



Bharat Heavy Electricals Limited

(A Govt. of India Undertaking)

Transmission Business Group

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CORRIGENDUM - 06 TO NIT NO-72560

Dated 31.05.2023

Subject: Corrigendum-06 to Tender enquiry for Supply & Services of 420 kV GIS FOR THDC VISHNUGAD PIPALKOTI PROJECT.

Project : THDC VISHNUGAD PIPALKOTI Project
Equipment / Item : SUPPLY & SERVICES OF 420kV GIS.
Enquiry No/Date : Enquiry No_61G2300312 Dated 11-03-2023
BHEL NIT NO : 72560
Original Tender due date : 03.04.2023

This Corrigendum is issued by BHEL-TBG against above mentioned NIT/ enquiry **for:**

- 1) Issuance of Technical clarifications (enclosed) based on pre-bid meeting queries,**
- 2) Technical Corrigendum (in addition to pre-bid clarifications),**
- 3) extension of due date of tender submission/opening to 14-06-2023.**

All other terms and conditions for this tender enquiry shall remain unchanged.

Bidder to ensure submission of offer on or before due date.

Note: Tender ID in CPP Portal is **2023_BHEL_23148_1.**

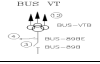
Thanking you

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Gaurav Agarwal
BHEL TBG, NOIDA

DOCUMENT TITLE: Annexure- 400KV GIS & its accessories - Pre-bid clarification by Bidders
PROJECT: Vishnugad Pipakoli Hydro Electric project (4X111MW)
REVISION NO: 00

Sl. No.	Document Reference	Clause no. and description	Deviations/ clarifications sought by bidders	Clarifications provided by THDCL/BHEL
A. Bidder-1				
1	Section-1/ TS TB-382-316-004 REV01	Clause 3: Specific Technical Requirements (14) Total number of interrupting chambers per phase of 420kV Circuit breaker - three Two nos.	We can offer only single interrupter CBs which fully complies to IEC 62271-100. Please confirm.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
2	Section-1/ TS TB-382-316-004 REV01	Clause 3: Specific Technical Requirements- Notes (2) The Bidder is to ensure that packing size of GIS materials shall be such that it should accommodate in a rail cart as provided in cutout area (7m x 4 m) in GIS floor for lifting of GIS material from MAT (main access tunnel).	To handle assembled bays at site, we request cutout area of 10m x 5m.	It shall be decided during detailed engineering.
3	Section-1/ TS TB-382-316-004 REV01	Clause 4: Other General Requirements (1) In addition to this, packing of GIS & its accessories shall be suitable for long term storage without any deterioration in quality and performance (min. 2 years).	Packing of GIS & its accessories shall be suitable for 6 months storage subject to Buyer following Seller's storage instructions.	Please refer clause 4.2 of section-1/ TS. OEM recommendation for storage including type of storage shall be duly taken care during detailed engineering.
4	Section-1/ TS TB-382-316-004 REV01	Clause 4: Other General Requirements (6) GIS bays may be commissioned at different point of time depending on the site conditions and as per 12 schedule for the project, and hence deployment the resources at multiple times at the by bidder in line with actual requirement is envisaged and payment for the same shall be made to bidder, for the reasons not attributable to bidder.	GIS bays shall be installed in one shot and testing and commissioning of the same shall be done after installation. Charging of lines, trafos can be at different point of time once GIS bays are on-line. Request to clarify the "multiple times" as we have only two GT bays in this project.	Please comply BOQ & TS.
5	Section-1/ TS TB-382-316-004 REV01	Clause 5: Bill of Quantities (A6) 420kV, 40kA for 15sec, 2000A Termination module for GIS busduct and CB to SF6 Bushing of Generator Transformer	Termination module including division of scope of supply shall be as per IEC 62271-211. Please confirm.	Please comply BOQ & TS.
6	Section-1/ TS TB-382-316-004 REV01	Clause 5: Bill of Quantities (A7) 420kV, 40kA for 1sec, 1 phase, 2000A, termination module for connecting GIS bay module with XLPE cable.	Termination module including division of scope of supply shall be as per IEC 62271-209. Please confirm.	Please comply BOQ & TS.
7	Section-1/ TS TB-382-316-004 REV01	Clause 5: Bill of Quantities (A8 & A17) SF6 gas & Structure	As the quantity of SF6 gas & structure material would vary from one GIS design to the other, we request you to amend the quantity unit of such items as 1 Lot & let the manufacturer estimate the same & quote accordingly.	Please comply BOQ & TS.
8	Section-1/ TS TB-382-316-004 REV01	Clause 5: Bill of Quantities (B1 to B12) Testing, maintenance & monitoring equipment	We request you to confirm make & model of each of these items.	Please comply BOQ & TS. Makes and models shall be reputed one.
9	Design Basis Report/ Section-2/ TS TB-382-316-004 REV01	Clause 5: General Design and Safety Requirements The pressure relief type gas monitoring arrangement and sensors shall be provided in GIS.	Gas density is monitored with temperature compensated gas density switches. Bursting discs are provided for pressure relief.	It shall be decided during detailed engineering.
10	Design Basis Report/ Customer TS/ Section-2 TS TB-382-316-004 REV01	Clause 6.0 Clause 15.10.2 The single phase circuit breaker in each bay module shall be of buffer type with two interrupting chambers per phase.	We propose single interrupter CBs which fully complies to IEC 62271-100 and technical requirements of this spec. Please confirm.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
11	Design Basis Report/ Section-2/ TS TB-382-316-004 REV01	Clause 6.0 Single phase switches shall be provided with operating mechanism for each phase suitable for operation from a 220Vdc ungrounded supply.	Proposed High speed earthing switches are group operated with one operating mechanism for all 3 poles.	It shall be decided during detailed engineering.
12	Section-2/ Customer TS/ TB-382-316-004 REV01	Clause 15.1.6 In addition to the above the bidder shall design his equipment so as to be suitable for integration / interfacing of Local Control Panels of GIS with Unit Control Board (UCB) & Computerized Control Systems (CCS).	Our LCC shall be provided with potential free contacts for interfacing. Pls. confirm. Any other requirements in LCC for interfacing to upper levels to be provided by main contractor.	It shall be decided during detailed engineering.
13	Section-2/ Customer TS/ TB-382-316-004 REV01	Clause 15.4.1: Ratings (vi) Rated voltage, V_{rms} 420 (v) Highest System Voltage, V_{rms} 440	Highest system voltage shall be 420kV/rms as per applicable IEC.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
14	Section-2/ Customer TS/ TB-382-316-004 REV01	Clause 15.4.1: Ratings (viii) 15.8.1.1, Disconnections type & ratings Rated lightning impulse withstand voltage(Vp) Across the open contacts - 1665 kVp Rated switching impulse withstand voltage(Vp) Phase to phase - 1425 kVp Across the open contacts - 1245 kVp	Rated lightning impulse withstand voltage(Vp) Across the open contacts shall be +125 + 240 kVp as per IEC Rated switching impulse withstand voltage phase to phase is not applicable for single phase encapsulated design. Also 50kV across open contacts shall be - 900 + 345 kVp, as per IEC.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
15	Section-2/ Customer TS/ TB-382-316-004 REV01	Clause 15.4.1: Ratings (vi) Material of enclosure Aluminium alloy or Nonmagnetic material. Steel for line breaker with PIR	As per SLD and BOQ, there are no PIR for any Circuit breaker. Material of enclosure of our type tested design shall be Aluminium Alloy.	Please comply BOQ & TS.
16	Section-2/ Customer TS/ TB-382-316-004 REV01	Clause 15.4.1: Ratings (vi) SF6 relative pressure at 20 deg C except for CB - a) Filling - 5.3 bar b) Alarm - 4.8 bar c) Minimum - 4.5 bar	Filling, Alarm and Guaranteed pressure of SF6 shall be as per OEM's type tested design.	Please comply BOQ & TS.
