



Bharat Heavy Electricals Limited

(A Govt. of India Undertaking)

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CORRIGENDUM - 03 TO NIT NO-55390

Subject: Corrigendum-03 for extension of due date for opening of bids for supply & supervision works for 400kV GIS – SAPDC/SJVN ARUN-III Project.

Project : SAPDC/SJVN ARUN-III PROJECT.
Equipment / Item : SUPPLY & SUPERVISION WORKS FOR 400kV GIS.
Enquiry No. / Date : 61Q2100253, DATED 29-10-2020, **ORIGINAL DUE ON: 12-11-2020.**
BHEL NIT NO : 55390.

TENDER SUBMISSION;

The corrigendum-03 has been issued against above mentioned NIT/ enquiry for supply & supervision of 400kV GIS for SAPDC/SJVN Arun-III Project & extend due date for opening of bid up to 15-12-2020 from 08-12-2020 and the same has also been uploaded in BHEL/CPP Portal.

Now, the extended due date for submission of offers is 15-12-2020 at 14.00 Hrs & bidder to ensure for submission of their offer on or before extended due date through email or hard bid.

Thanking you

Rajeev Kumar Roy
BHEL TBG, NOIDA



Annexure 1				
No.	Chapter/ page	Specification	Comment or deviation	BHEL's Clarification
1	1) pg 2 of 15	In general, no deviation from the requirements specified in various clauses of this specification shall be allowed.	Comments on specification shall be listed and request for clarification on the same.	In general, no deviation from the requirements specified in various clauses of this specification shall be allowed.
2	5) pg 3, 4 of 15	Type tests:	We wish to highlight that Type tests are carried out once to establish the design of the electrical equipment and need not be repeated unless there is a change in the design or any update in IEC stipulations. Most of the utilities in India specifies the validity of type test reports for GIS as ten (10) years.	Bidder to follow Specification
		The contractor shall submit the certificates from Govt. approved labs/ accredited laboratories of the type tests listed under Clause 16.A.7.3 of Section-2 for the 400 KV GIS & 400 KV SF6 CGI Bus Ducts which should have been carried out within last five (5) years from the date of bid opening (09.02.2018).	Moreover, it is not possible to conduct all the Tests in India and these type tests can be carried out only in laboratories abroad which is time consuming and involves high capital expenditure.	Bidder to follow Specification
		In case the contractor is not able to submit report of the type test(s) conducted within last five years from the date of bid opening, or in case the type test report(s) are not found to be meeting the specification requirements, the contractor shall conduct the type tests without any cost and delivery implication to BHEL/SAPDC/SJVN.	Hence, we request you to consider acceptance of type test reports [not older than ten (10) years] and amend the specifications accordingly.	Bidder to follow Specification
3	18 pg 12 of 15	Bidder shall conduct insulation co-ordination studies for establishing suitability of surge arrester rating, and any other requirement for successful operation of GIS.	As there are AIS equipment in pot head yard, insulation co-ordination study shall be in main contractor's scope.	Bidder to follow Specification. Insulation Coordination shall be in GIS Supplier's scope. Available required data shall be furnished to successful bidder. Bidder to shall also consider visiting the site for any additional information.
Section-2 Section-16A - Gas insulated Sub-station				
4	16 A.1 pg 1 of 61	Scope of work under this section covers the provision of labour, tools, plants, materials and performance of work necessary for the design, engineering, manufacture, quality assurance, quality control, shop assembly, shop testing, packaging & delivery at site including insurance, unloading, site storage and preservation, in plant transportation at site, erection / installation, testing supervision, pre commissioning, successful commissioning, performance and acceptance testing,.....	Site storage and preservation is excluded from GIS supplier's scope. Supervision of installation, commissioning and testing only shall be in our Scope of service.	Supervision of Storage shall be in the bidders scope , however , storage space shall be provided by BHEL. Area for Storage required shall be informed by the successful Bidder in their Storage and Preservation Manual.
5	16 A.1.1 b) pg 1 of 61	VT bay comprising of:one three phase group operated disconnector & earthing switch...	Offered GIS disconnectors are not combined with earthing switch. Hence one no. disconnector and one no. earthing switch shall be offered for VT bay.	Bidder to follow Specification
6	16 A.1.1 c) pg 2 of 61	The manufacturer shall perform an insulation co-ordination study to verify protection of switchgear and main transformers against over voltages is adequate. The final surge arrester characteristic, their number and exact locations of surge arrestors shall be decided after this study.	Additional SAs required if any after study, optional price for one set of GIS Surge arrester shall be provided.	Bidder to follow Specification
7	16 A.1.1 e) pg 2 of 61	e) GT bays ii) Three - 3 core, 500/1A single phase current transformers iii) Three - 2 core, 500/1A single phase current transformers iv) Three - 2 core, 2500-1250-625/1A single phase current transformers	As per given SLD, CT cores shall be considered on both sides of CB. The CT enclosure quantity shall be six no. single phase instead of nine no. single phase.	Bidder to follow SLD
8	16 A.1.1 e) pg 2 of 61	e) GT bays ix) GIS Adapter Section: Three, single phase gas insulator adapter section for oil to SF6 and SF6 to XLPE cable bushing connection, comprising of: a) Three- 4 core, 500/1A single phase current transformers b) 3-single phase 336 kV(r.m.s)SF6 Surge Arrestors c) 1-three phase group operated safety grounding switch complete with manual and motor driven operating mechanism.	As per given SLD and layout drawing, Cable box enclosure as per IEC 62271-209 shall be considered for GT bays. Termination kits/bushing for HV cables are excluded from scope.	Noted, to be further discussed during detailed Engg.
9	16A.1.2 iv) pg 4 of 61	iv) Continuous on-line monitoring and diagnostic systems in all individual bays (including LCD display) to monitor partial discharge, internal arcing, gas density, gas pressure, leakage, moisture etc., operating parameters such as current, voltage, temperature etc. complete with sensors, control / processor units, wiring/cabling in all respect.	Request to note that on-line PD monitoring system and on-line gas monitoring system are different.	Bidder to follow specification. To be further discussed during detailed Engg.
	Annexure-I, Line item A		For on-line partial discharge monitoring, dedicated panel shall be provided with one HMI to have <u>complete monitoring of GIS bays.</u>	
			On-line gas monitoring system offered can monitor pressure with one dedicated panel and one HMI if digital monitoring is confirmed as clause 16A.15.5.1 of spec calls for temperature compensated density switches.	
			Moisture shall be monitored off-line with Dew point meter. Given CT and VT shall be for Current and voltage measurement.	

10	16A.1.2 v) pg 4 of 61	1 no. - Remote monitoring and supervision station having time synchronization facility for (ii), (iii) & (iv) above, to be placed in control room for system operator.	Excluded from GIS supplier's scope.	Bidder to follow specification, to be considered as part of Continuous Online Monitoring System
11	16A.1.2 xii) pg 4 of 61	xiii) Two no. gas processing units suitable for evacuating, liquefying, filling, drying, vacuuming and purifying SF6 gas during initial installation, subsequent maintenance. xiv) Two no. Vacuuming machines suitable for vacuuming GIS compartments with latest technical requirements. Processing unit shall have facility of handling all said functions for at least 3 different compartments simultaneously.	Request to confirm the requirement of two nos. gas processing units. Vacuum machine/pump is part of gas processing unit. Hence separate vacuuming machine is not necessary to consider. Please confirm.	Bidder to follow specification Bidder to follow specification
12	16.A.1.4 pg 6 of 61	Any other item (s) not mentioned specifically but necessary for the satisfactory completion of scope of work defined above, as per accepted standard (s)/best international practice.	This clause is referred in mandatory spares list in Price Schedule III) item no. C.27 and given as one separate line item. Request to note that our scope and limits are as per Section-1 of our technical offer. We will not include/exclude items beyond this. Being given as line item in spares, please provide clear split-up to consider cost / clarify the requirement.	Please refer the updated Price Bid
13	16A.3.1 pg 7 of 61	f) BIL (kV Peak) i) to earth -1425 kVp ii) Across open switching device - 1665 kVp	f) BIL - Across open switching device shall be 1425 + 240 kVp as per IEC.	Noted, To be further discussed during detailed Engg.
14	16A.3.1 pg 8 of 61 16A.4.18.6 pg 28 of 61 16A.4.25.2 j) pg 36, 37 of 61	Radio interference voltage at 266 kV (rms) - Less than 2,500 micro volts Corona Extinction voltage - 320 kVrms	Not applicable to GIS. Applicable only to SF6 to Air bushing.	Noted, To be further discussed during detailed Engg.
15	16A.3.4 pg 9 of 61	iv) TESTS TO MEASURE LOSSES IN BUS CONDUCTOR AND ENCLOSURE OF THE GIS Tests at factory shall be carried out by the supplier to prove that actual measured during testing are within guaranteed values quoted in the tender. Tenderer shall furnish methodology of carrying out loss measurement in his tender. If after deduction of tolerance as specified by the tenderer, the actual losses during testing exceed the guaranteed value of losses up to a maximum limit of 10%. The supplier shall pay to the purchaser as penalties @ Rs. 2,50,000 per K.W. as specified in previous clauses.	Test shall be carried out on sample bus duct or busbar at factory as per standard factory testing procedure. Losses values shall be indicated in technical data sheet.	Bidder to follow specification
16	16A.4.1 pg 9 of 61	The GIS assembly shall consist of completely separate pressurized sections in order to de-pressurize one gas compartment for inspection, maintenance or, if necessary, repair while keeping the adjacent compartments in service.	Request to note that though gas sections are completely separated they are not electrically isolated. Due to safety reasons, maintenance or repair on pressurized sections is not recommended. We confirm maintenance on CB and line side components without outage of adjacent feeders.	Bidder to follow specification
17	16A.4.2 pg 10 of 61	Sufficient access openings shall be provided at the switchgear to ensure that each switchgear component can be inspected during installation or for future maintenance.	Being pressurized gas compartments, access opening for inspection and maintenance is not provided in GIS.	Bidder to follow specification
18	16A.4.6 pg 11 of 61	suitably sub-divided into individual arc and gas-proof compartments, at least for:- g) Current Transformers	Primary of the CT is only conductor inside GIS. Secondary cores are air insulated. As there is no switching elements in CT, separate gas proof compartment for CT conductor is not envisaged as per our standard design.	Shall be subject to customer approval at the time of detailed engineering.
19	16A.4.11 pg 12 of 61	The breaker enclosure shall have provision for easy withdrawal of the interrupter assemblies.	To avoid mal assembly at site, we recommend removing complete breaker pole for inspection and possible repairs at site. This can be done without disturbing the adjacent bays.	Bidder to follow specification
20	16A.4.13 pg 13 of 61	Wherever required, heaters shall be provided for equipment to ensure proper functioning of the switchgear at ambient temperatures, specified. The	Heaters shall be provided in LCC and mechanism cubicles. No need to provide heaters for GIS equipment.	Bidder to follow specification
21	16A.4.14 pg 14 of 61	The humidity will be up to 100 percent (indoors).	Humidity shall be as per IEC standard. As the GIS is indoor, 100% humidity (immersion in water) is not applicable.	Bidder to follow specification
22	16A.4.17.3 pg 17 of 61	Insulation co-ordination: The bidder shall carry out the insulation co-ordination study for the complete Power station covering the equipment to Pothead yard	Excluded from GIS supplier's scope.	Bidder to conduct Insulation Coordination study for 400kV System.
23	16A.4.17.4 pg 18 of 61	The Circuit breaker shall be supplied with thermostatically controlled tank heaters as required.	Tank heaters for CB is not required as the temperature range is complied.	Bidder to follow specification
24	16A.4.17.10 pg 21 of 61 16A.4.17.12 pg 24 of 61 z) No. of auxiliary contacts - 18 NO + 18 NC	each pole of each circuit breaker shall be provided with eighteen normally open 'a' and eighteen normally closed 'b' switches, Six 'a' and six 'b' switches shall be adjustable for early make or early break operation.	Each pole of CB shall be provided with Standard 16 NO + 16 NC where in 10NO+9NC shall be spare contacts. Request to note if required, contacts can be multiplied at CRP end. Auxiliary switches are adjustable at factory. Adjusting the switches at site is not recommended.	Bidder shall supply the required contacts as per specification. Shall be subject to customer approval during detailed engineering.

