



VOLUME I

SECTION 6.0

ERECTION & COMMISSIONING CONDITIONS OF THE CONTRACT (ECC)



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SECTION – 6

ERECTION & COMMISSIONING CONDITIONS OF THE CONTRACT (ECC)

1.0 GENERAL

- 1.1 The following shall supplement the conditions already contained in the other parts of the specifications and documents governing the scope of contract related to 'Plant' erection package to be executed for the “ **Battery Energy Storage System rated for 20MW/120MWh at the point of injection** using Vanadium Redox Flow Battery Technology with all associated electrical, mechanical and civil systems for the project and operation and maintenance of the plant for ten(10) years by the bidder **UNDER SINGLE EPC BASIS**.”
- 1.2 The Contractor shall, in addition to their respective Project Managers stationed at Head Quarters nominate one of the responsible officers as their residential/Site representative suitably designated for the purposes of overall responsibility and coordination of the services to be performed in respect of erection etc. at site. Such person shall function from the site office established by the Contractor, during the pendency of Contract.

2.0 SCOPE OF SERVICES

The Contractor shall be responsible for the complete execution of the erection, testing, and commissioning of the 20 MW / 120 MWh Battery Energy Storage System (BESS) based on Vanadium Redox Flow Battery (VRFB) Technology, including all associated electrical, mechanical, and civil systems, on a single EPC basis at the point of injection. The Contractor's obligations under this Section encompass the entire field execution lifecycle from mobilisation and site establishment through to final handing over and include coordination with GETCO, STU, GUVNL, and SLDC for metering, SCADA/EMS/PPC integration, telemetry, and First Time Charging (FTC); complete erection, pre-assembly, pre-commissioning, and commissioning of all plant and equipment; management of vanadium electrolyte transportation, storage, and quality preservation up to OAT; implementation of a well-defined Interface Management Plan for BESS and existing electrical systems including the 132 kV switchyard revival and revival at GETCO substation; and conduct of Performance Guarantee Tests. Throughout the contract period, the Contractor shall ensure full compliance with all applicable statutory, labour, and safety regulations, maintain strict safety protocols within the live plant premises particularly in areas with energised/charged equipment provide all necessary tools, manpower, insurance, and quality assurance measures at his own cost, and shall remain solely responsible for the protection, security, and safe custody of all plant, equipment, and materials at site until formal acceptance by the Owner/Purchaser.

The scope of work and duties and responsibilities of the Contractor shall broadly include the following, though not restricted to them.

- 2.1 Contractor shall coordinate with GETCO/STU/GUVNL/SLDC etc for all activities related to metering, telemetry (IEC 104 / IEC 61850), PPC/EMS/SCADA integration, PQ compliance, and first time charging (FTC) as per the requirements including Interface with Revival scope (132 kV switchyard, transformers, communication, metering) etc and at GETCO substation also.
- 2.2 Assisting the Owner/Purchaser, whenever required in checking and verification of equipment and materials supplied by the Contractor.
- 2.3 Erection, Technical supervision of erection including disassembly, preassembly etc., adjustments of the equipment supplied by the Contractor and performing trial and pre-commissioning tests.



- 2.4 Technical supervision of the initial operation of the equipment supplied by the Contractor till successful completion of trial operation and also maximum loading of the equipment followed by P.G. Tests.
- 2.5 Technical supervision of the work of repairs, modifications and alterations, etc., of equipment, wherever necessary.
- 2.6 Rendering technical assistance, clarifications and guidance on technical problems and drawing/documents relating to equipment supplied by the Contractor.
- 2.7 Preparation of detailed programmes / schedules for erection and testing and commissioning of equipment including material and manpower planning.
- 2.8 To conduct performance guarantee tests.
- 2.9 Any other related services though not specifically mentioned herein before but necessary for proper execution of the work, as stipulated.
- 2.10 The Contractor shall prepare and implement a well-defined Interface Management Plan covering all BESS and electrical interfaces with the existing system and GETCO substation. The plan shall clearly define scope boundaries, roles, responsibilities, coordination procedures, and safety requirements to ensure seamless integration without disturbance to the existing electrical system. The Contractor shall be fully responsible for effective coordination with all stakeholders.
- 2.11 Electrolyte transportation to site, unloading, storage, preservation, and maintenance of quality and quantity up to Operational Acceptance Test (OAT) shall be clearly defined and strictly adhered to by the Contractor, in line with safety regulations and manufacturer recommendations. The Contractor shall be fully responsible for any loss, deterioration, or non-compliance during this period.
- 2.12 The Contractor shall strictly adhere to all safety protocols while working inside the plant premises, particularly in areas having charged / live electrical equipment and existing electrical systems. All works shall be carried out as per the Owner's safety rules, permit-to-work system, and applicable statutory regulations. The Contractor shall be fully responsible for personnel safety and protection of existing plant installations.

3.0 REGULATION OF LOCAL AUTHORITIES AND STATUTES

The Contractor shall comply with all the rules and regulations of local authorities during the performance of his field activities. He shall also comply with various applicable labour laws like the Factories Act, the Minimum Wages Act, 1948, Payment of Wages Act and Contractor Labour (Regulation and Abolition Act), ESI Act, the Workman's compensation act, EPF Act, or any other law and the rules made there under in respect of any employee or workman employed or engaged by him or his sub-Contractor and all other statutory requirements as amended from time to time to the entire satisfaction of Central/State Govt. Authorities, shall be the responsibility of the Contractor and he shall have to make good loss, if any, suffered by GIPCL on account of default in this regard by the Contractor.

All registration and statutory inspection fees, electrical inspectorate fees, local body planning permission fee, pollution control board fee, PWD /Highways clearance fees, Railway clearance fees etc. in respect of his work pursuant to this Contract shall be to the account of the Contractor. Any registration, statutory inspection fees lawfully payable under the provisions of the Indian Regulations and any other statutory laws in respect of the plant equipment shall be to the account of the Contractor. Should any such inspection or registration need to be rearranged due to the fault of the Contractor or his Sub-Contractor, the additional fees for such inspection and/ or registration shall be borne by the Contractor. It is the



responsibility of the contractor to obtain the license/clearances from the above statutory bodies on behalf of the owner. Original fee receipts paid by the Contractor shall be handed over to Purchaser for record purposes.

The successful Bidder shall obtain license under Contract Labour (Regulation & Abolition) Act 1970, read with rules framed there under and furnish the same to the Company within One (01) month of the issue of Detailed order of Contract failing which the detailed order of contract shall be cancelled/terminated without any further notice and its EMD and/ or performance guarantee shall be forfeited.

4.0 STATUTORY RESPONSIBILITY — GERC / CEA / SLDC BESS COMPLIANCE

- 4.1 The Contractor shall comply with all applicable laws, by-laws, rules, regulations, and statutory requirements applicable to the VRFB BESS project. Without limiting the generality of the foregoing, the Contractor shall ensure compliance with and obtain all required approvals under the following:
- 4.2 Central Electricity Authority (CEA) Technical Standards for Connectivity to the Grid Regulations and CEA (Measures Relating to Safety and Electric Supply) Regulations — for 132 kV grid-connected BESS.
- 4.3 GERC Notification — applicable Battery Energy Storage regulations, scheduling, forecasting and deviation settlement requirements for BESS as notified from time to time.
- 4.4 Indian Electricity Grid Code (IEGC) — grid compliance including reactive power, frequency response, and metering obligations.
- 4.5 GETCO Grid Code — STU connectivity standards, protection relay settings, SCADA/RTU interface requirements for grid-connected BESS at GIPCL 132 kV bus.
- 4.6 SLDC requirements — scheduling, dispatch, deviation settlement and UI compliance from COD.
- 4.7 E-Waste (Management) Rules 2016, Hazardous Waste (Management) Rules 2016, and Battery Waste Management Rules 2022 — for handling and disposal of VRFB components and electrolyte.
- 4.8 All conditions of the GUVNL Power Purchase Agreement / BESPPA and GIPCL's obligations thereunder, in so far as they relate to the Contractor's scope of work.
- 4.9 Compliance with scheduling and forecasting as per applicable GERC/SLDC Regulations shall be the Contractor's responsibility from COD. All costs for scheduling coordination, SLDC telemetry, RTU installation, and QCA (Qualified Coordinating Agency) during the EPC and DLP period shall be borne by the Contractor.

5.0 ACCESS TO SITE AND WORKS ON SITE

- 5.1 Site will be handing over on "as is where condition". It is responsibility of contractor to investigate his requirements in view of EPC package at no cost to GIPCL. Any improvement, modification required is in scope of contractor.
- 5.2 The works so far as it is carried out on the Owner's premises, shall be carried out at such time as the Owner may approve.
- 5.3 In the execution of works, no persons other than the Contractor or his duly appointed representative, Sub-Contractor and workmen, shall be allowed to do work on the site, except by the special permission, in writing, of the Owner or his representative.
- 5.4 Bidder shall work within the existing switchyard and live electrical system areas shall be carried out only within the allocated and demarcated areas approved by the Owner. Movement of contractor's personnel, tools, and equipment outside the designated work areas is strictly prohibited without prior permission. The Contractor shall comply with all site safety rules, work permit systems, and instructions of the Owner/Employer.



- 5.5 For activities involving electrolyte or other hazardous chemicals, the Contractor shall ensure safe handling, storage, preservation, and disposal in accordance with applicable safety regulations and manufacturer recommendations. Only trained and experienced personnel shall be deployed for such works. Adequate PPE, safety measures, and expert supervision shall be ensured, especially during electrolyte handling and commissioning activities. The Contractor shall be fully responsible for personnel safety and prevention of any chemical-related incidents.

6.0 CONTRACTOR'S SITE OFFICE ESTABLISHMENT

- 6.1 The Contractor shall establish a site office at the site as required in the foregoing paras. Any written order or instruction of the Engineer or his duly authorized representative shall be communicated to the aforesaid authorized representative at the site office and same shall be deemed to have been communicated to the Contractor at his legal address & head office. The contractor shall employ a competent representative as required above to deal with work schedules & negotiations at site. He shall be assigned with authority & responsibility towards the above and he shall always be present at site during working hours.