17	Section-2/ Customer TS/ TB-382-316-004 REV01	Clause 15.4.1: Ratings (vi) No. of mechanical operation of CB of class M2 with maximum 3000A current before scheduled maintenance required is 12,000 operations	Mechanical operations are no-load operations. We confirm Class-M2 for proposed CBs.	It shall be decided during detailed engineering.
18	Section-2/ Customer TS/ TB-382-316-004 REV01	Clause 15.5.2: General Design and Safety Requirements Due to safety requirement for working on the pressurized equipment, whenever the pressure of the adjacent gas compartment is reduced, it should be ensured by the bidder that adjacent compartment would remain in service with reduced pressure.	Gas compartments are not electrically isolated. Due to safety requirements, we recommend to earth the gas compartment which is not a guaranteed pressure.	Please comply BOQ & TS along with service continuity requirements mentioned in Annexure-F of IEC 62271-203. Please refer Annexure-AA as attached for gas schematics.
19	Section-2/ Customer TS/ TB-382-316-004 REV01	Clause 15.5.13: General Design and Safety Requirements gas proof compartments atleast for- F) Current transformer	In our GIS design, CT secondary cores are all insulated. Primary of CT is only conductor inside GIS which may not require separate compartment as there is no switching elements.	Please comply BOQ & TS.
20	Section-2/ Customer TS/ TB-382-316-004 REV01	Clause 15.7.1.2: Circuits Breakers (vi) Rated short circuit breaking current - 40kA rms Percentage of DC component - > 70%	Percentage of DC component shall be as per IEC 62271-100.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
21	Section-2/ Customer TS/ TB-382-316-004 REV01	Clause 15.7.1.2: Circuits Breakers (viii) Rated small inductive breaking current - any value from 5kA to 10A without switching over voltage exceeding 2.3 p.u.	Rated small inductive breaking current shall be as per IEC 62271-101 i.e. 115 Amps.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
22	Section-2/ Customer TS/ TB-382-316-004 REV01	Clause 15.7.1.2: Circuits Breakers Construction & design The single phase circuit breaker in each bay module shall be of buffer type with two interrupting chambers per phase.	We propose single interrupter CBs which fully complies to IEC 62271-100 and technical requirements of this spec. Please confirm.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
23	Section-2/ Customer TS/ TB-382-316-004 REV01	Clause 15.7.2.2: Circuits Breakers Construction & design The circuit breakers shall be provided with independent and reliable hydraulic operating mechanism for each pole.	Offered Single Interrupter CBs have Spring operated mechanism for each pole.	It shall be decided during detailed engineering.
24	Section-2/ Customer TS/ TB-382-316-004 REV01	Clause 15.13.1.3: SF6 bushing connection The SF6 GIS to air bushing for termination of XLPE cable shall conform to IEC-157 & IEC -2009 (latest edition) and shall have the following ratings:	There is no SF6 GIS to air bushing termination for XLPE cable. It is HV termination kits for XLPE cable. We provide cable box enclosure as per IEC 62271-209. We exclude supply of 400kV HV cable termination kits.	Please comply BOQ & TS.
25	Section-2/ Customer TS/ TB-382-316-004 REV01	Clause 15.13.1.7: SF6 bushing connection Clause 15.13.1.8: SF6 bushing connection At porcelain used in the bushings shall be manufactured by the wet process. SF6 to Air bushings which shall be complete with suitable corona rings...	Request to note that there is no SF6 to Air bushing shown for Line bays in SLD layout drawing. Only cable termination is indicated. As already informed above, we consider only cable termination enclosure in scope. HV cable termination kits are excluded.	Please comply BOQ & TS.
26	Section-2/ Customer TS/ TB-382-316-004 REV01	Clause 15.14.1: Surge Arrester Surge arresters	Surge arrester parameters shall be decided during detailed engineering stage.	Please comply BOQ & TS.
27	Section-2/ Customer TS/ TB-382-316-004 REV01	Clause 15.19.5: Monitoring The equipment shall have provision to monitor the following parameters periodically to check anomalies and/or wear and tear of equipment: (i) Operation of mechanical components. The parameters to be monitored are - Fluid pressure, ... (ii) Wear of circuit breakers interrupting chamber (iii) Insulation failure, ... (iv) Safety bursting disc for each SF6 gas compartment.	i) CB analyser/Haz (Ultima Make) shall be supplied to determine the contact position and accumulated effect of interrupted currents. Measuring device for SF6 decomposition products shall be supplied. ii) Gas density switches for SF6 gas density monitoring UHF sensors shall be provided for PD detection. Sonic detection is not recommended as noise generated by GIS varies overtime. iv) Safety bursting disc: shall be provided for each gas compartment.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
28	Section-2/ Customer TS/ TB-382-316-004 REV01	Clause 15.21.6: Service Life SF6 circuit breakers, disconnect switches and ground switches will be subjected to frequent, and occasionally repetitive, no load operations and switching of load, capacitive and inductive current within their ratings. In order to minimize maintenance and component replacement, the tenderer shall submit proof that all offered SF6 GIS equipment has without a life of 10,000 normal operations.	Offered Circuit breaker, disconnect and safety grounding switch complies class-M2- 10,000 no load operations. Offered High speed earthing switch complies class M1 - 2,000 - No load operations.	It shall be decided during detailed engineering.
29	Section-2/ Customer TS/ TB-382-316-004 REV01	Clause 15.24.3.6: Type Tests In addition, the following type tests on one piece each of related component parts of a single pole assembly of one typical switching bay module shall be made:	Type tests are performed once for a design. We will submit relevant type test reports as per clause 1.8 of Section-1/Scope pg 5 of 8. We do not envisage repetition of any type tests in our offer.	It shall be decided during detailed engineering.
30	Section-2/ Customer TS/ TB-382-316-004 REV01	Clause 15.24.4.2: Commissioning Tests (a) One minute power frequency withstand tests for the main circuit as per IEC 517 G1: 7-1071 3.2 High voltage tests at site with lightning impulse and switching impulse voltages are also acceptable as alternative.	At Site, one minute power frequency withstand test for main circuits shall be performed. Type test reports performed already for Lightning and Switching impulse tests shall be submitted.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
B. Bidder-2				
1	Section-1/ TS TB-382-316-004 REV01	Clause 3: Specific Technical Requirements Any change in bay pitch (distance between bays) as per civil requirement for foundation layout during detailed engineering stage shall be incorporated.	Confirmed, however any change in length of busduct and bus bar shall be compensated as per unit rate defined in respective line item in Price Bid.	Any change in bay pitch (distance between bays) as during detailed engineering stage shall be paid as per actual measurement in "Gas Insulated bus duct" of BOQ.
2	Section-1/ TS TB-382-316-004 REV01	Clause 3: Specific Technical Requirements Total number of interrupting chambers per phase of 420kV Circuit breaker - three Two	Since this is application of hydro electric power plant, and customer has mentioned requirement of two nos interrupting chambers per phase which provides higher insulating strength, less wear of contacts and longer service life, we understand this is a mandatory requirement to be complied by GIS OEM and offer product accordingly.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
3	Section-1/ TS TB-382-316-004 REV01	Clause 3: Specific Technical Requirements- Note 4 Bidder shall offer their latest type tested compact model to accommodate in the specified & allocated space	Request to confirm the allotted space in which the GIS is to be offered. Pls share the autocad drawing for the substation area for confirmation.	Space allocated for GIS is already mentioned in Conceptual Layout Drawing of 400KV GIS.

