATED MVA	MVA	50
2	NUMBER OF WINDINGS (2 / 3)		2
3	HV SIDE VOLTAGE	KV	21



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4	MAXIMUM HV VOLTAGE	KV	22
5	MINIMUM HV VOLTAGE	KV	20
6	LV VOLTAGE	KV	11.5
7	FREQUENCY	HZ	50
8	X/R RATIO		29.5
9	SHORT CIRCUIT IMPEDANCE	P.U.	.12
10	TOLERANCE IN SHORT CIRCUIT IMPEDANCE	%	10
11	MOTOR LOADS CONNECTED TO UNIT TRANSFORMNER	MVA	26 (tentative)
12	MOTOR RATED VOLTAGE	KV	11
13	MOTOR STARTING CURRENT (TIMES FULL LOAD CURRENT)	TIMES	6
E	UNIT TRANSFORMER PARAMETERS (UT#2)		
1	RATED MVA	MVA	50
2	NUMBER OF WINDINGS (2 / 3)		2
3	HV SIDE VOLTAGE	KV	21
4	MAXIMUM HV VOLTAGE	KV	22
5	MINIMUM HV VOLTAGE	KV	20
6	LV VOLTAGE	KV	11.5
7	FREQUENCY	HZ	50
8	X/R RATIO		29.5
9	SHORT CIRCUIT IMPEDANCE	P.U.	.12
10	TOLERANCE IN SHORT CIRCUIT IMPEDANCE	%	10
11	MOTOR LOADS CONNECTED TO UNIT TRANSFORMNER	MVA	26 (tentative)
12	MOTOR RATED VOLTAGE	KV	11
13	MOTOR STARTING CURRENT (TIMES FULL LOAD CURRENT)	TIMES	6
F	STATION TRANSFORMER PARAMETERS		
1	RATED MVA	MVA	80/40/40
2	NUMBER OF WINDINGS (2 / 3)		3
3	HV SIDE VOLTAGE	KV	400
4	MAXIMUM HV VOLTAGE	KV	420
5	MINIMUM HV VOLTAGE	KV	380
6	LV VOLTAGE	KV	11.5
7	FREQUENCY	HZ	50



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8	X/R RATIO		34.1
9	SHORT CIRCUIT IMPEDANCE	P.U.	0.17(HV-LV1), 0.17(HV-LV2), 0.34(LV1-LV2)
10	TOLERANCE IN SHORT CIRCUIT IMPEDANCE	%	10
11	MOTOR LOADS CONNECTED TO STATION TRANSFORMNER	MVA	21
12	MOTOR RATED VOLTAGE	KV	11
13	MOTOR STARTING CURRENT (TIMES FULL LOAD CURRENT)	TIMES	5.4
G	SYSTEM PARAMETERS		
1	RATED VOLTAGE	KV	400
2	MAXIMUM VOLTAGE	KV	420
3	MINIMUM VOLTAGE	KV	380
4	RATED FREQUENCY	HZ	50
5	MAXIMUM THREE PHASE SHORT CIRCUIT CURRENT	KA	153.5
6	X/R RATIO		14

NOTES: PLEASE REFER ATTACHED SINGLE LINE DIAGRAM FOR CONFIGURATION

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- a] Filled in Data Sheet -B.
- b] Technical leaflet/ catalogue.
- c] Correction curves/ tables to arrive at current rating of GCB and series isolator at various ambient temperatures.
- d] Complete detailed calculation for short circuit capability of GCB for Generator Side and system side fault contribution.
- e] General Arrangement drawing of GCB showing various dimensions, space required for operation and maintenance, weight etc.
- f] Summary of Type tests certificates indicating key test results, clause & standard reference, date and place of testing.
- g] Write up on operating mechanism of GCB.
- h] Schedule of deviations.
- i] Schedule of BOQ cum price schedule. (Unpriced)
- j] Schedule of start-up and commissioning spares. (Unpriced)
- k] Schedule of Mandatory spares (if applicable). (Unpriced)
- l] Schedule of O&M spares (Recommended) for 3 years of plant operation. (Unpriced)
- m] Schedule of special tools and tackles. (Unpriced)
- n] Reference list.

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SL. No.	DOCUMENT TITLE	DWG. / DOCUMENT No.	CATEGORY
1	TECHNICAL DATASHEET FOR GENERATOR CIRCUIT BREAKER	PE-V0-412-510-E001	APPROVAL
2	GA AND FOUNDATION PLAN FOR GENERATOR CIRCUIT BREAKER	PE-V0-412-510-E002	APPROVAL
3	CONTROL & SCHEME DRAWING FOR GENERATOR CIRCUIT BREAKER	PE-V0-412-510-E004	APPROVAL
4	NAME PLATE FOR GENERATOR CIRCUIT BREAKER	PE-V0-412-510-E005	APPROVAL
5	SIZING CALCULATIONS INCLUDING SHORT CIRCUIT CALCULATIONS AS PER IEEE	PE-V0-412-510-E007	APPROVAL
6	SF6 PRESSURE SCHEME GENERATOR CIRCUIT BREAKER	PE-V0-412-510-E009	APPROVAL
7	FIELD QUALITY PLAN FOR GENERATOR CIRCUIT BREAKER	PE-V0-412-510-E010	INFORMATION
8	TYPE TEST CERTIFICATES OF GENERATOR CIRCUIT BREAKER	PE-V0-412-510-E011	INFORMATION
9	O/M MANUALS FOR GENERATOR CIRCUIT BREAKER	PE-V0-412-510-E012	INFORMATION
10	EQUIPMENT LIST OF GENERATOR CIRCUIT BREAKER	PE-V0-412-510-E110	INFORMATION
11	LIST OF MANDATORY SPARES	PE-V0-412-510-E112	APPROVAL
12	MANUFACTURING QUALITY PLAN FOR GENERATOR CIRCUIT BREAKER	PE-V0-412-510-E901	APPROVAL

Note:

1. The above list of drawings and documents is indicative.
2. Document schedule shall be as per NIT
3. The vendor after LOI shall submit drawings/documents in requisite number of copies as per NIT.



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DATA SHEET –A

<u>SL.NO.</u>	<u>PARAMETER</u>	<u>UNIT</u>	<u>VALUE</u>
1.00	Generator Circuit Breaker details		
1.01	Minimum continuous current rating at 50 °C	A	23595 (MIN.)
1.02	Rated voltage	kV	21
1.03	No. of poles	Nos.	3
1.04 (a)	Rated short time withstand current	kA	160
1.04 (b)	Duration	sec	3 (for GCB and dis-connector only)
1.05 (a)	Rated symmetrical breaking capability (i)System Source fault (ii)Generator Source fault	kA	(i) As per IEC/IEEE 62271-37-013 (ii) As per IEC/IEEE 62271-37-013
1.05 (b)	Rated making current capability (i)System Source fault (ii)Generator Source fault	kApeak	(i) As per IEC/IEEE 62271-37-013 (ii) As per IEC/IEEE 62271-37-013
1.06	One minute power frequency withstand voltage	kV(RMS)	As per IEC/IEEE 62271-37-013
1.07	Impulse withstand voltage	kV(Peak)	As per IEC/IEEE 62271-37-013
1.08	Location of GCB	Indoor / Outdoor	Indoor
1.09	Quantity of GCB	Nos.	2 (two)
1.10	Quantity of Earth Switch per GCB	Nos.	2
1.11	Quantity of Series Isolator per GCB	Nos.	1
1.12	Connection for Gas Turbine Starting circuit required	Yes/No	No
1.13	Configuration of Earth Switch, Series Isolator & Short circuiting connection with switch		As per Attachment – I of Section-I
1.14	Interrupting Medium		SF6
1.15	Type of cooling		Natural / Forced
1.16	Type of operating mechanism		Motorized or Hydraulic Spring Charged



