

SCOPE OF WORK AND SYSTEM DESCRIPTIONS

These specifications describe in general the Scope and Standard required in this Contract for the Replacement of HT Switchgear & Associated Works at 22kV Switch room at CORE N Level 6 and Core M Main substation.

These specifications shall be deemed to form and read and construed as an integral part of the Contract which Contractor will be required to enter with the Owner.

1 GENERAL

- 1.1 This specification is to be served as minimum requirements for the complete installations works to be executed.
- 1.2 The Contractor is to include in their cost for compliance with but not limit to all Authorities requirements, Singapore Standards, technical requirements, design intents and Employer requirements etc.
- 1.3 The Contractor is to note that all items indicated or shown in any parts of the requirements, specifications, documents and drawings are to be interpreted in conjunction and included in their tender submission.
- 1.4 The Contractor shall have the following Building Construction Authority Work head;
 - a) ME 05 Electrical Engineering L2 and above OR
 - b) ME 05 Electrical Engineering L1 with Bizsafe level 3 and above.

2 AUTHORITIES REQUIREMENTS

- 2.0 All materials supplied and installed by the Contractor in this project are to be in compliance with the latest edition of local Authorities requirements, Appointed Agencies, Singapore Standards or any latest editions of standards of SS, IEEE, IEE, IEC or BS for approval in lieu of availability of local Authorities requirements and Singapore Standards.

- 2.1 The Contractor shall engage, on behalf of SATS, any regulatory authority (if necessary) for the replacement work. Ie, SP group or CAG.

3 SCOPE OF WORKS

- 3.0 The Contractor is to include in their submission for any necessary demolitions and removals associated works, supply and installation of new materials in compliance with regulations and requirements (Authorities, Appointed Agencies, Singapore Standards, design intents etc), transportation and storage of necessary materials, testing and commissioning of installed works, defects and liability of materials and works, and all associated works and materials for the full functionality of the new complete installed system.
- 3.1 The Contractor is to include in their cost for all required related works and materials for the installation works for a complete system in safe environment.
- 3.2 The Contractor is to include in their cost for provision of all necessary works and materials to ensure that their installations are to the satisfactions of the Employer and Consultant.
- 3.3 The Contactor is to note that all materials are to be submitted with necessary documentations for the approval of the Employer and Consultant.
- 3.4 The Contractor is to include in their cost for insurances, performance bonds, security deposits etc.
- 3.5 The Contractor is not allowed to claim any additional of costs or extension of time in which the Contractor failure to obtain materials approval prior to their installation.

- 3.6 Removal and disposal of existing 1 lot of 22kV Hitachi Switchgears at 22kV Main Intake Substation at 22kV Switchroom at CORE N Level 6 and 1 lot of 22 kV Hitachi Switchgears at 22kV at Core M Substation room. All necessary associated works such as hoisting, transport, civil works etc are included. This will be done in 2 phases: 1st phase would be LHS Switchgears and 2nd phase would be RHS Switchgears.
- 3.7 Supply, Deliver, Install, Test & Commission 8 no. of new 22kV switchgear (GIS) located at existing 22kV switch room Core N and 12 no. of new 22 kV Switchgear (GIS) located at existing 22kV intake substation Core M. Cable entry shall be top entry type. This switchgear shall incorporate, including but not limited to, pilot wire protection, back up protection (50/50N/51/51N), ammeter, voltmeter and energy meter. The existing battery charger shall also be replaced with compatible type. This will be done in 2 phases: 1st phase would be Left Hand Side (LHS) Switchgears and 2nd phase would be Right Hand Side (RHS) Switchgears. Factory Acceptance Testing (FAT) shall be conducted at the country of manufacture before delivery to Singapore. SATS ,Project LEW and Building LEW shall be invited for the FAT.
- 3.8 Supply, Deliver and Install new cable terminations/joints by SPPG Licenced Cable Jointer, if necessary
- 3.9 Supply, Deliver and Install cable joints if existing cables are not long enough to terminate into new 22kV Switchgear.
- 3.10 Engagement of License Electrical Worker, 22kV Engineer grade, to be the Project LEW. The LEW shall supervise the entire project, including receive/cancel EMA Permit To Work (PTW), site supervision of removal/installation of switchgear, cable & transformer, witness site testing, endorse test reports, issue Certificate of Compliance (COC) to the Building LEW and attend First Time Energisation.
- 3.11 Engagement of the existing Building License Electrical Worker for all switching works. The Building LEW shall issue/cancel EMA Permit To Work (PTW) to the Project LEW. Building LEW shall receive and review test reports, receive COC and perform First Time Energisation. Building LEW has the final right to refuse Turn On if documents and/or installations are found not in order or not in compliance to local code of practice and or building requirements.