DOCUMENT TITLE: PROJECT: REVISION NO:		Annexure- 400kV GIS & its accessories - Pre-bid clarification by Bidders Vidhansabha Pipalkoti Hydro Electric Project (4X111MW) 00		
4	Section-1/ TS TB-382-316-004 REV01	Clause 3: Specific Technical Requirements- New 5 Bidder shall conduct insulation co-ordination & very fast transient overvoltage (VFTO) studies in line with IEC 62271 for establishing suitability of surge arrester rating, and any other technical requirement for successful operation of GIS.	We shall offer the Surge arresters as per the BOQ. In case of additional requirement of surge arrester is envisaged after conducting VFTO studies during execution, the same shall be at additional time and price implication. Insulation co ordination shall be in Scope of BH&L.	Please refer BOQ & TS.
5	Section-1/ TS TB-382-316-004 REV01	Clause 3: Specific Technical Requirements- New 6 CT/ VT parameters mentioned in SLD is indicative only. Bidder has to ensure correctness of CT/ VT using as per relays selected for GIS during contract stage/ detailed Engineering stage	The offered GIS shall be as per CT/ VT parameters mentioned in the tender document. In case of change in parameters, the same shall be compensated in price as required.	CT/ VT parameters mentioned in approved SLD are approved by customer. Please refer BOQ & TS.
6	Section-1/ TS TB-382-316-004 REV01	Clause 4: Other General Requirements (9) The bus enclosure shall be sectionalized in a manner that maintenance work on any bus disconnector (when bus and bus disconnector are enclosed in a single enclosure) can be carried out by isolating and evacuating the small affected section and not the entire bus.	Noted. Entire bus of the affected compartment shall not be live.	It shall be decided during detailed engineering.
7	Section-1/ TS TB-382-316-004 REV01	Clause 4: Other General Requirements (11) The positioning of the circuit breaker in the GIS shall be such that it shall be possible to access the circuit breaker of any feeder from the front side for routine inspection, maintenance and repair without interfering with the operation of the adjacent feeders	Access from front side to circuit breaker is possible only in design of circuit breakers that are horizontally oriented. For vertical circuit breakers, the access to interrupters is from top (to remove/repair interrupter), hence we understand that the requirement for 400 kV GIS in this project is with horizontal circuit breakers only. Pls confirm.	Please refer clause 15.7.2/Section-2 (TS). Kindly comply BOQ & TS.
8	Section-3/ TS TB-382-316-004 REV01	Clause 7: Type Testing The validity of type test reports shall be as per the latest CEA guidelines (amended time to time) as on the original scheduled date bid submission for BH&L tender.	We understand that this clause shall be superseded by clause 3. General technical requirement (i) Type test. Request to confirm as both are contradictory.	Please comply BOQ & TS and please follow the precedence of documents mentioned in Section-1 of TS.
9	Section-1/ TS TB-382-316-004 REV01	Clause 5: Bill of Quantities 420kV GIS equipment system shall have monitoring system, complete in all respect and comprising of following, but not limited to: (a) All gas compartments shall have their own independent gas supervision and alarm systems. There shall not be any interconnection between different gas compartments for the purpose of gas monitoring. (b) Individual temperature compensated gas pressure gauge(s)/ density device(s) shall be provided in each of the gas compartments which will monitor and indicate the state of gas density. The system shall be such that it can be installed separately/ integrated with SCADA/ DMS (as applicable).	a) Confirmed b) Confirmed. However, we understand that the requirement is for standard density monitors without analog/ digital output. Further, auxiliary contacts for alarm and trip shall be provided with density monitor and the same can be integrated (integration in BH&L scope) with CRP/SCADA to indicate alarm and trip status. Any dedicated continuous online gas monitoring system is not envisaged. Hope the same shall suffice the requirement, pls confirm.	Please comply BOQ & TS.
10	Section-1/ TS TB-382-316-004 REV01	Clause 12: Packing and Dispatch The equipment may be stored outdoors for long periods before installation. The packing shall be completely suitable for outdoor storage in areas with heavy rains and high ambient temperature. Hence, packing of the equipment shall be suitable for long storage (minimum 2 years).	In case the material is to be stored for longer periods, we request BH&L to store the material in Indoor Store only and in line with OEM storage guidelines.	Please refer clause 4.2 of section-1/ TS. OEM recommendation for storage including type of storage shall be duly taken care during detailed engineering stage.
11	Section-1/ TS TB-382-316-004 REV01	Clause 5: Bill of Quantities A.3) (a) 110kV-phase circuit breaker, complete with operating mechanism for 1.3.3 phase operation- test	The offered Circuit Breaker shall be with single phase operating mechanism only. Hope the same is acceptable.	Please comply BOQ & TS.
12	Section-1/ TS TB-382-316-004 REV01	Clause 5: Bill of Quantities (g) SF6 gas required for placing GIS into successful operation- 7 MT	The gas required for first filling shall be as per OEM design, hence request you to consider accordingly in BOQ as lot item included in respective GIS Bay/ GIB price.	Please comply BOQ & TS.
13	Section-3/ TS TB-382-316-004 REV01	Clause 15 (i) Terminal blocks The insulating material of terminal block shall be nylon 6.6 which shall be free of halogens, fluorocarbons etc.	The insulating material for terminal blocks shall be polyamide as per our design. Hope the same is acceptable.	It shall be decided during detailed engineering.
14	Section-2/ TS TB-382-316-004 REV01	Clause 15.5.1: General Design and Safety Requirements The GIS assembly shall consist of completely separate pressurized sections in order to depressurize one gas compartment for repair, maintenance or if necessary for repair while keeping the adjacent compartments in service	In view of safety of operating personnel working at site in case of repair, maintenance or replacement of gas compartment, the pressure of adjacent compartment shall be reduced and hence the same shall not be in service. Hope the same is acceptable.	Please comply TS and for service continuity requirements mentioned in Annexure-F of IEC 62271-203. Please refer Annexure-400kV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
15	Section-2/ TS TB-382-316-004 REV01	Clause 15.5.2: General Design and Safety Requirements Due to safety requirement for working on the pressurized equipment, whenever the pressure of the adjacent gas compartment is reduced, it should be ensured for the bidder that adjacent compartment would remain in service with reduced pressure	In view of safety of operating personnel working at site in case of repair, maintenance or replacement of gas compartment, the pressure of adjacent compartment shall be reduced and hence the same shall not be in service. Hope the same is acceptable.	Please comply TS and for service continuity requirements mentioned in Annexure-F of IEC 62271-203. Please refer Annexure-400kV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
16	Section-2/ TS TB-382-316-004 REV01	Clause 15.5.3: General Design and Safety Requirements The insulating material of the enclosure shall be such as to withstand an internal flash over without burn through for a period long enough (500ms) till the backup relay protection clears the fault.	We confirm to meet this stringent requirement to withstand an internal flash over without burn through for a period of 500ms through our robust enclosure design of which type test report is also available. Since this is a typical Technical requirement for HEP application to ensure safety and reliability of the system, we understand this is a mandatory requirement to be complied by GIS OEM.	Please refer Annexure-400kV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
17	Section-2/ TS TB-382-316-004 REV01	Clause 15.6.23: General Design and Safety Requirements Insulator arrangement shall be provided to visually observe the contact position of disconnecting switches and earth switches	Viewing window shall be provided for all disconnectors as per standard manufacturing practice. Every viewing window will have provision to see the contact positions. Only one standard endoscopic tool shall be supplied for all disconnectors.	It shall be decided during detailed engineering.
18	Section-2/ TS TB-382-316-004 REV01	Clause 15.6.24.1: General Design and Safety Requirements If any other alarm necessary to indicate deterioration of the gas insulating system	We do not envisage any other alarm apart from mentioned ones in a to c above.	It shall be finalized during detailed engineering stage.
19	Section-2/ TS TB-382-316-004 REV01	Clause 15.6.25: General Design and Safety Requirements In addition, indoor humidity will be about 70% where GIS system is to be installed and operated.	Indoor Humidity shall be in line with IEC.	Please refer Annexure-400kV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
20	Section-2/ TS TB-382-316-004 REV01	Clause 15.6.27: General Design and Safety Requirements If the equipment has not been type tested earlier, design calculations of simulated parameters should be furnished alongside the offer.	The design calculations shall be furnished in the even of order.	It shall be finalized during detailed engineering stage.
21	Section-2/ TS TB-382-316-004 REV01	Clause 15.7.1.2: General Design and Safety Requirements (x) percentage of DC component - >70%	Our product is designed for percentage of DC component - 40% as per IEC.	Please refer Annexure-400kV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
22	Section-2/ TS TB-382-316-004 REV01	Clause 15.7.1.2: General Design and Safety Requirements (xxvi) Number of auxiliary contacts - 12 NO and 12 NC on each pole wired to terminal blocks in control cabinet	We can confirm upto maximum 6 NO and 6 NC contacts.	Kindly comply BOQ & TS.
23	Section-2/ TS TB-382-316-004 REV01	Clause 15.7.2.17: General Design and Safety Requirements All DC coils (trip, close, auxiliary etc.) shall be equipped with surge suppression devices such as diodes across the coils to provide a discharge path for transient voltage.	Confirm, however surge suppression in DC coil not in scope, same function shall be met through MCB in LCC	It shall be finalized during detailed engineering stage.
24	Section-2/ TS TB-382-316-004 REV01	Clause 15.10.5: General Design and Safety Requirements Each high speed make proof grounding switch shall have clearly identifiable mechanical position indicator together with position indicator on the bay module control cabinet and provision for taking the signal to main control room.	As per OEM design, mechanical position indicator shall be provided on drive.	It shall be finalized during detailed engineering stage.
25	Section-2/ TS TB-382-316-004 REV01	Clause 15.19.5 Sonic detection for insulation failures	Request to elaborate the requirement as sonic detection is not applicable to GIS. There is no such provision envisaged.	Please refer Annexure-400kV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
26	Section-2/ TS TB-382-316-004 REV01	Clause 15.24.3.1 The following type tests shall be made on a complete single pole assembly of one typical switchgear bay module as per IEC 517	The type test reports shall be submitted for tests conducted as per IEC 62271-203.	It shall be finalized during detailed engineering stage.
27	Section-2/ TS TB-382-316-004 REV01	Clause 15.24.2.5 Electrical Tests/ Routine Tests	Routine tests shall be performed in line with IEC standards only. Additional tests are not envisaged.	It shall be finalized during detailed engineering stage.
28	Section-2/ TS TB-382-316-004 REV01	Clause 15.24.4.3 Commissioning Tests	Commissioning tests shall be performed in line with IEC standards only. Additional tests are not envisaged.	It shall be finalized during detailed engineering stage.
29	Section-1/ TS TB-382-316-004 REV01	Clause 16 Controlled switching Device for Line Bay CB	The application of CSO is recommended only in cases where length of transmission line is more than 180 kms. Hence, request to confirm the length of the line.	Kindly comply BOQ & TS.
30	Section-1/ TS TB-382-316-004 REV01	Clause 17 Structure Materials for support of GIS. Bus Ducts including Foundation Bolts, Embedded Items, Rails and/ or other items structural items specific to GIS shall be as per OEM design hence request you to consider accordingly in BOQ as lot item included in respective GIS Bay/GIB price.	The Support structure required for GIS, Bus ducts including Foundation Bolts, Embedded Items, Rails and/ or other items structural items specific to GIS shall be as per OEM design hence request you to consider accordingly in BOQ as lot item included in respective GIS Bay/GIB price.	Kindly comply BOQ & TS.
31	Section-2/ TS TB-382-316-004 REV01	Clause 8 Service continuity requirements The typical drawing for gas schematics is attached for reference purpose (Annexure-AA)	Request to share Annexure-AA as the same is not available in tender documents.	Please refer Annexure-400kV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
32	Section-3/ TS TB-382-316-004 REV01	3. General technical requirement Type test All equipment/systems to be supplied shall conform to type tests as per relevant standards and proven type. The Bidder / vendor shall furnish the reports of all the type tests carried out within last ten years from the date of signing of contract (i.e. 18.11.2024) and shall be available for review of electrical specification and relevant standards for all components / equipment / systems. These reports should be for the tests conducted on identical / similar components / equipment/systems to those offered / proposed to be supplied under this contract	The subject clause states that, type test reports to be submitted of offered product shall be conducted on identical/similar components/equipment/system, so we understand that the offered product should be type tested as per IEC 62271-203 from the manufacturing works from where the product is being offered and the type testing shall have to be completed before commencement of delivery of GIS. Pls confirm. Further regarding validity of type test, we understand type test report will be accepted if it is performed before 18.11.2024 i.e. within 10 years from date of signing of contract (i.e. 18.11.2024).	Please refer clause 7.0 of section-1 of TS. Kindly comply BOQ & TS.
33	Section-3/ TS TB-382-316-004 REV01	Clause 15 (i) Control wiring shall be stranded copper and shall be not smaller than 2.5 mm ² , except as otherwise agreed by the Owner	We confirm to the mentioned size for CT, however, for balance equipment cables, request to accept the size of 1.5 sqmm which is sufficient technically, in view of size constraint in LCC.	It shall be finalized during detailed engineering stage.
34	Section-3/ TS TB-382-316-004 REV01	Clause 15 (ii) For current and potential transformer secondary circuits the cross section of the conductors shall not be less than 6 mm ² and 4 mm ² respectively	We request to accept the size of 2.5 sq mm for CT and VT control cables as the same is sufficient technically.	It shall be finalized during detailed engineering stage.
35	Section-1/ SLD		We understand as per SLD that Bus V-bus with manual isolating link is acceptable. Pls confirm.	Please comply BOQ & TS.
C.	Bidder-3			

