Bharat Heavy Electricals Limited

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CORRIGENDUM - 03 TO NIT NO-62262

Subject: Corrigendum-03 Pre-Bid replies for Supply & Services of 220kV GIS for LTHPL TEESTA PROJECT.

Project	: LTHPL TEESTA PROJECT
Equipment / Item	: SUPPLY & SERVICES OF 220KV GIS.
Enquiry No/Date	: 61Q2200160, REV-01, DTD 13-01-22**, ORIGINAL DUE ON: 13-01-22**
BHEL NIT NO	: 62262.
Current due date	**: 01.02.2022**

The corrigendum-03 is issued by BHEL TBG against above mentioned NIT/ enquiry for supply & services of 220kV GIS for LTHPL TEESTA PROJECT. The Pre-bid replies of various queries are being enclosed here. Bidder to ensure submission of offer on or before due.

Note: Tender ID in CPP Portal is **2021_BHEL_6890_1.**

Thanking you

Vineet Gupta
BHEL TBG, NOIDA

Project Name: Teesta-VI H.E. Project (4x125 MW)

Comments on Technical Specification

Technical Specification: 220kV GIS (Doc No. TB-415-316-001 Rev 00)

Annexure-I

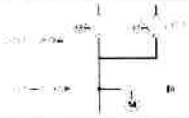
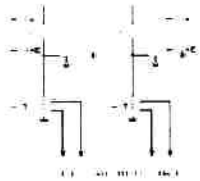
Sr. No.	Page No	Reference Clause No.	Description as per Technical Specs	Remarks - Query / Clarification	BHEL/Customer Reply
1	2	3	4	5	6
1	7 of 104	4.7	Bidder shall check and ensure adequacy of system protection for successful operation of GIS. After checking of system by bidder, GIS shall be installed and if any failure, malfunction of any part occurs after/ during commissioning, same shall be replaced immediately without any extra cost.	System adequacy shall be excluded from scope. However we confirm to perform only Insulation co-ordination.	Bay protection not in bidder scope.
2	7 of 104	4.9	CT/ VT parameters mentioned in CT VT parameter document is indicative only. Bidder has to ensure correctness of CT/VT sizing for GIS during contact stage / detailed Engineering stage.	Please note CT VT ratios are only mentioned in the Tender SLD. However considering 7 nos of cores in one bay other parameters like VA burden and knee point voltage shall be crucial on deciding the CTs. CT VT sizing shall be excluded from GIS OEM scope	To be finalised during detailed engg.
3	8 of 104	6.2	The GIS shall be single-phase enclosure type.	We would like to propose three phase busbar and rest switchgear as three phase encapculated. Please confirm.	Bidder to adhere to TS
4	9 of 104	6.7	The busbar system shall be sectionalized for each bay and contained in individual SF6 gas tight bus compartments to prevent contamination of the gas of the whole bus bar due to fault in one bay zone and refill lesser quantity of SF6 gas.	Please note busbar being passive requirement of segregation is not envisaged. We confirm to meeting Annexure F of IEC 62271-203	Bidder to adhere to TS
5	10 of 104	8.3	The layout shall ensure that GIS bus link section is provided for future extension of the GIS buses to avoid de-gassing and modification of the existing bus.	In line with sld there is no future extension requirement thus we understand future extension link requirement is not envisaged	Bidder to adhere to TS
6	22 of 104	Layout	Building expansion joint	Please confirm location of building expansion joint as the length of building is more than 120m	Shall be decided During Detailed Engg.
8	23 of 104	SLD	CT parameters	Please note CT VT ratios are only mentioned in the Tender SLD. However considering 7 nos of cores in one bay other parameters like VA burden and knee point voltage shall be crucial on deciding the CTs.	To be finalised during detailed engg.
9	25 of 104	5.2	Test on Surge arrestor	Surge arrestor being bought out item we shall provide RTC of vendor for review and approval	Bidder to adhere to TS
10	30 of 104	D.15	Supply: Mandatory Spares- HMI for gas monitoring and PD syste	We understand offline PD monitoring is requirement just against this line item we need to supply PD coupler 1 nos instead of PD system which has been mentioned	Bidder to adhere to TS
11	36 of 104	5.1.1.10	Continuous on-line monitoring and diagnostic systems to monitor gas density, gas pressure. leakage, operating parameters i-e. temperature etc. complete with sensors, control/processor units, wiring/cabling in all respect and integration of the systems with plant SCADA system. Communication protocolwith plant SCADA shall be as per IEC-61850/ Modbus	Temparature cannot be monitored rest parameters can be achieved using hybrid density monitor and HMI. Please confirm	Bidder to adhere to TS
12	44 of 104	5.5.6	The complete contact system (fingers, clusiers, jels, SF6 gas) shall be designed to withstand at least twenty (20) operations at full short-circuit rating without the necessity to open the circuit breaker for service or mainlenance.	We understand the requirement calls for 20 three phase operation at full short circuit. Please confirm.	To be designed to withstand at least twenty (20) operations at full short-circuit rating without the necessity to open the circuit breaker for service or mainlenance.
13	46 of 104	5.5.12	The arrestors shall be either the plug in construction or the disconned link type and be attached to the GIS in such a manner that they can be readily disconnected during the dieleckic tests.	Please note we shall offer surge arrestor with internal isolating link which can be accessed by removal of SF6 gas.	Bidder to adhere to TS
14	50 of 104	5.9.1	One (1) no EndoscoPe for checking the position of contact through viewing window	Please clarify make & model	Shall be decided During Detailed Engg. and shall be subjected to customer approval.
15	50 of 104	5.9.1	Special tools	Do we have any specific make and model for these tools and tackles	Shall be decided During Detailed Engg. and shall be subjected to customer approval.
16	58 of 104	3.10.2	Control and Monitoring	We understand same is part of CRP panel	Bidder to adhere to TS
17	60 of 104	3.11.2	All CT/ PT Circuits Minimum of 2 nos. of 6 sq. mm copper flexible	We would like to propose 4 sqmm copper flexible cable for CT and VT circuit. Please confirm.	Bidder to adhere to TS