7.0 COOPERATION WITH OTHER CONTRACTORS

- 7.1 The Contractor shall co-operate with all other Contractors or tradesmen and staff of the Owner/Purchaser, who may be performing other services on behalf of the Owner/Purchaser and the workmen who may be employed by the Owner/Purchaser and doing work in the vicinity of the works under the contract. The Contractor shall also so arrange to perform his work as to minimize, to the maximum extent possible, interference with the work of other contractors and his workmen. Any injury or damage that may be sustained by the employees of the other Contractors and the Owner due to the Contractor's work shall promptly be made good at his own expense. The Engineer shall determine the resolution of any difference or conflict that may arise between the Contractor and the other contractors or between the Contractor and the workmen of the Owner in this regard to their work. If the works of the Contractor is so delayed because of any acts or omission of another contractor, the Contractor shall have no claim against the Owner.
- 7.2 The Engineer shall be notified promptly by the Contractor of any defects in the other contractor's work that could affect the contractor's work. The Engineer shall determine the corrective measures, if any, required rectifying this situation after inspection of the works and such decisions by the Engineer shall be binding on the Contractor.

8.0 DISCIPLINE OF WORKMEN

- 8.1 The Contractor shall adhere to the disciplinary procedure set by the Purchaser/ Engineer in respect of his employees and workmen at site. The Engineer shall be at liberty to object to the presence of any representative or employee of the Contractor at the site, if in the opinion of the Engineer such employee has misconduct himself or be incompetent or negligent or otherwise undesirable and then the Contractor shall remove such a person objected to and provide in his place a competent replacement.
- 8.2 The Contractor at all time shall take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst his employees and for preservation of peace and protection of persons and property at and in the neighborhood of works.
- 8.3 Workers in electrolyte handling zones, need speciflized training and disciplined protocols .Charging/unloading of the electrolyte/chemical and during commissioning of the of VFRB, specialized engineer of the system to be deployed. VFRB specialized trained manpower having

9.0 CONTRACTORS ASSISTANCE IN WORK PLAN FOR FIELD OPERATION



- 9.1 Erection plan submitted by the Contractor and discussed with the Owner/Purchaser and finalized with necessary modifications form a part of contract documents & will be the essence for planning erection activities. The Contractor will furnish the detailed working schedules in respect of each of the activities.
- 9.2 The Contractor shall keep the Engineer informed in advance regarding his field activity plans and schedule for carrying out each part of the work. Any review of such plan or schedule or method of work by the Engineer shall not relieve the Contractor of any of his responsibility towards the field activities. Such reviews shall also not be considered as an assumption of any risk or liability by the Engineer or the Purchaser or any of his representatives and no claim of the Contractor will be entertained because of the failure of inefficiency of any such plan or schedule or method of work reviewed. The Contractor shall be solely responsible for the safety, adequacy and efficiency of plants and equipment, his erection methods.
- 9.3 The Contractor shall have the complete responsibility for the conditions of the work site including the safety of all persons employed by him or his Sub-Contractor and all the properties under his custody during the performance of the work. The requirement shall apply continuously till the completion of the Contract and shall not be limited to normal working hours. The erections reviewed by the Engineer is not intended to include review of Contractor's safety measures in, on or near the works site, and their adequacy or otherwise.
- 9.4 The first preparation of such erection plan will cover erection activities to be performed for the whole period of erection. Every subsequent plan in the last week of every month will contain updated report for reflecting progress achieved up to 20th day of the month (hereinafter reporting month) a firm programme for the first ensuing month and tentative programme for the second ensuing month. The firm erection programme for the first ensuing month will reflect the progress of the reporting month, erectable equipment and material available at site, resources at the immediate disposal and the inputs to be provided by the Owner/Purchaser. The firm work plan shall be broken down by the Contractor in week wise erection plan. The tentative work plan must set target for the complete month based on progress achieved through firm work plan of first ensuing month and identify constraints.
- 9.5 The erection work plan will be reviewed by the Owner with the assistance of the Contractor and Consultants where necessary.
- 9.6 **WORK TO BE OPEN FOR INSPECTION AND CONTRACTOR TO BE PRESENT**
- All works under or in course of execution or executed under the contract shall at all times be open to the inspection & supervision by engineer. Contractor shall at all times during the working hours and at other times with notice of engineer's visit to works shall have responsible representative available to receive instructions from the engineer, orders/instructions given to authorized representative shall be considered as if they are given to the contractor himself.
- 9.7 **NOTICE BEFORE WORK IS COVERED UP**
- The Contractor shall give adequate notice (normally seven days) to Engineer in writing before covering up or otherwise placing beyond the reach of inspection and measurement any work in order that the same may be measured & correct dimension thereof recorded. If contractor covers such works without notice, then Engineer reserves the right to get the same uncovered at the risk & cost of the Contractor.
- 10.0 Contractual Project Schedule — VRFB BESS PROJECT**
- 10.1 The Contractor shall provide a detailed programme of work covering all phases from Effective Date to OAT. The following key milestones shall form the basis of the Project Timeline (D = Effective Date of Contract):
- 10.2 D + 30 days: Engineering kick-off and design freeze submission.



- 10.3 D + 45 days: Erection schedule (Primavera / MS Project) submission and Owner approval.
- 10.4 D + 30 days: Interface Management Plan (IMP) submission and Owner approval.
- 10.5 D + 60 days: Civil works commencement (BESS complex — foundations, buildings, cable trenches).
- 10.6 D + 90 days: Major equipment supply commencement (VRFB stacks, PCS, EMS/SCADA).
- 10.7 D + 90 days: 132 kV switchyard revival works commencement at GIPCL Baroda and Nandeshwari/Jawahar Nagar Substation.
- 10.8 D + 180 days: VRFB stack erection commencement.
- 10.9 D + 390 days: Electrolyte delivery at site (first batch with CoA confirmation).
- 10.10 D + 420 days: Electrolyte fill complete; initial cycling tests commenced.
- 10.11 D + 450 days: BMS / PCS / EMS / SCADA commissioning complete.
- 10.12 D + 480 days: CEIG/CEI clearance obtained; GETCO interface commissioning complete.
- 10.13 D + 510 days: First Time Charging (FTC) / Grid synchronisation with SLDC approval.
- 10.14 D + 540 days (18 months): Scheduled Commissioning Date (SCD) / Provisional Acceptance Certificate (PAC).
- 10.15 From PAC: Defect Liability Period commences.
- 10.16 PAC + 12 months or PAC + 18 months (whichever earlier): Operational Acceptance Test (OAT) and Performance Guarantee Test (PGT)

The Contractor shall submit a Bar / PERT chart linked to the above milestones within 45 days of the Effective Date. All modifications by the Owner shall be incorporated. The timeline shall be updated monthly in the progress report. Delay in any milestone not attributable to Force Majeure or Owner's default shall attract LD provisions.

11.0 MANPOWER REPORT

- 11.1 The Contractor shall submit to the Engineer, on the first day of every month, a man power schedule for the next month, detailing the man power scheduled for the month, skill wise, sub-contractor wise and area wise.
- 11.2 The Contractor shall also submit to the Engineer on the first day of every month, a man power report of the previous month detailing the number of persons scheduled to have been employed and actually employed, skill-wise and the areas of employment of such labour.
- 11.3 The Contractor shall decide mutually with the Owner/Purchaser, from time to time, in regard to Contractors manpower deployment, plan and schedules for providing the services under the contract to match the erection programme.
- 11.4 The Contractor shall also intimate the programme of the visit of his personnel to site and departure from site. The Engineer will have the right to review the list of such personnel and ask for increase in the strength or reschedule the visits of such personnel, if in the opinion of the Engineer, the list of personnel furnished by the Contractor is not sufficient for effective performance of the Contract.

12.0 PROTECTION OF WORK

- 12.1 The Contractor shall have total responsibility for protecting his work till it is finally taken over by the Engineer. No claim will be entertained by the Purchaser or the Engineer for any damage or theft or loss to the Contractor's works and the Contractor shall be responsible for the complete restoration of the damaged works to its original condition to comply with the Specifications and Drawings. Should any such damage to the Contractor's works occur because of other party not under his supervision or control, the Contractor shall make his claim directly with the party concerned. If disagreement or conflict or dispute develops between the Contractor and the other party or parties concerned regarding the responsibility for damage to the Contractor's Works, the same shall be resolved as per the provision of the clause: 'Co-operation with other Contractors'. The Contractor shall not cause any delay in the repair of such damaged works



because of any delay in the resolution of such disputes. The Contractor shall proceed to repair the work immediately and no cause thereof will be assigned pending resolution of such dispute.

13.0 SECURITY

13.1 The Contractor shall have total responsibility for all equipment and materials in his custody stored, loose, semi-assembled and/ or erected by him at site. The Contractor shall make suitable security arrangements including employment of security personnel to ensure the protection of all materials, equipment and works from theft, fire, pilferage and any other damages and loss. All materials of the Contractor shall enter and leave the project site with the written permission of the Engineer in the prescribed manner. Inadequate provision in this regard will result in owner making security arrangements at contractor's cost.

14.0 EMPLOYMENT OF LABOUR

14.1 The Contractor shall employ on the work only his regular skilled employees with experience of his particular work.

14.2 Contractor's employees shall wear identification badges, safety helmets and applicable protective gear while on work at site.

14.3 In case the owner becomes liable to pay any wages or dues to the labour or to any Government agency under any of the provisions of the Minimum Wages Act, Workmen Compensation Act, Contract Labour Regulation Abolition Act or any other law due to act of omission of the Contractor, the Owner may make such payments and shall recover the same from the Contractor's bills. Periodic requirement of furnishing details shall be as per Owners policy shall be included.

14.4 As far as possible unskilled labour shall be engaged from local area of site, as per the local statutory (Labour) requirements, if any.

14.5 The Contractor shall at all time have due regard to the local religious, mythology beliefs, festivals & customs.

14.6 Contractor shall comply with all the provisions of labour, civil, State & Central laws, statutory rules, regulations under the law. In case of his non-compliance with any provision, he will indemnify the owner from and against all liabilities, damages, penalties, demand etc.

14.7 The Contractor shall obtain independent license under contract labour (Regulation and abolition act) from the concerned state labour authorities for which necessary certificate (Form 2) shall be issued by an Engineer.

14.8 Contractor's Employees: The Contractor shall provide and employ on the site in connection with the execution and maintenance/repair (during defect liability period) of the works the following:

- a) Technical personnel, skilled and experienced in their respective trades and are competent to give proper supervision to the work they are required to supervise and execute. The regular skilled employees with experience of the particular work are expected to be employed by the Contractor.
- b) Such skilled, semi-skilled labour as is necessary for the proper work strictly as per Specification and timely execution and maintenance of the works. No female labour shall be employed after darkness. No person below the age of 18 Years (eighteen years) shall be employed.
- c) Where required by Law Regulation of Local or other authority, such personnel shall be duly licensed by the Competent Authority to practice their trades, professions and callings.