DOCUMENT TITLE: PROJECT: REVISION NO:		Annexure- 400KV GIS & its accessories - Pre-bid clarification by Bidders Vihnagad Pipalkoti Hydro Electric project (4X111MW) 00		
1	Design Basis Report/ Section-2/ TS TB-382-316-004 REV01	Design basis report The single phase circuit breaker in each bay module shall be of buffer type with two interrupting chambers per phase	We would like to inform you that our CB type tested with single interrupter, our GIS type tested till 63kA with single interrupter, your short circuit current is 40kA, We are having 63kA, so we can complete your requirement. Please accept the same.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
2	Section-2/ TS TB-382-316-004 REV01	Clause 15.7: Circuit Breakers	We would like to inform you that as per Technical specification file in Line feeder PIR is required but as per BOQ and NIT the CBD is required for line feeder. Please clarify in Line feeder what type of CB is required.	Please comply BOQ & TS. Please note that CB with PIR is not required.
3	Section-2/ TS TB-382-316-004 REV01	Clause 15.5: General Design and Safety Requirements. The materials and dimensions of all components shall be such as to withstand an internal flash over without burn through for a period long enough (5000ms) at the backup safety protection clears the fault. The material shall be such that it has no effect of environment as well as from the by-products of SFS breakdown under arcing condition.	We would like to inform you that as per your short circuit current 40kA, but we are having short circuit current 63kA, as per IEC 62271-225 (page no 22) Burn through time is Equal or greater than for 40kA is 300ms. Even though our short circuit current is higher than your requirement, so we can complete your requirement. Please accept the same.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
4	Section-1/ TS TB-382-316-004 REV01	Clause 5: Bill of Quantities A.1) Interface module for future extension (Set: 2) A.12 Bus extension module (Set: 2)	We would like to inform you that, Interface module is required to connect existing GIS which of different make. As current scope of supply is a new substation due to that only extension module is required. We provided extension module. Kindly confirm the same.	Please comply BOQ & TS. Any change in bay pitch (distance between bays), during detailed engineering stage shall be paid as per actual measurement in "Gas Insulated bus duct" of BOQ.
5	Design Basis Report/ Section-1/ TS TB-382-316-004 REV01	Clause 7.4: Mandatory spare of GIS for the five years of successful operation.	We would like to inform you that we have considered spare parts as per BOQ Sr. No. 3.01 to 3.12. Kindly confirm same.	Please comply BOQ & TS.
6	Section-3/ TS TB-382-316-004 REV01	Relative Humidity	Relative Humidity -100%	Please comply BOQ & TS.
7	Section-1/ TS TB-382-316-004 REV01	3. Specific Technical Requirements-Notes 6. Bidder shall conduct insulation co-ordination & very fast transient overvoltage (VFTO) studies in line with IEC 60071 for establishing suitability of surge arrester rating, and any other technical requirement for successful operation of GIS.	We would like to inform you that Insulation Co-ordination studies, VFTO studies shall be EPC scope. Kindly confirm the same.	Please comply BOQ & TS.
8	Section-1/ TS TB-382-316-004 REV01	3. Specific Technical Requirements-Notes 9. CTV VT potentials mentioned in SLD is indicative only. Bidder has to ensure correctness of CTV/VT sizing as per relays selected for GIS during contract stage detailed Engineering stage.	We would like to inform you that CT & VT sizing calculation shall be under EPC scope. GIS OEM shall check the feasibility of the CT data and VT data, post receipt from EPC. Kindly confirm the same.	Please comply BOQ & TS.
9	Section-1/ TS TB-382-316-004 REV01	3. Specific Technical Requirements-Notes 12. All supporting structures including foundation bolts/ fixing bolts/ embedded plate/ chemical anchor bolts and hardware etc. required for fixing and erection of GIS and bus duct shall be in bidder scope.	We would like to clarify you that the foundation bolts/ fixing bolts/ embedded plate/ chemical anchor bolts and hardware etc. are in EPC scope. Kindly accept the same.	Please comply BOQ & TS.
10	Section-1/ TS TB-382-316-004 REV01	4. Other General Requirements Earthing of GIS Bidder to submit detailed calculations, sizing and layout drawings for earthing system during detailed engineering stage. Bidder to provide the bill of quantity for entire items included in the scope of the GIS. However, supply of 40mm MS ROD, 75x12/ 50dmm GI Flat & erection of earth mat shall be done by BHEL in supervision of bidder/ manufacturer as per manufacturer's design. Any other earthing material except 40mm MS Rod, 75x12/ 50dmm GI Flat, if required shall be in bidder's scope directly only.	We would like to inform you that, GIS OEM shall supply the design and drawing as per the earthing philosophy of GIS. Supply of all the material shall be under EPC scope of supply. GIS OEM shall only supply the provisions for earthing connections. Kindly confirm the same.	Please comply BOQ & TS.
11	Section-1/ TS TB-382-316-004 REV01	Clause 15.12.1.5 All supporting structures for the SFS bus-duct connections between the XLPE cable sealing ends and the GIS shall be supplied by the GIS manufacturer.	We would like to inform you that, GIS OEM shall supply support structures for GIS. Supply scope of Foundation bolts, Embedded items, rails and other supporting accessories shall be provided by EPC. Kindly confirm the same.	Please comply BOQ & TS.
12	Section-2/ TS TB-382-316-004 REV01	Clause 15.8.2.12 The disconnection and safety grounding switches shall have a mechanical key (locking key) and electrical interlocks to prevent closing of the grounding switches when isolator switches are in the closed position and to prevent closing of the disconnection when the grounding switch is in the closed position.	We provide electrical interlock between DS and ES however pad locking accessories shall be under EPC scope of work. Kindly confirm the same.	Please comply BOQ & TS.
13	Section-1/ TS TB-382-316-004 REV01	Clause 5: Bill of Quantities A.18 Supply: GIS- 420KV, 40kA for 1sec, 2000A GIS double main bus scheme - Complete Earthing Mainline including High Frequency Earthing	We would like to inform that High frequency earthing will be EPC scope. Kindly confirm the same.	Please comply BOQ & TS.
14	Section-1/ TS TB-382-316-004 REV01	Clause 5: Bill of Quantities D.10 Supply: Mandatory Spares- Gas Density Relay	We would like to inform you that, we understand that Gas density device is Gas density relay. Kindly confirm the same.	It shall be finalized during detailed engineering stage.
15	Section-2/ TS TB-382-316-004 REV01	Clause 15.13: SFS Bushing Connection	We would like to inform you that, Requirement of Bushing is not mentioned in customer document for present scope of supply. We require at least one bushing during testing of GIS. Hence we have considered test bushing in special tools. Kindly accept the same.	It shall be finalized during detailed engineering stage.
22	Section-3/ TS TB-382-316-004 REV01	TYPE TESTING: The Bidder / vendor shall furnish the reports of the type tests carried out within last two years from the date of signing of contract (i.e. 18.11.2014) as listed in relevant clauses in respective electrical specification and relevant standards for all components, equipment / systems.	As per CEA latest guidelines for Type Test Report acceptance, CEA allowed the Type test Report validity for EHV GIS till next 15 Year from the issuance of Report. Kindly accept the validity duration till 15 Years replace of 10 Years.	Please refer clause 7.0 of section-1 of TS. Kindly comply BOQ & TS.
24	Section-1/ TS TB-382-316-004 REV01	Clause 5: Bill of Quantities B.13 Services: GIS- 420KV- Insulation Co-Ordination Studies including VFTO for GIS System	Insulation Co-Ordination Studies is under scope of bidder, however BHEL should confirm to release the study input details along with GIS layout approval to successful bidder. Otherwise, Manufacturer can not commence manufacturing activity until Insulation coordination study shall not be completed. Kindly confirm to provide the inputs as per above requested timeline.	Please comply BOQ & TS.
25	Section-1/ TS TB-382-316-004 REV01	Clause 5: Bill of Quantities A.9 Supply: GIS- 420KV, 40kA for 1sec, 2000A GIS double main bus scheme - SFS gas required for placing GIS into successful operation 7 MT SFS gas quantity required for compensation losses before placing into successful operation.	We would like to inform you that we will perform the SFS gas leakage test after installation complete and we will supply sufficient gas to compensate the site testing activities. Every GIS manufacturer design require different quantity of SFS Gas for the complete project. Hence we request you to kindly specify the SFS Gas in One (1) Lot/ for each manufacturer's consideration. Please accept the same.	Please comply BOQ & TS.
26	Section-1/ TS TB-382-316-004 REV01	Clause 5: Bill of Quantities A.13 Supply: GIS- 420KV, 40kA for 1sec, 2000A GIS double main bus scheme - Structure Materials for support of GIS, Bus duct including Foundation Bolts, Embedded items, Rails and other items structural items specific to GIS -30MT support structure for GIS equipment.	We would like to inform you that we will submit this details during detail engineering time. Every GIS manufacturer design require different quantity of Structure Material for the complete project. Hence we request you to kindly specify the Structure Material in One (1) Lot/ for each manufacturer's consideration. Please accept the same.	Please comply BOQ & TS.
D. Bidder-4				
1	Section-1/ TS TB-382-316-004 REV01	Single Line Diagram and Conceptual Layout Conceptual Layout for GIS Floor Dimensional Drawing	Kindly share the Dimensioned AUTOCAD copy of the GA layout and the Section drawings for the 420KV GIS requirement. Also request to share the details for Expansion joints location and Power trols terminal locations	Space allocated for GIS is already mentioned in Conceptual Layout Drawing of 420KV GIS. Any change in bay pitch (distance between bays), during detailed engineering stage shall be payable as per actual measurement in BxQ item "Gas Insulated bus duct".
2	Section-1/ TS TB-382-316-004 REV01	Clause 3.14 Specific Technical Requirements-Notes Total number of interrupting chambers per phase of 420KV Circuit breaker	For the offered GIS CB the number of interrupting chamber shall be 1 No. , Providing 2 Nos, interrupting chamber is not possible type tested design of Siemens GIS. The detailed settle-up enclosed	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
3	Section-1/ TS TB-382-316-004 REV01	Clause 3.14 Specific Technical Requirements-Notes 7. Bidder shall submit 3D model (surface model light weight model) compatible with Primavera/ any other 3D software for complex GIS and its accessories.	The specific models are governed under Intellectual property rights, submitting of the same is not envisaged	Please comply BOQ & TS.
4	Section-1/ TS TB-382-316-004 REV01	Clause 3.14 Specific Technical Requirements-Notes 13. Fixing and erection of GIS duct on GIS cum cable gallery floor including foundation/ fixing bolts/ embedded plate shall be in bidder scope of supply.	Kindly share the Dimensioned AUTOCAD copy of the GA layout and the Section drawings for the 420KV GIS requirement. Also request to share the details for Expansion joints location and Power trols terminal locations	Space allocated for GIS is already mentioned in Conceptual Layout Drawing of 420KV GIS. Any change in bay pitch (distance between bays), during detailed engineering stage shall be payable as per actual measurement in BxQ item "Gas Insulated bus duct".
5	Section-1/ TS TB-382-316-004 REV01	Clause 3.14 Specific Technical Requirements-Notes 22. The Bidder is to ensure that packing size of GIS materials shall be such that it should accommodate in cut out size provided in cutout area (7m x 4 m) in GIS floor for lifting of GIS material from MAT (main access tunnel).	The extension provision will be considered on both sides in line with the BOQ requirement, however it is observed that there exists no additional space in the GIS hall for future extensions. Request a confirmation on the requirements	Please comply BOQ & TS.
6	Section-1/ TS TB-382-316-004 REV01	Clause 3.14 Specific Technical Requirements-Notes 23. This project is hydro project located at high altitude with transportation limitations such as road width, bridge load capacity and tunnel etc.	Kindly share the Dimensioned AUTOCAD copy of the GA layout and the Section drawings for the 420KV GIS requirement. Also request to share the details for Expansion joints location and Power trols terminal locations	Please comply TS and BOQ. However, any additional "MT" size shall be decided during detailed engineering.
7	Section-1/ TS TB-382-316-004 REV01	Clause 5: Other General Requirements 2. Open closed store area: Open closed store area shall be provided by BHEL. However, bidder shall provide that tentative space requirement for covered and/or open store area during tender stage only. In addition to this, bidder shall submit their standard storage instruction manual specifically specifying the item with type of storage.	We recommend that all material be stored in covered, dry area and elevated areas. Any storage exposed to direct water, submerged in water is not recommended. The copy of storage guidelines is enclosed.	Noted. Storage recommendations shall be finalized during detailed engineering stage.
9	Section-1/ TS TB-382-316-004 REV01	Clause 5: Other General Requirements 4. Transportation of Special Tools & Tackles, Testing Instruments Transportation of special tools & tackles, testing instruments, special plant including HV test on removable basis is deemed to be included in bidder's scope, however unloading/ loading, unpacking/ packing and shifting at working place shall be in BHEL scope.	Kindly share the complete Route survey details for planning the freight and transportation requirements, also requested to share the details for GIS hall and locations of storage areas for proper planning of space requirements	Please comply BOQ & TS.
10	Section-1/ TS TB-382-316-004 REV01	Clause 5: Other General Requirements 6. Modular Design The bus enclosure shall be sectionalized in a manner that maintenance work on any bus disconnector (when bus and bus disconnector are enclosed in a single enclosure) can be carried out by isolating and evacuating the small affected section and not be established.	Not Applicable to offered GIS design.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
11	Section-1/ TS TB-382-316-004 REV01	7. Type Testing a) Earthquake withstand test	Not Applicable to GIS. Necessary calculations for Seismic details shall be shared during detail Engineering stage.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
12	Section-1/ TS TB-382-316-004 REV01	Clause 5: Bill of Quantities A.5 Supply: GIS- 420KV, 40kA for 1sec, 2000A GIS double main bus scheme - Gas insulated bus duct	It is observed that the inter bay interconnection busduct pipes to compensate the bay spacing the GIS hall are not the part of this line item. We request to kindly add the same to this item	Any change in bay pitch (distance between bays) as during detailed engineering stage shall be payable as per actual measurement in BxQ item "Gas Insulated bus duct".
13	Section-1/ TS TB-382-316-004 REV01	Clause 5: Bill of Quantities Circuit Breaker analyzer kit with DCRM having min. 15 channels along with laptop of any required make & model which shall be subject to approval by customer during detailed engineering. For further details, Please refer Section-2 along with applicable Modules.	Kindly share the make and model for this requirement, for CB analyser the number of channels recommended is 6.	Please comply BOQ & TS.

