

SECTION – 1

1.1 SCOPE

Scope of work covers Design, manufacture, Testing, Delivery at site, supervision of installation and commissioning including site testing along with necessary equipment, training of BHEL and SJVNL personnel and guarantee for Two years for 420 kV Gas Insulated Substation (GIS) as per the specification complete with all auxiliaries, accessories, spare parts and warranting a trouble free safe operation of the installation.

This section covers the scope and quantities of 420 kV GIS. The Specific Technical Requirements for the above item as specified by the customer (SJVNL.) are given in Section-2. The offered equipment shall also comply with the General Technical Requirements for the project as detailed under section-3 of this specification.

In case of any discrepancies between the requirements mentioned under Section-1/Section-2 and those specified in the Section-3, the specifications given under Section-1/Section-2 shall prevail and shall be treated as binding requirements.

The equipment is required for the following project:

Name of the Customer : Satluj Jal Vidyut Nigam Limited
Name of the Project : Rampur Hydroelectric Project, (H.P.) India

1.2 BILL OF QUANTITIES :

S.No.	Description	Unit	Qty
A	SUPPLY.		
1	420 kV GIS (As per SLD TB-2-319-510-001) 4000A, 50kA as follows:		
1.1	GIS with Double busbar scheme comprising: <ul style="list-style-type: none">- Six (6) Generator Transformer Bays 800A including Gas Insulated bus duct for interconnection between GSU transformer and respective unit bays of GIS through SF6 to Oil bushings as per the detailed Spec.- Four (4) 400kV Line Bays 2000A including GIS bus duct for interconnection between GIS & outgoing lines through SF6 to Air bushing as per detailed Spec.- One (1) Bus Coupler Bay 4000A as per detailed Spec.- SF6 Gas Processing Unit as per Cl. 7.18 of Section-2- On-line Monitoring System as per Cl. 7.19 of Section-2- Enclosure Grounding System- Any other equipment not specifically mentioned in specification but necessary for completion of project (Local Control Unit shall house bay control unit to be supplied by the bidder.) (For Details of bay equipment refer Section 2).	Set	1

2	Supply of Structure work for Installation of GIS including support structure for SF6 to Oil bushings, foundation bolts, embedded parts in floors etc., as per specification which are required for installation of GIS as per the detailed specification. (The Civil works will be done by customer based on supplier design & drawings).	Lot	1
3	Grounding: Supply of grounding material of GIS (Cl. No. 7.22.4 of Section-2).	Lot	1
4	Mandatory Spare parts as per cl. 1.4, Section-1 of Technical Specifications.	Lot	1
5	Testing instruments		
5.1	Supply Charges: The tenderer shall quote for testing devices, instruments etc. required during assembly, erection, testing and commissioning & during service of 420 kV SF6 GIS. A complete list of the items shall be furnished in the tender with technical details, quantities, itemized rates and prices. Any additional requirement shall be the responsibility of the supplier and no extra price shall be payable for the same at later stage #	Lot	1
B	OPTIONAL ITEMS		
1	Price for addition/deletion of 2000A line bays including bus duct alongwith all other accessories required to complete*	Set	1
2	Price for addition/deletion of 800A transformer bay including bus duct alongwith all other accessories required to complete*	Set	1
3	Bus Duct* (This would be operational when B.1 & B.2 come into effect)	Mtr	1
4	Bus Duct Bends* (This would be operational when B.1 & B.2 come into effect)	No.	1
C	SERVICES		
1	Supervision of Erection of the grounding of GIS as per the detailed specification (Cl. No. 7.22.4 of Section-2).	Lot	1
2	Supervision of Erection, Testing and Commissioning inclusive of all testing equipments/instruments for GIS. To & Fro fare of the vendor's personnel to be borne by the vendor. Lodging, Boarding and local conveyance would be provided by BHEL/ Customer. All testing instruments and items required for assembly, testing and commissioning are to be brought by vendor. Non-consumable items can be taken back by vendor after completion. List of returnable items/instruments to be mentioned separately. Prices of these consumables should be part of A.1.1.	Lot	1
3	Training at supplier's works (6 Customer Engineers + 2 BHEL Engineers = 8 Engineers for a period of 6 weeks) as per specification in Section-2 as per cl. No. 7.40.1.(a).(ii) including To & Fro fare, lodging & boarding charges.	Engineer weeks (8 round trips)	48