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1.17	Rated Short Circuit duty Cycle		CO-30MIN –CO
1.18	Continuous current duty Cycle		CO-3 MIN –CO
2.00	<u>Auxiliary supplies</u>		
2.01	DC	V	220
2.02	AC [Any single phase power for lighting and heating circuits to be derived by vendor from this supply]	Phase, Wire, Hz	415V, 3 phase, 4 wire effectively earthed (240V, 1 phase, 2 wire, 50 Hz).
3.00	<u>Requirement of potential free Auxiliary Contacts for Purchaser's use:</u> (In addition to those required for own operation indications)		
3.01	Total number of contacts furnished for GCB		
	a. Normally Open (NO) numbers	Nos.	12 Minimum
	b. Normally Close (NC) numbers	Nos.	12 Minimum
3.02	Total number of contacts furnished for Disconnecting switch		
	c. Normally Open (NO) numbers	Nos.	6 Minimum
	d. Normally Close (NC) numbers	Nos.	6 Minimum
3.03	Total number of contacts furnished for Earth switch		
	e. Normally Open (NO) numbers	Nos.	6 Minimum
	f. Normally Close (NC) numbers	Nos.	6 Minimum
4.00	<u>Trip Coils</u>		
4.01	No. of Trip Coils provided	Nos.	2
4.02	Voltage rating of Trip coil	V	220V DC
4.03	Minimum operating voltage of trip coil	% rated voltage	IEC/IEEE 62271-37-013
5.00	<u>Wiring (copper wiring)</u>		
5.01	Internal Wiring	Sq.mm.	1.5 sq.mm.
5.02	Motor Circuit	Sq.mm.	2.5 sq.mm. or higher as per requirement of motor ratings
5.03	CT & VT circuit	Sq.mm.	2.5 sq.mm.



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6.00	O&M Spares (3 years operation)	Yes	TO BE PROVIDED AS PER ANNEXURE-A
7.00	Startup & commissioning spares	Yes	TO BE PROVIDED AS PER ANNEXURE-A (minimum requirement)
8.00	Spares for Testing	Yes	TO BE PROVIDED AS PER ANNEXURE-A
9.00	SF6 Gas leakage Detector	Quantity	1



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DATA SHEET –B

TECHNICAL PARTICULARS

[TO BE SUBMITTED ALOGWITH TECHNICAL OFFER]

SL.NO.		UNIT	SPECIFIED	OFFERED
	GENERATOR CIRCUIT BREAKER			
1.01	a. Manufacturer			
	b. Country of Manufacture			
	c. Type Designation			
1.02	Applicable Standard		IEC/ IEEE 62271-37-013	
1.03	Rated voltage (kV)			
1.04	Rated frequency	Hz	50	
1.05	Rated continuous current (A) at ambient temperature of: 40°C 50°C			
1.06	Interrupting medium		SF6	
1.07.01	Rated short time withstand current	kA		
1.07.02	Duration	sec		
1.08	Breaking capability			
i)	System source fault			
	a) Rated symmetrical breaking current	kA rms		
	b) Rated asymmetrical breaking current	kA rms		
	c) DC component			
	d) Rated making current	kApeak		
	e) Suitability of GCB checked		Yes/ No	
ii)	Generator source fault			
	a) Rated symmetrical breaking current	kA rms		
	b) Rated asymmetrical breaking current	kA rms		
	c) DC component			
	d) Rated making current	kApeak		
	e) Suitability of GCB checked		Yes/ No	
1.09	Rated short circuit duty cycle		CO -30 - CO	
1.10	Rated impulse withstand voltage	kVpeak		
1.11	Rated Power frequency `dry test' withstand voltage: Earth : Across the pole :	kVrms kVrms		



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1.12	Type of cooling		Natural/ Forced	
1.13	Maximum allowable temperature of main contacts	Deg. C	105/90	
1.14	Degree of protection of breaker enclosure		Air leakage < 2%	
1.15	Whether canopy is required, if GCB is installed outdoor			
1.16 a)	Voltage rating of motor driven pumps (in hydraulic mechanism)	V		
1.16 b)	Power rating of motor driven pumps	kW		
1.16 c)	No. of motor driven pump	Nos.		
1.17 a)	Voltage rating of fans (in forced cooling)	V		
1.17 b)	Power rating of fan motor	kW		
1.17 c)	No. of fan motor	Nos.		
1.18	Does GCB has provision of lockout features for open and close conditions of GCB?			
1.19	Stored energy of GCB is suitable for how many CO operations?			
1.20	Maximum current under natural cooled conditions which can be carried by GCB at following ambient temperatures: --°C --°C --°C --°C 50°C	A		
1.21	Nominal Ratings of the basic model quoted: Normal current : Normal voltage : System source Fault current : Generator source Fault current : Making current : Dielectric withstand voltage :	A kV kA kA kApeak kVrms, kVpeak		
1.22	Circuit breaker closing time	msec		
1.23	Circuit breaker break time	msec		
1.24	Whether specified safety interlocks and locking features provided as per the specification?			



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1.25	Type of operating mechanism provided			
1.26	No. of poles: Whether three poles of the circuit breaker are gang operated?			
1.27	Whether circuit breaker has anti pumping feature?			
1.28	Whether circuit breaker has trip free mechanism?			
1.29	Whether lockout feature provided for the circuit breaker?			
1.30	Whether separate SF6 gas monitors provided for each of the three phases of the circuit breaker?			
1.31	No. of SF6 gas monitors provided for each GCB			
1.32	a) No. of trip coils provided b) Voltage rating of trip coil c) Minimum operating voltage of trip coil	V V		
1.33	Emergency current rating during loss of coolant at 50°C ambient (if applicable)	A		
1.34	Time available at rated current before load reduction	min		
1.35	Rate at which load current should be reduced	A/sec		
1.36	Reduced continuous operating current	A		
1.37	Rated short circuit duty cycle			
1.38	Rated permissible tripping time	msec		
1.39	Maximum permissible temperature rise of main contacts and conducting joints for continuous rating over the ambient air temperature of 50 deg C: Copper: Silver: Silver alloy:	 Deg C Deg C Deg C		
1.40	Minimum creepage distance	mm		
1.41	Clearance in air of live parts - phase to earth	mm		
1.42	a) Control circuit suitable for aux. supply voltage of b) Mechanism motor suitable for aux. supply voltage of	V V		



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1.43	Value of capacitor included in GCB on generator transformer side	nF/phase		
1.44	Value of capacitor included in GCB on generator side	nF/phase		
1.45	a) DOP of GCB local control panel b) Is DOP type test certificate for GCB LCP enclosed?			
1.46	Whether cable glands and lugs are included as per the specification?			
1.47	Whether all interconnecting cables between various equipment of GCB and associated devices in bidder's scope are included?			
1.48	Whether sufficient quantity and types of spares are included for start up & commissioning of specified no. of GCBs?			
1.49	No. of series isolators provided per GCB on: Gen. trfr. side:			
1.50	No. of earth-switches provided per GCB on: Gen. trfr. side: Generator side:			
1.51	Catalogues attached for GCB: for series isolator: for earth-switch:			
1.52	Earth switch			
	a) Manufacturer			
	b) Country of manufacture			
	c) Type designation			
	d) Reference Standard			
	e) Rated service voltage	kV		
	f) Rated frequency	Hz		
	g) Rated normal current at 50 deg C	A		
	h) Rated short time withstand current			



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	i) Rated peak withstand current j) Rated power frequency withstand voltage k) Rated impulse withstand voltage l) No. of poles per switch m) No. of control mechanism per switch n) Ambient air temp. limits o) Control circuit suitable for aux. supply voltage of? p) Mechanism motor suitable for aux. supply voltage of?	kArms kApeak kV kV Deg C V V		
1.53	Series isolator			
	a) Manufacturer b) Country of manufacture c) Type designation d) Reference Standard e) Rated service voltage f) Rated frequency g) Rated normal current at 50 deg C h) Is series isolator fully compatible with GCB in respect of normal current ratings at various ambient temperatures? i) Rated short time withstand current j) Rated peak withstand current k) Rated power frequency withstand voltage	kV Hz A kArms kApeak kV		



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	l) Rated impulse withstand voltage m) No. of poles per switch n) No. of control mechanism per switch o) Ambient air temp. limits p) Control circuit suitable for aux. supply voltage of? q) Mechanism motor suitable for aux. supply voltage of?	kV Deg C V V		
1.54	a) Whether all type tests have been conducted on GCB as per IEC/IEEE 62271-37-013? b) Have all the type tests been carried out at independent test laboratories?			
1.55	Summary of Type test reports for GCB enclosed as Annex. No.			
1.56	Whether the offer includes performance of all site tests specified in the spec.?			
1.57	a) Whether all type tests have been conducted on series isolator as per IEC 62271-102? b) Summary of Type test reports for series isolator enclosed as Annex. No.			
1.58	a) Whether all type tests have been conducted on earth-switch as per IEC 62271-102? b) Summary of Type test reports for earth-switch enclosed as Annex. No.			
1.59	Requirement of potential free Auxiliary Contacts for Purchaser's use: (In addition to those required for own operation and indications)			
1.59.01	Total number of contacts furnished for GCB			
	a. Normally Open (NO) numbers	Nos.		
	b. Normally Close (NC) numbers	Nos.		
1.59.02	Total number of contacts furnished for Disconnecting switch			
	c. Normally Open (NO) numbers	Nos.		