- d) The same technical personnel of the Contractor shall continue till completion of work and if at all it is necessary to withdraw any of the technical personnel of the Contractor to any other site, the same shall be done with written approval of Engineer or Purchaser unless it is a case of resignation.
- e) If any of the personnel is not found to be performing his services in a manner as expected of him, under the contract, the Contractor on advice from the Engineer shall replace such person(s) at his cost with those acceptable to the Engineer, by mutual agreement.

14.9 The Contractor shall be responsible for payment of timely salaries to the said labour/ employees. The Contractor shall also be liable to extend/ provide all the benefits admissible to said labour/ employee under various laws in force.

14.10 All travelling expenses including provisions of all necessary transport to and fro from site, lodging allowances and other payments to the Contractor's employees shall be sole responsibility of the Contractor.

14.11 EPF

The contractor will deduct and deposit EPF of his labour staff/worker as applicable from time to time in his own EPF A/c code and then produce a photocopy of documentary evidence of EPF Challan with each R.A. Bill for the period concerned.

15.0 FIRST AID

15.1 The Contractor shall provide necessary first aid facilities for all his employees, representatives and workmen working at the site. Sufficient number of Contractor's personnel shall be trained in administering first-aid. The contractor shall maintain fully equipped Ambulance with medical assistance needed for emergency treatment at hospitals.

16.0 CLEANLINESS

16.1 The Contractor shall be responsible for keeping the entire area allotted to him clean and free from rubbish, debris etc., during the period of Contract. The Contractor shall employ enough number of special personnel to thoroughly clean his work-area at least once in a day. All such rubbish and scrap material shall be stacked or disposed in a place to be identified by the Engineer. Materials and stores shall be so arranged to permit easy cleaning of the area. In areas where equipment might drip oil and cause damage to the floor surface, a suitable protective cover of a flame resistant, oil proof sheet shall be provided to protect the floor from such damage.

16.2 Similarly the offices of the Contractor shall be kept clean and neat to the entire satisfaction of the Engineer. Proper hygiene and clean sanitary arrangements shall be provided by the Contractor, in the work-areas and office of the Contractor.

16.3 In the event Contractor fails to keep his work area clean, the Engineer shall be free to engage alternate labour, after serving written notice to that effect to the Contractor, to clean up the Contractor's work area and realize the amount spent on this account from the Contractor.

17.0 LINES AND GRADES

17.1 All the works shall be performed to the lines, grades and elevation indicated on the drawings. The Contractor shall be responsible to locate the layout of the works. Basic horizontal and vertical control points will be established and marked by the Engineer at site at suitable points. The Contractor shall inform the Engineer well in advance of the time and places at which he wishes to do work in the area allotted to him so that suitable datum points may be established



and checked by the Engineer to enable the Contractor to proceed with his works. Any work done without being properly located may be removed and/ or dismantled by the Engineer at Contractor's expense.

18.0 FIRE PROTECTION

- 18.1 The work procedures that are to be used during the erection shall be those which minimize fire hazards to the extent practicable. Combustible materials, combustible waste and rubbish shall be collected and removed from the site at least once each day. Fuels, oils and volatile or flammable materials shall be stored away from the erection equipment and materials storage areas in safe containers. Untreated canvas paper, plastic or other flammable flexible materials shall not at all be used at site for any other purposes unless otherwise specified. If any such materials are received with the equipment at the site, the same shall be removed and replaced with acceptable materials before moving into the erection area or storage.
- 18.2 Similarly corrugated paper fabricated cartons, etc shall not be permitted in the erection area either for storage or for handling of materials. All such materials used shall be water proof and flame resistant type. All the other materials such as working drawings, plans etc., which are combustible but essential shall be protected against combustion resulting from welding sparks, cutting flames and other similar fire sources.
- 18.3 All the Contractor's supervisory personnel and sufficient number of workers shall be trained for firefighting and shall be assigned specific fire protection duties. Enough No. of such trained personnel must be available at the site during the entire period of the Contract.
- 18.4 The Contractor shall provide enough fire protection equipment of the types and number for the warehouses, office, temporary structures, labour colony area, etc. Access to such fire protection equipment shall be easy and kept open at all times. The compliance of the above requirements under fire protection shall in no way relieve the Contractor of any of his responsibilities and liabilities due to fire accidents occurring other to his materials and equipment or to those of others working in the area.

19.0 THERMAL RUNAWAY AND FIRE PROTECTION FOR PCS / POWER ELECTRONICS

- 19.1 While vanadium electrolyte is inherently non-flammable (aqueous), the VRFB BESS installation includes Power Conversion Systems (PCS), HV transformers, LV switchgear, and associated power electronics that present electrical fire risks. The Contractor shall comply with the following:
- 19.2 Carry out thermal runaway characterisation testing for PCS enclosures in accordance with IEC 62619 and NFPA 855 requirements, or provide OEM certification confirming compliance.
- 19.3 Install automatic fire suppression systems (clean agent / aerosol type) in all PCS rooms and HV transformer bays. Fire suppression shall be interlocked with PCS trip and SCADA alarm.
- 19.4 Provide addressable smoke detection and fire alarm systems interconnected with the SCADA/EMS for remote monitoring and alarm.
- 19.5 Ensure that no flammable or combustible materials are stored within PCS or electrical equipment rooms.
- 19.6 Provide separate fire compartmentation between the VRFB electrolyte storage/piping area and the PCS/electrical equipment rooms, with fire-rated walls and self-closing fire doors.
- 19.7 Comply with NFPA 855 (Standard for Installation of Stationary Energy Storage Systems) or equivalent IEC standard for ESS installation fire safety, including minimum separation distances, ventilation requirements, and suppression system design.
- 19.8 Submit a Fire Safety Report covering fire risk assessment, suppression system design, detection system design, and emergency response procedure to the Owner for approval prior to commencement of commissioning.

20.0 CONTRACTOR'S AREA LIMITS



- 20.1 The Engineer will mark out the boundary limits of access roads, parking spaces, storage and erections area for the Contractor and the Contractor shall not tress-pass the areas not so marked out from him. The Contractor shall be responsible to ensure that none of his personnel move out of the areas marked out for his operations. In case of such a need for the Contractor's personnel to work, out of the areas marked out for him, the same shall be done only with the written permission of the Engineer.

21.0 CONTRACTOR'S COOPERATION WITH THE OWNER/ PURCHASER

- 21.1 In cases where the performance of the erection work by the Contractor affects the operation of the system facilities of the Purchaser, such erection work of the Contractor shall be scheduled to be performed only in the manner stipulated by the Engineer and the same shall be acceptable at all times to the Contractor. It shall be the responsibility of the Contractor to provide all necessary construction power and construction water, temporary instrumentation and other measuring devices required during construction, erection, start-up and operation of the equipment systems which are erected by him. The Contractor shall also be responsible for flushing and initial filling of all the oil and lubricants required for the equipment furnished and erected by him so as to make such equipment ready for operation.
- 21.2 The Contractor shall be responsible for first fill of oils, lubricants and essential chemicals etc which will be required under the scope of specification unless specifically excluded under exclusions in these documents and Specifications.

22.0 PRE-COMMISSIONING TRIALS & INITIAL OPERATIONS

- 22.1 The pre-commissioning trials and initial operations of the equipment furnished and erected by the Contractor shall be the responsibility of the Contractor as detailed in relevant clauses of this document. The Contractor shall provide, in addition, test instruments, calibration devices, etc and the labour required for the successful performance of these trials. If it is anticipated that the above test may prolong for a long time, the Contractor's workmen required for the above test shall always be present at site during such trials.
- 22.2 Pre-commissioning Tests including but not restricted to the following, should be conducted by the Contractor as per instruction of owner during site execution:
- 22.3 All pre-commissioning, trials, operations shall be as per statutory guidelines of GEDA/GETCO/GUVNL/SLDC/GIPCL etc only.
1. BESS pre-commissioning tests (as per Technical Specification for BESS & IEC/IS standard, CEA guidelines)
 2. Transformer pre-commissioning tests (as per Technical Specification for Transformer & IEC/IS standard, CEA guidelines)
 3. Pre-commissioning tests for other all auxiliary systems (as per Technical Specification for respective system/equipment & IEC/IS standard, CEA guidelines)
- 22.4 All test reports shall be submitted by the Contractor to the Chief Electrical Inspector (CEIG/CEI) for obtaining approval for charging and commissioning of the system. Any required inspection/visit by CEIG/CEI prior to granting clearance for final testing and commissioning of the overall system shall be arranged by the Contractor at his own cost. Approval for first-time charging from RLDC / NLDC / CTU / POSOCO, as applicable, shall be within the scope of the Contractor. All fees, charges, and expenses related to statutory approvals, inspections, and compliances shall be borne entirely by the Contractor.