Project Name: Teesta-VI H.E. Project (4x125 MW)

Comments on Technical Specification

Technical Specification: 220kV GIS (Doc No. TB-415-316-001 Rev 00)

Annexure-II

Sr. No.	Page No	Reference Clause No.	Description as per Technical Specs	Remarks - Query / Clarification	BHEL/Customer Reply
1	2	3	4	5	6
1	Page no. 7 of 104	4. Other General Requirements	Bidder shall conduct insulation co-ordination studies in line with IEC:60071 for establishing surge arrester rating, quantity and any other requirement for successful operation of GIS.	Please be informed that, we are not considering insulation coordination study in our scope. However, if required it will be provided on chargeable basis.	Bidder to adhere to TS
2	Page no. 7 of 104		Bidder shall be required to submit 3D OGA Drawing (light weight surface 3D model, exportable in 3D Autocad), compatible with Primtech for complete GIS & its accessories.	These data pertains to the intellectual property of the manufacturer and are protected under relevant laws. Hence we regret to share these data.	Noted
3	Page no. 8 of 104		The GIS Equipment shall be complete with all necessary supports, ladders, galleries, staircases, catwalks, movable platforms or walkways (for accessing the equipment above two meters for maintenance and operation), mechanism cabinets, internal cable raceways etc for each bay and it shall be of modular construction and extendable design.	Please be informed that, considering safety & convenience in operation/maintenance our modules in GIS are arranged in such a way that pathways/walkways is not required. All operating mechanisms of GIS equipment are accessible at height level for a personnel to operate.	Bidder to adhere to TS
4	Page no. 16 of 104	Single line diagram		We wish to inform you that, The bus-bar disconnecting switch cum-earthing switch and line disconnecting cum earthing switch is a three position gang operated switch with a common operating mechanism. Hence as per OEM standards, main bus bar-1 is connected to bus-disconnecting cum earthing switch and main bus bar-2 is connected to disconnecting switch.	Bidder to adhere to TS
5	Page no. 16 of 104	Single line diagram		Please note that for electromagnetic VT application used in GIS, as VT primary itself earthed, there is no need of additional earthing mechanism after VT disconnector. However additional earthing is required in case of CVT to additionally earth the capacitive charge after disconnecting from line.	Bidder to adhere to TS
6	Page no. 23 of 104	Key Single line diagram	Current and Voltage trannsformer	We have considered CT core distributed on both sides of circuit breaker for line and transformer bays. Please provide us the CT details of protection class PS (minimum knee point voltage, maximum secondary winding resistance & maximum excitation current) and metering class 0.2S(burden). And please provide the burden of secondary winding of VT.	Shall be decided During Detailed Engg. and shall be subjected to customer approval.
7	Page no. 28 of 104	BOQ Description	Supply- GIS: 220kV, 40kA for 1 second, 2000A GIS double main bus scheme - Structure Materials for support of GIS, Bus Ducts, SF6 to oil bushing/ connection and SF6 to Cable connection including Foundation Bolts, Embedded Items, Rails and/ or other items structural items required	Please be informed that, Supply and Provision of Foundation bolts or Hardware for fixing the Base Frame to Foundation surface is exclude. However, fixing Anchors for the GIS Bay to Base Frame is included.	Bidder to adhere to TS
8	Page no. 29 of 104		Supply- GIS: 220kV, 40kA for 1 second, 2000A GIS double main bus scheme - Complete Earthing Materials including High Frequency Earthing	Please note that as per OEM design standards, enclosures are of continous designs and the grounding(earthing) will be done/provided at the bottom structures and from the structures the earthing will be done to the main earth mat in GIS floor/Sub station. Moreover, please note that as per OEM standard designs HF earthing is not applicable and the earthing shall be as per IEEE80 requirement The earthing connection from GIS/GIB enclosures to earthing terminal(at the GIS/GIB structures) will be in GIS OEM scope and the earthing connection from GIS/GIB structure earthing terminal to the earthing mat/riser(main earth mat) shall be in main contractor scope..	Bidder to adhere to TS