- 3.12 Make good of any affected building works and services during the course of works during the removal and replacement of the switchgears.
- 3.13 Application of all necessary permits and approval for hoisting works, civil works or structural works.
- 3.14 Engagement of a Structural PE for any submission and endorsement for all necessary works for the complete hoisting works, if necessary.
- 3.15 Take charge of the delivery, hoisting, storage etc of all necessary materials for the removal and replacement works.
- 3.16 Update of existing SLDs related to the scope of work of this project in the switch room. Original editable softcopy must be handed over to Client. In the case there is no SLD drawing, contractor to print out the new SLDs and to be displayed in the switch rooms.
- 3.17 The new switchgears model should have a track records of being installed at least 5 different local site and has been used for at least 10 years without failure at each site.

4 DELIVERY, STORAGE AND MATERIALS PROTECTION

- 4.0 The Contractor is to include in their pricing and be responsible for the delivery and storage of materials till they are installed in their final locations.
- 4.1 The Contractor is also to include in their cost for diversion of any services obstructing during the course of their installation works and making good of affected areas that are damaged during their course of installation works.
- 4.2 The Contractor is to be responsible for providing protection to the materials and equipment form any damage. In event of any damage to the materials or equipment, the Contractor is to replace with new materials or equipment for the damaged item at no additional cost to the client.

4.3 The Contractor is to include in their cost for obtaining any permits from relevant Authorities or parties.

5 TESTING AND COMMISSIONING

5.0 The Contractor is to include in their cost for engagement of all necessary equipment, skilled workers, Licenced Cable Jinter, Professional Engineer and Licence Electrical Worker of appropriate grade to conduct all testing and commissioning of the installation.

5.1 The installation included in this contract is to be testing according to the required tests to the satisfactory of the client, engineer and relevant Authorities or Appointed Agency.

5.2 Any costs incurred with relation to any testing required shall be included in tender.

5.3 Other related fees such as engagement of LEW, Authority testing fees, electrical installation maintenance & servicing charges throughout DLP period shall also be included.

5.4 The tests shall comprise a thorough inspection of the entire installation and the operational and performance tests specified or necessary to confirm compliance with the Specification.

5.5 All equipment used for testing and commissioning must possess valid calibration certifications.

5.6 All testing and commissioning shall be carefully pre-planned and scheduled in order that it is fully coordinated with other relevant trades and shall be carried out in a safe and efficient manner with a minimum of inconvenience to all concerned.

5.7 Prior to conducting any factory acceptance, site acceptance test or testing and commissioning of equipment, the Contractor is to submit their Methods of Statement of Testing of Equipment for approval of the Consultant.