23.0 VRFB BESS SYSTEM-SPECIFIC PRE-COMMISSIONING AND COMMISSIONING PROCEDURE

- 23.1 The Contractor shall prepare and submit a detailed VRFB BESS Pre-Commissioning and Commissioning Procedure to the Owner for approval at least sixty (60) days prior to the planned



- commencement of commissioning activities. The procedure shall be prepared in accordance with IEC 62933 (Electrochemical based energy storage systems for use with power systems) and shall cover the following stages as a minimum:
- 23.2 Civil and structural readiness inspection — foundations, bunding, secondary containment, cable trenches, buildings, firefighting infrastructure.
 - 23.3 Electrical system readiness — 132 kV switchyard revival check, transformer energisation pre-commissioning tests (IR, ratio, vector group, tan delta), HT/LT cabling insulation resistance and continuity tests, earthing system resistance measurement and bonding verification.
 - 23.4 VRFB stack mechanical inspection — module integrity check, electrolyte manifold pressure tightness test (hydraulic/pneumatic), pump and valve functionality, flow rate calibration.
 - 23.5 Electrolyte system pre-commissioning — tank integrity check, piping hydrostatic pressure test, pump dry-run and wet-run tests, flow rate calibration, electrolyte batch quality verification per IEC 62932 (vanadium concentration, acid concentration, density, OCV).
 - 23.6 BMS (Battery Management System) commissioning — SOC calibration, cell voltage monitoring validation, alarm, protection set-point and trip verification per Technical Specification.
 - 23.7 PCS (Power Conversion System) commissioning — DC-AC conversion test at reduced load, protection relay settings verification, grid-forming capability test, reactive power capability test.
 - 23.8 EMS / SCADA / RTU commissioning — IEC 104 / IEC 61850 protocol interface testing with GETCO/SLDC, data logging validation, historian archival verification, cybersecurity access control setup.
 - 23.9 First Electrolyte Fill — under VRFB OEM supervisor's presence with Owner's Representative witness; batch analysis confirmation; SOC verification; initial 3-cycle charge-discharge test.
 - 23.10 Grid Compliance Tests — reactive power capability, frequency response, power factor verification, anti-islanding tests as per GETCO Grid Code requirements.
 - 23.11 First Time Charging (FTC) — coordination with RLDC / NLDC / CTU / POSOCO for approval; SLDC scheduling and ramp-up plan; energisation under CEIG / CEI presence.
 - 23.12 Performance Guarantee Test (PGT) — as per IEC 62933-2-1; witnessed by Owner / Engineer and third-party NABL-accredited inspector.
 - 23.13 All pre-commissioning, trials and operational activities shall comply with the statutory guidelines and requirements of GEDA, GETCO, GUVNL, SLDC, and GIPCL. GEDA-authorized representative shall witness and validate commissioning. COD certification shall be issued by GEDA after successful commissioning. All CEIG/CEI inspection fees, clearance costs, and statutory compliance charges shall be borne entirely by the Contractor. Approval for first-time charging from RLDC / NLDC / CTU / POSOCO, as applicable, shall be within the scope of the Contractor.
- 24.0 PROGRESSIVE COMMISSIONING PROCEDURE**
- 24.1 The Contractor shall plan and execute commissioning of the VRFB BESS in a phased manner. The following provisions shall apply:
 - 24.2 Part commissioning shall be permitted in a maximum of three (03) instalments; the first instalment shall be for not less than fifty percent (50%) of the rated 20 MW / 120 MWh capacity.
 - 24.3 For each commissioned tranche, the Contractor shall demonstrate all specified performance parameters (availability, RtE, dispatchable capacity) on a pro-rata basis before claiming commissioning milestone payment for that tranche.
 - 24.4 If any capacity remains un-commissioned nine (9) months beyond the Scheduled Commissioning Date (SCD), such un-commissioned capacity shall be treated as declared commissioned capacity and the provisions of SCC Clause 75.0 LD clause shall apply, and the entire CPBG shall be encashable at Owner's discretion.
 - 24.5 SLDC scheduling and dispatch obligations shall commence from the date of each part commissioning as per applicable GERC/IEGC regulations.
 - 24.6 The PAC and DLP shall commence from the date of commissioning of each tranche separately. OAT shall not commence until the full rated capacity is commissioned.

25.0 MATERIALS HANDLING AND STORAGE



- 25.1 All the equipment furnished under the Contract and arriving at site shall be promptly received, unloaded and transported and stored in the storage (within shed & without shed subject to item type, preservation etc) spaces by the Contractor including re-handling re-transporting to erection works.
- 25.2 Contractor shall be responsible for examining all the consignments and notify the Engineer immediately of any damages, shortage, discrepancy etc for the purpose of Engineer's information only. The Contractor shall submit to the Engineer every week a report detailing all the receipts during the week. However, the Contractor shall be solely responsible for any shortages or damage in transit, handling and/ or in storage and erection of the equipment at the site. Any demurrage, wharf age and other such charges claimed by the transporters, railways etc., shall be to the account of the Contractor.
- 25.3 The Contractor shall maintain an accurate and exhaustive record detailing out the list of all equipment received by him for the purpose of erection and keep such record open for the inspection of the Engineer at any time.
- 25.4 All the equipment shall be handled very carefully to prevent any damage or loss. No bare wire rope slings, etc shall be used for unloading and/or handling of the equipment without the specific written permission of the Engineer. The equipment stored shall be properly protected to prevent damage either to the equipment or to the floor where they are stored. The equipment from the storage shall be moved to the actual location at the appropriate time so as to avoid damage of such equipment at site.
- 25.5 All electrical panels, control gears, motors and such other devices shall be properly dried by heating before they are installed and energized. Other exposed parts shall be protected against moisture ingress and corrosion during storage and periodically treated to prevent corrosion due to prolonged storage. Preservation procedure for power transformers shall also be submitted and followed at site.
- 25.6 All the electrical equipment/accessories, such as motors, cables, etc. shall be tested for insulation resistance at least once in three months from the date of receipt till the date of commissioning and a record of such measured insulation values maintained by the Contractor. Such records shall be open for inspection by the Engineer.
- 25.7 The Contractor shall ensure that all the packing materials, and protection devices used for the various equipment during transit and storage are removed before the equipment are installed. The packing materials and protection devices shall remain the property of the Purchaser.
- 25.8 The consumable and other supplies likely to deteriorate due to storage must be thoroughly protected and stored in a suitable manner to prevent damage or deterioration in quality by storage.
- 25.9 All the materials stored in the open or dusty location must be covered with suitable weather proof and flame proof covering material wherever applicable.
- 25.10 If the materials belonging to the Contractor are stored in areas other than those earmarked for him, the Engineer will have the right to get it moved to the area earmarked for the Contractor at the Contractor's cost.
- 25.11 The Contractor shall be responsible for making suitable indoor storage facilities to store all equipment which require indoor storage. Normally, all the electrical equipment such as motors, control gears, DG sets and transformers and consumables like electrodes, lubricants, etc. shall be stored in the closed storage space. The Engineer, in addition, may direct the Contractor to move certain other materials which in his opinion will require indoor storage, to indoor storage areas which the Contractor shall strictly comply with.



25.12 Dismantling work should be done with due diligence so as not to damage the equipment. The dismantled materials / equipment should be handed over to the owner at the storage place & site indicated by the owner.

26.0 ELECTROLYTE MANAGEMENT, QUALITY ASSURANCE AND BATCH TESTING

26.1 Procurement and Supply:

- a) All vanadium electrolyte supplied under the Contract shall comply with IEC 62932 (Flow rate battery electrolyte — Vanadium electrolyte for use in vanadium redox flow batteries) and shall be sourced from the VRFB OEM's approved supplier. The Contractor shall submit electrolyte specifications, Certificate of Analysis (CoA), and test results for each batch to the Owner prior to dispatch from the manufacturing source. No batch shall be dispatched to site without Owner's written acceptance of the CoA.

26.2 Transportation and Storage:

- a) Electrolyte shall be transported in IBC containers or purpose-built tanks in compliance with applicable regulations for UN3264 (Corrosive liquid, acidic, inorganic).
- b) A dedicated, covered, acid-resistant storage area with secondary bunding (minimum capacity $\geq 110\%$ of maximum stored electrolyte volume) shall be constructed before the first electrolyte delivery to site.
- c) Temperature monitoring (target 5°C to 40°C; freeze and overheating to be avoided) shall be maintained throughout storage. Continuous temperature logging data shall be submitted to the Owner monthly.
- d) Electrolyte batch quality analysis (vanadium concentration, sulphuric acid concentration, density, state of charge) shall be carried out at site upon receipt by an approved laboratory or by the OEM's representative, with results submitted to the Owner within 48 hours of receipt.

26.3 Electrolyte Fill and Commissioning:

- a) First electrolyte fill shall be carried out only under the supervision of the VRFB OEM's qualified commissioning engineer with the Owner's Representative in attendance.
- b) All electrolyte handling personnel shall be equipped with acid-resistant PPE (face shield, chemical gloves, apron, chemical-resistant boots) before commencement of fill operations.
- c) After fill, the Contractor shall perform initial cycling tests (minimum 3 full charge-discharge cycles) to verify electrolyte performance parameters meet IEC 62932 and Technical Specification requirements before declaring electrolyte commissioning complete.

26.4 Electrolyte Accountability and Inventory:

- a) The Contractor shall maintain a running Electrolyte Inventory Register recording batch numbers, quantities received, quantities filled, any losses or spillages, top-up requirements, and final inventory at OAT. The register shall be submitted to the Owner monthly and be available for audit at any time. Any unexplained electrolyte loss exceeding 0.5% of total volume per month shall be investigated and reported to the Owner in writing within 24 hours.

27.0 CONSTRUCTION/ERECTION MANAGEMENT

27.1 The field activities of the contractors working at site will be coordinated by the Engineer and the Engineer's decision shall be final in resolving any disputes or conflicts between the Contractor



and other contractors and tradesmen of the Owner regarding scheduling and co-ordination of work. Such decision by the Engineer shall not be a cause for extra compensation or extension of time for the Contractor.

- 27.2 The Engineer shall hold weekly meetings of all the Contractors working at Site, at a time and a place to be designated by the Owners Engineer. The Contractor shall attend meetings and take notes of discussions during the meeting and the decisions of the Owner and shall strictly adhere to that decision in performing his works. In addition to the above weekly meetings, the Owner may call for other meetings either with individual contractors/sub-contractors or with selected number of contractors and in such a case the Contractor, if called, will also attend such meetings.
- 27.3 Time is the essence of the Contract and the Contractor shall be responsible for performance of his works in accordance with the specified erection schedule. If at any time, the Contractor is falling behind the schedule, he shall take necessary action to make good for such delays by increasing his work force or by working overtime or otherwise accelerate the progress of the work to comply with the schedule and shall communicate, such actions in writing to the Engineer, satisfying that his action will compensate for the delay. The Contractor shall not be allowed any extra compensation for such action.
- 27.4 The Engineer shall, however, not be responsible for provision of additional labour and / or materials or supply or any other services to the Contractor.
- 27.5 The Contractor shall be solely responsible for managing all interfaces with OEMs, other contractors, grid authorities, statutory bodies and utility agencies. Any delay arising out of interface issues shall be at the Contractor's risk and shall not entitle the Contractor to any extension of time or additional cost unless expressly approved in writing by the Owner.
- 27.6 Mobilization and Demobilization: The Contractor shall mobilise manpower, tools, plant, machinery and construction facilities strictly in line with the approved erection schedule. Upon completion of works, all temporary facilities, debris, surplus materials and construction equipment shall be demobilised and the Site shall be restored to its original condition at no additional cost to the Owner.