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	d. Normally Close (NC) numbers	Nos.		
1.59.03	Total number of contacts furnished for Earth switch			
	e. Normally Open (NO) numbers	Nos.		
	f. Normally Close (NC) numbers	Nos.		
1.60	Trip Coils			
1.60.01	No. of Trip Coils provided	Nos.		
1.60.02	Voltage rating of Trip coil	V		
1.60.03	Minimum operating voltage of trip coil	% rated voltage		
1.61	Wiring (copper wiring)			
1.61.01	Internal Wiring	Sq.mm.		
1.61.02	Motor Circuit	Sq.mm.		
1.61.03	CT & VT circuit	Sq.mm.		
1.62	Voltage Transformer			
1.62.01	Voltage Tranformer-1(Generator side)			
(a)	Primary Voltage	kV		
(b)	Secondary Voltage	kV		
(c)	Rated Output (VA)	VA		
(d)	Accuracy Class			
1.62.02	Voltage Tranformer-2(Generator Transformer side)			
(a)	Primary Voltage	kV		
(b)	Secondary Voltage	kV		
(c)	Rated Output (VA)	VA		
(d)	Accuracy Class			
1.63	Current Transformer			
1.63.01	Current Transformer-1 (Generator Side)			
(a)	CT ratio	A		
(b)	Accuracy Class			
(c)	Burden	VA		
(d)	Knee Point Voltage (Applicable for PS class CT)	V		
(e)	Excitation Current (Applicable for PS class CT)	mA		
1.64	SF6 Gas leakage Detector	Nos.		

DATA SHEET –C



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TECHNICAL PARTICULARS

[TO BE SUBMITTED AFTER AWARD OF CONTRACT]

SL.NO.		UNIT	SPECIFIED	OFFERED
	GENERATOR CIRCUIT BREAKER			
1.01	a. Manufacturer			
	b. Country of Manufacture			
	c. Type Designation			
1.02	Applicable Standard		IEC/ IEEE 62271-37-013	
1.03	Rated voltage (kV)			
1.04	Rated frequency	Hz	50	
1.05	Rated continuous current (A) at ambient temperature of: 40°C 50°C			
1.06	Interrupting medium		SF6	
1.07.01	Rated short time withstand current	kA		
1.07.02	Duration	sec		
1.08	Breaking capability			
i)	System source fault			
	a) Rated symmetrical breaking current	kA rms		
	b) Rated asymmetrical breaking current	kA rms		
	c) DC component			
	d) Rated making current	kApeak		
	e) Suitability of GCB checked		Yes/ No	
ii)	Generator source fault			
	a) Rated symmetrical breaking current	kA rms		
	b) Rated asymmetrical breaking current	kA rms		
	c) DC component			
	d) Rated making current	kApeak		
	e) Suitability of GCB checked		Yes/ No	
1.09	Rated short circuit duty cycle		CO -30 - CO	
1.10	Rated impulse withstand voltage	kVpeak		
1.11	Rated Power frequency `dry test` withstand voltage: Earth : Across the pole :	kVrms kVrms		
1.12	Type of cooling		Natural/ Forced	



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1.13	Maximum allowable temperature of main contacts	Deg. C	105/90	
1.14	Degree of protection of breaker enclosure		Air leakage < 2%	
1.15	Whether canopy is required, if GCB is installed outdoor			
1.16 a)	Voltage rating of motor driven pumps (in hydraulic mechanism)	V		
1.16 b)	Power rating of motor driven pumps	kW		
1.16 c)	No. of motor driven pump	Nos.		
1.17 a)	Voltage rating of fans (in forced cooling)	V		
1.17 b)	Power rating of fan motor	kW		
1.17 c)	No. of fan motor	Nos.		
1.18	Does GCB has provision of lockout features for open and close conditions of GCB?			
1.19	Stored energy of GCB is suitable for how many CO operations?			
1.20	Maximum current under natural cooled conditions which can be carried by GCB at following ambient temperatures: --°C --°C --°C --°C 50°C	A		
1.21	Nominal Ratings of the basic model quoted: Normal current : Normal voltage : System source Fault current : Generator source Fault current : Making current : Dielectric withstand voltage :	A kV kA kA kApeak kVrms, kVpeak		
1.22	Circuit breaker closing time	msec		
1.23	Circuit breaker break time	msec		
1.24	Whether specified safety interlocks and locking features provided as per the specification?			
1.25	Type of operating mechanism provided			



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1.26	No. of poles: Whether three poles of the circuit breaker are gang operated?			
1.27	Whether circuit breaker has anti pumping feature?			
1.28	Whether circuit breaker has trip free mechanism?			
1.29	Whether lockout feature provided for the circuit breaker?			
1.30	Whether separate SF6 gas monitors provided for each of the three phases of the circuit breaker?			
1.31	No. of SF6 gas monitors provided for each GCB			
1.32	a) No. of trip coils provided b) Voltage rating of trip coil c) Minimum operating voltage of trip coil	V V		
1.33	Emergency current rating during loss of coolant at 50°C ambient (if applicable)	A		
1.34	Time available at rated current before load reduction	min		
1.35	Rate at which load current should be reduced	A/sec		
1.36	Reduced continuous operating current	A		
1.37	Rated short circuit duty cycle			
1.38	Rated permissible tripping time	msec		
1.39	Maximum permissible temperature rise of main contacts and conducting joints for continuous rating over the ambient air temperature of 50 deg C: Copper: Silver: Silver alloy:	Deg C Deg C Deg C		
1.40	Minimum creepage distance	mm		
1.41	Clearance in air of live parts - phase to earth	mm		
1.42	a) Control circuit suitable for aux. supply voltage of b) Mechanism motor suitable for aux. supply voltage of	V V		
1.43	Value of capacitor included in GCB on	nF/pha		



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	generator transformer side	se		
1.44	Value of capacitor included in GCB on generator side	nF/phase		
1.45	a) DOP of GCB local control panel b) Is DOP type test certificate for GCB LCP enclosed?			
1.46	Whether cable glands and lugs are included as per the specification?			
1.47	Whether all interconnecting cables between various equipment of GCB and associated devices in bidder's scope are included?			
1.48	Whether sufficient quantity and types of spares are included for start up & commissioning of specified no. of GCBs?			
1.49	No. of series isolators provided per GCB on: Gen. trfr. side:			
1.50	No. of earth-switches provided per GCB on: Gen. trfr. side: Generator side:			
1.51	Catalogues attached for GCB: for series isolator: for earth-switch:			
1.52	Earth switch			
	a) Manufacturer			
	b) Country of manufacture			
	c) Type designation			
	d) Reference Standard			
	e) Rated service voltage	kV		
	f) Rated frequency	Hz		
	g) Rated normal current at 50 deg C	A		
	h) Rated short time withstand current			
	i) Rated peak withstand current	kArms		



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	j) Rated power frequency withstand voltage k) Rated impulse withstand voltage l) No. of poles per switch m) No. of control mechanism per switch n) Ambient air temp. limits o) Control circuit suitable for aux. supply voltage of? p) Mechanism motor suitable for aux. supply voltage of?	kA_{peak} kV kV Deg C V V		
1.53	Series isolator			
	a) Manufacturer b) Country of manufacture c) Type designation d) Reference Standard e) Rated service voltage f) Rated frequency g) Rated normal current at 50 deg C h) Is series isolator fully compatible with GCB in respect of normal current ratings at various ambient temperatures? i) Rated short time withstand current j) Rated peak withstand current k) Rated power frequency withstand voltage l) Rated impulse withstand voltage	kV Hz A kA_{rms} kA_{peak} kV		