4	Type Test Charges as per detailed specification in Section-2 \$	Lot	1
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*** These are optional items. Prices of these shall not to be considered for evaluation.**

Supplier has to provide two separate lists of testing instruments for supply and returnable purpose. Testing instruments required for future use shall be listed in Supply purpose list and testing instruments required for erection purpose only shall be listed in returnable purpose list. Supplier to ensure minimum inventory for supply.

\$ It shall be responsibility of the supplier to give technically correct Type Test Reports. In case, the reports are found to be technically lacking, the tests are to be done by him free of cost to BHEL. However, prices for each Type Test are to be indicated separately and these shall be loaded to the offer. Test shall be conducted if desired by purchaser / customer to be repeated.

Note : Overall responsibility of Erection, Testing & Commissioning would rest with the supplier. Any manpower (Labour) required would be provided by BHEL, details of which should be intimated by the supplier at the time of quoting.

1.3 THE SCOPE OF SUPPLY SHALL ALSO INCLUDE

- a) First filling of SF6 gas for the equipment supplied plus an additional quantity sufficient for conducting all tests on equipment at site before placing it into successful operation. Additionally, 10 percent of total quantity of SF6 gas shall also be supplied in non-returnable cylinders.
- b) Design & drawings of Grounding of GIS as per Cl. No. 7.22.4 of Section-2.
- c) One gas processing unit suitable for evacuating, liquefying, filling, drying and purifying SF6 gas during initial installation, subsequent maintenance and future extension of the GIS.
- d) One set of switchgear handling equipment and any special tool required for handling and dismantling of the switchgear and auxiliary equipment.
- e) All equipment, instruments and devices necessary for maintenance of the switchgear and auxiliary equipment.
- f) All materials, consumables, tools, devices, testing equipment and instruments necessary for complete installation, testing, commissioning and placing into successful operation of the equipment.
- g)
 - i) Complete installation, testing, commissioning and placing into successful operation of the equipment.
 - ii) One set of applicable standards.

1.4 Spare Parts (Mandatory):

The tenderer shall quote for the supply of the following spares indicating their itemized unit prices. The tenderer shall also submit with his proposal a recommended list of spares for complete GIS equipment required for its initial 5 years of normal operation from the date of Commissioning in the form of Annexure-VI. The purchaser reserves the right to purchase any or all of the spare parts listed below or recommended by manufacturer. Total price of recommended spares would be considered for evaluation. BHEL reserves the right to procure less than the recommended / specified quantity or items of spares:-