28.0 INTERFACE MANAGEMENT PLAN — BESS AND EXISTING ELECTRICAL SYSTEM

The Contractor shall prepare, submit for Owner approval, and implement a comprehensive Interface Management Plan (IMP) within thirty (30) days of the Effective Date of the Contract. The IMP shall address all interfaces between the new VRFB BESS system and the existing electrical infrastructure at GIPCL Baroda plant and at Nandeshwari / Jawahar Nagar Substation, covering as a minimum:

- 28.1 132 kV switchyard revival scope — interface between existing breakers, busbars, CTs/PTs, protection relays, and new BESS equipment; outage requirements and switching sequence plan.
- 28.2 HT Transformer interfaces — new / revived transformer connections to 132 kV bus and BESS HV side; protection coordination and interlocking scheme.
- 28.3 Communication system interfaces — OPGW, optical fibre cable, RTU, IEC 104 / IEC 61850 interface with GETCO / SLDC; redundancy provisions.
- 28.4 Metering interfaces — Main Meter and Check Meter at GETCO substation (Class 0.2S, ABT-compliant), backup meter at GIPCL 132 kV bus; interface with GETCO's AMR/metering system.
- 28.5 Protection and control interfaces — protection relay coordination study, interlocking schemes, differential protection settings, SCADA/EMS data flow and alarms.
- 28.6 Civil interfaces — existing cable routes, trenches, building utilisation, road access routes for heavy equipment.
- 28.7 The IMP shall clearly define scope boundaries between GIPCL's existing systems and the Contractor's new installations, identify required outage windows for integration work with advance notice periods, and specify safety precautions including permit-to-work requirements for work on or near live / energised systems. The IMP shall be updated at each project phase and reviewed monthly with the Owner at site coordination meetings. The Contractor shall be



solely responsible for effective coordination with all stakeholders including GETCO, SLDC, and electrical inspectorate.

29.0 FIELD OFFICE RECORDS

29.1 The Contractor shall maintain at his site office up to date copies of all drawings, Specification and other Contract Document and any other supplementary data complete with all the latest revisions there to. The Contractor shall also maintain in addition the continuous record of all changes to the above Contract documents drawings, Specification, supplementary data, etc effected at the field and on completion of his total assignment under the Contract shall incorporate all such changes on the drawings and other engineering data to indicate as installed conditions of the equipment furnished and erected under the Contract. Such drawings and Engineering data shall be submitted to the Engineer in required number of copies.

30.0 CONTRACTOR'S MATERIALS BROUGHT ON TO SITE

30.1 The Contractor shall bring to site all equipment component, parts, materials, including erection equipment, tools and tackles for the purpose of the works under intimation to the Engineer. The right on all such goods shall, from the time of their being brought shall rest with the Purchaser but may be used for the purpose of the works only and shall not on any account be removed or taken away by the Contractor without the written permission of the Engineer. The Contractor shall be solely liable and responsible for any loss or destruction thereof and damage thereto. Contractor shall maintain the duly signed laser for material inwards etc along with watch and ward responsibility.

30.2 The Owner shall have a lien on such goods throughout the period of contract for any sum or sums which may at any time be due or owing to him by the Contractor, under, in respect of or by reasons of the contract. After giving a 15 (fifteen) days notice in writing of his intention to do so, the Owner shall be at liberty to sell and dispose of any such goods, in such manner as he shall think fit including public auction or private treaty and to apply the proceeds in or towards the satisfaction of such sum or sums due as aforesaid.

After the completion of the works, the Contractor shall remove under the direction of the Engineer, the materials such as construction/ erection tools and tackles, erection equipment, packing material which is no more required by the owner for preservation or future need of repair or O&M activities, scaffolding, etc. from the site after written permission of the Engineer. If the Contractor fails to remove such materials, within fifteen (15) days of a notice by the Engineer to do so, then the engineer shall have the liberty to dispose of such materials as detailed in above clause and credit the proceeds thereof to the account of the Contractor.

31.0 PROTECTION OF PROPERTY AND CONTRACTOR'S LIABILITY

31.1 The Contractor shall be responsible for any damage resulting from his operation. He shall also be responsible for protection of all persons including members of public and employees of the Purchaser and Engineer and the employees of the Contractors and Sub-Contractors, and all public and private property including structures, buildings, other plants and equipment and utilities either above or below the ground.

31.2 The Contractor shall ensure provision of necessary safety equipment such as barriers, sign boards, warning lights and alarms, etc to provide adequate protection to persons and property. The Contractor shall be responsible to give reasonable notice to the Engineer and the Purchaser of public or private property and utilities when such property and utilities are likely to get damaged or injured during the performance of his works and shall make all necessary arrangements with such Purchasers, related to removal and/ or replacement or protection of such property and utilities.



32.0 PAINTING

32.1 All exposed metal parts of the equipment including piping, structures, railings etc. wherever applicable, after installation unless otherwise surface protected, shall be first painted with at least one coat of suitable primer which matches the shop primer paint used, after thoroughly cleaning all such parts of all dirt, rust, scales, greases, oils and other foreign materials by wire brushing, scraping or sand blasting, and the same being inspected and approved by the engineer for painting. Afterwards, the above parts shall be finished with two coats of alloyed resin machinery epoxy paints (refer respective section paint for anti-corrosive paint to be applied on all BESS area equipment. All with shot blasted with SA 2-1/2 surface finish followed by painting i.e. 2 + 2). The quality of the finish paint shall be as per the Indian Standards or equivalent and to be of the colour as approved by the Engineer. Painting procedure shall be as per the Volume II of this tender. Any items required to touch-up after installation, will be in bidders' scope.

33.0 UNFAVOURABLE WORKING CONDITIONS

33.1 The Contractor shall confine all his field operations to those works which can be performed without subjecting the equipment and materials/ works to adverse effects during inclement weather conditions, like monsoon, storms, water logging, flood, etc. and during other unfavorable working/ erection conditions. No field activities shall be performed by the Contractor under conditions which might adversely affect the quality and efficiency thereof, unless special precautions or measures are taken by Contractor in a proper and satisfactory manner in the performance of such works and with the concurrence of the Engineer. Such unfavorable working/ erection conditions will in no way relieve the Contractor of his responsibility to perform the works as per the schedule.

34.0 PROTECTION OF MONUMENTS & REFERENCE POINTS

34.1 The Contractor shall ensure that any finds such as relic, antiquity, coins, fossils, auspicious tree, plants, etc which he may come across during the course of performance of his works either during excavation or elsewhere, are properly protected and handed over to the Engineer. Similarly, the Contractor shall ensure that the bench marks, reference points etc which are marked out either with the help of Owner or by the Owner shall not be disturbed in any way during the performance of his works. If any work is to be performed which may disturb such references, the same shall be done only after these are transferred to other suitable location under the direction of the Engineer. The Contractor shall provide all necessary materials and assistance for such relocation of reference points etc.

35.0 WORK & SAFETY REGULATIONS

35.1 It is to be noted that the work has to be executed within well developed and occupied plant area. Hence, any temporary/permanent construction/removal of the structure/equipment/item shall be contractors' scope only. Safety & security of existing equipment/structure/item is prime aspect; hence contractors has to make well defined plan to avoid any encroachment/threat to existing premises/system.

35.2 The Contractor shall ensure the safety of all the workmen, materials and equipment either belonging to him or to others working at site. The Contractor shall have to provide necessary and adequate safety measures including personal protective equipment and precautions to avoid any accident, which may cause damage to any equipment/ material or injury to workmen. The Owner shall not be responsible for any such accidents. The Contractor shall deploy qualified safety officer at site who shall be responsible for the safety aspects of the site.

35.3 The Contractor will notify the Engineer of his intention to bring on to site any equipment or any container, with liquid or gas (SF₆) or other substance which may create hazard. The Engineer shall have the right to prescribe the conditions under which such equipment or container may



be handled and used, during the performance of the works and the Contractor shall strictly adhere to such instructions. The Engineer shall have the right to inspect any erection plant for fabricated item and to forbid its use, if in his opinion it is unsafe. No claim due to such prohibition shall be entertained by the Purchaser.

- 35.4 Where it is necessary to provide and/or store petroleum products or petroleum mixture and explosive, the Contractor shall be, responsible for carrying out such provisions and/or storage in accordance with the rules and regulations laid down in Petroleum Act 1934, Explosive Act 1948, and Petroleum and Carbide of Calcium manual published by the Chief Inspector of Explosives of India. All such storage shall have prior approvals of the Engineer. In case any approvals are necessary from the Chief Inspector of Explosive or any statutory authorities, the Contractor shall be responsible for obtaining the same.
- 35.5 The Contractor shall be responsible for provision of all safety notices and safety equipment required both by the relevant legislations and the Engineer as he may deem necessary.
- 35.6 Contractor has to arrange all safety protocols in concurrence/approval of GIPCL for various work permits/hot works/confined space work/height work/excavation work/night work/front clearance/lifting work/special safety work/scaffolding etc and contractor has to arrange all the safety norms and provision for execution of the work.
- 35.7 The Contractor shall be responsible for the same storage of his and his Sub-Contractor's radioactive sources, if any.
- 35.8 Any hazardous material used during construction or used as part of the plant has to be taken back by the supplier for recycling or dumping purpose after its operating/ working life, so that it may not affect the environment or any living being. The Contractor shall comply with the State Pollution Board regulation.
- 35.9 The Contractor shall also be responsible for payment of sum as indicated below,

a.	Upon 1st Fatal Accident	1% of the Contract price as awarded, limited to Rs. 50,00,000/-
b.	Upon 2nd Fatal Accident	1.5% of the Contract price as awarded, limited to Rs. 75,00,000/-
c.	Upon 3rd Fatal Accident	2% of the Contract price as awarded, limited to Rs. 1,00,00,000/-
d.	Re-occurrence of Fatal Accident even after 3rd Fatal Accident	2% of the Contract price as awarded, limited to Rs. 1,00,00,000/- per fatal accident

- 35.10 For the purpose of calculation of the aforesaid amounts, 'Contract price, as awarded', shall mean the total Contract Price for both Supply of Goods and Works for the Plant/facilities as per the originally awarded Contract/ Letter of Intent (LOI) (where contract has not been signed) exclusive of any taxes & duties.
- 35.11 HSE Audit and stop work authority: The Owner or its authorized representative shall have the right to conduct HSE audits at Site at any time and issue Stop Work instructions in case of unsafe practices or non-compliance with safety requirements. Work shall recommence only after corrective measures are implemented to the full satisfaction of the Owner.
- 35.12 Contractor shall have to engage the "Safety competent person" (As a third party) approved by GIPCL while erection of the critical/heavy/longer structure. The contractor has to approved the load lifting plan from "competent person" and concurrence of the GIPCL has to taken before initiation of the work.