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	m) No. of poles per switch n) No. of control mechanism per switch o) Ambient air temp. limits p) Control circuit suitable for aux. supply voltage of? q) Mechanism motor suitable for aux. supply voltage of?	kV Deg C V V		
1.54	a) Whether all type tests have been conducted on GCB as per IEC/IEEE 62271-37-013? b) Have all the type tests been carried out at independent test laboratories?			
1.55	Summary of Type test reports for GCB enclosed as Annex. No.			
1.56	Whether the offer includes performance of all site tests specified in the spec.?			
1.57	a) Whether all type tests have been conducted on series isolator as per IEC 62271-102? b) Summary of Type test reports for series isolator enclosed as Annex. No.			
1.58	a) Whether all type tests have been conducted on earth-switch as per IEC 62271-102? b) Summary of Type test reports for earth-switch enclosed as Annex. No.			
1.59	Requirement of potential free Auxiliary Contacts for Purchaser's use: (In addition to those required for own operation and indications)			
1.59.01	Total number of contacts furnished for GCB			
	a. Normally Open (NO) numbers	Nos.		
	b. Normally Close (NC) numbers	Nos.		
1.59.02	Total number of contacts furnished for Disconnecting switch			
	c. Normally Open (NO) numbers	Nos.		
	d. Normally Close (NC) numbers	Nos.		
1.59.03	Total number of contacts furnished for Earth switch			



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	e. Normally Open (NO) numbers	Nos.		
	f. Normally Close (NC) numbers	Nos.		
1.60	Trip Coils			
1.60.01	No. of Trip Coils provided	Nos.		
1.60.02	Voltage rating of Trip coil	V		
1.60.03	Minimum operating voltage of trip coil	% rated voltage		
1.61	Wiring (copper wiring)			
1.61.01	Internal Wiring	Sq.mm.		
1.61.02	Motor Circuit	Sq.mm.		
1.61.03	CT & VT circuit	Sq.mm.		
1.62	Voltage Transformer			
1.62.01	Voltage Tranformer-1(Generator side)			
(a)	Primary Voltage	kV		
(b)	Secondary Voltage	kV		
(c)	Rated Output (VA)	VA		
(d)	Accuracy Class			
1.62.02	Voltage Tranformer-2(Generator Transformer side)			
(a)	Primary Voltage	kV		
(b)	Secondary Voltage	kV		
(c)	Rated Output (VA)	VA		
(d)	Accuracy Class			
1.63	Current Transformer			
1.63.01	Current Transformer-1 (Generator Side)			
(a)	CT ratio	A		
(b)	Accuracy Class			
(c)	Burden	VA		
(d)	Knee Point Voltage (Applicable for PS class CT)	V		
(e)	Excitation Current (Applicable for PS class CT)	mA		
1.64	SF6 Gas leakage Detector	Nos.		



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SECTION : **II**

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1.00.00 SCOPE

1.01.00 The scope includes:

1.01.01 Design, engineering, manufacturing, assembly, testing, inspection, packing & delivery of:

- Generator circuit breaker
- Start-up and commissioning spares.
- Mandatory spares, as specified.
- Recommended spares for three (3) years of plant Operation & Maintenance.
- Special tools and tackles.
- Cable glands, cable lugs and foundation bolts.

1.01.02 Supervision of erection, testing & commissioning.

1.01.03 Training of engineers.

1.02.00 Terminal points:

- Bus bar of GCB.
- Enclosure of GCB.
- Cable glands and lugs in Local Control Panel.
- Earthing terminals of GCB Local Control Panel.

2.00.00 CODES AND STANDARDS.

S.NO	STANDARD NUMBER	STANDARD TITLE
1	IEC/IEEE 62271-37-013	High-voltage switchgear and control gear – Part 37-013: Alternating-current generator circuit-breakers
2	IEEE Std. C37.013-1997 (R2008)	IEEE Standard for AC High-Voltage Generator Circuit Breakers Rated on a Symmetrical Current Basis
3	IEEE Std. C37.013a-2007	IEEE Standard for AC High Voltage Generator Circuit Breakers Rated on a Symmetrical Current Basis Amendment 1: Supplement for Use with Generators Rated 10–100 MVA
4	IEC 62271-102	High-voltage switchgear and control gear - Part 102: Alternating current disconnectors and earthing switches



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3.00.00 GENERATOR CIRCUIT BREAKER

3.01.00 The Generator Circuit Breaker (GCB) shall be of the metal enclosed type suitable for direct connection to phase isolated generator bus duct in a manner designed to preserve the phase isolated principle. The breaker shall have continuous and short time current ratings as those indicated in the datasheet-A of section-I, Volume-II.

3.02.00 The design and testing of the generator circuit breaker shall be in line with IEC/ IEEE 62271-37-013.

3.03.00 Each phase of the circuit breaker shall be enclosed in a non-magnetic (Aluminium alloy) enclosure. The degree of protection of the enclosure shall be such that the air leakage rate shall not exceed 5% of the total enclosure volume per hour. The enclosure shall be minimum flux type so as to prevent heating of nearby metallic structures.

3.04.00 Support insulators shall be interchangeable and of high creepage distance, high mechanical and dielectric strength as required by the circuit breaker. Insulators shall be so mounted as to provide easy access for cleaning and removal.

3.05.00 The interrupters of the circuit breaker shall be SF6 type. The rated short circuit duty cycle shall be CO - 30 minutes – CO and continuous current duty cycle shall be CO - 3 minutes – CO.

3.06.00 GCB, isolator and earthing switch shall have separate operating mechanism. The operating mechanism for isolator and earth switch shall be motor operated.

Hand operation of the operating mechanism shall also be possible for GCB, isolator and earthing switch. Interlock shall be provided to prevent motor operation when the switch is being manually operated.

3.07.00 The circuit breaker shall be operated with a hydraulic/spring charged operating mechanism. All the three poles of the circuit breaker shall be gang operated. The circuit breaker shall have antipumping feature.

3.08.00 Hydraulic Operating Mechanism:

Each three-phase circuit breaker shall have a hydraulic system complete with all associated pipework etc. The total stored energy in the operating system offered shall be sufficient for 2 CO operations

Protection shall be provided to take care of possible failure of the hydraulic system that drives the breaker. Upon failure of the hydraulic system in the open position, the breaker shall remain locked in open position and shall not tend to close. Similarly, upon failure of the hydraulic system in the closed position, the breaker shall remain locked in closed position.

3.09.00 Spring Operating Mechanism:

Spring charged mechanism shall be complete with all its accessories. The total stored energy in the operating system offered shall be sufficient for O-C-O operations.



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Provisions shall be made to prevent a closing operation of the breaker when the spring is in the partial charged condition. Mechanical interlocks shall be provided in the operating mechanism to prevent discharging of closing springs when the breaker is already in the closed position.

3.10.00 The visual check of the position of the Breaker, Disconnecting switch, starting switch & earthing switch shall be possible from outside the phase enclosure by means of inspection windows.

3.11.00 Each circuit breaker shall be provided with a shunt opening release. Such release shall have duplicate actuating coils. These coils shall be capable of opening the circuit breaker at any load or short circuit.
Rated auxiliary voltage and the minimum operating voltage of the trip coils shall be as per the values specified in the datasheet-A of section-I, Volume-II. GCB shall have closing coil and tripping coil supervision relays & both the trip coils shall be monitored.

3.12.00 SF6 gas monitor(s) shall be provided for each circuit breaker by bidder as per bidder's standard and proven practice, ensuring utmost reliability of the equipment and failsafe monitoring of SF6 gas, covering all phases and associated pipework. Bidder in the bid shall declare the number of SF6 gas monitor(s) included.
Interlock shall be provided to prevent breaker from opening when the SF6 gas density falls to a level, which is inadequate to complete a successful opening operation of the breaker at its rated capacity.

3.13.00 Following interlocks and locking facilities shall be provided:

- a) It shall be possible to key-lock the series isolator in 'open' position blocking both electrical and hand closing of the isolator.
- b) Key interlock shall be provided to prevent unauthorized operation of GCB.
- c) Interlock shall also be provided between GCB and isolator.
- d) Interlock shall also be provided between earth-switch and isolator.
- e) Mechanical Interlock shall also be provided in addition to electrical interlock for circuit breaker, isolators and earth switches.