25	16A.4.17.10 pg 21, 22 of 61	with an electrical phase dis-agreement circuit, complete with a time delay relay with adjustable setting. The relay shall provide automatic 3-phase tripping of the circuit breaker.... The supplier shall supply all relays, switches and accessories to provide for fail-safe operation....	In LCC, control circuit requirement is met with contactors and timers. No relays envisaged in LCC.	Shall be subject to customer approval during detailed engineering. However, Bidder to consider the space requirement of CSD for mounting into LCC Panel.
26	16A.4.17.10 pg 22 of 61	The circuit breaker shall have local storage sufficient for a duty cycle following the loss of supply to the main energy storage system.	The circuit breaker shall have local storage sufficient for O-CO operation.	Bidder to follow the Technical Specification . Shall be subject to customer approval during the detailed engineering.
27	16A.4.17.12 pg 22 of 61	a) Type of breaker - 420 kV rated voltage three phase metal enclosed, double interrupter, horizontal mount, SF6 gas insulated spring operated...	Offered CB shall have single interrupter, horizontal mount, SF6 gas insulated and spring operated for CB with out PIR and for CB with PIR, it will be with double interrupter.	Bidder to follow technical specification
28	16A.4.18.2 pg 26 of 61	Each isolator switch shall be supplied with 18 (eighteen) normally open and 18 (eighteen) normally closed auxiliary switches for other use over and above those required for switchgear interlocking purposes....	As standard, 4 NO+4NC auxiliary switches shall be available for customer use. As required, can be multiplied at CRP end.	Bidder shall supply the required contacts as per specification. Shall be subject to customer approval during detailed engineering.
29	16A.4.18.3 pg 26 of 61	After tripping of circuit breaker, operation of the respective isolator control switch to open will first initiate rapid closure of the associated high-speed grounding switch.	Standard safe interlocking schemes shall be followed.	Noted .Shall be subject to customer approval during the detailed engineering.
		The grounding switches will be required to close before the isolator switches are open in order to dissipate the trapped charges, when the lines are taken out of service for maintenance, etc.		
	16A.4.20.2 pg 31 of 61			
30	16A.4.18.5 pg 27 of 61	All the disconnecting switches shall have endoscopic arrangement allowing easy visual confirmation from outside the enclosure	Viewing window shall be provided for all disconnectors. Endoscope is an instrument for viewing the contact positions. Need not to be provided for all disconnectors. Only one endoscopic tool shall be supplied.	Endoscopic arrangement is to be provided as per the Technical Specification.
31	16A.4.19.2 pg 29 of 61	Each ground switch/high speed switch operator shall be fitted with six normally open and six normally closed auxiliary switches for other use over and above those required for local interlocking and position indication purposes.	As standard, per mechanism, 4 NO+4NC auxiliary switches shall be available for customer use. As required, can be multiplied at CRP end.	Bidder shall make available all NO and NC auxiliary switches as per Technical Specification .
	16A.4.20.3 pg 31 of 61			
32	16A.4.21 pg 32 of 61	The current transformers incorporated into the GIS will be used for protective relaying and metering and shall be metal enclosed type.	Primary of the CT is only conductor inside GIS. Secondary cores are air insulated.	Noted .Shall be subject to customer approval during the detailed engineering.
33	16A.4.21 pg 32 of 61	The marshalling box shall be used for the star/delta configuration and be equipped with terminals with short circuiting facility for the secondary circuits.	There is no marshalling box for GIS CTs. Only terminal box shall be provided in which short circuiting facility will be available.	Noted. However Terminal shall meet the functionality/requirement of the technical specification.
34	16A.4.21 pg 32 of 61	Rated insulation levels - as per IEC 60044-1....	Shall be as per latest IEC standard 61869-2.	Noted . Shall be subject to customer approval during the detailed engineering.
			Temperature rise limits shall be as per latest IEC 62271-1, table 14	
		Limit of temperature rise - IEC 60044-1		
35	16A.4.23.1 pg 33 of 61	The bushing shall employ capacitive grading and divided into independent gas compartments by a barrier insulator with grading electrodes. If the bushings of condenser type with grading elements are offered, these shall be fitted with capacitance taps for the measurement of tan delta and partial discharge.	We offer Composite type SF6 to Air bushing which has no capacitive grading. Tan-delta measurement is not applicable for the same.	Noted. Applicable Guidelines for checking the healthiness of the Composite type of SF6 to Air bushing shall be applicable.
36	16A.4.25.1 pg 35 of 61	SF6 gas insulated, metal enclosed surge arrestors of the gapless metal oxide, heavy-duty, station type shall be located on H.V. side of generator transformers, GIS near XLPE interface, Bus & Line Reactor and Busbar.	GIS Surge Arresters are considered for Bus bars, BR bays and LR bays as per customer SLD. We have not considered GIS Surge Arresters for GT bays. Please confirm.	Bidder to follow the Single Line Diagram in the Technical Specification
37	16A.4.26 pg 39 of 61	In no case, max length of GIB between two close barriers shall be 3 m.	Request to note that the length 3 Mtrs given is too small for one gas compartment. One single length of GIB itself comes to 9 Mtrs and max. length for one gas compartment shall be 10 to 11 Nos./lengths of GIB ie, approx. 100 Mtrs. Single phase 100 Mtrs length shall be considered as one gas compartment in our offer.	Bidder to follow Technical Specification . Shall be discussed during the detailed engineering.
38	16A.5.2 pg 40 of 61	Two feeders of A.C. and D.C. supply each will be made available as main and stand by feeder for supplying power to one local control panel.	Shall be in main contractor's scope.	Noted
39	16A.5.4.1 pg 42 of 61	"The unit shall be provided with gas testing kit to measure the moisture contents of the gas and with pressure monitoring system. Acidity measurement instrument with nozzle etc. shall also be provided".	Moisture can be measured with dew point measuring device which is already part of Schedule V(A). For SO2 measurement, Device for decomposition products measurement is considered as per Schedule V(D).	Bidder to follow specification . Bidders is advised to carefully follow specification and price bid and not to club together items of different schedules.