S No.	Item	Quantity
1.	SF6 /Air outdoor bushings, complete with gaskets and connectors	2 Nos.
2.	420 kV 2000A circuit breaker interrupting heads, complete with all necessary apparatus	1 No.
3.	420 kV, 800 A circuit breaker interrupting heads complete with all necessary apparatus	1 No.
4.	420 kV, 4000A circuit breaker interrupting heads, complete will all necessary apparatus	1 No.
5.	420 kV, 2000 A circuit breaker operating mechanisms, complete with all necessary connecting apparatus	1 No.
6.	420 kV, 800 A circuit breaker operating mechanisms, complete with all necessary connecting apparatus	1 No.
7.	420 kV, 2000A isolator switch internal parts, complete with all necessary gaskets, mounting hardware etc.	One Set each
8.	420 kV, 2000 A isolator switch operating mechanism	One Set each
9.	420 kV, 800 A isolator switch operating mechanism	One Set each
10.	420 kV, 800 A isolator switch internal parts, complete with all necessary gaskets, mounting hardware etc.	One Set each
11.	420 kV, 4000 A isolator switch internal parts, complete with all necessary gaskets, mounting hardware etc.	One Set each
12.	420 kV, 4000A isolator switch operating mechanism, complete with all necessary connecting apparatus	One Set each
13.	420 kV safety grounding switch internal parts complete with all necessary gaskets, mounting hardware etc	One Set
14.	420 kV, safety grounding switch operating mechanism, complete with all necessary connecting apparatus	One Set
15.	$\frac{420 \text{ kV}}{\sqrt{3}}$ / $\frac{110 \text{ V}}{\sqrt{3}}$ / $\frac{110 \text{ V}}{\sqrt{3}}$ / $\frac{110 \text{ V}}{\sqrt{3}}$ VT core, complete with all gaskets, mounting hardware etc	One Set
16.	400 kV current transformer cores, set to comprise one core of each ratio, burden and accuracy used in the equipment	One Set
17.	336 kV, single phase, station class gas insulated gap less surge arrestors	2 Nos.
18.	Gas monitoring devices complete with all necessary fittings, gaskets & switches	3 Nos.
19.	Control switches/control relays comprising one switch / relay of each type and rating used in the control cubicles	One Set
20.	Low voltage circuit breakers, comprising one circuit breaker of each type and rating used in the control equipment	One Set
21.	Control circuit fuses, each set to comprise one of each type and rating of control circuit fuse used on the equipment	Ten Sets
22.	LEDs, each set to comprise one of each type and rating used on the equipment	Ten Sets
23.	Inspection windows	Three sets
24.	Sheer pins	Hundred sets
25.	420 kV circuit breaker closing coils	Hundred sets
26.	420 kV circuit breaker trip coils	Two Hundred sets
27.	Spare parts for SF6 gas processing unit	One Set
28.	Cards, contactors and auxiliary relays in local control cubicles	20% of each

		type
29.	Spare auxiliary contacts for isolator switches and grounding switches	One Set
30.	420 kV high speed fault making switch internal parts complete with all necessary gaskets, mounting hardware etc	One Set
31.	420 kV high speed fault making grounding switch internal operating mechanism complete with all necessary connecting equipment	One Set

1.5 SPECIAL TOOLS, TACKLES & SLINGS

Complete outfit of tools, special tools, spanners, gauges, slings and other lifting devices, instruments and appliances necessary for the complete assembly, erection at site, dismantling and maintenance of the GIS & CGI bus duct, including all accessories covered by the contract together with suitable racks for holding them shall be supplied by the contractor.

The spanners shall be single ended and made to fit each size of nut and bolt of the GIS as stated above. One set of spanners tools, appliances and special tools shall be supplied.

The bidder shall propose, design and provide the handling equipment for the erection and future maintenance of SF6/Air bushing outside the GIS Building. For which bidder has to take prior approval from the purchaser.

1.6 CONSUMABLES

The tenderer shall include and quote for all consumables that shall be required for the site assembly, erection, testing & commissioning of the 420 kV Gas Insulated Switchgear. A complete list of the items of consumables and their quantities shall be furnished in the tender alongwith the rate and total prices. SF6 Gas for 420 kV GIS (with 10% extra) shall be included in the quoted prices of the equipment. Prices of these consumables should be inclusive of the price of A.1.1 of BOQ.

Any additional requirement shall be the responsibility of the supplier and no extra prices shall be payable for the same.

1.7 COMMISSIONING SPARES

The tenderer shall include and quote for all commissioning spares, if any, required for commissioning of the 420 kV Gas Insulated Switchgear. A complete list of the items of commissioning spares and their quantities shall be furnished in the tender alongwith the rate and total prices. Price of these commissioning spares should be inclusive of the price of A.1.1 of BOQ.

Any additional requirement shall be the responsibility of the supplier and no extra prices shall be payable for the same.

Note:- 1) All mounting hardware is in bidder scope.

2) Tentative layout plan and section drawings of GIS and other relevant drawings are enclosed.

3) In case of any transit damage from supplier's Works to Port or Port to Site, topmost priority shall be given by the supplier to replenish the material.