- 35.13 Contractor has to deploy full time safety engineer (PDIS/ADIS Qualified) along with respective area expert (civil/structural/mechanical/electrical etc) before initiation of the work.
- 35.14 In addition to it, GIPCL may appoint the retainer/consultant for various works/consulting/experts' opinion etc, contractor has to co-operate the same.

36.0 ELECTRICAL SAFETY REGULATIONS

- 36.1 In no circumstances will the Contractor interfere with switchgear, fuses and any other electrical equipment belonging to the Purchaser.
- 36.2 Before the Contractor connects any electrical appliances to any plug or socket belonging to the Purchaser, he shall: Satisfy the Engineer that the appliances are in good working condition. Inform the Engineer of the maximum current rating, voltage and phases of the appliances. Obtain permission of the Engineer detailing the socket to which the appliances may be connected.
- 36.3 The Engineer will not grant permission to connect until he is satisfied that: The appliance is in good condition and is fitted with suitable plug. The appliance is fitted with a suitable cable having two earth conductors, one of which shall be earthed metal sheath surrounding the cores.
- 36.4 No electric cables/wires in use by the Contractor/Purchaser shall be disturbed without prior permission. No weight of any description shall be imposed on any such cable and no ladder or similar equipment shall rest against or be attached to it. Jointing of cables and wires is not permitted.
- 36.5 No work shall be carried out on any live equipment. The equipment must be made safe and a permit to work issued by the Engineer should be obtained before any work is carried out.
- 36.6 The Contractor shall employ the necessary number of qualified, full time electricians to maintain his temporary electrical installation.
- 36.7 The major equipment & plants erection, testing & commissioning shall be as per IER 1956 & CEIG's/CEA clearance and approval shall be obtained by the contractor at his cost.
- 36.8 Any statutory approval required vide electrical work/MCC approved plan etc will be in bidders' scope only.

37.0 FOREIGN PERSONNEL

- 37.1 The Contractor shall submit to the Purchaser list on all foreign personnel he proposed to deploy for the performance of the works under the Contract, at least sixty (60) days prior to their departure to India. Such data will include for each person, the name, his present address, his assignment and responsibility in connection with the works, and a short resume of his qualification, experience etc., in relation to the work to be performed by him.
- 37.2 Any person unsuitable and unacceptable by the Purchaser shall not be deployed at site. Any person deployed at site if found unsuitable or unacceptable by the Purchaser, the Contractor shall within a reasonable time make alternative arrangements for providing a suitable replacement and repatriation of such unsuitable personnel.
- 37.3 No person deployed at site for the purpose for the works shall be repatriated without the consent of the Purchaser in writing based on a written request from the Contractor for such repatriation giving reasons for such an action to the Engineer. The Purchaser may give permission for such repatriation provided he is satisfied that the progress of work will not suffer due to such repatriation.



37.4 The cost for passports, visas and other travel expenses to and from India incurred by the Contractor shall be to his account. The Purchaser will not provide any residential accommodation and/or furniture for any of the Contractor's personnel including foreign personnel and the Contractor shall make his own arrangements for such facilities.

37.5 The Contractor and his expatriate personnel shall respect all Indian Acts, laws, rules and regulations and shall not in any way, interfere with Indian Political and religious affairs and shall conform to any other rules and regulations of the Government of India, the Purchaser and the Engineer may establish from time to time on them. The Contractor's expatriate personnel shall work and live in close cooperation and coordination with other co-workers and the community and shall not engage themselves in any other employment either part time or full time nor shall they take part in any local politics.

37.6 The Purchaser shall assist the Contractor, to the extent possible in obtaining necessary permits to travel to India and back, by issuing necessary certificates and other information needed by the Government of India.

38.0 CODE REQUIREMENTS

38.1 The erection requirements and procedures to be followed during the installation of the equipment shall be in accordance with the relevant Indian Regulations, CEA/PGCIL(CTU)/POSOCO/RLDC's Guidelines, ICE, IECC, BSS, IEC, NFPA, ASME codes and accepted good engineering practice, the Engineer's drawings and other applicable Indian recognized codes and the laws and regulations of the Government of India.

39.0 GRID COMPLIANCE, SLDC COORDINATION AND SCHEDULING OBLIGATIONS

39.1 The Contractor shall ensure full compliance with all GETCO / SLDC / GUVNL / IEGC requirements for the 132 kV VRFB BESS grid connection, including but not limited to:

39.2 Installation and commissioning of Main Meter and Check Meter (Class 0.2S, ABT-compliant) at the designated metering point at GETCO's substation, and backup meter at GIPCL's 132 kV bus, in coordination with GETCO's metering team.

39.3 Installation of communication equipment (UGFO cable, FOTE / PMU if required by GETCO) for RTU/SCADA data transfer to GETCO's control centre in accordance with GETCO's RTU specifications.

39.4 Protection relay settings, protection coordination study, and inter-trip scheme approved by GETCO prior to first energisation. Anti-islanding protection testing as per GETCO grid code.

39.5 SLDC registration for the BESS as a grid-connected entity; scheduling and dispatch protocols compliance from COD as per GERC/IEGC regulations.

39.6 IEC 104 / IEC 61850 protocol commissioning and acceptance test with SLDC / GETCO representatives.

39.7 DSM / UI charges attributable to the Contractor's failure to comply with SLDC scheduling or dispatch instructions shall be borne entirely by the Contractor.

39.8 All fees, charges, and costs payable to GETCO for inspections, meter testing, protection relay approvals, and communication commissioning shall be borne by the Contractor.

40.0 FACILITIES TO BE PROVIDED BY THE OWNER/ PURCHASER

40.1 The following facilities alone shall be provided by the Owner to the Contractor for execution of this work. Any other facility, whatsoever required to complete the works shall be arranged by the Contractor within the contract price.

40.2 Space

40.3 The Contractor shall advise the Purchaser within seven (07) days from the date of acceptance of the Letter of Intent, about his exact requirement of space for his office, canteen, storage area, pre-assembly and fabrication areas, toilets, etc., the above requirement shall be reviewed by



the Engineer and available open space will be allotted to the Contractor for erection of his temporary structures like office, storage sheds, and other utilities, etc., for his own as well as his Sub-Contractor's use. No space will be provided by the Purchaser for the Contractor's labour. All facilities for labour housing shall be the sole responsibility of the Contractor. The balance requirement of space over and above what is allotted by GIPCL shall be met by the Contractors through his own means.

40.4 Available open space shall be provided to the Contractor for storage of materials during the period of storage and erection. The bidder shall visit the site and if required shall make his own arrangement for extra space if required at his cost. Bidder shall indicate the storage space requirements in his offer and this shall be discussed and finalized subject to availability.

40.5 The Contractor shall make proper arrangement for safe storage and protection of the equipment/materials during storage and erection till commissioning.

40.6 Electricity

40.7 As the Project Construction activities cannot be confined to a particular point and non-availability of any STU substation nearby, the Contractor shall arrange the construction power through DG sets to meet their construction need at their own cost. The Contractor shall make his own distribution arrangement to the spots of requirements including required electrical power distribution board with electrical protection including ELCBs. All initial installation and distribution costs for construction power shall be borne by the contractor. Statutory approvals required for DG set and payment of electricity duty shall be in the scope of the Contractor.

40.8 All temporary wiring must comply with safety erection regulations and shall be subjected to Engineers inspection/ approval before connection to supply. The non-availability of supply or its quality shall not be cited as hindrance of work execution.

40.9 Water

40.10 The Contractor shall make his own arrangement for water for erection/construction & drinking purposes (or any other purpose required by contractor). However the owner may provide water based on availability from existing water network at one point, distribution at required locations is contractor's responsibility.

40.11 Erection Tools and Equipment

40.12 The Purchaser shall not be responsible or held liable for any damage to person or property consequent upon the use, misuse or failure of any construction/ erection tools and equipment used by the Contractor or any of his Sub-Contractors, such construction/ erection tools and equipment may be furnished, rented or loaned to the Contractor or any of his Sub-Contractors.

40.13 The acceptance of such construction/ erection tools and equipment by the Contractor or his Sub-Contractors shall be construed to mean that the Contractor accepts all responsibility for and agrees to indemnify and save harmless the Purchaser from any and all claims for said damages resulting from said use, misuse or failure of such construction tools and equipment.

41.0 AUXILIARY POWER SUPPLY ARRANGEMENT AND METERING AT SITE

41.1 Construction Power:

41.2 The Contractor shall make its own arrangements for all construction power requirements through DG sets or through a temporary connection from Discom. All costs including DG set procurement, statutory approvals, electricity duty, and distribution arrangement to various work locations shall be borne by the Contractor.



41.3 Permanent Auxiliary Power Connection:

41.4 The Contractor shall design, install, commission, and maintain a separate metered auxiliary power connection for the VRFB BESS system as required under the BESPPA / SCC provisions. The auxiliary power meter shall be of accuracy Class 0.2S and shall be read and recorded monthly by the Contractor, with readings submitted to the Owner within 5 working days of month-end. Cost of auxiliary power consumed during the O&M period shall be on the Contractor's account as per the Contract terms. DSM / UI charges arising from auxiliary power scheduling non-compliance shall be borne exclusively by the Contractor.

42.0 CLOSING OF SITE OFFICE

42.1 After completing the works at site, the contractor shall remove all temporary works constructed by him as identified by the Owner and hand over back to the Owner the balance clear space & un-dismantled closed space as constructed. No cost shall be paid for the sheds handed over to the owner after closing of the office / storage yard.

42.2 The contractor shall remove all erection equipment brought by him to site for execution of the contract as directed by the owner within the time limits to be stipulated then by the owner, failing which site rent at applicable rates shall be intimated and levied on the Contractor.

42.3 All the balance supplies left over after completing the erection works & belonging to the Owner shall be deposited and stacked in the stores as instructed by the Owner.

42.4 Unless all material are removed and clear space is handed over back to the owner, the final bill payment as well as release of contract performance security shall not be considered by the owner.