- 5.8 Control, protection and operative devices shall be checked for correct adjustment and rating.
- 5.9 The Contractor is to conduct their internal self-test of the installation before requesting the installation to be tested by the Engineers.
- 5.10 During the testing, any equipment or materials not in compliance or faulty are to be replaced or repaired together with all any associated materials and labours cost at no cost implication for retest till the test result are in compliance of the requirements.
- 5.11 The Consultant reserved the right to conduct any additional required tests to confirm the material or equipment are operating to the desire parameters at no additional cost to the contract.
- 5.12 The Contractor is to provide any required equipment for any test throughout the entire test duration.
- 5.13 The Contractor is to give notice of 7 working days in advance to the Consultant for their attendance for any proposed test.
- 5.14 The Contractor shall ensure that the Project Manager shall be kept fully informed regarding the nature of testing and commissioning. Steps shall be taken that any possible hazards or inconvenience that may arise due to the testing and commissioning shall be minimized.
- 5.15 Carry out all commissioning tests necessary to put the systems into functional use and to approval before Practical Completion is granted. Each item of equipment individually and each complete system as a whole shall be checked and adjusted to achieve satisfactory performance.
- 5.16 All test procedures used and results obtained for both works and site tests shall be submitted in the form of a written "Test Report".
- 5.17 All test reports are to be endorsed by respective parties and the Project LEW are to be included in the Operational & Maintenance manual.

5.18 Upon completion of the installation, the Contractor is to arrange a handover inspection with the employer, building LEW, Engineers and relevant Authorities or Appointed Agency.

5.19 A Certificate of Practical Completion will be issued after the inspection of the installation is satisfactory.

6 MAINTENANCE

6.1 The Contractor is to include in their pricing for the service and routine maintenance of their installed material and equipment for a 12 months Defects Liability Period (DLP).

6.2 The commencement of the DLP will be upon the issuance of the Certificate of Conformity

7 PRACTICAL COMPLETION

7.1 The Contractor is liable to replace any material or equipment that is defective, faulty or poor workmanship at no costs to the client.

7.2 The Contractor shall at his own expense pay for spare parts, tools and other items necessary for the proper maintenance of the system.

7.3 The Contractor is to engage their Project LEW and building LEW during DLP for any rectification works.

7.4 The Contractor is to submit a routine maintenance checklist and schedule for approval prior commencement of the servicing and maintenance during DLP.

7.5 The Contractor is to liaise with the employer or his representative for any routine maintenance schedule.

- 7.6 The Contractor is to brief the Employer of his representative when completing the routine maintenance. The routine maintenance report is to be signed off by the Employer or his representative.
- 7.7 The Contractor is to compile every service report for all the work which has been carried out during each visit, including comments on any improper functioning of various systems, and comments on any items requiring detailed examination at or before the next schedule visit.
- 7.8 All service reports are to be submitted to the Employer for record after each maintenance work has been conducted.
- 7.9 The Contractor is to liaise and conduct a final inspection at the last of the routine maintenance with the Employer and the Consultant.
- 7.10 A Certificate of Final Completion will be issued after the final inspection of the installation is satisfactory.

8 PROJECT SCHEDULE

- 8.1 The project is to complete 20 weeks from the date of Letter of Award OR till the date of the scheduled shut down for the property, which ever is earlier.

9 OPERATION AND MAINTENANCE (O&M) MANUALS

- 9.1 Provide two (2) complete print sets and one (1) softcopy in a thumb drive of O&M manuals and necessary for the efficient operation, maintenance and repair of installation within the Works including but not limited to the following.
- a. A general description of the installation work;
 - b. Identity of equipment suppliers / manufacturers, including names, address and contact numbers;
 - i. Equipment details, ie. Equipment schedule

- ii. Signed T&C reports;
- iii. Certificates of conformity;
- iv. Part warranties;
- v. Maintenance requirements, i.e. maintenance schedule and troubleshooting guides;
- vi. Manufacturers' handbooks;
- vii. Performance data sheets;
- viii. Copies of all "as-built" drawings;
- ix. Manuals shall be of A4 size in multi-ring binders.