Project Name: Teesta-VI H.E. Project (4x125 MW)					
Comments on Technical Specification					
Technical Specification: 220kV GIS (Doc No. TB-415-316-001 Rev 00)					
9	Page no. 35 of 104	GAS INSULATED SWITCHGEAR EMII, Volun)e IIIB (PTS) 5. GAS INSULATEO SWTCHGEAR	k) Cable tray, cable pit/trench.... .....GIS manufacturer scope	We wish to inform that, cable tray, Cable pit/ trench including chequered plates shall not be in GIS manufacturers scope.	Any material to be erected on/for GIS modules/bus-duct in scope of bidder.
10	Page no. 38 of 104	GAS INSULATED SWITCHGEAR EMII, Volun)e IIIB (PTS) 5.3 Rating and functional charachteristics B) System requirement	Auxiliary AC supply, 3 phase 415±10% V	The panel light, socket and heater shall be energized by 1P+N, 230V AC, 50Hz. We request you to provide the same as an auxiliary AC supply.	Noted
11	Page no. 39 of 104	GAS INSULATED SWITCHGEAR EMII, Volun)e IIIB (PTS) E) Earthing switch	i) Making capacity k A (peak)	We wish to inform that making capacity is applicable only for high speed earthing switch.	Noted
12	Page no. 44 of 104	GAS INSULATED SWITCHGEAR EMII, Volun)e IIIB (PTS) 5.5.6 Circuit breakers	The operating mechanism shall be spring/spring..... .....hydraulic/spring.....subject to employers approval	Circuit breaker with operating mechanism of spring/spring type is considered to be of highest reliability to the system, as compared to any other mixed actuating medium like spring actuated with hydraulic medium etc.. Accordingly our offered operating mechanism of circuit breaker meets the intent of the specification fully.	Noted
13	Page no. 44 of 104		Grading capacitors shall..... .....interrupting elements	We wish to inform you that our offered type tested circuit breaker is of single interrupter type design and grading capacitors are not applicable.	Noted
14	Page no. 48 of 104	GAS INSULATED SWITCHGEAR EMII, Volun)e IIIB (PTS) 5.5.18 Local control cubicle	The cubicle shall be utilized as both the switchgear bay local control module..... ..... with the system.	We understand this is the requirement of BCU(Bay Control Unit) and this BCU shall be in scope of main contractor and the cut out for BCU shall be provided in GIS-LCC.	Noted. Cut-out required shall be decided during detailed Engg.
15	Page no. 60 of 104	Technical Specification: 220kV GIS Doc No. TB-415-316-001 Rev 00 3.11.2 Terminal blocks	All circuits except CT /PT circuits Minimum of two of 2.5 sq. mm copper flexible All CT/ PT circuits Minimum of 2 nos. of 6 sq. mm copper flexible	As per our standard design, all circuits except CT/PT circuit shall be wired with minimum cable size of 1.5sqmm and CT/PT circuit shall be wired with minimum cable size of 2.5sqmm. Kindly confirm.	Bidder to adhere to TS