42.5 On completion of the erection activities the contractor shall return the labour license to the Labour Commissioner and submit a proof of having cancelled the labour license to the owner.

43.0 DEFECTIVE WORKS

43.1 If the works or any portion thereof shall be damaged in any way excepting by the acts of the Purchaser, or if defects not readily detected by prior inspection shall develop before the final completion and acceptance of the whole work, the Contractor shall forthwith make good, without compensation, such damage or defects in a manner satisfactory to the Purchaser/Engineer. In no case shall defective or imperfect work be retained.

44.0 DEFECT LIABILITY

44.1 The Contractor must warrant that the facilities or any part thereof shall be free from defects in the design, engineering, materials and workmanship of the Plant and Equipment supplied and of the work executed.

44.2 If it shall appear to the authorized representative of the Company that any supplies have been executed with unsound, imperfect or unskilled workmanship, or with materials of any inferior description, or that any materials or articles provided by the Contractor for the execution of Contract are unsound or otherwise not in accordance with the Contract, the Contractor shall on demand in writing inform the authorized representative of the Company specifying the item, materials or articles complained of, notwithstanding that the same may have been inadvertently or otherwise passed, certified and paid for. The Contractor shall forthwith rectify or remove and replace that item so specified and provide other proper and suitable materials or articles at its own charge and cost, and in the event of failure to do so within a period to be specified by the authorized representative of the Company in its demand aforesaid, the Project Manager may on expiry of notice period rectify or remove and re-execute the time or remove and replace with others, the materials or articles complained of as the case may be at the risk and cost in all



respects of the Contractor. The decisions of the authorized representative of the Company as to any question arising under this Clause shall be final and conclusive.

- 44.3 If during the Defect Liability Period any defect found in the design, engineering, materials and workmanship of the Plant and Equipment supplied or of the work executed by the Contractor, the Contractor shall promptly, in consultation and agreement with GIPCL regarding appropriate remedying of the defects, and at its cost, repair, replace or otherwise make good (as the Contractor shall, at its discretion, determine) such defect as well as any damage to the Facilities caused by such defect.
- 44.4 GIPCL shall give the Contractor a notice stating the nature of any such defect together with all available evidence thereof, promptly following the discovery thereof. GIPCL shall afford all reasonable opportunity for the Contractor to inspect any such defect.
- 44.5 GIPCL shall provide the Contractor all necessary access to the Facilities and the Site to enable the Contractor to perform its obligations.
- 44.6 The Contractor may, with the consent of the Company, remove from the Site any Plant and Equipment or any part of the Facilities that are defective, if the nature of the defect and/ or any damage to the Facilities caused by the defect is such that repairs cannot be expeditiously carried out at the Site.
- 44.7 If the repair, replacement or making good is of such a nature that it may affect the efficiency of the Facilities or any part thereof, the Company may give to the Contractor a notice requiring that tests of the defective part of the Facilities shall be made by the Contractor immediately upon completion of such remedial work, whereupon the Contractor shall carry out such tests.
- 44.8 If such part fails the tests, the Contractor shall carry out further repair, replacement or making good (as the case may be) until that part of the Facilities passes such tests. The tests, in character, shall in any case be not inferior to what has already been agreed upon by GIPCL and the Contractor for the original equipment/part of the Facilities
- 44.9 If the Contractor fails to commence the work necessary to remedy such defect or any damage to the Facilities caused by such defect within a reasonable time (which shall in no event be considered to be less than seven (07) days), the Company may, following notice to the Contractor, proceed to do such work, and the reasonable costs incurred by GIPCL in connection therewith shall be paid to GIPCL by the Contractor or may be deducted by the Company from any monies due to the Contractor or claimed under the Performance Guarantee, without prejudice to other rights, which GIPCL may have against the Contractor in respect of such defects.
- 44.10 If the Facilities or any part thereof cannot be used by reason of such defect and/ or making good of such defect, the Defect Liability Period of the Facilities or such part, as the case may be, shall be extended by a period equal to the period during which the Facilities or such part cannot be used by the Company because of any of the aforesaid reasons. Upon correction of the defects in the Facilities or any part thereof by repair/ replacement, such repair/ replacement shall have the defect liability period of eighteen (18) months from such replacement.
- 44.11 In addition, the Contractor shall also provide an extended warranty for any such component of the Facilities and for the period of time. Such obligation shall be in addition to the Defect Liability Period specified under Clause 10.1.0 in Sec-4.

45.0 PROGRESS PAYMENT FOR SITE WORK

- 45.1 All progressive payments for erection/ construction works shall be based on milestone progress achieved. The Contractor shall submit a detailed schedule for such milestones which shall be mutually discussed and agreed between Purchaser and Contractor.



45.2 The Contractor shall not demand nor be entitled to receive payment for the work or portion thereof, except in the manner set-forth in his 'Contract' and only after the Purchaser/ Engineer shall have given a certificate for such payment.

46.0 FACILITIES TO BE PROVIDED BY THE CONTRACTOR

46.1 TOOLS, TACKLES AND SCAFFOLDINGS

46.2 The Contractor shall provide at his own expense, all the erection equipment, cranes, man lifter, hydra, farana, erection tools, machine tools, power tools, tackles, hoists cranes, derricks, cables sling, skids, scaffolding, work benches, tools for rigging, cribbing and blocking, welding machines, preheating and stress relieving equipment, X-ray and all associated protection equipment, instruments, appliances, materials and supplies required for unloading, transporting, storing, erection, testing and commissioning that may be required to accomplish the work under the Contract unless otherwise to final determination of the Purchaser/ Engineer. He shall submit a list of all such material to the Purchaser/ Engineer before the commencement of preassembly at 'site'. These tools and tackles shall not be removed from the 'site' without the written permission of the Purchaser/ Engineer.

46.3 The Contractor shall also furnish all necessary expandable devices like anchors, grinding and abrasive wheels, hacksaw blades, taps, dies, drills, reamers, chisels, files, carborundum stones, wire brushes, necessary scaffolding, ladders, wooden planks, timbers, sleepers and consumable materials like oxygen, acetylene, argon, lubricating oils, greases, cleaning fluids, graphite powder and flakes, fasteners, gaskets, temporary supports, stainless steel shims of various thickness as required, cotton waste, cheese cloth and all other miscellaneous supplies of every kind required for carrying out the work under the 'Contract'.

46.4 The Contractor shall provide all reasonable facilities including tools, personnel, etc., and ensure co-ordination with the Purchaser/ Engineer and the Manufacturer's erection supervisors to enable them to carry out all supervision, measurements, checks etc., in a satisfactory manner.

46.5 The Contractor shall inform the Purchaser about arrival of all tools, tackles and scaffoldings. The Contractor shall not dispose or transport or withdraw any tools, tackles, equipment and material provided by him for the 'Contract' without taking prior written approval from the Purchaser/Engineer, and the Purchaser/ Owner at all times shall have right to refuse permission for disposal, transport or withdrawal of tools, tackles, equipment and materials, if in his opinion, the same will adversely affect the efficient and expeditious completion of the 'Project'.

47.0 COMMUNICATION

47.1 The Contractor shall make his own arrangement for all his communication needs such as mobile, Internet Connectivity, telephone; telex etc., at his site office.

48.0 RTU / SCADA / EMS / PPC INSTALLATION AND COMMISSIONING AT SITE

48.1 SCADA / EMS / PPC System Scope:

The Contractor shall design, supply, install, test, commission, and integrate a complete SCADA / EMS / PPC system for the VRFB BESS as specified in Volume II Technical Specification. The system shall provide real-time monitoring, control, data acquisition, alarm management, event logging, and reporting for the full VRFB BESS installation including all stacks, electrolyte systems, PCS units, auxiliary systems, fire detection, and grid interface.

48.2 SLDC / GETCO Interface:



The Contractor shall install and commission an RTU at the GIPCL site configured for IEC 104 / IEC 61850 protocol communication with SLDC / GETCO.

SCADA interface with GETCO's control centre shall be commissioned and tested per GETCO's RTU specification, and the acceptance test shall be witnessed by GETCO's representatives.

The Contractor shall coordinate with SLDC for scheduling portal registration, telemetry interface, and punch-in obligations as required from COD.

48.3 Data Reporting and Archival:

The SCADA system shall archive all VRFB performance data (power, energy, SOC, availability, RtE, electrolyte parameters, temperature, alarms, trips, events) at 1-minute or better resolution for the full O&M period. Data shall be accessible by the Owner in real-time and historical formats via OPC-DA / OPC-UA or a web-based interface. Data integrity and cybersecurity of the SCADA system shall be ensured as per IEC 62351 requirements. The Contractor shall not remove, modify, or delete any archived data without prior written consent of the Owner.

49.0 GETCO / STU INTERFACE REQUIREMENTS AT SITE

49.1 The Contractor shall comply with all GETCO / STU interface requirements for the 132 kV VRFB BESS grid connection at site, including but not limited to:

49.2 Installation of Main Meter and Check Meter (Class 0.2S, ABT-compliant) at the GETCO-designated metering point and backup meter at GIPCL's 132 kV bus. Meter configuration, sealing, and commissioning shall be in coordination with GETCO's metering team.

49.3 Installation of communication equipment (UGFO / OFC cable, FOTE / PMU where required by GETCO) for RTU and SCADA data transfer to GETCO's Energy Management Centre (EMC).

49.4 Protection relay settings verification, protection coordination study approval, and inter-trip scheme testing as per GETCO grid code requirements prior to first energisation.

49.5 Anti-islanding protection testing and grid compliance testing as per GETCO Grid Code and CEA regulations.

49.6 All fees, charges, costs, and deposits payable to GETCO for inspections, meter testing, CT/PT verification, protection relay approvals, communication system commissioning, and any other GETCO requirements shall be borne by the Contractor.

49.7 The Contractor shall submit to the Owner copies of all GETCO approvals, inspection reports, and commissioning clearances as they are received.

50.0 INSURANCE

50.1 In addition to the conditions covered under the clause entitled "Insurance", the following provisions shall also apply to the portion of the works to be done beyond the Contractor's own or his Sub-Contractor's manufacturing works. Comprehensive insurance of equipment during erection and commissioning, workmen's Compensation Insurance, comprehensive Automobile insurance and Comprehensive General Liability Insurance shall be the responsibility of the Contractor. Contractor shall generally take the insurance from nationalized insurance companies.