3.14.00 **Disconnecting switch, starting switch and Earthing switch**

3.14.01 The arrangement shall include disconnecting switch, starting switch & earthing switch as per the Attachment-I of Section-I, Volume-II.

3.14.02 The hinged point of Starting switch shall be connected with external cable from Gas turbine generator static starter. (Applicable for gas turbine generator set)

3.14.03 The design and testing of disconnecting switch, starting switch & earthing switch shall be in line with IEC 62271-102.



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3.15.00 Local Control Panel (LCP)

- 3.15.01 Each three-phase circuit breaker shall have a local control panel, for control of the auxiliaries. It shall have all the necessary indication for gas (SF₆) pressure/ density, temperature etc. as per the standard practice of the manufacturer.
- 3.15.02 Mimic diagram shall be provided on local control panel (LCP). LCP shall contain stay put type local/remote selector switch, spring return to neutral control switch/ Push Button for GCB, isolator & earth switch, electrically operated semaphore/ LED indicators for indicating status of GCB, isolator and earth switch.
- 3.15.04 Two nos. incoming DC supply feeders will be made available by purchaser for GCB. Necessary arrangement shall be provided in GCB LCP for receiving these two feeders. Independent MCBs and voltage supervision relays shall be provided in GCB LCP for each DC supply. Auto contactor controlled 220V DC changeover scheme shall be provided.
- 3.15.05
- a) It shall be possible to know abnormal or fault or lockout conditions from GCB local control panel. Visual annunciation shall be provided for this purpose alongwith 'lamp reset' and 'lamp test' push buttons on GCB LCP.
 - b) Separate sets of contacts for annunciation of various abnormal conditions of GCB in Central control room (CCR) shall be provided.
 - c) Two sets of contacts of GCB lockout conditions (when GCB is 'closed') shall be provided for interlocking in generator protection scheme. This is in addition to the requirements of GCB abnormal condition contacts given in b) above.
 - d) Potential-free contacts shall be provided on GCB LCP for indication in CCR for following conditions:
 - i) GCB selected for remote control
 - ii) GCB ready for 'close'
 - iii) DC failure at GCB
 - e) Bidder to provide potential free auxiliary contacts for purchaser's use, in addition to requirement in d) above, as indicated in Data sheet-A of section-I, Volume-II. These contacts shall be wired to the terminal blocks of LCP for external use.
 - f) Operation counter for GCB shall be provided in Local Control Panel.
- 3.15.06 Gland plate of local control panel shall be of adequate size for terminating external cables using glands (Glands and lugs in bidder's scope). No. of external cables, glands and lugs shall be finalized after the award of LOI and there shall not be any price implication on this account.
- 3.15.07 Spare terminals shall be provided in local control panel. Number of spare terminals shall not be less than 10%.
- 3.16.00 All interconnecting cables between various equipment in the scope of the bidder shall be included by bidder in their scope.



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3.17.00 Bidder must also establish that the model quoted is suitable for asymmetrical and symmetrical short circuit current contribution from generator side and system side to a 3-phase fault. Bidder to refer Attachment-II of section-I, Volume-II to compute generator side and system side fault current and establish GCB suitability as per IEC/ IEEE 62271-37-013. Bidder must take a negative tolerance on generator reactances and an over- voltage factor of 1.05 for calculating the fault currents.

Bidder must also include the computations/ verification checks for the above in the bid. In the absence of this, the bid will be treated as incomplete and liable to be rejected.

4.00.00 COLOUR OF PAINT

The colour of paint shall be intimated to the vendor after the award of LOI and there shall be no commercial implication on this account.

5.00.00 TESTS

5.01.00 ROUTINE TESTS

The equipment shall be completely assembled, wired, adjusted and routine tested at manufacturer's works as per IEC/ IEEE 62271-37-013. Series isolator and earth switch shall be tested as per IEC 62271-102.

5.02.00 TYPE TESTS

All equipment offered should be of type-tested design. Offered model of GCB should have been type tested as per latest version of standard IEC/ IEEE 62271-37-013. Series isolator and earth switch should have been type tested as per IEC 62271-102.

5.03.00 SITE TESTS

Each generator circuit breaker shall be subjected to the following tests after it is totally assembled at site in its final location.

- i/ Leakage tests alongwith generator busduct
- ii/ Gauge tests
- iii/ Stored energy system tests
- iv/ Electrical resistance of current path tests
- v/ Clearance and mechanical adjustment check tests
- vi/ Timing tests
- vii/ Low frequency withstand voltage tests

5.04.00 WITNESSING OF TESTS



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All tests shall be performed in presence of purchaser's representatives. The vendor shall give at least 45 days advance notice for routine tests and type tests (if required as per cl. 4.02.00).

6.00.00 QUALITY PLAN

- a. The manufacturer shall furnish a detailed Quality Plan for approval covering testing on all major components like, enclosures, castings, forgings, insulators, springs, contacts, nozzles, cylinders (SF6), manometers, pressure switches, density meters, valves, pipes and fittings, pumps, coils (for tripping and closing), heaters, relays, filters, base frame, support structures, SF6 gas, terminals, etc. The tests shall include all applicable tests like, material, chemical and other tests as per relevant material and international standard. The critical casting and forgings and weld joints shall also be subject to UT/RT and dye penetration examination to ensure freedom from defects. All pressurized vessels/enclosures shall be pressure and leak tested at 1.5 times the design pressure or twice the operating pressure.
- b. The assembled generator circuit breaker shall be tested in accordance with IEC/ IEEE 62271-37-013. The manufacturer shall furnish a detailed test procedure for routine and type test for BHEL/ultimate customer review and approval.
- c. Routine tests on isolator and earth-switch shall be conducted as per IEC 62271-102.

7.00.00 SPARES

- 7.01.00 Bidder to furnish list of start-up and commissioning spares which may be required during the start-up and commissioning of the equipment.
- 7.02.00 Mandatory spares shall be quoted (if applicable) as per BOQ-cum-price schedule as part of NIT.
- 7.03.00 The bidder shall furnish a list of "Recommended spares for 3 years of normal operation of the plant".
- 7.04.00 Various schedules of spares to be submitted alongwith the bid shall indicate description of spare parts alongwith type designation, quantity, unit price, total price etc.

8.00.00 SPECIAL TOOLS & TACKLES

- 8.01.00 Bidder shall offer one set of unused special tools and tackles which are required for erection, assembly, adjustment, maintenance and dismantling of GCB.
- 8.02.00 These tools and tackles shall be separately packed and sent to site prior to erection of GCB.
- 8.03.00 List of special tools and tackles, alongwith quantity shall be furnished as a part of offer.

9.00.00 SUPERVISION OF ERECTION, TESTING AND COMMISSIONING

Bidder shall quote for "Supervision of Erection, Testing and Commissioning" of each GCB. Required instruments for site testing of GCB shall be arranged by the vendor, in case the



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SECTION : II
REV NO. : 00 DATE : 10.05.2016
SHEET : 8 OF 8

same are not available at site. These instruments shall be brought by the vendor and shall be taken back after completion of commissioning.

10.00.00 TRAINING OF ENGINEERS

Bidder shall provide training for a maximum of six (6) engineers from BHEL/ultimate customer at works, training centre etc. The training shall also include application, layout, design, construction, operating principle, operating mechanism, local control panel, operation, maintenance, site inspection, erection, site testing, spares etc. of GCB.

10.01.00 The language of instructions shall be English. All training material to be supplied to engineers shall be in English.

10.02.00 The training programme shall be finalised after the award of LOI.

11.00.00 O & M MANUAL

11.01.00 The vendor shall submit after the award of LOI, draft "O & M Manual" for approval. Final "O & M Manual" shall be properly bound.

11.02.00 The O & M Manual shall contain:

11.02.01 Complete set of approved drawings together with performance/ rating curves of the equipment and test certificate wherever applicable.

11.02.02 Storage and handling instructions.

11.02.03 Step by step procedure for erection, testing & commissioning of equipment.

11.02.04 The operating and maintenance instructions of the equipment shall be in sufficient details to enable the owner to maintain, dismantle, reassemble and adjust all parts of the equipment. They shall give a step-by-step procedure for all operations likely to be carried out during the life of the plant/ equipment.