40	16A.15.5 .1, 16A.5.5.2, 16A.5.5.3 pg 44 of 61		As per description in 16A.15.5.1, temperature compensated gas density switches are asked for. Please clarify conventional gas density switches with potential free contacts for SCADA interfacing is accepted or digital gas monitoring system is required. Also if digital gas monitoring is provided, gauges in each gas compartment may not be required as the same can be visualized in HMI. Please confirm your requirement	
		16A.15.5 .1 Gas monitoring system		
		comprising of a temperature compensated SF6 gas density monitoring unit and pressure gauge having alarm / trip contacts.	For all on-line monitoring system, one dedicated panel with one HMI shall be provided. CB monitoring system is an extended feature of gas monitoring system. Hence sub-station will have totally 2 panels with HMI for PD and gas monitoring.	Noted. Shall be subject to customer approval during the detailed engineering.
		16A.5.5.2 Partial discharge monitoring system		
		16A.5.5.3 Circuit breaker monitoring system		
		1. Continuous on-line monitoring and diagnostic systems in all individual bays (including LCD display) shall be provided in their respective Local Control Panels.		
		2. A remote station for system operator to control and supervise all the above 3 systems in the control room is to be provided and the same should be time synchronize with plant control system.		
41	16A.5.10 pg 47 of 61	Heaters ..	Heaters provided in LCC and operating mechanism cubicles are suitable for connection to a single-phase AC supply.	Noted. Shall be subject to customer approval during the detailed engineering.
		All heaters shall be suitable for connection to a 415 V AC, 3-phase, 4 wire, 50 Hz supply.		
42	16A.5.11 pg 47 of 61	In order to minimize maintenance and component replacement, the supplier shall submit proof that all offered SF6 GIS equipment has a minimum service life of 20,000 normal operations/as per relevant IEC/IEEE standard.	Maximum service life of CB, DS, ES shall be M2, 10,000 mechanical operations as per IEC.	Bidder to follow Specification/Technical Corrigendum
			For High speed earthing switch, same shall be M1, 2000 mechanical operations	Bidder to follow Specification/Technical Corrigendum
43	16A.7.2.2 pg 52 of 61	e) Control Cubicle	Operation and function checks of control cubicle are done with test simulator during factory routine tests.	Noted shall be subject to customer approval at the time of detailed engineering
		iii) Operation test of all pressure density monitoring switches.		
			Operation check of all pressure density monitoring switches or density sensors (if on-line gas monitoring is offered) are done during site commissioning tests.	Noted shall be subject to customer approval during the detailed engineering
44	16A.7.2.2 pg 52 of 61	f) Current transformers (As per IEC 60044-1)	Supplier routine test reports shall be submitted.	Noted shall be subject to customer approval during the detailed engineering
		Following tests shall be carried out for current transformers used for protection purpose.		
45	16A.7.2.2 pg 52 of 61	i) Knee point voltage tests.....iv) Turns ratio test		
		g) Surge Arrester	NA for GIS surge arrester having single column.	Noted
46	16A.7.2.3 pg 53 of 61	v) Current distribution test for multi-column arrester		
		In addition to the above tests, all enclosures shall be pressure tested after manufacture in accordance with the latest requirements of IEC 517, Section 31.	Supplier test reports shall be submitted as indicated in our test plan.	Noted shall be subject to customer approval at the time of detailed engineering
47	16A.7.2.4 pg 54 of 61	For bus bars & bus ducts the routine testing shall be as per the relevant IEC standard & shall also include the following:	Not applicable for GIS Bus bars and bus ducts.	Noted
		viii) Section shall be RIV free at 2 times r.m.s line to ground voltage.		
48	16A.7.4 pg 56 of 61	f) Check of all relay settings shall be in accordance with the calculated values and afterwards primary inspection tests by introducing fault artificially wherever feasible, otherwise testing with testing apparatus (simulated method). Primary checking of all tripping circuits.	Excluded from GIS supplier's scope.	Bidder to consider settings for CSD
49	16A.10.2 pg 60 of 61	Instruments for testing & commissioning:	Please provide the make and model to consider.	Bidder to follow specification
		1. The contractor shall provide the highest model of the mentioned make or equivalent.		
50	16A.11.2 pg 61 of 61	Recommended Spare Parts	We do not recommend any spares as spares list given in Schedule-III is more than sufficient.	Noted
Section-3				
51	3.7.2.7 to 3.7.2.16 pg 9 & 10 of 38	Protection requirement, Indicating instruments and Meters, Integrating instruments..... Measuring transformers	Auxiliary power supply requirements – Local control Panel for GIS will not have any protection and metering equipment.	Noted. However CSD interface to be taken care by the bidder.

52	Schedule-5,			Please indicate Bay Width applicable to your design . There may be minor changes during the detailed engineering same needs to be accommodated in the Layout . Bidder to comply with the Technical Specification
	2.15 pg 147/200	Any change in bay pitch (distance between bays) as per civil requirement for foundation layout during detailed engineering stage shall be incorporated by the bidder without any cost and delivery implication to BHEL.	As per layout drawing, there are no columns shown. Distance between GIS bays considered is enough to adjust the column positions. Please confirm.	
53	Layout drawings	Layout drawing	In layout drawing, bus bars are spread out throughout the GIS building. Please confirm whether changes in bay sequence are acceptable.	Bay sequence to be kept as per the Technical Specification and shared Layout Drawing.
Annexure-I Rev 00 – Bill of Quantity				
54	Line item no. A.11	(a) 400kV XLPE Cable to SF6 Bushing Module shall be of the plug-in type with dry-type or fluid-filled terminations.	Cable box enclosure suitable for XLPE cable (dry type) shall be considered as per IEC 62271-209. Quantity of cable box enclosures shall be as per PS. Please note that termination kits/bushings for HV cables are excluded from GIS supplier's scope.	Noted
		Bidder have to supply GIS with cable termination modules for all GT Bays (In GIS building and in GT Cavern area)		
55	Item no. A.18	SUPPLY- GIS: 400KV, 50KA FOR	GIB Quantity indicated is for 5 bays. Any increase in GIB shall be paid at actuals at unit rate quoted. Please confirm.	Noted
		IS, 2500A, SINGLE PHASE GAS		
		INSULATED BUS DUCT – 300 Mtrs		
56	Item no. A.24	Continuous Online Monitoring system shall be complete in all respects and comprising of following but not limited to,	If on-line digital gas monitoring with digital sensors is offered, no need to have temperature compensated gas pressure devices with gauges in bay. Please confirm your requirement.	Noted , shall be subject to customer approval during the detailed engineering.
		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.		
57	Item no. B.1 & B.2	Gas processing units suitable for evacuating, liquefying, filling, drying, vacuuming and purifying SF6 gas during initial installation, subsequent maintenance..... Two nos.	Requirement of 2 Nos. may please be clarified. As vacuuming machine is part of gas processing unit, requirement of additional vacuum machines may please be confirmed.	Bidder to follow specification
		Vacuuming machines suitable for vacuuming GIS compartments with latest technical requirements. Processing unit shall have facility of handling all said functions for at least 3 different compartments simultaneously. – 2 Nos.		
58	Item no. C.2	single phase 420 kV 2500A circuit breaker complete with all necessary apparatus. -three nos.	As operating mechanisms are indicated as different line item, we have not considered operating mechanism with the CB poles, DS, ES and HES. Please confirm.	CB/DS/ES or HES complete with all necessary apparatus but without Mechanism may be considered at respective BOQ line items
59	Item no. C.7	420 kV, 2500A isolator switch internal parts, complete with all necessary gaskets, mounting hardware etc.	We consider only fixed and moving contacts of isolator as against this item.	Bidder to follow specification
60	Item no. C.20 & C. 21	Circuit breaker – Closing coils – 100 sets	Quantity seems to be high. Please confirm.	Bidder to follow specification
		Circuit breaker – Trip coils – 200 sets		
61	Item no. D.7 & D.8	SUPPLY- GIS:FILLING HANDLE FOR SF6 GAS PROCESSING MACHINE	Dilo requirement is repeated. It is already covered in B.1 and B.2. Please clarify.	Bidder to follow specification
		SUPPLY- GIS:GAS SERVICE CART		
62	Item no. H.1	Training at manufacturer's works	Our standard training schedule at factory is for 5 days with max, 8 trainees. Please confirm/clarity whether this training duration is for complete package or only for GIS.	Noted shall be subject to customer approval during the detailed engineering.