4) Bidder shall give dimensional GIS building layout and sectional elevation drawing along with bid showing all details as follows:

a) Location of GIS

b) Maintenance space required

- c) **Location of local control cabinet**
- d) **Height of EOT crane and building with matching as given in SJVN drg.**
- e) **All embedded parts drawing**
- f) **Trench layout drawing**
- g) **Routing of GIS Bus duct**
- 5) **For transport limitation please refer to clause 3.2.2 of Section 3.**

1.8 Drawings / Documents

The drawings / documents submitted shall be project and product specific and shall incorporate all project details and title block and numbering scheme of the customer as detailed in Section 2 & 3.

1.9 Specific Project requirement and Special terms & conditions

1. Delivery requirement - 31.08.2010
2. Taxes & Duties : The project is a World Bank financed one & taxes and duties as applicable are as under:
 - a. Customs Duty - Nil
 - b. Excise Duty - Nil
 - c. Service Tax - Applicable towards supervision of Erection, Testing & Commissioning as per the prevailing rate.
 - Project Authority Certificate for availing tax exemption for Customs Duty & Excise duty shall be made available.
3. Following documents to be arranged / provided by vendor.
 - Original Invoice
 - Non-negotiable Bill of Lading /AWB
 - Insurance Declaration
 - Material Dispatch Clearance Certificates
 - Packing List
 - Factory inspection report, test / compliance certificates
 - Certificate of Origin
 - Guarantee Certificate

4. Pre-qualifying criteria :

The vendor shall have designed, manufactured, type tested and at least the specified quantity and rating specified here in under or higher, which should be in successful operation for at least 2 years in last 10 years.

420 KV Class GIS & CGI Bus ducts and auxiliary equipment for minimum three power stations and 420 KV, 50 Hz, 2000A, 40 KA short circuit rating, SF-6 gas insulated switchgear for indoor installation consisting of circuit breakers, current transformers, potential transformers, disconnect switches, ground switches, high speed make proof grounding switches, transition bus section between GIS and oil/SF6 bushing etc. for minimum 10 bays.

5. Special terms & Conditions:

5.1. Functional Guarantee :

The equipment offered shall meet the rating and performance requirements stipulated as follows.

Sl. No.	Gas Insulated Switchgear (per meter)	Losses (KW) not to exceed (KW/Meter/Phase)
1	Busbar	0.105 KW
2	Enclosures	0.188 KW

Liquidated damages shall be levied for short fall @ Rs.280000/- per KW.

5.2. Defect liability period :

The Defect liability period shall be twelve (12) months from the date of operational Acceptance. In case of any defect in the equipment, the contractor shall rectify the same by permissible repairs or replacement of the defective part at its own cost and after successful rectification of the defect, the guarantee shall be applicable afresh for a period of 12 months from the date of such rectification / replacement subject to maximum defect liability period of 36 months from the date of operational acceptance.

5.3. SITE REGULATIONS & SAFETY

The Supplier shall be responsible for the safety of their personnel during the Supervision of Erection, Testing & Commissioning of GIS and as such all site regulations and safety regulations prevailing shall be followed.

5.4. LOSS OR DAMAGE TO PROPERTY, ACCIDENT etc.

- i. Vendor to assist BHEL for assessing the extent of damage for claim settlement.

- ii. Accident or injury to persons of supplier during supervision of erection, testing & commissioning: To be in the account of vendor.

6. Responsibility indicator:

- a. Customs clearance - By BHEL. Any taxes to be paid at the discharge port for clearing the material is in BHEL's scope.
- b. Inland Transportation in India – By BHEL.
- c. Inland Insurance in India - By BHEL
- d. Insurance at Site - By BHEL
- e. Cargo Insurance up to port of discharge- by Vendor for an amount of 125% of the CIF Indian Port of Entry value
- f. Site Storage - By BHEL
- g. Erection of Equipment - BY BHEL under supervision of Vendors
- h. Testing & Commissioning - By Vendor
- i. Performance Guarantee Test - By Vendor
- j. Handing Over to Customer after PG test - BHEL & Vendor

7. Port of discharge for imported consignment - Mumbai, India.

8. Additional Information:

Consignee Address: The project Manager

Rampur HEP

PO Koyal, Village Bayal, Tehsil : Rampur

Distt. Kullu, Himachal Pradesh – 172 023

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