11.02.05 Spare part catalogue for all the equipment.

11.02.06 A separate section of the manual shall be for each size/ type of equipment and shall contain a detailed description of construction and operation, together with all relevant pamphlets, drawings and list of parts with procedure for ordering spares. Maintenance instructions shall include charts showing lubrication, checking, testing and replacement procedures to be carried out daily, weekly, monthly and at longer intervals to ensure trouble free operation. Where applicable, fault location charts shall be included to facilitate finding the cause of mal-operation or break down. A collection of manufacturer's standard leaflets will not be accepted as a compliance of this clause. The manual shall be specifically compiled for the concerned project.

ANNEXURE-A

I) LIST OF O & M SPARES (3 YEARS OF OPERATION)

	item description	unit	qty	remarks
1	SF6 density meter/ leakage detector	no.	1	
2	Circuit breaker closing coil	no.	1	
3	Circuit breaker tripping coil	no.	2	
4	Isolating switch, selector switch, breaker control switch, position indicators, contactor/relays, push button, timer	%	5	5% of the total number, minimum 1 no. of each type & rating
5	Power and control fuses/circuit breakers of different rating	%	5	5% of the total quantity, minimum 1 no. of each type & rating
6	Indicating lamp	%	10	10% of the total quantity, minimum 1 no. of each color & type
7	Auxiliary switch assembly	set	1	1 set each for circuit breaker and switches
8	Motor kit (as applicable)	no.	1	
9	Hydraulic oil for operating mechanism (as applicable)	can	2	
10	Carbon cleaning brush	set	2	

II) STARTUP AND COMMISSIONING SPARES (minimum requirement)

	item description	unit	qty	remarks
1	Lifting beam, shackles and straps	set	1	
2	consumables like lubrication grease etc.	set	1	
3	emergency operating lever	no.	1	
4	hand cranking device	no.	1	
5	foundation bolts	set	1	

NOTE Other spares, as applicable, as per manufacturer's standard shall be supplied for successful erection, commissioning and testing of GCB at site.

III) SPARES FOR TESTING

	item description	unit	qty	remarks
1	contact resistance measurement equipment	set	1	
2	event recorder for measuring operating time	set	1	

NOTE 1. Spares for testing shall be on free returnable basis.
2. any other instrument required for site testing of the GCB as per clause 4.03.00 (tests after delivery/ site tests) on free returnable basis shall be provided



SPECIAL CONDITIONS OF CONTRACT (REV 01)

**FOR 2 X 660 MW ENNORE SEZ COAL BASED STPP AT ASH DYKE OF
NCTPS, CHENNAI, Job No. 412**

These Conditions shall be read in conjunction with General Condition of Contract (GCC) enclosed along with the tender enquiry. In case of any conflict or inconsistency, the requirement of SCC shall prevail over the GCC.

1.0	Project Name	2 X 660 MW ENNORE SEZ COAL BASED STPP
2.0	Ultimate Customer (TANGEDCO)	Tamilnadu Generation and Distribution Corporation (TANGEDCO)
3.0	Location of Plant	Site for main plant is located near ennore port (approx. 5 km) and approx. 5 km from Athipattu Pudunagar, State : Tamil Nadu, Nearest Airport: Chennai (60 km), Nearest Seaport: Ennore Port (Approx. 5 km), Nearest Railway Station: Athipattu Pudunagar (Approx. 5 kms), Site is adjacent to the Chennai-Howrah broad gauge line. Access to site: Distance from Chennai city is 35 km. All weather roads from Pattamandri on the Thiruvottiyar district highway.
4.0	Consignee Address / BHEL Site Office Address	Construction Manager BHEL Site-Office 2 x 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS Vayalur Village, Ambathur Taluk, Thiruvallur District, Tamil Nadu.
	Notes:	1. Consignee address in LR should be strictly as per Sl. No. 04. 2. Vendor to note that to effect "Sale in Transit", BHEL shall issue "Delivery Note" to the Transporter for transferring the ownership from BHEL to customer (TANGEDCO). 3. It is Vendor's responsibility to ensure availability of trucks well in advance for dispatch of material to meet contractual delivery requirement. Delivery note shall be carried by transporter along with other dispatch documents
5.0	Buyer and Paying Authority	A) <u>For Inter-State sales (where CST is applicable):</u> 1. For those packages, for which PO is placed by BHEL-PEM - PEM, Noida . 2. For those packages for which PO is placed by BHEL-PSSR & LOA is issued by BHEL-PEM - BHEL-PSSR, Chennai .

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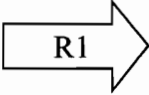
		B) FOR Intra-State sales (where VAT is applicable): 1. For those packages, for which PO is placed by BHEL-PEM- <u>Paying Authority shall be BHEL-PEM, Noida. However Buyer will be BHEL HPBP, TIRUCHIRAPALLI.</u> Detailed requirements are enclosed as Annexure I which are to be followed strictly. 2. For those packages for which PO is placed by BHEL-PSSR & LOA is issued by BHEL-PEM - <u>Paying Authority shall be BHEL-PSSR, Chennai. However Buyer will be BHEL HPBP, TIRUCHIRAPALLI.</u> Detailed requirements are enclosed as Annexure I which are to be followed strictly.
6.0	Mode of Dispatch	By Road/Rail/Sea on Door Delivery and freight Pre-Paid Basis.
7.0	Road Permit Required	Not applicable
8.0	Transit Insurance	In BHEL Scope. Vendor shall inform the following details of dispatches to the Underwriter (refer details below) under intimation to BHEL-PEM and BHEL Site office: (1) Policy No. (2) Consignee Name. (3) Consignment Details (items with their weights and value (in INR)). (4) Project Name and P.O. No. (5) LR No. and date, Despatch origin and destination details, Inv. No..
	Policy No.	SCE - 500300/44/15/04/40000004 MARINE - 500300/21/15/02/00000005 Policy period : 15/04/2015 - 14/04/2018
	Underwriters	M/s. United India Insurance Company – New Delhi D-24 & E-25, 2nd Floor Himalaya House 23 KG Marg, Connaught Place, New Delhi
9.0	BHEL-PEM TIN No.	09765702874
10.0	Customer CST & VAT Nos.	TANGEDCO CST No. - 1248670 TANGEDCO TIN / VAT No. - 33181706465 TANGEDCO TAN No. - CHET 11 952 D TANGEDCO PAN No. - AADCT4784E
11.0	Unloading at site	- By BHEL site office for Supply packages. (The Vendor shall furnish LR wise Gross Wt. and net weight of the consignment for the purpose of handling the consignment by BHEL site loading/unloading contractor). - By Vendor for Turnkey i.e. Supply and Erection & Commissioning Packages.

(Signature)

(Signature)

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12.0	Storage at site	- By BHEL site for Supply packages. - By Vendor for Turnkey i.e. Supply and Erection & Commissioning Packages.
13.0	Movement of Material within Site	- By BHEL site for Supply packages. - By Vendor for Turnkey i.e. Supply and Erection & Commissioning Packages.
14.0	Provision of facilities at Site (Applicable for Turnkey Packages) 	Construction Power: HT power supply (33KV/433 V or 11KV/433 V) shall be made available for erection work at the rates prevailing at the time of usage on chargeable basis as per HT tariff V (Temporary construction supply) rates applicable as per TNERC tariff order. Fuel and start-up power required during testing, commissioning, PG testing, re-testing etc. shall be provided at free of cost. Construction Water: Construction water shall be available at one point within the plant boundary on chargeable basis subject to availability.
15.0	Inspection Agency (Domestic supplies)	Later
	Inspection Agency (Imported supplies)	Later