Annexure 2					
Sl. No.	Clause No	Page No.	As per Technical Specification	Clarification	BHEL
A-SECTION 1					
1	5. Type tests:	Page 4 of 15	The contractor shall submit the certificates from Govt. approved labs/ accredited laboratories of the type tests listed under Clause 16.A.7.3 of Section-2 for the 400 KV GIS & 400 KV SF6 CGI Bus Ducts which should have been carried out within last five (5) years from the date of bid opening (09.02.2018). These type test reports should be for the tests	Kindly note that the offered GIS has been type tested in line with IEC 62271-203, there have not been any specific design changes in the offered type tested design after the type test for the same. In line with the same we request to kindly accept the GIS with Type test reports carried out with last ten (10) years from date of bid opening	Bidder to meet the requirements of the Technical Specification ie TTR shall not be older than 5 years from 9 Feb 2018. TTR shall be reviewed during Detailed Engineering
2	6. Functional Guarantee:	Page 4 of 15	The bidder has to consider the functional guaranteed value for the GIS equipment as per following :-	Kindly note that the values provided as per the requirement depend upon the Current rating of the GIS under offer, we confirm to this requirement For 400kV GIS, 2500A , 40°C, 50Hz system, We request to kindly confirm as to how this value shall be monitored at site OR a manufacturer declaration for the assigned electrical ratings shall be sufficient	Bidder to follow specification. Bidder to submit the procedure during detailed engineering . The same is subjected to customer approval during detailed engineering
3	18. OTHER GENERAL INFORMATION:	Page 12 of 15	i) CT/ VT parameters mentioned in SLD is indicative only. Bidder has to ensure correctness of CT/VT sizing as per relays selected for GIS during contract stage / detailed Engineering stage.	Kindly note that the offered GIS CT parameters as per the SLD are best technically feasible as per the offered GIS design, in consideration to the same any changes to the design during detail engineering shall be associated with price implication	Bidder to adhere to the specification. No additional price implications at contract stage shall be allowed.
Section-2; SECTION - 16 A GAS INSULATED SUBSTATION					
4	16A.1.2 Miscellaneous components and auxiliary system	Page 5 of 61	iv) Continuous on-line monitoring and diagnostic systems in all individual bays (including LCD display) to monitor partial discharge, internal arcing, gas density, gas pressure, leakage, moisture etc., operating parameters such as current, voltage, temperature etc. complete with sensors, control / processor units, wiring/cabling in all respect.	Kindly note that there exists no single on-line monitoring and diagnostic system for HV GIS the measurement of PD, internal arcing , gas pressure,leakage, moisture are carried out by separate measuring equipments. We request to kindly confirm the exact requirement for a due consideration into offer	Bidder to follow Specification The specification is clear about the requirement of the Online Monitoring System, which may be a single system or an integrated one.
5	16A.1.2 Miscellaneous components and auxiliary system	Page 5 of 61	xiii) Two no. gas processing units suitable for evacuating, liquefying, filling, drying, vacuuming and purifying SF6 gas during initial installation, subsequent maintenance. Processing unit shall have facility of handling all said functions for at least 3 different compartments simultaneously. Both processing units complete with all valves, couplings, fittings etc. shall include the following: a. 20 no. hose pipe – 20m b. 10no. hose pipe – 10m c. 5no. hose pipe – 5m Four way coupling / manifold – 10 sets Straight coupling – 12 sets	Kindly confirm the make and type for the equipment required. There exists a quantity mismatch between the BOQ and the specification clause requirement	Bidder to adhere to the Price Bid Schedule. Make and Model shall be subject to the customer approval.
6	16A.1.2 Miscellaneous components and auxiliary system	Page 5 of 61	xiv) Two no. Vacuuming machines suitable for vacuuming GIS compartments with latest technical requirements. Processing unit shall have facility of handling all said functions for at least 3 different compartments simultaneously.	Kindly confirm the make and type for the equipment required. There exists a quantity mismatch between the BOQ and the specification clause requirement	Bidder to follow updated price bid schedule . Make and Model shall be subject to the customer approval.
7	16A.3.4 Guarantees & Penalties	Page 8 of 61	i) The bidder shall indicate guaranteed maximum values of total losses (conductor loss & enclosure loss) & further indicate whether losses are firm or subject to tolerance. In case losses are subject to tolerance, ceiling shall be indicated for tolerance.	Kindly note that the values provided as per the requirement depend upon the Current rating of the GIS under offer, we confirm to this requirement For 400kV GIS, 2500A , 40°C, 50Hz system, We request to kindly confirm as to how this value shall be monitored at site OR a manufacturer declaration for the assigned electrical ratings shall be sufficient	Bidder to follow specification . Bidder to submit the procedure during detailed engineering . The same is subjected to customer approval.
8	16A.4 DESIGN AND CONSTRUCTION	Page 9 of 61	TESTS TO MEASURE LOSSES IN BUS CONDUCTOR AND ENCLOSURE OF THE GIS	Kindly specify the IEC and the methodology as per which this type test shall be conducted	Bidder to consider the total losses in GIS as per the Specification . Bidder to submit the procedure during detailed engineering . The same is subjected to customer approval during the detailed engineering.
9	16A.4.13	Page 14 of 61	c) Any other alarm necessary to indicate deterioration of the gas insulating system.	Not Applicable for the offered GIS design	Bidder to follow specification
10	16A.4.17.8	Page 20 of 61	The control supply shall have provision of HRC fuses of appropriate capacities for overload protection.	Kindly note that protection requirement shall be made possible by the provision of MCBs	Noted, shall be subject to customer approval during detailed engineering.
11	16A.4.18.2	Page 26 of 61	Each isolator switch shall be supplied with 18 (eighteen) normally open and 18 (eighteen) normally closed auxiliary switches for other use over and above those required for switchgear interlocking purposes. Also, it shall be possible	Kindly note that the requirement of NO + NC contact shall be made possible with the provision of contact multiplier provision, request to kindly provide a concurrence on the same	Bidder shall supply the required contacts as per specification. Shall be subject to customer approval during detailed engineering.
12	16A.4.18.3	Page 26 of 61	Isolator provided with safety grounding switches shall have mechanical key and electrical interlocks to prevent closure of the grounding switches when the isolator switches are in the closed position and to prevent closure of the isolator switch when the grounding switch is in the closed position.	The Isolators are provided with Electrical interlocks for avoidance of this condition. In addition to the same, the Isolators shall also have a provision of Padlock facility to avoid any specific accidental operation	The requirement of the spec shall be met
13	16A.4.18.5	Page 27 of 61	All the disconnecting switches shall have endoscopic arrangement allowing easy visual confirmation from outside the enclosure of full travel of the switch contacts to both of the open and close positions.	We understand the requirement is to have provision to fix the endoscopic camera in all the disconnector switches and to visualize the contact position 1 no. portable type camera shall be provided.	Endoscopic Arrangement is to be provided as per the specification.

14	16A.4.20.1	Page 30 of 61	These Three phase switches shall be group operated from a single electric motor operator suitable for operation from a 220 V DC ungrounded supply.	The high speed earth switches shall be operated with three separate DC motors dedicated for each phase of the High speed earth switches	Noted.
15	16A.4.21	Page 32 of 61	The particulars of the various cores are likely to change within reasonable limits. Manufacturer is required to have these values confirmed by purchaser before proceeding with design of the cores.	Kindly note that the offered GIS CT parameters as per the SLD are best technically feasible as per the offered GIS design, in consideration to the same any changes to the design during detail engineering shall be associated with price implication	Bidder to meet the requirements of SLD and follow Technical Specification.
16	16A.4.21	Page 33 of 61	e) Maximum Radio Interference <2,500 Microvolt voltage at 266 kV (r.m.s.) f) Corona extinction voltage 320 kV (r.m.s.)	Not Applicable for the offered GIS design	Applicable for SF6 to Air Bushing
17	16A.4.23.1	Page 34 of 61	The 400 kV overhead lines are to be connected to SF6 GIS by Air to SF6 gas filled bushings through 400 kV Bus Ducts. The air terminations shall consists of a polymer which encloses the conductor & an appropriate ground sleeve. The space surrounded by the porcelain insulator shall be filled with SF6 gas slightly above atmospheric pressure.	The offered SF6/Air bushings shall be polymeric type. Request to kindly confirm	Noted
18	16A.4.26	Page 38 of 61	Each end of the main bus bars shall be designed for convenient future extension of the switchgear.	As per the GA Layout provided with the tender, it is observed that extension facility is provided on one side of the GIS Bays, kindly confirm if an extension facility shall be required on the other side of the GIS	Bidder to follow specification. Extension capability shall be required on both the sides
19	16A.4.26	Page 38 of 61	The actual length of the bus duct would be finalized after layout is frozen. For any change in length for bus duct shall have no financial implication on the purchaser.	Kindly note that the offered GIS busduct length shall be in line with the tender drawings and the tender BOQ, any specific changes during detail engineering shall be associated with a price implication	GIS bus duct is unit rate item of BOQ. Payment shall be made on unit rate basis.
20	16A.4.26	Page 39 of 61	Where the bus passes through building, walls, flooring or other enclosures, the supplier shall supply the wall plates, flanges and all bolts.	Kindly note that the design of the foundation bolts shall be included in BHEL scope .	Bidder to follow the specification Bidder shall be responsible for the design and supply of the wall plates, flanges and all bolts.
21	16A.4.26	Page 39 of 61	In no case, max length of GIB between two close barriers shall be 3 m. The means of identification used shall be a black band, approx. 10mm wide, permanently affixed to the barrier insulator on outer surface of the bus duct at the location of the barrier insulation.	The location of Barriers and allocation of gas compartments is dependent on the manufacturers type tested design, we request to kindly keep the max length provision flexible and open for manufacturers proposition.	Bidder to follow specification
22	16A.5.4.1	Page 42 of 61	An SF6 gas processing unit suitable for evacuating, liquifying, evaporating, filling, drying and purifying SF6 gas during the initial installation, subsequent maintenance and future extension of GIS shall be provided. The cart shall be equipped with rubber wheels and shall be easily maneuverable by two workers within the switchyard building. "The unit shall be provided with gas testing kit to measure the moisture contents of the gas and with pressure monitoring system. Acidity measurement instrument with nozzle etc. shall also be provided".	Kindly note that gas testing and moisture measurement are two separate kits and not a part of the gas processing unit, the same are not provided separately in the tender BOQ we request to kindly provide a BOQ line item for the same	Bidder to quote in line with the Price bid and refer detailed BOQ.
23	16A.5.5	Page 43 of 61	Continuous on line monitoring system shall be provided to monitor conditions such as partial discharge, internal arcing, gas density, gas pressure, gas leakage, moisture etc. and operating parameters such as current, voltage, temperature etc. of GIS for smooth operation and detection of any changes in insulation at an early stage during normal operation to take appropriate remedial action. Each system shall be complete with sensors, input/ output module, control/processor unit, relays, junction boxes, cabling and associated accessories for measuring, monitoring and data acquisition of intended parameters to be monitored.	Kindly note that there exists no single on-line monitoring and diagnostic system for HV GIS the measurement of PD, internal arcing , gas pressure, leakage, moisture are carried out by separate measuring equipments. We request to kindly confirm the exact requirement for a due consideration into offer	Bidder to quote in line with the Price bid , Technical Specification and refer detailed BOQ.
24	16A.5.5.2	Page 44 of 61	Partial discharge monitoring system	This item is not included as a part of supply BOQ, we infer the same is excluded from scope of supply	Bidder to quote in line with the Price bid and refer detailed BOQ.
25	16A.5.5.3	Page 44 of 61	Circuit breaker monitoring system	This item is not included as a part of supply BOQ, we infer the same is excluded from scope of supply	Bidder to quote in line with the Price bid and refer detailed BOQ. This item is the part of Continuous Online Monitoring System.
26	16A.5.11	Page 47 of 61	In order to minimize maintenance and component replacement, the supplier shall submit proof that all offered SF6 GIS equipment has a minimum service life of 20,000 normal operations/as per relevant IEC/IEEE standard	The service life for CB, DS, WIP ES shall be guaranteed for 10000 No load operations and for HSES it shall be 2000 No load operations. Request a concurrence on the same	Refer Latest Specification /Corrigendum
27	16A.7.2	Page 50 of 61	In addition, corrosion protection tests at random on all equipment shall be performed.	Kindly note that as the equipment is proposed for indoor application, test for corrosion on equipment is not envisaged, also the aluminum enclosures are not prone to surface corrosion. Request to kindly accept.	Provision of the Technical Spec shall prevail.