Project Name: Teesta-VI H.E. Project (4x125 MW)

Comments on Technical Specification

Technical Specification: 220kV GIS (Doc No. TB-415-316-001 Rev 00)

Annexure-III

Sr. No.	Page No	Reference Clause No.	Description as per Technical Specs	Remarks - Query / Clarification	BHEL/Customer Reply
1	2	3	4	5	6
1		3. Specific Technical Requirements	Painting of switchgear - GIS Bay / GIB : RAL 7038 - LCC for GIS :RAL 1013	Paint shade will be RAL7032. Kindly accept.	Shall be decided During Detailed Engg. and shall be subjected to customer approval.
2		4. Other General Requirements	6. Bidder shall be required to submit 3D OGA Drawing (light weight surface 3D model, exportable in 3D Autocad), compatible with Primtech for complete GIS & its accessories.	The Necessary drawings such as Layout, Civil drawings shall be submitted in AutoCAD format. The 3D modelling drawing cannot be submitted as the same is proprietary and Technology related.	Noted
3		4. Other General Requirements	5. Bidder shall conduct insulation co-ordination studies in line with IEC:60071 for establishing surge arrester rating, quantity and any other requirement for successful operation of GIS.	Insulation co-ordination studies excluded from CGPISL scope.	Bidder to adhere to TS
4		4. Other General Requirements	10. Any change in bay pitch (distance between bays) as per civil requirement for during detailed engineering stage shall be incorporated by the bidder without any cost and delivery implication to BHEL.	Any change in the layout will have price and delivery implications based on the nature of change.	Shall be decided During Detailed Engg.
5		5. Earthing of GIS	Bidder to submit detailed calculations and layout drawings for earthing system during detailed engineering stage based on technical specification Section-2 of technical specification, bidder's design philosophy, IS/IEC requirement as applicable. Bidder to provide the bill of quantity of entire items required for the earthing of the GIS. However, supply of 40mm MS ROD, 75X12/50x6mm GI Flat shall be done by BHEL. Any other earthing material, as per design/BOQ, shall be in bidder's scope of supply only. Erection of earthing will be done by BHEL team under the supervision of bidder/manufacturer, as per manufacturer's design.	CGPISI scope will be upto GIS earthing risers only.	Bidder to adhere to TS
6		6. Modular Design & Future extensions	4. The switchgear shall be of the freestanding, self-supporting dead-front design, with all highvoltage equipment installed inside gas-insulated, metallic grounded enclosures, and suitably sub-divided into individual arc and gas proof compartments, preferably for: (1) Bus bars (2) Intermediate compartment (3) Circuit breakers (4) Line dis-connectors (5) Voltage transformers (6) Gas Insulated bus duct section between GIS and, (7) Gas insulated bus section between GIS and oil filled transformer. (8) Current Transformers	Line side disconnector and current transformer will be in same gas compartment. Kindly accept.	Bidder to adhere to TS
7		BOQ Description	Supply: Special Tools	Excluded from CGPISL scope	Bidder to adhere to TS
8		BOQ Description	Supply: Testing Instruments	Excluded from CGPISL scope	Bidder to adhere to TS
9		5.1.1 245kV GIS	7) Grounding of GIS and GIB with existing Earthmat.	CGPISI scope will be upto GIS earthing risers only.	Bidder to adhere to TS
10		5.1.1 245kV GIS	15) Tools and instruments in accordance to clause 5.9 "Tools and Instruments" of this section	Excluded from CGPISL scope	Bidder to adhere to TS
11		5.6 Circuit breakers	Grading capacitors shall be provided to ensure uniform voltage distribution between interrupting elements.	Grading capacitors are not envisaged. 245KV GIS is offered as per type tested design.	Noted
12		5.5.17 On-line monitoring	Continuous on line monitoring system shall be provided to monitor conditions such as gas density, gas pressure, gas leakage, moisture (offline) etc. and operating parameters such as current, voltage, temperature etc. of GIS and GIB 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, .iunction boxes, cabling and associated accessories for measuring,monitoring and data acquisition of intended parameters to be monitored.	Temperature compensated Gas density switch with potentially free contacts is provided for SF6 gas monitoring. UHF sensors provided for GIS monitoring. All other systems excluded from CGPISL scope of supply.	Bidder to adhere to TS
13		5.6.3 Design calculation	The Contractor shall submit the design calculation in accordance lo Clause 2.4 of "General Technical Specification (GTS)" covering at least the following for review / acceptance: Insulation Co-ordination studies for surge arrestor location and sufficiency of numbers.	Excluded from CGPISL scope	Insulation Co-ordination studies in scope of bidder
14		5.9.1	Special Tools	Excluded from CGPISL scope	Bidder to adhere to TS
15		5.9.1.2	Testing Instruments	Excluded from CGPISL scope	Bidder to adhere to TS