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16.0	Dispatch Documents required (to be furnished by Vendor for payment)	<u>For Despatch Payment</u> For materials originating from Indian Territory (a). One (1) original and Six (6) copies of the clean rail/lorry receipt. For payment Receipted LR (signed & stamped)/ confirmation from site regarding receipt of packages/ Boxes original / copy. (b). One (1) original and Six (6) copies of signed Invoices (Paying Authority along with TIN No. should be mentioned, for VAT cases Annexure-I to be followed). (c). One (1) original and Seven (7) copies of Challan and Packing List (clearly showing number of packages, gross weight and net weight). (d). Six (6) copies of inspection certificate, if any issued by the customer. (e). Eight (8) copies of Customer/BHEL MDCC. (f). Six (6) copies of Approved Test Certificates if any. (g). Delivery order- Two (2) copies. (h). Guarantee Certificate – One (1) Original + One (1) copy. (i). Insurance Intimation - Two (2) copies. (j). CQIR / Inspection Reports – One (1) Original + One (1) copy. (k). PVC Calculation and copy of all applicable indices, if PVC applicable. – Two (2) copies. For materials originating from non-Indian Territory (a). Three (3) original and Seven (7) copies of clean bill of lading or One (1) clean original Airway Bill & Four (4) copies, in case of air freight. (b). One (1) original and Six (6) copies of signed Invoices (Paying Authority along with TIN No. should be Mentioned). (c). One (1) original and Seven (7) copies of Packing List (clearly showing number of packages, gross weight and net weight).
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		(d). Six (6) copies of certificate of country of origin. (e). Eight (8) copies of Customer/BHEL MDCC. (f). Six (6) copies of inspection certificate, if any, issued by the customer/his authorised representative. (g). Six (6) copies of certificate from the vendor to the effect that drawings and catalogues for customs clearance purpose have been kept with the packages for shipment. (h). Six (6) copies of certificate from the vendor to the effect that the contents in each case are not less than that entered in the invoices and guaranteed as new and as per the relevant technical specifications. (i) Shipping Specification – One (1) copy. (j). Quality Certificate – One (1) copy. (k). Approved Test Certificates if any. - Six (6) copies. (l). Guarantee Certificate – One (1) Original + One (1) copy. (m). Inspection Reports – One (1) Original + One (1) copy. (n). PVC Calculation and copy of all applicable indices, if PVC applicable. – Two (2) copies. For Claiming Freight, MRC & Services Payments refer GCC.
17.0	Material Receipt Certificate (MRC).	FOR Packages wherever E&C is in the scope of Vendor, The vendor shall arrange Material Receipt Certificate from the project site, duly signed by Customer and BHEL-Site after receipt & physical verification of the material at site. FOR Supply Packages, Material Receipt Certificate shall be arranged by BHEL-PEM. Vendor to provide copy of receipted LR's to enable BHEL-PEM to obtain MRC from site.




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18.A	Taxes & Duties (For Domestic Bidder) (Concessional Custom Duty against EC except for packages mentioned at sr. no. 18 C)	All bidders/vendors to note that this project is a Non-Mega (ICB) power Project. However Essentiality certificate shall be issued by TANGEDCO (Ultimate customer) for availing concessional custom duty under Project Import Regulations. Essentiality certificate shall be issued by TANGEDCO (Ultimate customer) for the specified items to be imported by the vendor, limited to CIF content mentioned in the NIT, for availing concessional custom duty. The bidder has to indicate in their offer, the import contents (if any) for the package i.e. list of items along with qty., currency of import, country of import & CIF value. The benefits availed in concessional custom duty must be passed onto BHEL in their offer. Availability of CIF for the packages, if any, shall be intimated in NIT.
		Concessional Sales Tax against issuance and exchange of form 'C' & 'E1/E2' / VAT, as applicable, are to be quoted by the bidder in their offer. Bidders has to note that in order to derive the total Landed Cost to BHEL following pricing elements shall also be considered in evaluation: i. ED (as applicable on self-manufactured items)- Except for packages mentioned at Sr. no. 18C. ii. CST/VAT (as applicable), iii. Service Tax (For Supply Packages). iv. Freight (including service Tax), However R1 i. Service tax quoted in case of Turnkey packages shall not be considered for evaluation purpose. However same shall be considered for ordering purpose. VAT for Intra-state dispatch shall be paid subject to conditions specified in Annexure I. "Wherever cenvat credit, if applicable could not be availed by BHEL within statutory time limit of six months(as per cenvat credit rule,2014) due to delay in submission of invoices or for any other reason attributable to bidder/contractor, liability towards loss of such cenvat credit(Excise duty/service tax etc) should be passed on to bidders/contractors." Entry Tax/ Octroi: Not Applicable.

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18.B	Taxes & Duties (For Order Directly to Foreign Bidders)	In case of Order on foreign supplier, the dispatches shall be FOB (Port of Dispatch) basis and the Taxes Duties in the country of dispatch shall be borne by Foreign Bidder & to be accounted in the prices quoted to BHEL/PEM/NOIDA. Evaluation shall be done as per provisions of GCC.
18.C	Custom duty (CD) & Excise duty ED for water treatment plant. R1 →	Custom duty (CD) & Excise duty (ED) are exempted against exemption certificate for following packages as per GOI notification 14/2004-Custom dated 08/01/2004 and 3/2004-Central Excise dated 08/01/2014 respectively :- 1. Oxygen dosing system 2. Chemical Dosing system 3. Condensate polishing unit 4. Pre-Treatment plant 5. Effluent treatment plant 6. Electrolytic Chlorination plant 7. Sewage Treatment plant Necessary documents shall be facilitated by TANGEDCO from concerned Government authorities for availing relevant exemption by BHEL. Exemption certificate shall be arranged by BHEL and provided to vendor for their self-manufactured as well as sub-vendor items directly dispatchable to site. Vendor should quote their price considering benefits of NIL Custom duty and NIL Excise duty. However vendor shall indicate the list of imported items, quantity and value of imported items in Indian Rupee and Foreign currency, amount of CD, rate of CD alongwith the country of import in their bid.
19.0	Packing, Identification & marking	• The supplier shall include and provide for securely protecting and packing the materials so as to avoid loss or damage during handling & transport by air, sea, rail and road. • All packing shall allow for easy removal and checking at site. Special precaution shall be taken to prevent rusting of steel and iron parts during transit by sea. Gas seals or other materials shall be adopted by the Contractor for protection against moisture during transit. • The number of each package in a shipment shall be shown in fraction, numerator showing number of the package and the denominator showing total number of packages in a lot / consignment. The packages number shall be generally prepared in the sequence in which they will be required for erection. • Each package delivered under the Contract shall be marked by and at the expense of the supplier and such marking must be distinct and in English language (all previous irrelevant markings being carefully obliterated). Such marking shall show the description and quantity of contents, the name and

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address of consignee, the gross weight and net weight of the package, the name of the Contractor with a distinctive number of mark sufficient for purposes of identification. All markings shall be carried out with such materials as to ensure quickness of drying, fastness and indelibility. Each equipment or parts of equipment shall, when shipped or railed or otherwise dispatched be tagged with reference to the assembly drawings and corresponding part numbers. Each bale or package shall contain a packing note quoting specifically the name of the Contractor, the number and date of contract and the name of the office placing the contract, nomenclature of the stores and include a schedule of parts for each complete equipment giving the part numbers with reference to the assembly drawing and the quantity of each part, drawings nos. and tag numbers.

- Rotor bearings should not be used as a support while packing.
- Besides wherever necessary, packing shall bear a special marking "TOP", "BOTTOM", "DO NOT TURN OVER", "KEEP DRY", "HANDLE WITH CARE", etc.
- All packing cases, containers (excluding marine container), packing and other similar materials shall be new.
- Notwithstanding anything stated in this clause, the Contractor shall be entirely responsible for loss, damage or depreciation or deterioration to the materials & supplies due to faulty and/or insecure packing.
- One copy of respective standard manufacturer's erection instruction/operation instruction manual shall be kept in each package/container for immediate reference.
- Each and every package box shall be marked with the following, as a minimum:

(i). Name and address of Consignee :

(ii). Project reference :

(iii). Contract No.:

(iv). Packing No.: (1/10, 2/10, 3/10 when there are 10 packages For one consignment)

(v). Net Weight/Gross Weight :

(vi). Port of Loading :

(vii). Destination Port : Ennore Port

(viii). Packing Mark : [symbols indicating "TOP" and other special markings as per

clause 10.10.(4) & 10.10.(6) above]

(ix). Type of Equipment :

"E" (for Equipment supply)

"T" (for Tools & Tackles)

"S" (for Mandatory Spares)

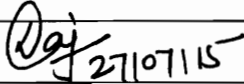
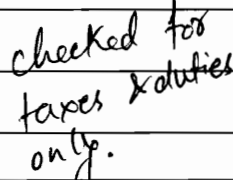
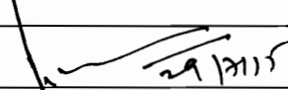
- Two copies of packing list should be kept in case/package No. 1 of each consignment of the goods and four copies in each case (three inside the box and one copy in a special packet at the outer side of the box).