28	16A.7.2.4	Page 55 of 61	p) The Supplier shall offer only the dis-connectors which are proved against the effect of VFT (dis-connector switching and very fast transients).	Provision of Type test reports to meet this requirement is not envisaged and prescribed as per IEC 62271-203	Bidder to follow specification
Section 3					
29	3.7.2.15 Measuring converters	Page 10 of 38	The converters shall be suitable for direct connection to the secondary circuits of the potential and current transformers used, or other sensors, each as they apply. The converters shall be static type, having all accessories to provide an output signal of 4-20 mA, filtered DC.	Kindly confirm the applicability for GIS Gas density monitors for this item	Bidder to follow the specification.
30	3.7.2.16 Measuring transformers	Page 10 of 38	All VTs shall have readily accessible HRC current limiting fuses on both primary and secondary sides. The class of insulation should be E or better.	The VT secondaries shall be protected using MCBs	Noted . Shall be subject to customer approval
Bill of quantities for 420 kV GIS					
31	SUPPLY- GIS : 400KV, 50KA FOR 1S, 2500A, DOUBLE MAIN BUS SCHEME - GENERATOR TRANSFORMER GIS BAY	--	c) Three nos. Single phase , SF6 to OIL Termination Module on GT. d) Six nos. Single Phase ,SF6 to EHV Cable Module e) Three nos. Single Phase ,Interfacing Modules .	The items mentioned are included as a part of Interfacing module, kindly confirm	Please follow the latest SLD and Detailed BOQ.
32	SUPPLY- GIS : 400KV, 50KA FOR 1S, 2500A, DOUBLE MAIN BUS SCHEME - LINE GIS BAY WITH PIR	--	g) Three Nos. of single phase 336kV, 20kA , SF6 gas insulated metal enclosed zinc oxide surge arrestors.	As per SLD the Surge arrester for this bay is AIS type kindly confirm	Please refer to SLD . Surge Arresters for the Line Bay are of AIS Type
33	SUPPLY- GIS : 400KV, DOUBLE MAIN BUS SCHEME - LOCAL CONTROL CUBICLES (LCC)	--	Local Control Cabinet (LCC) for each bay shall be supplied. LCCs shall be separate freestanding floor mounted type for at least the following but not limited to - (1) 4 nos of fully equipped GT Bay Modules (2) 2 nos of fully equipped Line Bay Modules (3) 2 nos of fully equipped Line Reactor Bays Module (4) 1 nos of fully equipped Bus Reactor Bay Module (5) 1 nos of fully equipped Bus Coupler (6) 2 Sets of Bus VT Bay Module (7) 2 Sets of Bus Surge Arrester Bay Module (8) 2 Sets of Bus Extension Module (9) 4 Sets of Interfacing GIS Module	The LCC for BUS VT, bus extension and interfacing can be clubbed into adjacent GIS Bays instead of providing additional panels, kindly confirm	Please follow the latest Technical Specification and detailed BOQ .
34	SUPPLY- GIS : 400KV, CONTINUOUS ONLINE MONITORING AND DIAGNOSTIC SYSTEM INCLUDING REMOTE MONITORING AND SUPERVISION STATION	--	Continuous Online Monitoring system shall be complete in all respects and comprising of following but not limited to, Continuous on-line monitoring and diagnostic systems in all individual bays (including LCD display) to monitor partial discharge, internal arcing, gas density, gas pressure, leakage, moisture etc., operating parameters such as current, voltage, temperature etc. complete with sensors, control / processor units, wiring/cabling in all respects , also comprising of following but not limited to Gas Monitoring System as follows,	Kindly note that there exists no single on-line monitoring and diagnostic system for HV GIS the measurement of PD, internal arcing , gas pressure,leakage, moisture are carried out by separate measuring equipments. We request to kindly confirm the exact requirement for a due consideration into offer	Bidder may quote for multiple system that shall cover the requirements specified herein.
35	SUPPLY- GIS : SF6 GAS PROCESSING UNIT	--	Gas processing units suitable for evacuating, liquefying, filling, drying, vacuuming and purifying SF6 gas during initial installation, subsequent maintenance and future extension of the GIS. Processing unit shall have facility of handling all said functions for at least 3 different compartments simultaneously. Both processing units complete with all valves, couplings, fittings etc. shall include the following: a. 20 no. hose pipe – 20m b. 10no. hose pipe – 10m c. 5no. hose pipe – 5m Four way coupling / manifold – 10 sets Straight coupling – 12 sets Required fittings and accessories for above. SF6 Gas Processing Unit shall be as per section -2 of technical specification.	Kindly specify the make and type for this equipment	Shall be subject to customer approval at the time of detailed engineering. Bidder to follow specification
36	SUPPLY- GIS : VACUUMING MACHINE	--	Vacuuming machines suitable for vacuuming GIS compartments with latest technical requirements. Processing unit shall have facility of handling all said functions for at least 3 different compartments simultaneously.	Kindly specify the make and type for this equipment	Shall be subject to customer approval at the time of detailed engineering. Bidder to follow specification
37	SPARES- GIS : SHEER PINS	--	Sheer pins.	Kindly provide the technical details for this item, this item is excluded from scope of supply	Provision of the Technical Spec shall prevail.
38	SPARES- GIS : SPARE PARTS FOR SF6 GAS PROCESSING UNIT	--	Spare parts for SF6 gas processing unit.	Kindly share the list of items required for supply item	Bidder to follow specification. Shall be subject to customer approval at the time of detailed engineering
39	SUPPLY- GIS : TEMPERATURE METERING SET	--	Temperature metering set of make Manutan or equivalent	Kindly share the technical details for this supply item	Bidder to follow specification. Shall be subject to customer approval at the time of detailed engineering
40	SUPPLY- GIS : FILLING HANDLE FOR SF6 GAS PROCESSING MACHINE	--	Filling handle , DILO or equivalent	Kindly share the technical details for this supply item	Bidder to follow specification. Shall be subject to customer approval at the time of detailed engineering
41	SUPPLY- GIS : GAS SERVICE CART	--	Gas service cart of make DILO or equivalent	Kindly share the technical details for this supply item	Bidder to follow specification. Shall be subject to customer approval at the time of detailed engineering
42	SUPPLY- GIS : TOOLS FOR SERVICE MODULE TIGHTENING	--	Tools for service module tightening	Kindly share the technical details for this supply item	Bidder to follow specification. Shall be subject to customer approval at the time of detailed engineering
43	SUPPLY- GIS : SF6 GAS DECOMPOSITION PRODUCT	--	SF6 Gas decomposition product of make DILO or equivalent	Kindly share the technical details for this supply item	Bidder to follow specification. Shall be subject to customer approval at the time of detailed engineering
44	SUPPLY- GIS : INSULATION TESTER DEVICE	--	Insulation tester device of Make Meggar or equivalent	Kindly share the technical details for this supply item	Bidder to follow specification. Shall be subject to customer approval at the time of detailed engineering

45	SUPPLY- GIS : OSCILLOSCOPE	--	Oscilloscope of make with all necessary auxiliaries, accessories and consumables, Fluke / equivalent make.	Kindly share the technical details for this supply item	Bidder to follow specification.Shall be subject to customer approval at the time of detailed engineering
46	SUPPLY- GIS : HEAVY INDUSTRIAL VACUUM CLEANER	--	Heavy industrial vacuum cleaner with all necessary auxiliaries, accessories and consumables. Eureka Forbes or equivalent make	Kindly share the technical details for this supply item	Bidder to follow specification.Shall be subject to customer approval at the time of detailed engineering
47	SUPPLY- GIS : TOOLS FOR ANNUAL MAINTENANCE OF GIS	--	Tools for Annual Maintenance (Operation, Maintenance & Handling) of GIS shall be supplied by the contractor. Details of tools to be finalized during detailed engineering in consultation with the supplier.	Kindly provide the list of items be supplied	Bidder to follow specification.Shall be subject to customer approval at the time of detailed engineering
Drawings					
50	Drawing Number:TB-3- 405-316-001	--	Spacing between bays, if required to be changed to adjust with building column and beam without any cost implicating to BHEL at contract stage only.	Kindly provide the dimensioned copy of GIS hall layout show the exact location of Beams, columns and expansion joints. In case of any changes during detail engineering this creates a major financial impact on the project. A check and confirmation of the same is requested	To enable inclusion of adequate expansion joint/bellows in the Bus a line item is created in the BOQ.Bidder shall quote at the respective optional item head.
51	Drawing Number:TB-3- 405-316-001	--	GA Layout	Kindly provide the Autocad copy of GA Layout and section drawing for an check and confirmation of Buduct requirements for offered GIS	Already Provided