DOCUMENT TITLE: Annexure- 400KV GIS & its accessories - Pre-bid clarification by Bidders
PROJECT: Vishnugad Pipakhal Hydro Electric project (4X111MW)
REVISION NO: 00

14	Design Basis Report Section-2/ TS TB-382-316-004 REV01	Clause 1. Note: All the circuit breakers of GIS bays shall be without PIR (pre-insertion resistor) however, line Circuit Breakers shall be equipped with CSD (Control Switching Device).	Kindly reconfirm the requirements for PIR and CSD, we observe that CB with PIR has been called up in the specifications. Also for CSD compatibility we request to share the line details and data as per enclosed datasheet for check and confirmation of the CSD	Please refer clause 15.7 CIRCUIT BREAKERS/ Customer TS Section-C. Please comply BOQ & TS.
15	Design Basis Report Section-2/ TS TB-382-316-004 REV01	Clause 4.0 GIS Parameters a) Rated one minute power frequency with stand voltage (kVrms) b) Phase to Earth: 520 c) Arrester open contacts: 610 d) System earthing: Effectively grounded	The values shall be in line with applicable IEC 62271-203.	It shall be decided during detailed engineering stage.
16	Design Basis Report Section-2/ TS TB-382-316-004 REV01	Clause 5.0: General Design and Safety Requirements The GIS assembly shall consist of completely separate pressurized sections in order to depressurize one gas compartment for inspection, maintenance or if necessary for repair while keeping the adjacent compartments in service.	Kindly note that any maintenance activity requires the affected compartment de-gassed and adjacent compartments at reduced pressure, this renders the affected bay out of service which in line with IEC 62271-203. Request a concurrence on the same	It shall be decided during detailed engineering stage.
17	Design Basis Report Section-2/ TS TB-382-316-004 REV01	Clause 6.0: Equipment data a) Circuit Breaker The circuit breakers shall be provided with independent and reliable operating mechanism. The single phase circuit breaker in each bay module shall be of puffer type with two interrupting chambers per phase. They shall be designed for installation in SF6 gas insulated metal clad switchgear and shall use SF6 gas for both insulation & arc quenching.	For the offered GIS CB the number of interrupting chamber shall be 1 No., providing 2 Nos. interrupting chamber is not possible type tested design of Siemens GIS	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
18	Design Basis Report Section-2/ TS TB-382-316-004 REV01	Clause 6.0: Equipment data b) Dis-connector Safety grounding switch shall be mechanically key interlocked with its associated disconnector.	The interlocking type shall be electrical, provision of mechanical interlocks is not envisaged.	It shall be decided during detailed engineering stage.
19	Design Basis Report Section-2/ TS TB-382-316-004 REV01	Clause 6.0: Equipment data c) SF6 GIS to XLPE Cable Termination Module The SF6 gas filled bushing components at GIS end shall be suitable for single run 800sqmm XLPE copper cables connection.	Cable sealing kits supply shall be excluded from GIS supplier scope, kindly confirm	Please comply BOQ & TS.
20	Design Basis Report Section-2/ TS TB-382-316-004 REV01	Clause 6.0: Equipment data d) SF6 GIS to Transformer Oil Bushing: The connections between transformer HV terminal with oil bushing & SF6 bus duct of GIS are to be housed inside the enclosure.	Transformer termination kits are excluded from GIS supplier scope, kindly confirm	Please comply BOQ & TS.
21	Design Basis Report Section-2/ TS TB-382-316-004 REV01	7.0 Schedule of Equipment and Quantities 7.2 The scope of supply shall also include the following: i) Portable gas leak detector - 1 No ii) Portable dust counter- 1 No iii) Special gas mask for GIS maintenance - 2 Nos. iv) Power operated insulation tester- 1 Set v) Tong tester for suitable range - 1 Set vi) Portable SF6 gas analyzer offline - 1 Set vii) Dew point meter - 1 Nos. viii) Ladder/ walkways/ mobile platform- 1 lot	Kindly share the technical specifications for each of the item required	Makes and models shall be required one. Please comply BOQ & TS.
22	Design Basis Report Section-2/ TS TB-382-316-004 REV01	8.0 Service Continuity requirements The typical drawing for gas schematics is attached for reference purpose. (Annexure-AA)	Kindly provide Annexure -AA.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
23	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.1.4: Scope All the Testing Instruments and Devices required for testing, commissioning and final acceptance tests of the entire equipment at site shall be arranged by the supplier.	We infer that the requirement of the testing instruments and devices required for this purpose shall be on a returnable basis	It shall be decided during detailed engineering stage.
24	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.1.5: Scope In addition to the above the bidder shall design his equipment so to be suitable for integration/ interfacing of Local Control Panels of GIS with Unit Control Board (UCB) & Computerized Control Systems (CCS).	Any integration with UCB, CCS shall be excluded from Siemens Ltd. Scope	Please comply BOQ & TS.
25	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.2.2: System Details Two nos. of outgoing 400KV feeder bays of GIS shall be connected by means of 400 KV XLPE 800 mm ² single core copper cables for each phase running inside the cable tunnel from transformer hall, cavern to the 400KV substation from where the power shall be evacuated through 2 nos. of 400KV single circuit lines.	Kindly share the overall GA drawings for check and confirmation for interconnection	All the details required for GIS system is provided. Please comply BOQ & TS.
26	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.3: Standards Clause 15.3.2: Standards The bidder is required to furnish the English version copy of all the standards along with the tender.	The offered 400KV GIS shall conform to IEC 62271-203 Provision of any additional standard is excluded from Siemens Ltd. Scope of supply.	However, other applicable standards for GIS equipments shall also be complied. Please comply BOQ & TS.
27	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.4.1: Ratings i) SF6 relative pressure at 20 deg C except for circuit breaker	The gas pressures are manufacturer specific provision, the same shall be suitable to the customer requirements.	It shall be decided during detailed engineering stage.
28	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.4.1: Ratings ii) No of mechanical operation with maximum 3000A current before scheduled maintenance is required: 12000	The offered 400KV GIS conforms to M2 Mechanical Endurance class (10000). The provision of this requirement is not envisaged.	It shall be decided during detailed engineering stage.
29	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.4.1: Ratings iii) SF6 relative pressure at 20 deg C except for circuit breaker	Pressures for the GIS modules shall be as per manufacturers standard type tested design, kindly confirm	It shall be decided during detailed engineering stage.
30	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.4.1: Ratings iv) SF6 relative pressure at 20 deg C except for circuit breaker	Pressures for the GIS modules shall be as per manufacturers standard type tested design, kindly confirm	It shall be decided during detailed engineering stage.
31	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.6.1: General Design and Safety Requirements Due to safety requirement for working on the pressurized equipment, whenever the pressure of the adjacent gas compartment is reduced, it should be ensured by the bidder that adjacent compartment would remain in service with reduced pressure.	Considering the safety provisions of working upon the gas filled GIS enclosures, the provision of this requirement is not envisaged and recommended as such.	Please comply BOQ & TS and service continuity requirements mentioned in Annexure-F of IEC 62271-203. Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
32	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.5.3: General Design and Safety Requirements The material and thickness of the enclosure shall be such as to withstand an internal flash over without burn through for a period long enough(30mins) till the backup relay protection clears the fault. The material shall be such that it has no effect of environment as well as from the by products of SF6 breakdown under arcing condition.	The offered GIS shall conform to the provisions of IEC 62271-203 for this requirement.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
33	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.5.6: General Design and Safety Requirements Each pressure filled enclosure shall be designed and fabricated to comply with the requirements of the applicable pressure vessel codes and based on the design temperature and design pressures as defined in IEC 617.	The GIS Enclosures shall conform to CEMLEC Standards.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
34	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.6.23: General Design and Safety Requirements Endomoter arrangements shall be provided to visually observe the contact position of disconnecting switches and earth switches.	The Disconnecter and Earth Switch enclosures shall be provided with observation windows, provision of any specific Endomoter arrangements shall be excluded from Siemens Ltd. Scope of supply.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
35	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.6.24: General Design and Safety Requirements a) Moisture in gas b) Any other alarm necessary to indicate deterioration of the gas insulating system	The Provision of this requirement is not envisaged for the offered GIS Alarm circuits	It shall be decided during detailed engineering stage.
36	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.7.1.2: CIRCUIT BREAKERS- Type & Rating Generator-transformer, and bus coupler breakers	The rated operating duty shall be O-0.3sec-CD-3min-CD	Please comply BOQ & TS.
37	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.7.1.2: CIRCUIT BREAKERS- Type & Rating - Percentage of D.C. >70% component	For the offered GIS CB the DC component shall be less than 50%.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
38	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.7.1.2: CIRCUIT BREAKERS- Type & Rating a)ii) Operating mechanism 3 Hydraulic operating mechanism	The operating mechanism for 400KV GIS CB shall be Spring-spring type.	It shall be decided during detailed engineering stage.
39	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.7.1.2: CIRCUIT BREAKERS- Type & Rating a)iii) Radio interference voltage Not exceeding 2500micro-volts at 266 KV (rms) a)iv) Corona extinction voltage 320 KV (RMS)	Not Applicable for offered 400KV GIS CB	It shall be decided during detailed engineering stage.
40	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.7.2.1: CIRCUIT BREAKERS- Construction & Design The single phase circuit breaker in each bay module shall be of puffer type with two interrupting chambers per phase	The single phase circuit breaker in each bay module shall be of puffer type with two interrupting chambers per phase.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
41	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.7.2.6: CIRCUIT BREAKERS- Construction & Design Insulation Co-ordination	We infer that only Insulation coordination study is required for this request. Any other VFTO or transferred potential studies are excluded from Siemens Ltd. Scope.	Please comply BOQ & TS.
42	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.1.1.2.1: CIRCUIT BREAKERS- Construction Details The secondary windings shall be air insulated and mounted inside the metal enclosure. All the current transformers shall have effective electromagnetic shields to protect against high frequency transients.	The offered 400KV GIS CT shall be Gas encapsulated type, kindly confirm.	Please comply BOQ & TS.
43	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.13.1: SF6 BUSHING CONNECTION- SF6 GIS to XLPE Cable Termination SF6 GIS to XLPE Cable Termination	The Cable termination kit supply is excluded from Siemens Ltd. Scope. The same shall be in line with IEC.	Please comply BOQ & TS.
44	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.16.1.1: CONTROL EQUIPMENT- Circuit Breaker Accessories/Auxiliary Equipment One vermin-proof sheet metal cabinet of class IP-54 and adequate size shall be provided for housing the operating	The Panels shall conform to IP 43 ingress protection class	Please comply BOQ & TS.
45	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.16.1.9: BUSBARS Where the interconnecting GIB bus passes through building walls, flooring or other enclosures, the supplier shall supply the wall plates, flanges and their fixings.	Kindly share the details and locations of the passes to propose	Please comply BOQ & TS.
46	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.16.2.1: Bay Module Control Cabinets The cabinet shall have double, full height, hinged, gasketed, lockable doors. One door shall have a safety glass window through which the various switchgear controls can be viewed without opening the doors.	The design of LCC panels shall be in line with manufacturers standard in line with the customer requirement. Kindly confirm.	It shall be decided during detailed engineering stage.
47	Section-2/ Customer TS/TB-382-316-004 REV01	Clause 15.16.2.4: Bay Module Control Cabinets The bus voltage transformer secondary terminal circuit breaker will be mounted with in the bus VT bay module control cabinet.	The secondary terminals of GIS VTs shall be provided in the terminal boxes of GIS VT.	It shall be decided during detailed engineering stage.