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20.0	Commissioning spares	The commissioning spares shall be properly packed separately in separate box and each spare shall be properly tagged giving details (to match the description given in the packing slip) to facilitate their proper identification. Three copies of packing list is to be kept inside the box and one copy in a special packet at the outer side of the Box.		
21.0	Mandatory Spares	The Mandatory spares shall be properly packed separately in separate box indicating Mandatory Spares in bold letters and each spare shall be properly tagged giving details i.e. item number of the equipment in line with the Ultimate Customer Contract & Number per item (to match the description given in the packing slip) to facilitate their proper identification by ultimate customer M/s TANGEDCO. Three copies of packing list along with Manufacturing drawing no. Reference, Catalogue reference etc. is to be kept inside the box and one copy in a special packet at the outer side of the Box.		
22.0	Submission of Final Drawing / Documents along with O&M Manual, Type Test Certificates (if any)	As per GCC/ Technical specification/ Kickoff meeting.		
	Prepared By	Checked & Reviewed By	Vetted By Finance	Approved By
Name:	RAJEEV KUMAR	ANUJ KUMAR	SWATI NAIR	PERMINDER SINGH
Designation:	SR.ENGINEER	DGM	checked for taxes & duties only.	AGM/DH
Signature:				
Date:	27/07/15	27/7/15	28/7/15	29/7/15

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Annexure-I

SPECIAL CONDITIONS OF CONTRACT (REV 01)

2 X 660 MW ENNORE SEZ COAL BASED STPP, Job No. 412

In order to avail the benefit of input tax credit available to BHEL in case of VAT leviable on intra-state transaction between BHEL and vendor, & to fulfill the compliances as per requirements of applicable State's VAT law, the following modality shall be applicable:

BHEL has identified a nodal agency in each State to take care of VAT compliances in the State in which project is located. For the subject project nodal agency shall be:

BHEL HPBP, TIRUCHIRAPALLI – 620014, Tamil Nadu
VAT TIN No. 33243560005

Nodal agency is defined as Buyer in such cases, where VAT is applicable.

Vendors' original tax invoice for intra State transactions is one of important documents for availing Input Tax credit. In this regard the following may be noted by all vendors for strict compliance:

- As a general rule, a tax invoice must be original, must contain vendor's TIN No with full address, invoice no & date, product description with unit rate, quantity, value, VAT rate, VAT amount, gross value of bill, **buyer i.e. BHEL's address with TIN No.** (as given above) special marking like "Original" and/or "valid for input credit"/ Buyer can take credit against this" etc as per applicable State VAT law.
- Please note that BHEL's address and TIN to be mentioned in vendors tax invoice shall be **principal place of business & applicable TIN No. of nodal agency of BHEL, as given above.** In no case the vendors, invoices shall be addressed to BHEL PEM nor shall they contain our TIN as buyer.
- As original tax invoice of vendors are to be furnished to nodal unit for assessment/VAT audit purposes, extra copy of Original invoice is required to be submitted by vendors for retaining with bank payment voucher.
- Original tax invoice along with extra copy of Original Tax invoice in line with respective state VAT law shall be essential document to be submitted by vendor for claiming payment.
- Vendor shall also furnish a certificate/statement/document as prescribed under applicable State VAT law. Please note that some of the States requires additional certificate/documents e.g. Haryana requires certificate in form C-4 in addition to original tax invoice.
- Please note that reimbursement/payment of VAT shall be subject to furnishing of Vat complaint tax invoice and other certificate/document as per applicable State VAT law.
- Tax invoice must show Vat rate & VAT amount separately and in no case all inclusive prices is to be shown in the tax invoice since input credit is not admissible in case VAT is not indicated separately.
- In case vendor is unable to furnish Vat compliant tax invoice & other certificate/document, VAT shall not be reimbursed by BHEL.

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Where the supplies are made from within the same state where the project is located, the vendor has to provide VAT tax invoice for such supplies even if the price quoted is all inclusive.

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General Points of PQR

1. Offers of the JV companies/ Joint Bidders/ bidders having collaboration/ licensing agreement/ MOU/ Indian subsidiaries shall be evaluated as follows:
 - a. If bidder happens to be an Indian subsidiaries of foreign OEM, then the credentials of the foreign OEM can also be considered for meeting PQR.
 - b. If bidder happens to be the Joint Venture Company, then the credentials of any of JV partners can be also considered for meeting PQR.
 - c. If bidder happens to bid jointly with their partner, then credentials of both the partners will be considered for meeting PQR as per distribution of the work. In all such cases, lead bidder as specified in bid documents shall be responsible for overall execution of the contract and all guarantee/ warranty.
 - d. If bidder happens to be the having valid collaboration agreement/ MOU/ licensing agreement with some other company, then the credentials of collaborator/ MOU partner/ licensing company can also be considered for meeting PQR.

Note: If bidder(s) qualifies on the basis of credentials of his principal/ JV partner/ Collaborator/ joint bidder etc., then the principal/ JV partner/ Collaborator/ MOU partner/ joint bidder shall be responsible for overall design vetting and warranty/ guarantee of the package. The scope matrix clearly defining their respective roles including design vetting, manufacturing of critical component, E&C etc. etc. and warranty/ guarantee shall be submitted along with the offer.

2. Bidder to note that the arrangement of bidding (joint bid partners/ collaborator/ MOU partner/ licensing company etc.) once offered to BHEL as a part of bidding documents cannot be changed till the execution of the project.
3. Consideration of offer shall be subject to customer's approval of bidders, if applicable.
4. Bidder to submit all supporting documents in English. If documents submitted by bidder are in language other than English, a self-attested English translated document should also be submitted.
5. Any other project specific requirement shall be as per Annexure-I and bidder shall submit relevant supporting documents.
6. Notwithstanding anything stated above, BHEL reserves the right to assess the capabilities and capacity of the bidder/collaborators to perform the contract, should the circumstances warrant such assessment in the overall interest of BHEL.
7. After satisfactory fulfillment of all the above criteria/ requirement, offer shall be considered for further evaluation as per NIT and all the other terms of the tender.

	PRE-QUALIFICATION REQUIREMENTS FOR GENERATOR CIRCUIT BREAKER	PE-PQ-999-510-E001
		REVISION NO. 03 DATE 29/04/2016
		SHEET NO. 1 OF 1

ITEMS : Generator circuit breaker complete with isolator, earth switches, surge capacitor, manual shorting connection

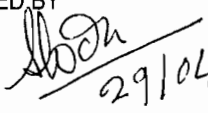
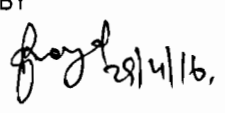
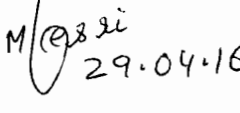
RATING : **Continuous current rating:** 6000 Amps and above, **Short circuit current rating:** 63kA and above, **Rated voltage:** Suitable for generator voltage of 10.5kV and above.

SCOPE: Supply : YES; Erection & Commissioning : NO; Supervision of Erection & Commissioning : YES;

1	Availability of complete type test report as per relevant IEEE/IEC standard conducted at independent laboratory or witnessed by third party.
2	Vendor should be designer and manufacturer of generator circuit breaker.
3	In-house capability to carry out all routine & acceptance test as per relevant IEEE/IEC standard.
4	Option -1 : Performance certificates for min. 2 years of trouble free operation at minimum 2 different installations/sites for above rating of GCB. Performance certificate should be from end user only. OR Option-2 : Repeat orders received from two different purchasers/end users for above rating of GCB during last 5 years from the date of application for registration or date of techno-commercial bid opening (as applicable) provided the gap between the awards of purchase orders is minimum 2 years. OR Option-3 : 1 no. performance certificate (as per Option-1) and 1 no. repeat order (as per Option-2). OR Option-4 : Successful execution of a major order from BHEL-PEM for above rating of GCB.
5	Minimum two (2) nos. purchase orders for supply of Generator Circuit Breaker of above rating shall be submitted which should not be more than five (5) years old from the date of application for registration or date of techno-commercial bid opening (as applicable) for establishing continuity in business.

NOTE:

Supplier to comply to "general points of PQR" available at <http://bhhelpem.com/vensection/PMD/PMD.aspx>
In case supplier is not OEM, the offer shall be evaluated as per point no 1 of "general points of PQR".

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