Project Name: Teesta-VI H.E. Project (4x125 MW)

Comments on Technical Specification

Technical Specification: 220kV GIS (Doc No. TB-415-316-001 Rev 00)

Annexure-IV

Sr. No.	Page No	Reference Clause No.	Description as per Technical Specs	Remarks - Query / Clarification	BHEL/Customer Reply
1	2	3	4	5	6
1	BOQ	Sr. No. 1.06 & 1.07	Customer's Requirement: - Extension Module	We would like to inform you that, we understand by BOQ mentioned data that extension module are to be considered for Bus Bar only on both sides. Kindly confirm the same.	Noted
2	BOQ	Sr. No. 1.15	Customer's Requirement: -Online Gas Monitoring	We would like to inform you that, we shall supply gas density monitor for each and every gas tight compartment. Gas density monitors have NO NC contacts and shall moitor the gas continuously. We shall provide alarms for various gas pressure stages. Kindly confirm the same	Bidder to adhere to TS
3	BOQ	Sr. No. 1.16	Customer's Requirement: -UHF Coupler	We would like to inform you that we understand that along with GIS =, UHF sensors also need to be supplied. However please clarify whether online PDM or Portable PDM shall be considered under scope of supply Kindly clarify the same.	Bidder to adhere to TS
4	BOQ	Sr. No. 6.01 to 6.25	Customer's Requirement: -	We would like to inform you that, we understand that, the mentioned data under 6.01 to 6.25 are not be considered under present scope. Only Unit rates are to be provided for same. Kindly confirm the same.	Confirmed. BOQ H.1 to H.25 is for unit rates only.
5	TS	Cl. 3	Customer's Requirement: Relative Humidity - 96 4%	We would like to inform you that, our GIS is type tested at 95% of humidity level. However we can gurantee satisfactory operation of the GIS at 96.4% as well. Kindly accept the same	Shall be decided During Detailed Engg. and shall be subjected to customer approval.
6	TS	Cl. 3 Point 24	Customer's Requirement: -Paint	We would like to inform you that, painting specification should be considered as per manufacturer's recommendation. We apply RAL 7032. Kindly accept the same.	Shall be decided During Detailed Engg.
7	TS	Cl. 4 Point 5	Customer's Requirement: -Insulation Co-ordination Study	We would like to inform you that Insulation Co-ordination study shall be EPC scope. Kindly confirm the same.	Insulation Co-ordination studies in scope of bidder
8	TS	Cl. 4 Point 6	Customer's Requirement: -3 D Drawings	We would like to inform you that we shall provide the required drawings with necessary dimensions and views in 2 D only. We shall not provide 3 D Drawings Kindly confirm the same.	Noted
9	TS	Cl. 4 Point 9	Customer's Requirement: -CT/VT data	We would like to inform you that CT & VT sizing calculation shall be under EPC scope. GIS OEM shall check the feasibilty of the CT data and VT data, post receipt from EPC. Kindly confirm the same.	Confirmed
10	TS	Cl. 5	Customer's Requirement:-Earthing	We would like to inform you that, GIS OEM shall supply the design and drawing as per the earthing philosphy 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.	Bidder to adhere to TS
11	TS	SLD Page 23	Customer's Requirement:-CT Data	We would like to inform you that, as per the SLD, there is requirement of 7 CT cores in one bay. Hence we are considering duly distributed CT cores on both side of CB as per the feasibilty studies. Kindly confirm the same.	Shall be decided During Detailed Engg. and shall be subjected to customer approval.