DOCUMENT TITLE: PROJECT: REVISION NO:		Annexure- 400KV GIS & its accessories - Pre-bid clarification by Bidders Vihvagad Pipalkoti Hydro Electric project (4X111MW) 00		
48	Section-2/ Customer TS/TB-382-316-004 Rev01	Clause 15.16.1.3: CONTROL EQUIPMENT- Circuit Breaker Accessories/Auxiliary Equipment All control cables shall be Flame Retardant and shielded. Cable shields shall be grounded at both ends. Grounding connections shall be as short & direct as possible and shall terminate at the point of entry to cabinets or terminal boxes.	We infer that the all cable for control shall be FRLS type, kindly confirm	It shall be decided during detailed engineering stage.
49	Section-2/ Customer TS/TB-382-316-004 Rev01	Clause 15.18.1: SFG GAS PROCESSING UNIT Mobile SFG gas processing unit suitable for receiving, recharging, recharging, filling, drying and purifying SFG gas during the initial installation, subsequent maintenance shall be provided. The unit shall be provided with gas testing kit to measure the moisture contents of the gas and with pressure monitoring system. The instrument for the measurement of acidity shall also be.	The Requirement calls for separate provision of Gas Handling plant, Gas analyzer and Moisture analyser. Request to kindly provide separate items in the Price schedule for this requirement.	Please comply BOQ & TS.
50	Section-2/ Customer TS/TB-382-316-004 Rev01	Clause 15.19.5: MONITORING The equipment shall have provision to monitor the following parameters periodically to check anomalies and/ or wear BS test of equipment: a) Operation of mechanical components: The parameters to be monitored are: — Fluid pressure(s) or hydraulic mechanism power reserve — The displacement speed of the moving parts — The travel of moving parts b) Friction of moving parts c) Wear of circuit breakers interrupting chamber: The parameters to be monitored are: — Determination of contact closing position — Accumulated effect of interrupted currents — Decomposition products content in SFG Gas Insulation failure: The parameters to be monitored are: — SFG gas density monitoring of all the compartments — High frequency current detection for partial discharge detection — Sonic detection Safety burning disc for each SFG gas compartment.	The measurement of parameters mentioned under this clause is not possible using a gas density monitor. We request to kindly confirm the exact requirements to provide a price for the item requirement.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
51	Section-2/ Customer TS/TB-382-316-004 Rev01	Clause 15.21.6: Service Life In order to minimize maintenance and component replacement, the tenderer shall submit proof that all offered SFG GIS equipment has withstood a life of 10,000 normal operations	We infer that this requirement calls for M2 class GIS Circuit breaker, the type test reports shall be provided during detail engineering.	It shall be decided during detailed engineering stage.
52	Section-2/ Customer TS/TB-382-316-004 Rev01	15.24.3.6: Type tests In addition, the following type tests on one piece each of related component parts of a single pole assembly of one typical switchgear bay module shall be made	The offered GIS bay modules shall conform to the prescriptions of IEC 62271-203 shall be confirmed for this requirement. Certain tests have been carried out upon the complete GIS Bays. The conduction of these tests on the individual GIS Modules is not envisaged.	It shall be decided during detailed engineering stage.
53	Section-2/ Customer TS/TB-382-316-004 Rev01	15.24.3.6: Type tests Special tests (optional) i) Chopped lightning impulse test as a type test	Not Applicable for offered 400KV GIS	It shall be decided during detailed engineering stage.
54	Design Basis Report Section-2/ TS-TB-382-316-004 Rev01	Annexure AA Service continuity requirements for GIS	With reference to Annexure- AA, it is to submit that the offered design of Siemens Ltd. 400KV GIS Busbar is Passive type without any compartmentalization in GIS busbar (i.e. Busbar and Busbar disconnector in separate gas compartments and no compartmentalization in GIS busbar); the specific gas SLD provided for this tender is for Active busbar design wherein the bus and bus disconnector are in same gas compartment and this design has its own specific requirements/backlogs of provision of additional buffer compartments in busbar and Siemens does not offer Active Busbar design philosophy for its switchgear rated 220KV and above. Request to please note that the offered switchgear with passive non segregated busbar design meets all the requirements of Service continuity as per IEC, repair and maintenance clauses without any specific deviations. With a due consideration to the above, we request your kind support for acceptance of the passive non-segregated bus design which is fully type tested in accordance with IEC 62271-203.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
0.	Bidder-6			
1	Doc No. TB-382-316-004 Rev 01 Page 7 of 185 (4-14)	3. Specific Technical Requirements 14. Total number of interrupting chambers per phase of 420KV circuit breakers: Two nos	Please be informed that offered 420KV circuit breaker shall be single interrupter design as per type tested OEM standard design	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
2	Page 8 of 185 (5-15)	Notes: 9. Bidder shall conduct insulation co-ordination & very fast transient overvoltage (VFTO) studies in line with IEC 60071 for establishing suitability of surge arrester rating, and any other technical requirement for successful operation of GIS.	Kindly note for insulation co-ordination the following studies will be in GIS manufacturer scope 1) Overvoltage study on the system and selection of SA for the substation is excluded from GIS manufacturer scope. We will only provide results of Overvoltage on GIS equipment due to backflashover on transmission line due to lightning phenomenon, by simulation in EMTP software 2) We will provide report and results of internal VFTO in GIS due to bus disconnector operation.	Please comply BOQ & TS.
3	Page no. 8 of 185 (5-15)	Notes: 9. CT/ VT parameters mentioned in SLD is indicative only. Bidder has to ensure correctness of CT/VT rating as per relay selected for GIS during contract stage. Detailed Engineering stage. 10. Any change in bay pitch (distance between bays) as per civil requirement for foundation layout will have implications on techno-commercial factors which has to be discussed during detailed engineering.	CT-VT parameters has been considered as mentioned in SLD and included in our technical proposal. If any major change in parameters then we will have implications on techno-commercial factors which has to be discussed during detailed engineering.	(i) Noted. CT/ VT parameters mentioned in approved SLD are approved by customer and hence, any change is not envisaged. Please refer BOQ & TS. (ii) Any change in bay pitch (distance between bays) as per civil requirement for foundation layout shall be payable as per actual measurement in BOQ item "Gas Insulated bus bar".
4	Project : Vihvagad Pipalkoti Hydro Electric project (4X111MW) Page no. 21 of 185 (3-4)	Bill of quantities for 420KV GIS in accessories, rev-01 12. All supporting structures including foundation bolts/fixing bolts embedded plate/ chemical anchor bolts and hardware etc. required for fixing and erection of GIS and bus duct shall be in bidder scope. 13. Fixing and erection of GIS duct on GIB cum cable gallery tie including foundation fixing bolts/ embedded plate shall be in bidder scope of supply.	We would like to inform as per OEM design standards GCB structure will be mounted on the embedded plate, and other equipment structures shall be provided with adapter plate fixing with mechanical anchor bolts. Adapter plate and anchor bolts shall be supplied by GIS manufacturer. Embedded plate for GCB is excluded from GIS manufacturer scope (Kindly find the reference attached foundation plan drawing of one bay for embedment details ref 2-281-0A-001)	Please comply BOQ & TS.
5	Page no. 21 of 185 (3-4)	Supply: GIS: 420KV, 40kA for 1sec, 2000A GIS double main bus scheme. Online continuous gas monitoring and alarm System Individual temperature compensated gas pressure gauge(s)/ density detector shall be provided in each of the gas compartments which will monitor and indicate the state of gas density. The system shall be such that it can be installed separately/ integrated with SAS/SCADA (As applicable). For further details, Please refer Section-2 along with applicable drawing.	We (GIS Manufacturer) provide Hybrid Type of Gas Density monitor which provides local gas density monitoring at LCC and also has additional sensor/output with 4-20mA output for density the gas density, at SCADA/SAS Please be informed that only this hybrid GDM with sensors shall be provided on each gas compartment. Cabling from GDM to SCADA/SAS, junction boxes associated accessories for integration to SCADA, programming at SCADA, adapting database/displays of online monitoring is excluded from GIS manufacturer scope.	It shall be decided during detailed engineering stage.
6	TB-382-316-006, Rev-05 Page no. 21 of 185 (3-4)	Supply: GIS: 420KV, 40kA for 1sec, 2000A GIS double main bus scheme. Online continuous partial discharge monitoring system (PDM)	As GIS OEM we propose Altaviva make continuous online partial discharge monitoring system.	Please comply BOQ & TS.
7	TB-382-316-006, Rev-05 Page no. 24 of 185 (5-4)	Supply: Maintenance Equipment Circuit Breaker analyser kit with DCRM having minimum 15 channels alongwith Laptop	We would like to inform that circuit breaker analyser kit with DCRM with 6 channels for static and dynamic contact resistance measurement shall be supplied. Laptop is excluded from GIS manufacturer scope.	Please comply BOQ & TS.
8	TB-382-316-006, Rev-05 Page 43 of 185 (5-12)	5.5 EQUIPMENT DATA: a) Circuit Breaker: The circuit breaker mechanism shall be hydraulic or spring or a combination of spring and hydraulic mechanism.	Circuit breaker with spring charged operating mechanism is considered to be of highest reliability to the system, as compared to hydraulic mechanism or any other mechanism with moving actuating medium like spring actuated with hydraulic medium etc. Accordingly our offered operating mechanism of circuit breaker is Motor charged spring operated type.	It shall be decided during detailed engineering stage.
9	TB-382-316-006, Rev-05 Page 44 of 185 (6-12)	b) High Speed Make Proof Grounding switches: Single phase switches shall be provided with operating mechanism for each phase suitable for operation from a 220V DC independent supply	We wish to inform that as per OEM standards 3 phase high speed grounding switch shall be gang operated with a common operating mechanism.	It shall be decided during detailed engineering stage.
10	TB-382-316-006, Rev-05 Page 45 of 185 (7-12)	7.0 Schedule of requirements and quantities: a) Generator transformer bay D) Line feeder bay Two nos three pole 2000A group operated bus bar disconnectors with common grounding switch each complete with manual and motor driven operating mechanism.	Please be informed that, as per OEM standard design, one bus bar is connected to bus-disconnecting cum earthing switch and other bus bar is connected to disconnecting switch. One earth switch suffices the requirement of earthing between bus DB and GCB.	It shall be decided during detailed engineering stage.
11	TS- 420 KV GIS Vihvagad Pipalkoti HE Project Page no. 55 of 185 (15-2)	15.3 STANDARDS The bidder proposing any other standards than the above referred standards must specifically indicate the standards to which the switchgear conforms.	Please be informed that IEC standards mentioned in tender specification is outdated standards. Offered GIS type tested as per latest IEC standards which is mentioned in our technical specification. Kindly refer.	It shall be decided during detailed engineering stage.
12	TS- 420 KV GIS Vihvagad Pipalkoti HE Project Page no. 56 of 185 (15-3)	15.4 RATINGS Highest System Voltage, kV rms 440	As per clause 3, specific technical requirements (Doc No. TB-382-316-004 Rev 01). Maximum System voltage is 420kV. Please confirm.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
13	TS- 420 KV GIS Vihvagad Pipalkoti HE Project Page no. 56 of 185 (15-5)	15.4 RATINGS a) No safety requirement for setting on the pressurized equipment, whenever the pressure of the adjacent gas compartment be vented by the bidder that adjacent compartment would remain in service with reduced pressure.	Please be informed that rated pressure and alarm level shall be as per OEM standard Rated filling pressure of GCB: 7bar abs @ 20°C Other compartments: 7bar abs @ 20°C The gas pressure for each compartments is having two set points below normal operation, stage 1: First Low pressure alarm at 6.7 bar @ 20 deg.C stage 2: Second Low pressure alarm (Lock out pressure for GCB) at 6.4 bar @ 20 deg.C	It shall be decided during detailed engineering stage.
14	TS- 420 KV GIS Vihvagad Pipalkoti HE Project Page no. 56 of 185 (15-5)	15.4 RATINGS a) No mechanical operation with maximum 2000A current before scheduled maintenance is required: 12,000	Please be noted that The service life of circuit breaker shall be at least 12,000 switching operation at rated current is a contradiction to as per IEC/IEEE standard. We would like to inform you that extended mechanical endurance of 10,000 operations is applicable at no-load condition as per IEC 62271-100. As GIS, OEM we recommend temporary inspection after every 2000 operations at rated normal current.	It shall be decided during detailed engineering stage.
15	TS- 420 KV GIS Vihvagad Pipalkoti HE Project Page no. 56 of 185 (15-6)	15.5 GENERAL DESIGN AND SAFETY REQUIREMENTS 15.5.2 Due to safety requirement for working on the pressurized equipment, whenever the pressure of the adjacent gas compartment be vented by the bidder that adjacent compartment would remain in service with reduced pressure.	It is not recommended in any live section of GIS to keep in service with reduced pressure, and also when any maintenance activity undertaken in any compartment that relevant section is deenergized and out of service, however the compartments are arranged complying the highest level of service continuity, as per IEC as well as this technical specification, such that during maintenance and reducing of pressure of adjacent compartment whole GIS is not affected.	It shall be decided during detailed engineering stage.