Clarification on Pre-Bid Queries of 400kV GIS Manufacturers

Project : Arun 3 HEP
Date of Meeting : 11/11/2020

Annexure 3

S.No	PART/VOL.	PAGE NO	CLAUSE NO	SUBJECT	BIDDER'S QUERY	Bhel Reply
1	01_Section1	15 of 15	Annuxure_TQR	Selection of Sub-Vendor The Bidder shall have designed, manufactured, type tested at least the minimum specified quantity of all equipment as below covered under the scope of this contract of at least the rating as specified herein under or higher:	We understand for the offered GIS, in case of an Indian GIS manufacturer who has not conducted the type testing of GIS manufactured in India but the collaborator company or group company have conducted the type testing of GIS manufactured at their works, the type test reports of the collaborator company or group company shall be acceptable provided that the design of the GIS being offered from Indian works is same as that of GIS manufactured & successful type tested from the collaborator company or group company is acceptable. Kindly confirm.	Noted. Shall be subject to the customer approval at the time of detailed engineering
2	01_Section1	3 of 15	5	Type test:	Request to accept type test validity of 10 years as same is acceptable by central and state utility in India. Also, the same is accepted in previous SJVNL Buxuar Project. Request to accept the same.	Bidder to follow specification.
3	01_Section1	3 of 15	6	Functional Guarantee:	As per IEC, Performance testing is not applicable to GIS. This clause is not applicable in case of GIS as there are no losses in case of testing of it and all test will be performed as per IEC 62271-203. Kindly accept the same.	Bidder to follow specification.
4	01_Section1	6 of 15	8. (a)	a) Drawings / Documents required for Engineering Manufacturing Clearance	Following documents are IPR related & not in scope of GIS manufacturer - s.no. 6,8,15,17,19. Request to excluded following documents from GIS manufacturer scope.	Bidder to follow specification.
5	01_Section1	6 of 15	8. (b) (1)	b) Additionally, the successful bidder is required to submit drawings and documents that shall cover but not limited to the following:	Following documents are IPR related & not in scope of GIS manufacturer - s.no. 1,5,6,10. Request to excluded following documents from GIS manufacturer scope.	Bidder to follow specification.
6	01_Section1	7 of 15	10)	Earthing of GIS:	GIS manufacturer shall provide necessary earthing points on GIS enclosure/structure/bus duct/bushings. Further as a standard practice it is requested to remove the earthing design and supply from GIS manufacturer scope. Manufacturer shall provide necessary technical support for the same.	Bidder to follow specification.
7	01_Section1	7 of 15	11) Drawings Enclosed:	Note: Refer attached layout drawing for GIS Building Size. GIS be supplied should be accommodated in area as per cl. No. 16A. 4.7 of Section-2. Bay sequence of GIS may change during detailed engineering.	Our offer shall be based on Tender SLD and Layout. If any change in Bay sequence or variation in quantity such as (Bus duct etc) is expected due to change in layout, same shall be compensated by purchaser as per actual. Kindly accept.	Bidder to follow specification.
8		12 of 15	19) OTHER GENERAL	e) Bidder shall conduct insulation co-ordination studies for successfully establishing suitability of surge arrester rating, and any other requirement for successful operation of GIS.	As a standard practice, it is requested to include insulation coordination study in the scope of purchaser. GIS manufacturer shall provide necessary technical support. Kindly accept	Bidder to follow specification. Insulation Coordination Study shall be in the Bidders scope
9	02_GIS-section-2	2 of 61	16A.1.1 Detailed Scope of Work	e) Generator Transformer bays: viii) Three-336 kV single phase, SF6 insulated, metal enclosed zinc oxide surge arrestors.	It is understood that 3 nos. 336kV single phase SF6 insulated metal enclosed zinc oxide surge arrestors to be provided in GIS adapter section. Surge arrester mentioned in viii) is not required. This is inline with SLD. Kindly confirm whether surge arrester is required in GIS GT Bay also or in GIS adapter section in GT cavern area only?	Bidder to follow latest SLD and Detailed BOQ in the Technical Specification
10	02_GIS-section-2	3 of 61	16A.1.1 Detailed Scope of Work	ix) GIS Adapter Section: - c) 1-Three phase group operated safety grounding switch complete with manual and motor driven operating mechanism.	It is understood that Ground switch mentioned in point c) of GIS adapter section for GT bay shall be of High speed earthswitch type. Same mentioned in technical scope of work as safety grounding type is a typographical error. Same is inline with SLD only.	Bidder to follow the SLD provided with the Technical Specification
11	02_GIS-section-2	4 of 61	16A.1.2 Miscellaneous components and auxiliary system	i) Local control panels for each of the above bays.	It is understood that LCC shall be of standalone type to be placed in GIS service bay area. Kindly confirm the distance.	Bidder to follow specification.
12	02_GIS-section-2	6 of 61	16A.2	The relevant abstract (in soft / hard copy) of all referred standards shall be provided free of cost during engineering stage for facilitating review/ approval of submitted drawing/documents.	The IEC/IS/IEEE & other standard are purchased copies in the name of M/s. ABB and is not entitled to share the standard or make copies. Thus, request to accept the deviation	Bidder to Follow the specification . Relevant abstract may be shared to supplement the information provided in the drawings.
13	02_GIS-section-2	8 of 61	16A.3.4	Guarantees & Penalties	This clause is not applicable in case of GIS as there are no losses in case of testing of it and all test will be performed as per IEC 62271-203. Kindly accept the same.	Bidder to follow the specification.
14	02_GIS-section-2	8	16A.3.1	Control voltage DC 220V +10%/-20%	We can provide DC with -10% instead of -20%. At -20% operation can't be guaranteed. Kindly accept the same	Bidder to Follow the specification .
15	02_GIS-section-2	8 of 61	16A.3.v)16A.4.2	Minimum burn through=500msec	Request consider burn through as per Table 4 of IEC 62271-203. We confirm 300ms without burn through.	Bidder to Follow the specification .
16	02_GIS-section-2	14 of 61	16A.4.14	For design purposes, the barometric pressure shall be calculated for elevation of GIS floor.	We understand it will be in scope of M/s BHEL.	Bidder to ensure the pressure requirements and performance of the CGI DUCT according to the Site geographic location.
17	02_GIS-section-2	16 of 61	16A.4.15	To prove the capability of the equipment to withstand the "Equipment design earthquake" the supplier shall model the equipment, mathematically as series of discrete mass points connected by members in such a manner that it will represent the equipment completely installed and ready for service. The resulting system shall be dynamically analyzed using "Model Analysis". The calculations shall be supplied to the purchaser. Alternatively, the supplier may use other means, if agreed to in advance by the purchaser and shall supply all details of these tests alongwith the offer.	We are using Response spectra method for dynamic analysis of GIS and structure. We model the equipment with uniformly distributed load applicable to component of GIS. It meets the requirement mentioned in the clause.	Bidder to follow the Specification.
18	02_GIS-section-2	17 of 61	16A.4.17.2	Out-of-Phase Switching	We understand under this clause, IEC standard values and conditions will be considered. Kindly confirm.	Bidder to follow the Specification.
19	02_GIS-section-2	20	16A.4.17.8	The circuit breaker shall further be provided with amber lamp to indicate healthy trip conditions.	Amber lamp cannot be provided in the LCC however if required healthy trip condition can be checked remotely in CRP. Also note that through TCS relay (in CRP) trip circuit healthy conditions can be checked. In LCC terminal provision is available. Amber lamp is not feasible to provide in LCC. However, if any input is received from CRP for healthy condition we can wire Amber lamp in MIMIC plate. Request to accept the same	Bidder to follow the Specification.
20	02_GIS-section-2	22	16A.4.17.10	c) Level 3 Initiate automatic circuit breaker tripping and isolation at a point where sufficient stored energy is still available to perform the operation.	As per design, we do not have such provision in drive. Request exclude the same from requirement	Bidder to follow the Specification.
21	02_GIS-section-2	24	16A.4.17.12 (z)16A.4.	18 NO and 18 NC in each pole wired to terminal block-control cabinet.	In CB drive (HMB) total 12 NO & 12 NC are provided. Any additional auxiliary contacts can be provided via contact multiplier in LCC. Kindly confirm the same.	Bidder shall supply the required contacts as per specification. Shall be subject to customer approval during detailed engineering.