Project Name: Teesta-VI H.E. Project (4x125 MW)					
Comments on Technical Specification					
Technical Specification: 220kV GIS (Doc No. TB-415-316-001 Rev 00)					
12	TS	Annexure - I Cl. 5.1	Customer's Requirement:-Type Test	We would like to inform you that, we have a;ready performed the mandatory type tests as per IEC 62271-203 & IEC 62271-1.Hence we do not envisage any re type test requirement. If re type testing is considered then the cost for the same shall be borne by EPC/Client. Kindly confirm the same.	Bidder to adhere to TS
13	TS	Annexure - I Cl. 5.2	Customer's Requirement:-Shop Test	We would like to inform you that, we shall submit the pressure test on enclosure & Gas leakage test report for review. Testing of enclosure at GIS OEM place is not envisaged. Kindly confirm the same.	Bidder to adhere to TS
14	TS	Annexure - I Cl. 5.2	Customer's Requirement:-Shop Test	We would like to inform you that, we shall submit the tests conducted at OEM place for CT cores and VT. Testing at GIS OEM is not possible and is not envisaged. Kindly confirm the same.	Bidder to adhere to TS
15	TS	Cl. 5.5.6 Page 44	Customer's Requirement:-No of operations at SC - 20, without maintenance	We would like to inform you that, we can guarantee that our GIS CB can withstand 10 operations at SC value, however maintenace break is required for the further operations. Kindly confirm the same.	Bidder to adhere to TS
16	TS	Cl. 5.8 Page 49	Customer's Requirement:-	We would like to inform you that, Spare parts shall be considered as per BOQ only. Kindly confirm the same.	Bidder to adhere to TS
17	TS	Cl. 5.9 Page 50	Customer's Requirement:-	We would like to inform you that,Special tools shall be considered as per BOQ only. Kindly confirm the same.	Bidder to adhere to TS
18	TS	-	Customer's Requirement: Power frequency phase to earth/across open switching distance and between phases (rms value) -430/530kV	We would like to inform you that As per IEC 62271-203 Table 2 the rated short duration power frequency withstand voltage in between phase to earth,across open switching device and btween phases is 460kV. And across Isolating distance is 530kV. Kinfly confirm the same	Shall be as per relevent IEC/IS Standards
19	TS	-	Customer's Requirement: Lightning impulse phase to earth/across open switching distance and between phases (peak value) -1050/1200kV	We would like to inform you that As per IEC 62271-203 Table 2 the rated lightning impulse withstand voltage in between phase to earth,across open switchning device and between phases is 1050kV and across Isolating distance is 1200kV. Kinfly confirm the same	Shall be as per relevent IEC/IS Standards
20	TS	4.5.9	Customer's Requirement: Each earthing switch shall be electrically interlocked with its associated disconnector and circuit breaker and mechanically position padlocked	We provide electrical interlock between DS and ES however pad locking accessories shall be under EPC scope of work. Kindly confirm the same.	Bidder to adhere to TS
21	TS	4.5.11	Customer's Requirement: As per SLD. L A Without isloating link As per TS: The arrestors shall be either the plug in construction or the disconnect link type and be attached to the GIS in such a manner that they can be readily disconnected during the dielectric tests	We would like to inform that we have considered the LA requirement as per SLD only. Kindly confirm the same.	Bidder to adhere to TS
22	TS	-	Customer's Requirement: a)Implemented technology for control shall be digital and local control cubicle shall incorporate bay control unit for integration to plant SCADA system through local control Board for GIS c) Trip circuit healthiness	We would like to inform you that BCU shall be not be a part of LCC. Bay control unit shall not be in GIS scope of supply it will be in EPC scope of work. However we shall provide space provision for mounting of BCU. Also the scope of trip cricuit healthiness shall be in CRP scope. Kindly confirm the same.	Noted.
23	TS	-	Customer's Requirement: Endoscope for checking the position of contact through viewing window	We would like to inform that Endoscope is not required direct view of contact is possible. Kindly confirm the same.	Shall be decided During Detailed Engg. and shall be subjected to customer approval.