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16	TS- 420 KV GIS Vishnugad Pipalkoti HE Project Page no. 98 of 185 (15-14)	15.5.13) The switchgear shall be suitably sub-divided into individual arc and gas-proof compartments at least for: a) Busbars b) Bus Line disconnectors	As per OEM standard and Type Tested design bus disconnectors are a part of bus-bars and is placed in same gas compartment which is segregated bay wise and also intermediate compartment with gas tight barriers are provided as modules without any passivity of Bus Bars.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
17	TS- 420 KV GIS Vishnugad Pipalkoti HE Project Page no. 98 of 185 (15-14)	15.6 GENERAL DESIGN AND SAFETY REQUIREMENTS 15.5.23) Endomater arrangement shall be provided to visually observe the contact position of disconnecting switches and earth switches.	Please be informed that Accessible inspection windows are provided to visually observe the contact position of disconnecting switches and earth switches. We do not envisage or provide endoscope for the subject tender.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
18	TS- 420 KV GIS Vishnugad Pipalkoti HE Project Page no. 94 of 185 (15-14)	15.7 CIRCUIT BREAKERS 15.7.1 Type & Rating k) Rated out-of-phase breaking current(mca) 40KA	As per IEC 62271-100, the rated out-of-phase breaking current shall be 25 % of the rated short-circuit breaking current. Hence for offered OEM type tested GIS, rated out-of-phase breaking current is 15.75KA	It shall be decided during detailed engineering stage.
19	TS- 420 KV GIS Vishnugad Pipalkoti HE Project Page no. 94 of 185 (15-14)	15.7 CIRCUIT BREAKERS 15.7.1 Type & Rating k) Percentage of D.C Component >70%	We wish to inform you that as per OEM type tested design, the highest percentage of DC component at short circuit test duty T100a is 51%.	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
20	TS- 420 KV GIS Vishnugad Pipalkoti HE Project Page no. 94 of 185 (15-14)	15.7 CIRCUIT BREAKERS 15.7.1 Type & Rating x) Number of trip coils 2 per pole Number of closing coils 2 per pole	We wish to inform that as per OEM standards we will provide 2 trip coils per phase and 1 close coil per phase.	It shall be decided during detailed engineering stage.
21	TS- 420 KV GIS Vishnugad Pipalkoti HE Project Page no. 95 of 185 (15-14)	15.7 CIRCUIT BREAKERS 15.7.1 Type & Rating xv) Radio interference voltage xxv) Corona extinction voltage	Please be informed that radio interference voltage and corona extinction voltage is not applicable for metal enclosed gas insulated switchgear.	It shall be decided during detailed engineering stage.
22	TS- 420 KV GIS Vishnugad Pipalkoti HE Project Page no. 94 of 185 (15-17)	15.7 CIRCUIT BREAKERS 15.7.2 Construction & Design 15.7.2.3 Inrush and magnetizing current associated with large power transformers (three single phase 48 MVA transformers) will have to be switched ON by the circuit breakers without re-sinking and without causing excessive switching surges. Occasionally, a power transformer operating under Ferro resonant conditions and having non-sinusoidal current and voltage wave-forms with higher than normal peak values will have to be switched ON. The supplier shall provide proof test data and comment on breaker for such applications.	As per IEC 62271-110 testing for no load transformer switching/inductive current switching as applicable for transformer bay is not required since the duty is less severe than any other switching duty and due to non linearity of transformer core the duty cannot in any case be correctly modelled in a test lab. Hence test data is not envisaged.	It shall be decided during detailed engineering stage.
23	TS- 420 KV GIS Vishnugad Pipalkoti HE Project Page no. 98 of 185 (15-14)	15.7 CIRCUIT BREAKERS 15.7.2.7 All DC coils trip, close, auxiliary etc.) shall be equipped with surge suppression devices such as diodes across the coils to provide a discharge path for transient voltage.	Kindly note that as per OEM standards diode is not envisaged across trip coil, close coil or auxiliary circuit.	It shall be decided during detailed engineering stage.
24	TS- 420 KV GIS Vishnugad Pipalkoti HE Project Page no. 77 of 185 (15-27)	15.12 BUS VOLTAGE TRANSFORMERS Rated secondary burden, VA (approx.) 75° 75° 75°	We wish to inform you that the burden of secondary cores of voltage transformer 100VA mentioned is abnormally high. Normal burdens are 25-50VA which is more than adequate for substation protection system requirements. Also as per latest CEA guidelines rated burden for voltage transformer shall not exceed 50VA. Accordingly, and as per best engineering practice & proven design acceptable to reputed clients, we considered 50VA burden for each windings of voltage transformer	Please comply BOQ & TS.
25	TS- 420 KV GIS Vishnugad Pipalkoti HE Project Page no. 97 of 185 (15-34)	15.16 BUSBARS In case of leakage of the gas from any compartment, indication of respective compartments should be provided on the annunciator.	During leakage of gas from any compartment gas density falls and the following alarm signals are indicated on annunciator. stage 1: First Low pressure alarm at 6.7 bar @ 20 deg C stage 2: Second Low pressure alarm (Lock out pressure for GCB) at 6.4 bar @ 20 deg C	It shall be decided during detailed engineering stage.
26	TS- 420 KV GIS Vishnugad Pipalkoti HE Project Page no. 98 of 185 (15-39)	15.19 MONITORING The equipment shall have provision to monitor the following parameters periodically to check anomalies and/or wear & tear of equipment. a) Operation of mechanical components: The parameters to be monitored are: - Fluid pressure(s) or hydraulic mechanism power reserve - The displacement speed of the moving parts - The travel of moving parts - Friction of moving parts b) Wear of circuit breakers interrupting chamber: The parameters to be monitored are: - Determination of contact closing position - Accumulated effect of interrupted currents - Decomposition products content in SF6 Gas c) Insulation failure: The parameters to be monitored are: - SF6 gas density monitoring of all the compartments - High frequency current detection for partial discharge detection - Sonic detection d) Safety bursting disc for each SF6 gas compartment.	a) Operation of mechanical components: The parameters to be monitored are: - Fluid pressure(s) or hydraulic mechanism power reserve: As per OEM standards Kindly note that circuit breaker mechanism is spring/spring type without any hydraulic/pneumatic operations or spring actuated with hydraulic/pneumatic operation and Fluid pressure(s) or hydraulic mechanism power reserve is not applicable. The displacement speed of the moving parts: Please be informed that contact travel speed can be obtained as and when required after connecting portable type CB analyzer kit. The travel of moving parts: Please be informed that contact travel characteristics can be obtained as and when required after connecting portable type CB analyzer kit. Friction of moving parts: Please be informed that the friction of moving parts, can be visually monitored after inspecting the operating mechanism and connecting rod with or without dismantling case by case during circuit breaker/ mechanism maintenance as and when required. The schedule of maintenance shall be as per OEM recommendation. b) Wear of circuit breakers interrupting chamber: The parameters to be monitored are: - Determination of contact closing position: Please be informed that the Determination of contact closing position, can be visually monitored after inspecting the interrupting chamber after dismantling during circuit breaker maintenance. The schedule of maintenance shall be as per OEM recommendation. Accumulated effect of interrupted currents: Please be informed that the Accumulated effect of interrupted currents can be visually monitored after inspecting the interrupting chamber after dismantling during circuit breaker maintenance. The schedule of maintenance shall be as per OEM recommendation. Decomposition products content in SF6 Gas: Please be informed that the decomposition product contents can be measured as and when required for each and every gas compartment by connecting portable type SF6 gas multi-analyzer kit. c) Insulation failure: The parameters to be monitored are: - SF6 gas density monitoring of all the compartments: SF6 gas density monitoring is achieved by GDMs provided on each and every gas compartment as mentioned in Sino 5. High frequency current detection for partial discharge detection: Ultra high frequency couplers shall be provided integrated with gas tight spacer and Partial discharge can be monitored after connection of PD equipment. Sonic detection: Sonic detection is not applicable. d) Safety bursting disc for each SF6 gas compartment: Confirmed	Please refer Annexure-400KV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET.
27	TS- 420 KV GIS Vishnugad Pipalkoti HE Project Page no. 97 of 185 (15-41)	15.22 GROUNDING The GIS manufacturer is also required to supply all the earthing connectors and associated hardware material for the following: i) Connecting all GIS equipment, bus ducts, enclosures, control cabinets, supporting structures etc. to the ground bus of GIS. ii) Connecting grounding bus of GIS to the groundmat in transformer / GIS cavern provided by the purchaser in the vicinity	Please be informed that, GIS internal earthing shall be under GIS manufacturer scope and final earthing terminal shall be provided on GIS structure. Connection from GIS earthing terminal to sub-station ground mat/riser earth terminal and associated hardware shall not be in GIS manufacturer scope	Please comply BOQ & TS.