Clarification on Pre-Bid Queries of 400kV GIS Manufacturers

S.No	PART/VOL	PAGE NO	CLAUSE NO	SUBJECT	BIDDER'S QUERY	Bhel Reply
22	02_GIS-Section-2	25	16A.4.18 Isolator switch	Isolator switches shall be of the 3-phase, single-pole, group-operated type, installed in the switchgear in locations as shown on the single line diagram to provide electrical isolation of the circuit breakers from the transformer, double bus, bus reactors, line reactors and transmission lines.	Kindly confirm the requirement of Disconnector/Isolator at Line Reactor/Transformer/Bus reactor side in respective GIS bay. Same is not present in SLD.	Bidder to follow the SLD provided with the Technical Specification
23	02_GIS-Section-2	26	16A.4.18.2	Each isolator switch shall be supplied with 18 (eighteen) normally open and 18 (eighteen) normally closed auxiliary switches for other use over and above those required for switchgear interlocking purposes.	In Disconnector drive total 12 NO & 12 NC are provided. Any additional auxiliary contacts can be provided via contact multiplier in LCC. Kindly accept the same	Bidder shall supply the required contacts as per specification. Shall be subject to customer approval during detailed engineering.
24	02_GIS-Section-2	19	16A.4.17.6	Local operation shall be by means of an open/close control switch located in the bay module control cabinet.	Local operation will be done through Push Buttons instead of control switches. The advantage of having pushbutton is that it will be two hand operation. i.e. person needs to use two hands (one for ON/OFF execution pushbutton and another for drive selection pushbutton). This will ensure that person is doing operation intentionally and no operation will be carried out by mistake as for manual operation two pushbuttons needs to be pressed simultaneously. Request to accept the same	Bidder to please follow the specification
25	02_GIS-section-2	39 of 61	16A.4.26 & SLD	The "Interface" arrangements between the equipment shall be in the scope of GIS supplier.	The GT bay have interface of two cable sealing end as per the SLD. We understand the interface of two cable sealing end i.e supply and installation of 400kV Power cable, male & female connectors are not in scope of GIS manufacture. i.e as per IEC 62271-209.	.Bidder to follow technical specification .Bidder to please follow the detailed BOQ provided with the Technical Specification
26	02_GIS-section-2	39 of 61	16A.4.26	In no case, max length of GIB between two close barriers shall be 3 m. The means of identification used shall be a black band, approx. 10mm wide, permanently affixed to the barrier insulator on outer surface of the bus duct at the location of the barrier insulation.	The subject clause is manufacturer design dependent and request to accept as per GIS manufacturer design.	Bidder to please follow the specification
27	02_GIS-Section-2	39	16A.5.1 (b)	One set of adequately rated, thermostatically controlled, anti-condensation heaters with provision for monitoring of heater failure, wired to terminal blocks.	Heaters are provided for drives and LCC but thermostat can be provided only in LCC. HV drives don't have provision for thermostat. The heater provided in drive is designed in such a way that it should be continuously on. So, it will have desired output as required for components of drive. Provision of Thermostat in Drive is not required & not feasible. Kindly accept the same.	Noted. Shall be subject to the customer at the time of the detailed engineering
28	02_GIS-Section-2	40	16A.5.1	All control cables shall be provided with double metallic shield.	Only Single shielded cables can be provided. Kindly accept the same	Bidder to follow the Technical Specification
29	02_GIS-Section-2	41	16A.5.2.1	Mimic diagram of the switchgear bay complete with semaphore indicators for the switchgear component position indication, and local control switches for open-close or close-trip control of the circuit breaker, isolators and grounding switches.	Local operation will be done through Push Buttons instead of control switches. Kindly accept the same.	Noted . Shall be subject to the customer approval at the time of detailed engineering
30	02_GIS-Section-2	41	16A.5.2.3	The annunciator panel shall be complete with an audible warning horn and acknowledge/reset, horn silence and lamp test push buttons.	Horn & lamp test push buttons can't be provided in annunciator. All alarms are present in SCADA. Kindly accept the same	Bidder to follow the Specification
31	02_GIS-Section-2	47	16A.5.10	The heater in the mechanism housing shall be connected inside the housing to this supply and shall be thermostatically controlled. Leads to tank heaters shall be enclosed in conduit. All thermostat and temperature indicating devices shall be calibrated in metric unit	Heaters are provided for drives and LCC but thermostat can be provided only in LCC. HV drives don't have provision for thermostat. The heater provided in drive is designed in such a way that it should be continuously on. So, it will have desired output as required for components of drive. Provision of Thermostat in Drive is not required & not feasible. Kindly accept the same.	Bidder to follow the Specification
32	02_GIS-Section-2	50	16A.7.2 Routine tests	However, for electronic modules, equipment and individual components burn-in tests, temperature and voltage stress tests shall also be performed.	Kindly specify the test for such modules.	Bidder to follow the specification
33	02_GIS-Section-2	56	16A.7.4 Field Tests	f) Check of all relay settings shall be in accordance with the calculated values and afterwards primary inspection tests by introducing fault artificially wherever feasible, otherwise testing with testing apparatus (simulated method). Primary checking of all tripping circuits.	any scope related to relay setting shall not be in GIS manufacturer scope. Same shall be in CRP manufacturer scope. Kindly confirm.	Bidder to follow the Specification . Setting for the CSD shall be in the Bidders scope
34	02_GIS-section-2	57 of 61	16A.7.6	PERFORMANCE TESTING	As per IEC, all routine and FAT test will be performed. Performance testing is not applicable to GIS. Kindly accept the same.	Bidder to follow the Specification
35	02_GIS-section-2	59	16A.9 SITE INSTALLATION	The Contractor shall provide and install the concrete inserts/ embedment, support steels and/or components for foundation/supports purpose as per approved erection drawings and coordinate the activities with civil contractors to keep his activities in synchronism with civil work.	It is understood that concrete inserts/steel/channel support or components supply as well installation shall not be in GIS manufacturer scope. Same is the standard practice, since the task involve is more related to civil. We shall provide full technical support as required.	Bidder to follow the Specification
36	02_GIS-Section-2	4	16A.1.2	ii) Control switching devices (point on wave controller) for all circuit breaker bays. iii) SF6 gas monitoring for all individual bays.	Kindly let us the positioning of the CSD & SF6 gas monitoring, whether it is in LCC or in CRP.	CSD shall be housed inside the LCC. However complete scope related to CSD placement and setting shall be in the Bidders scope. Gas Monitoring System shall be placed at technically suitable position subject to customer approval during detailed engineering.
37	02_GIS-section-2	4 of 61	16A.1.2 iii) & v)	SF6 gas monitoring for all individual bays. 1 no. - Remote monitoring and supervision station having time synchronization facility for (ii), (iii) & (iv) above, to be placed in control room for system operator.	We understand the requirement is of SF6 gas online monitoring system. Kindly confirm.	Bidders understanding is correct . It is covered under the Continuous Online Monitoring System

Annexure 4

S.No	Reference Document	Reference Clause/DocNo.	Technical Issue	Customer's Requirement	Bidder's Remarks	BHEL's Reply
1	TS	Cl. 5	Type Test validity	Customer's Requirement: The contractor shall submit the certificates from Govt. approved labs/ accredited laboratories of the type tests listed under Clause 16.A.7.3 of Section-2 for the 400 KV GIS & 400 KV SF6 CGI Bus Ducts which should have been carried out within last five (5) years from the date of bid opening (09.02.2018).	Bidder's Remarks: We would like to inform you that, kindly accept the typ test report carried out for type tests within 10 years from the the date of bid opening (09.02.2018). Kindly accept the same.	Bidder to follow the Tender Specification
2	TS	Cl. 16A.4.17.1 & Cl. 16A.4.17.12	Operating Mechanism for CB	Customer's Requirement: Full details regarding electro spring operating mechanism and constructional & operational feature must be described in the bid.	Bidder's Remarks: We would like to inform you that, Kindly accept hydraulically operated CB mechanism for GIS. The same is accepted to various state and central utilities.	Bidder to follow the Tender Specification
3	Bid Price Schedule	Sr. No. A2	Line Feeder Bay CB with PIR with CSD	Customer's Requirement:1) As per Technical specification BoQ, the CB for Line feeder bay is to be provided without PIR & with CSD. 2) As per Price Schedule BoQ item No. A.2 the CB for Line Feeder Bay is to be provided with PIR and CSD.	Bidder's Remarks: Kindly clarify the discrepancy between TS BoQ & Price Schedule BoQ. We request to you to accept CB without PIR & with CSD for Line feeder bay, since interconnecting transmission line length between proposed Substation location (Arun-3 HEP) and Dhalkebar Substation is less than 200 km.	Bidder to follow the Tender Specification
1	Price bid format -01 for Indian Bidder-Arun-III	Sr. No. A	Cable Trays Requirement	Customer's Requirement : The scope of supply shall also include all erection and mounting hardware and interconnecting cables between GIS to LCC and between LCC to LCC including Cable Trays, Tags, Glands, ferrules, Lugs etc.	Bidder's Remarks: We would like to inform you that, only the cable trays required over the GIS body shall be in GIS scope of supply. The Cable trays required in between GIS to LCC or LCC to LCC shall be EPC scope of supply. Kindly accept the same.	Bidder to provide cable tray and fixing arrangements on the GIS system fro routing of the GIS cables (Indoor and Outdoor) upto the cable trench on the GIS Floor. All the cable trays inside the cable trench shall be provided by BHEL.
2	Price bid format -01 for Indian Bidder-Arun-III	Sr. No. A.20	Foundation bolts & Anchor Fastner	Customer's Requirement : c. Foundation bolts/Anchor fastning bolts for the GIS system.	Bidder's Remarks: We would like to inform you that, we shall provide the details regarding the Foundation bolts & Anchor fastner requirement in our foundation drawing, which shall be submitted during detailed engineering. However the supply for the Foundation bolts/Anchor fastning bolts for the GIS system shall be under EPC scope. Kindly accept the same.	Bidder to follow the specification . Supply of the foundation bolts/anchor fastners shall be in the scope of the contractor.