10 LIQUIDATED DAMAGES

- 10.1 The Contractor shall ensure that they meet the contract period and complete the work in a timely manner. The Employer shall be entitled to claim Liquidated Damages from the contractor, and the contractor shall pay the employer, \$200 per day of delay from the end date of the contract, capped at 20% of the contract sum.
- 10.2 The contractor may seek for an extension for the contract period one month before the contract end date, subject to the approval of the employer.
- 10.3 The Contractor has to be contactable at any time during the DLP to attend any breakdown maintenance within 1 hour for critical items that will cause the entire system to be malfunction from the acknowledgement of breakdown call from the Client. A Liquidated damage of \$200 per hour of delay of attendance will be charged to the contractor.

11 Making Good and Site Cleaning

- 11.1 Keep the site, buildings, adjacent roads and footpaths etc. clean during the progress of work and periodically cart away all dirt, building rubbish and

superfluous materials as the Works proceed and at completion. Rubbish chute shall be erected and maintained in a safe condition and to be structurally sound.

- 11.2 The contractor shall maintain a high standard of housekeeping and cleanliness on site for the whole duration of the works. This is also essential that unnecessary clutter is removed for fire safety and hygiene purposes.
- 11.3 Proper safety signages are to be displayed when cleaning in progress, such as wet mopping of the floor and put up temporary directional signages during the work progress.
- 11.4 The contractor is required to implement protection measures for the common areas during the renovation works and during movement of bulky items along the common areas. This would include the use of elevator pads, wall pads, floor protection layer and other suitable protection covers to protect the common areas and lifts from damage.
- 11.5 All reinstatement cost due to damage and clean-up of common areas will be borne by the Contractor. The contractor will have to put in place suitable common area protection and to liaise with SATS for a joint site survey prior to work commencement.
- 11.6 Use entrances, exits and roads as only nominated. Make good any damage to fencing, piping, footways, roads and surfaces generally and any other work which may be disturbed or injured by cartage or other operations.

a) CHASINGS AND OPENINGS

- I. Chasing and openings in walls, ceilings or floors shall be covered or plugged with approved filler and the surface painted.
- II. All chasings shall be made before walls are rendered.

b) SURFACES

- I. Surfaces damaged during delivery, erection or installation of equipment shall be repaired to its 'prior to damage' condition, approved by the Employer.

12 SECURITY DEPOSIT

- 12.1 A **security deposit of 5% of contract sum** shall be submitted prior to work commencement in a form of a Banker's guarantee or a cheque made payable to **SATS Ltd.** It shall be returned upon satisfactory completion.
- 12.2 Under the contract, the payment will be honoured within 30 days of the receipt of invoice and certification by the Company's executive in charge for its release.

STAGE		% of Contract Price
1.	Confirmation of all drawings, sample and catalogue for all parts and materials	20%
1.	Upon completion of 50% physical works to SATS Limited satisfactory	40%
2.	Upon completion of 100% physical works and submission of all document to SATS Limited's satisfactory.	40%
TOTAL %		100%

The total Contract Price shall include all works specified in this agreement, and the total Contract Price S (\$)_____

Contractor business/company stamp

Signature of Contractor or its authorised signatory

Full Name and Designation of Contractor or its authorised signatory

Quotation Price Breakdown

Please refer to the PDF file attached.

13 Schedule of Deviations

The tenderer shall list below or on separate sheets all deviations from the specification requirements.

Failure to comply with this condition and any deliberate attempts to conceal deviations from these requirements will invalidate the tender.

Tenders complying with basic requirements but with minor details not identical with those specified will not necessarily be rejected.

Explanation of these deviations shall however be furnished with the tender.

If no details are given the tender will be assumed to comply with the Specification requirements in all respects.

S/N	Specification Reference	Deviation	Explanation	Cost implication (S\$)

Authorized Signature & Company Stamp

Date

14 Documents to be submitted

Contractors are to submit the following documents together with the necessary supporting documents ;

- I. Proposed Model of the switchgear and it's accessories.
- II. Catalogue of the switchgear and it's accessories.
- III. Gantt chart for the proposed work
- IV. Company's track records of switchgear replacement work