Doc. Ref. No. Technical Corrigendum-00
Project: Vishnugad Pipalkoti Hydro Electric project (4X111MW)
Date: 25.05.2023
Ref. No.: NIT No. 72560/ Enquiry No 61G2300312 dtd. 11-03-2023

Sl. No.	Document Description of Original Technical Specification	Technical Corrigendum-00
		Remarks, if any
1	Technical Specification TB-382-316-004 REV01	Please refer Annexure-400kV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET in addition to original Technical Specification TB-382-316-004 REV01 . Please refer Annexure- 400kV GIS & its accessories - Pre-bid clarification by Bidders also.

Note: Amendment/ addendum/ clarification/ corrigendum issued herein shall form part of Technical Specification. All bidders to please note that amendment/addendum/ clarification/ corrigendum issued will supersede the respective clause/ sub-clause of Technical Specification Document to the extent for the clause/ sub-clause or part thereof the amendment is issued.

DOCUMENT TITLE: Annexure- 400kV GIS & its accessories - EXCEPTIONS & DEVIATIONS SHEET

PROJECT: Vishnugad Pipalkoti Hydro Electric project (4X111MW)

REVISION NO: 00

Sl. No.	Document Reference	Clause no. and description	Reference Documents	THDCIL/ BHEL's Clarifications
1	Design Basis Report/ Customer TS/ Section-2/ TS TB-382-316-004 REV01	Clause 6.0 Clause 15.10.2 The single phase circuit breaker in each bay module shall be of puffer type with two interrupting chambers per phase.		420kV GIS Circuit Breaker with single interruptor is acceptable for VPHEP subject to meeting all the technical requirements as specified in the contract document.
2	Section-2/ Customer TS/ TB- 382-316-004 REV01	Clause 15.4.1: Ratings iv) Rated voltage, kVrms 420 v) Highest System Voltage, kVrms 440	Please refer IEC 62273-100/ 203	Noted. Highest system voltage shall be as per IEC.
3	Section-2/ Customer TS/ TB- 382-316-004 REV01	Clause 15.4.1: Ratings Clause 15.8.1.1: Disconnectors- type & ratings Rated lightning impulse withstand voltage(kVp) - Across the open contacts - 1665 kVp Rated switching impulse withstand voltage(kVp) Phase to phase - 1425 kVp -Across the open contacts - 1245 kVp	Please refer IEC 62273-100/ 203,	Noted.
4	Section-2/ Customer TS/TB- 382-316-004 REV01	Clause 15.7.1.2: Circuits Breakers x) Rated short circuit breaking current - 40kA rms - Percentage of DC component - > 70%	Please refer IEC 62273-100/.	<p>Clause 4.101.2 of IEC 62271-100 (DC Time constant of rated short circuit current) specifies a stadard time constant of 45ms and in special case, DC time constant of 60ms for 420kV class circuit breakers.</p> <p>Further, under note 2 (IEC 62271-100, 2003-05), it states that " Some applications may require even higher values for example, circuit breakers close to generators. In these circumstances, time constant and additional test requirements should be specified in the enquiry."</p> <p>The percentage of DC component has been clearly stipulated in the tender specifications considereing special application requirement, therefore, the same needs to be complied with either through single or double interrupter circuit breaker.</p>
5	15.7.1.2 (Pg. 15-16)	Rated small inductive breaking current - any value from 0.5A to 10A without switching over voltage exceeding 2.3 p.u	Please refer IEC 62271-100.	Low reactive switching capability for switching requirement of 50MVAR reactor with maximum 2.3 pu overvoltage is to be ensured.
6	Section-2/ Customer TS/TB- 382-316-004 REV01	Clause 15.19.5: Monitoring The equipment shall have provision to monitor the following parameters periodically to check anomalies and/or wear and tear of equipment : i) Operation of mechanical components. The parameters to be monitored are : Fluid pressure..... ii) Wear of circuit breakers interrupting chamber iii) Insulation failure ...Sonic detection iv) Safety bursting disc for each SF6 gas compartment.		Manufacturer's recommended practices and provisions shall be accepted, however, online gas density monitoring and partial discharge monitoring shall be provided.
7	Section-2/ Customer TS/TB- 382-316-004 REV01	Clause 15.24.4.3: Commissioning Tests (a) One minute power frequency withstand tests for the main circuit as per IEC 517 Cl. 7.107.1.3.2 high voltage tests at site with lightning impulse and switching impulse voltages are also acceptable as alternative.	Please refer IEC 62271-203.	Noted. Commissioning tests shall be conducted as per relevant IEC at site.
8	Section-2/ TS TB-382-316- 004 REV01	Clause 15.5.3: General Design and Safety Requirements The material and thickness of the enclosures shall be such as to withstand an internal flash over without burn through for a period long enough (500ms) till the backup relay protection clears the fault.	Please refer IEC 62271-203.	Noted. It shall be as per relevant IEC.
9	Section-1/ TS TB-382-316- 004 REV01	Clause 4. Other General Requirements 9. Modular Design The bus enclosure shall be sectionalized in a manner that maintenance work on any bus disconnector (when bus and bus disconnector are enclosed in a single enclosure) can be carried out by isolating and evacuating the small effected section and not the entire bus.		Though the service continuity requirement is applicable to and fulfilled by both types of GIS configuration, however, BHEL's contention that clause 15.5.13 of volume 5 of contract specification/ document (section-2 of TS) does not mention/ restrict that switching component can not be a part of bus bar is not correct. The referred clause does specify individual arc and gas proof compartment for bus bar in addition to some other components listed. This needs to be complied.
10	Section-1/ TS TB-382-316- 004 REV01	7. Type Testing s) Earthquake withstand test		Noted.
11	Section-2/ Customer TS/TB- 382-316-004 REV01	Clause 15.5.6: General Design and Safety Requirements Each pressure filled enclosure shall be designed and fabricated to comply with the requirements of the applicable pressure vessel codes and based on the design temperature and design pressures as defined in IEC 517.		Accepted subject to conformance to the contractual requirements.
12	Section-2/ Customer TS/TB- 382-316-004 REV01	Clause 15.5.23: General Design and Safety Requirements Endometer arrangement shall be provided to visually observe the contact position of disconnecting switches and earth switches.		Noted for the viewing ports availability, however, conformamnce to the contract is to be ensured.

13	Design Basis Report/ Section-2/ TS TB-382-316-004 REV01	Annexure-AA Service continuity requirements for GIS		<p>As per clause 15.5.13 of volume 5 of contract specification/ document (section-2 of TS),</p> <p>"The switchgear shall be of the free standing, self-supporting with easy accessibility to all the parts during installation & maintenance, dead front design with all high-voltage equipment installed inside gas insulated metallic and earthed enclosures, suitably sub-divided into individual arc and gas-proof compartments at least for:</p> <p>a) Busbars b) Intermediate compartment c) Circuit breakers d) Bus / Line disconnectors e) Gas insulated bus section between generator-transformer and GIS. f) Current Transformers g) Voltage Transformers h) Surge Arrestors i) Gas Insulated bus section between GIS and XLPE cable</p> <p>GIS shall be of isolated phase type and each phase/pole shall be housed in a separate enclosure. "</p> <p>The referred clause does specify individual arc and gas proof compartment for bus bar in addition to some other components listed. This needs to be complied.</p>
14	TS TB-382-316-004 REV01	Provision of test bushing for HV testing of GIS		<p>All bidders shall include the provision of Test Bushing required for HV testing during testing and commissioning of GIS, which shall brought at site on returnable basis as a part of special Tools and Tackles for project requirement.</p>