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1	TS	Cl. 5	Type Test validity	Customer's Requirement: The contractor shall submit the certificates from Govt. approved labs/ accredited laboratories of the type tests listed under Clause 16.A.7.3 of Section-2 for the 400 KV GIS & 400 KV SF6 CGI Bus Ducts which should have been carried out within last five (5) years from the date of bid opening (09.02.2018).	Bidder's Remarks: We would like to inform you that, kindly accept the typ test report carried out for type tests within 10 years from the the date of bid opening (09.02.2018). Kindly accept the same.	Bidder to follow the Tender Specification
2	TS	Cl. 16A.4.17.1 & Cl. 16A.4.17.12	Operating Mechanism for CB	Customer's Requirement: Full details regarding electro spring operating mechanism and constructional & operational feature must be described in the bid.	Bidder's Remarks: We would like to inform you that, Kindly accept hydraulically operated CB mechanism for GIS. The same is accepted to various state and central utilities.	Bidder to follow the Tender Specification
3	Bid Price Schedule	Sr. No. A2	Line Feeder Bay CB with PIR with CSD	Customer's Requirement:1) As per Technical specification BoQ, the CB for Line feeder bay is to be provided without PIR & with CSD. 2) As per Price Schedule BoQ item No. A.2 the CB for Line Feeder Bay is to be provided with PIR and CSD.	Bidder's Remarks: Kindly clarify the discrepancy between TS BoQ & Price Schedule BoQ. We request to you to accept CB without PIR & with CSD for Line feeder bay, since interconnecting transmission line length between proposed Substation location (Arun-3 HEP) and Dhalkebar Substation is less than 200 km.	Bidder to follow the Tender Specification
3	Price bid format -01 for Indian Bidder-Arun-III	Sr. No. A.24 & Cl. 16A.5.5	Continuous Online Monitoring & Diagnostic system	Customer's Requirement : Continuous on-line monitoring and diagnostic systems in all individual bays (including LCD display) to monitor partial discharge, internal arching, gas density, gas pressure, leakage, moisture etc.	Bidder's Remarks: We would like to inform you that, we are considering separate Gas Density monitor for each compartment, which shall monitor gas parameter continuously. Whenever there is leakage of gas for any compartment, we shall provide alarms to monitor the same. We are also supplying suitable equipment to monitor gas quality such as moisture, SF6 decomposition products etc. along with SF6 gas handling cart. For monitoring of internal arc, no solution exist and the same is applicable for all HV GIS manufacturer. Kindly accept the same.	Bidder to follow specification.
4	BOQ	-	-	Customer's Requirement : N/A	Bidder's Remarks: We would like to inform you that, we have received two BOQ as follows 1. Price bid format -01 for Indian Bidder-Arun-III 2. BHEL enquiry for 220kV GIS We understand if any discrepancy found, the document mentioned under Sr. No. 1 shall prevail. Kindly confirm the same.	Refer the latest Price Bid Format
5	TS	Cl. 19 f	3D Drawing	Customer's Requirement: f) Bidder shall be required to submit 3D/Isometric OGA Drawing for complete GIS and bus duct.	Bidder's Remarks: We would like to inform you that, as per Hyosung standard, we shall not submit the 3D/Isometric OGA Drawing for complete GIS and bus duct. However we supply complete plan, section drawings for GIS. Ladder, platform arrangements drawings in order to get the complete understanding Kindly accept the same.	Bidder to essentially submit the 3D Drawing for the GIS system.

S.No	Reference Document	Reference Clause/DocNo.	Technical Issue	Customer's Requirement	Bidder's Remarks	BHEL's Reply
1	TS	Cl. 5	Type Test validity	Customer's Requirement: The contractor shall submit the certificates from Govt. approved labs/ accredited laboratories of the type tests listed under Clause 16.A.7.3 of Section-2 for the 400 KV GIS & 400 KV SF6 CGI Bus Ducts which should have been carried out within last five (5) years from the date of bid opening (09.02.2018).	Bidder's Remarks: We would like to inform you that, kindly accept the type test report carried out for type tests within 10 years from the date of bid opening (09.02.2018). Kindly accept the same.	Bidder to follow the Tender Specification
2	TS	Cl. 16A.4.17.1 & Cl. 16A.4.17.12	Operating Mechanism for CB	Customer's Requirement: Full details regarding electro spring operating mechanism and constructional & operational feature must be described in the bid.	Bidder's Remarks: We would like to inform you that, Kindly accept hydraulically operated CB mechanism for GIS. The same is accepted to various state and central utilities.	Bidder to follow the Tender Specification
3	Bid Price Schedule	Sr. No. A2	Line Feeder Bay CB with PIR with CSD	Customer's Requirement:1) As per Technical specification BoQ, the CB for Line feeder bay is to be provided without PIR & with CSD. 2) As per Price Schedule BoQ item No. A.2 the CB for Line Feeder Bay is to be provided with PIR and CSD.	Bidder's Remarks: Kindly clarify the discrepancy between TS BoQ & Price Schedule BoQ. We request to you to accept CB without PIR & with CSD for Line feeder bay, since interconnecting transmission line length between proposed Substation location (Arun-3 HEP) and Dhalkebar Substation is less than 200 km.	Bidder to follow the Tender Specification
6	TS	Cl. 16 A 1.1	Insulation Co-ordination	Customer's Requirement: The manufacturer shall perform an insulation co-ordination study to verify protection of switchgear and main transformers against over voltages is adequate. The final surge arrester characteristic, their number and exact locations of surge arrestors shall be decided after this study.	Bidder's Remarks: We would like to inform you that, insulation co-ordination study is not under GIS scope. Kindly consider the same in EPC scope. Kindly accept the same.	Insulation Coordination Study is under the scope of the Bidder.
7	TS	Cl. 16A.4.2	Burn through time	Customer's Requirement : The material and thickness of the enclosures shall be such as to withstand an internal flashover without a burn through for a period long enough (500ms) to enable to backup relay protection to clear the fault.	Bidder's Remarks: We would like to inform you that, as per IEC 62271-203 Table 4, it is clearly stated that for the Rated short circuit current of >40kA, the duration of current shall be for 300ms with no fragmentation, however burn through is acceptable. Kindly accept the same as per IEC.	Bidder to follow the specification
8	TS	Cl. 16A.3.1 n	Radio interference voltage	Customer's Requirement : Radio interference voltage at 320kV rms = Less than 500 micro volts.	Bidder's Remarks: We would like to inform you that, as per IEC 62271-1 Cl. 6.9.1.1, The switchgear and controlgear shall be considered to have passed the test if the radio interference level at $1.1 \times U_r / 3$ does not exceed 2500 μV . We understand there has been a printing error. Kindly accept the same as per IEC.	Bidder to follow specification
9	TS	Cl. 16A.4.13 c	Alarm deterioration of gas insulating system	Customer's Requirement : Any other alarm necessary to indicate the deterioration of the gas insulating system.	Bidder's Remarks: We would like to inform that, no other alarms are required to indicate the deterioration of the gas insulating system. Kindly accept the same.	Noted. Shall be subject to the customer approval at the time of detailed engineering

S.No	Reference Document	Reference Clause/DocNo.	Technical Issue	Customer's Requirement	Bidder's Remarks	BHEL's Reply
1	TS	Cl. 5	Type Test validity	Customer's Requirement: The contractor shall submit the certificates from Govt. approved labs/ accredited laboratories of the type tests listed under Clause 16.A.7.3 of Section-2 for the 400 KV GIS & 400 KV SF6 CGI Bus Ducts which should have been carried out within last five (5) years from the date of bid opening (09.02.2018).	Bidder's Remarks: We would like to inform you that, kindly accept the type test report carried out for type tests within 10 years from the date of bid opening (09.02.2018). Kindly accept the same.	Bidder to follow the Tender Specification
2	TS	Cl. 16A.4.17.1 & Cl. 16A.4.17.12	Operating Mechanism for CB	Customer's Requirement: Full details regarding electro spring operating mechanism and constructional & operational feature must be described in the bid.	Bidder's Remarks: We would like to inform you that, Kindly accept hydraulically operated CB mechanism for GIS. The same is accepted to various state and central utilities.	Bidder to follow the Tender Specification
3	Bid Price Schedule	Sr. No. A2	Line Feeder Bay CB with PIR with CSD	Customer's Requirement:1) As per Technical specification BoQ, the CB for Line feeder bay is to be provided without PIR & with CSD. 2) As per Price Schedule BoQ item No. A.2 the CB for Line Feeder Bay is to be provided with PIR and CSD.	Bidder's Remarks: Kindly clarify the discrepancy between TS BoQ & Price Schedule BoQ. We request to you to accept CB without PIR & with CSD for Line feeder bay, since interconnecting transmission line length between proposed Substation location (Arun-3 HEP) and Dhalkebar Substation is less than 200 km.	Bidder to follow the Tender Specification
10	TS	Cl.16A.4.14 b	Humidity	Customer's Requirement : The humidity will be upto 100 percent (indoor).	Bidder's Remarks : We would like to inform you that, our GIS is type tested at 95% of humidity level and same shall be sufficient for indoor GIS. Kindly accept the same.	Bidder to follow specification
11	-	-	-	Customer's Requirement: Bidder to confirm whether the reports are available from the parent Manufacturer or from the works from where the Breaker is offered.	Bidder's Remarks: We shall submit the type test reports of Parent Company (Hyosung Corporation, Korea).	Noted. Shall be subject to the customer approval at the time of detailed engineering
12	-	-	-	Customer's Requirement: 10. SF6 to Air Bushing – Polymer or Porcelain Type : Technical adequacy / superiority of the offered item against the specification may be established with relevant documents	Bidder's Remarks: We would like to inform you that, we shall supply Composite/polymeric type SF6 to Air Bushing.	Noted .

Annexure 5				
No.	Chapter/ page	Specification	Comment or deviation	BHEL's Clarification
1	16A.4.17.12 pg 22 of 61	a) Type of breaker - 420 kV rated voltage three phase metal enclosed, double interrupter, horizontal mount, SF6 gas insulated spring operated...	Offered CB shall have single interrupter, horizontal mount, SF6 gas insulated and spring operated for CB with out PIR and for CB with PIR, it will be with double interrupter.	Bidder shall supply circuit breaker with CSD without PIR.- 420 kV rated voltage three phase metal enclosed, double/single interrupter type in line with the Technical Specification and Bill of Quantity.