50.2 WORKMEN'S COMPENSATION INSURANCE

a) The insurance shall protect the Contractor against all claims applicable under the workmen's compensation Act 1948 (Government of India). This policy shall also cover the Contractor against claims for injury, disability, disease or death of his or his Sub-Contractor's employees, which for any reason are not covered under the workmen's compensation Act, 1948. The liabilities shall not be less than:

b) Workmen's compensation: As per statutory provisions

c) Employee's liability : As per statutory provisions



- d) Recoveries will be made from Contractor's bills for any liability for the accident and refund shall be considered later after the claim is fully settled by the insurance authorities.

50.3 COMPREHENSIVE AUTOMOBILE INSURANCE

The insurance shall be in such a form to protect the Contractor against all claims for injuries, disability, disease and death to members of public including the Purchaser's men and damage to the property of others arising from the use of motor vehicles during on or off the site operations, irrespective of the ownership of such vehicles. The liability covered shall be as per Motor Vehicles Act.

50.4 COMPREHENSIVE GENERAL LIABILITY INSURANCE

- a) insurance shall protect the Contractor against all claims arising from injuries, disabilities, diseases or death of members of public or damage to property of others, due to any act or omission on the part of the Contractor, his agents, his employees, his representative and Sub-Contractors or from riots, strikes and civil commotion. This insurance shall also cover all the liabilities of the Contractor arising out of the clause 50.0 entitled "Defense of Suits" under Section – 4 General Terms and Conditions of Contract.
- b) The hazards to be covered will pertain to all the works and areas where, the Contractor, his Sub-Contractors, his agents and his employees have to perform work pursuant to the Contract.

50.5 FIRE INSURANCE

- a) Unless otherwise instructed by the Purchaser/ Engineer, the Contractor shall, on signing the 'Contract', insure the works and keep them insured until the completion of the 'Contract' against loss or damage by fire, with the Company to be approved by the Purchaser/Engineer, in the joint names of the Purchaser and the Contractor for such amount and for any further sum, if called upon to do so by the Purchaser/Engineer, the premium of such further sum being allowed to the Contractor as an authorized extra. Such policy shall cover the property of the Purchaser only and shall not cover any property of the Contractor or any Sub-Contractor, or his employees. The Contractor shall deposit the policy receipts for the premium with the Purchaser/Engineer within twenty one (21) days from the date of signing the 'Contract' unless otherwise instructed by the Purchaser/Engineer. In default of the Contract insuring as provided above, the Purchaser may so insure and may deduct the premiums paid from any money due, or which may become due to the Contractor. The Contractor shall, as soon as the claim under the policy is settled, or the work reinstated by the Insurance Office should they elect to do so, proceed with all due diligence with the completion of the works in the same manner as though the fire had not occurred and in all respects under the same conditions of 'Contract'. The Contractor will arrange all the replacement material damaged during fire accident if any without for finalization of his claim with insurance Company. The claim received if any will be passed on to the Contractor.
- b) The above are only illustrative list of insurance covers normally required and it shall be the responsibility of the Contractor to maintain all necessary insurance coverage to the extent both in time and amount to take care of all his liabilities either direct or indirect, in pursuance of the Contract.

51.0 CHEMICAL AND ENVIRONMENTAL LIABILITY INSURANCE



- 51.1 In addition to the insurance coverages specified under Clause 50.0, the Contractor shall obtain and maintain throughout the Contract period (EPC + DLP + O&M) a Chemical / Environmental Liability Insurance policy covering:
- 51.2 Third-party bodily injury and property damage arising from vanadium electrolyte spillage, leakage, or chemical release during transportation, storage, handling, and commissioning at or near the project site.
- 51.3 Environmental damage including soil, water, and groundwater contamination due to electrolyte or other chemical spills at site.
- 51.4 Costs of clean-up, remediation, decontamination, and disposal required under applicable environmental laws including the Environment Protection Act and Hazardous Waste Rules.
- 51.5 The minimum coverage shall be not less than INR 5 Crore per incident and INR 10 Crore in aggregate per policy year. The policy shall name GIPCL as an additional insured. Policy documents shall be submitted to the Owner for acceptance within thirty (30) days of the Effective Date. In the event of any chemical incident, the Contractor shall notify the Owner within one (01) hour and submit a written incident report within twenty-four (24) hours.

52.0 ADHERENCE TO MANUFACTURER'S INSTRUCTION

- 52.1 Adherence to instructions of the Manufacturer's supervisory engineers, where provided, is compulsory. The Contractor shall work under the guidance of the Manufacturer's supervisors to ensure that erection procedure adopted by the Contractor as well as completed erection of equipment is such as not to interfere with or prevent equipment from functioning as intended, as well as to the entire satisfaction of the Manufacturer's supervisor/ Purchaser/ Engineer.
- 52.2 The Contractor shall also permit and provide all facilities for the Manufacturer's erection supervisors to carry out all checks that they may wish to and approve any erection procedure and / or final setting and alignment of component, in order to satisfy themselves that erection has been carried out as intended by them. This shall, however, in no way relieve the Contractor of his responsibility for providing adequate and competent supervision and quality workmanship. In case of any dispute, the decision of the Purchaser/ Engineer/ Manufacturer's erection supervisor shall be final.

53.0 MODIFICATIONS

- 53.1 The Contractor shall carry out all modifications at site as directed by the Purchaser/Engineer to complete the work covered in this Contract. It is the responsibility of the Contractor to get the prior approval for such modifications from the Purchaser/ Owner before such works are taken final.

54.0 HANDING OVER

- 54.1 In the event of the Contractor being prevented by causes not attributable to him from proceeding with erection or from completing erection before he withdraws from the site he shall hand over to the Purchaser for safe keeping during his absence such Contract material that he is usable to erect, and the Purchaser will furnish a receipt for material so handed over.
- 54.2 If the executions of Performance Guarantee Tests (PG tests) are delayed for reasons beyond the control of the Contractor, the plant may be handed over to the Purchaser. However, the Contractor has to complete the PG tests at the appropriate time and establish the Guaranteed Parameters. The Guarantee cover for equipment and spares etc. will take effect only from the date of satisfactory completion of PG tests, and written acceptance of the results by the Purchaser. However the maximum delay shall be limited to 6 months beyond the stipulated date or a mutually agreed period.



55.0 WASTE MATERIALS & DE MOBILISATION

- 55.1 All waste materials as decided by the site Engineer should be let out of the compound at Contractor's cost and the Contractor should keep the site always clean during progress of work.
- 55.2 On Completion of work, the Contractor shall promptly demobilize from the site and leave the place within two months from the date of handing over of site to GIPCL, in a manner, as directed by the owner/ Engineer.

56.0 INCIDENTAL WORKS

- 56.1 All the works such as cleaning, checking, leveling, assembling, temporary erection for alignment, dismantling of certain equipment for checking and cleaning, preparation, fabrication of plates/ sheets, tubes and pipes as per general engineering practice at site, cutting, gauging, grinding, straightening, filling, chipping, drilling, reaming, lapping, shaping, fitting, heat treatment cable laying, etc. and minor civil works as incidental to the erection and necessary to complete the work satisfactorily shall be carried out by the Contractor's workers at no extra cost, to the Owner.

57.0 LIABILITY FOR ACCIDENTS AND DAMAGE

- 57.1 In EPC contract the contractor shall be entirely responsible for all loss, damage or depreciation to the plant until the plant has been delivered at the site on the plinth/ structure or as decided by the Engineers.
- 57.2 The Contractor shall, during the progress of the work, properly cover up and protect the plant from injury by exposure to the weather, and shall take every reasonable , proper, timely and useful precaution against accident or injury to the same from any cause and shall be and remain answerable and liable for all accidents or injuries thereto which until the same be, occasioned by the acts or omissions of the Contractor or his workmen or Sub-Contractors and all losses and damages to the plant arising from such accidents or injuries as aforesaid shall be made good in the most complete and substantial manner by and at the sole cost of the Contractor and to the reasonable satisfaction of the Engineer.
- 57.3 Until the plant shall be or deemed to be taken over as aforesaid, the Contractor shall also be liable for and shall be deemed to have indemnified the Purchaser in respect of all damage or injury to any person or to any property of the Purchaser or of others occasioned by the negligence of the Contractor or his workmen or Sub-Contractors or by defective design, work or material, but not otherwise.
- 57.4 Provided that the Contractor shall not be liable under the Contract for any loss or profit or loss of Contracts or any claims made against the Purchaser not already provided for in the Contract, nor for any damage or injury caused by or arising from the acts of the Purchaser or of others, or (save as to damage by fire as hereinafter provided) due to circumstances over which the Contractor has no control, nor shall his total liability for loss, damage or injury exceed the total value of the Contract.
- 57.5 The Contractor shall be deemed to have indemnified and save harmless to the Purchaser against all actions, suits, claims, demands, costs or expenses arising in connection with injuries suffered prior to the date when the plant shall have been taken over by person employed by the Contractor or his Sub-Contractor on the works whether under the general law or under the Workmen's Compensation Act VIII of 1923, or any other statute in force on the date of the Contract dealing with the question of the liability of Owner for injuries suffered by employees and to have taken steps properly to insure against any claims there under.
- 57.6 On the occurrence of an accident which results in the death of any of the workmen employed by the Contractor or which is so serious as to be likely to result in the death of any such



workmen, the Contractor shall, within 24 hours of the happening of such accident intimate in writing to the Engineer, the fact of such accident. The Contractor shall indemnify the GIPCL against all loss or damage sustained by the GIPCL resulting directly or indirectly from his failure to give intimation in the manner aforesaid including the penalties or fines if any payable by the GIPCL as a consequence of the GIPCL's failure to give notice under the workmen's Compensation Act or otherwise, to conform to the provision of the said act in regard to such accident.

- 57.7 In the event of any claim being made or action brought against the Purchaser involving the Contractor and arising out of the matters referred to and in respect of which the Contractor is liable under this clause, the Contractor shall be immediately notified thereof and he shall, with the assistance if he so requires of the Purchaser, but at the sole expense of the Contractor conduct all negotiations for the settlement of the same or of any litigation that may arise there from. In such case, the Purchaser shall, at the expense of the Contractor, afford all available assistance for any such purpose.
- 57.8 In the event of an accident in respect of which compensation may become payable under the Workmen's Compensation Act VIII of 1923, whether by the Contractor or by the Government as Principal, it shall be lawful for the Owner to retain out of money due and payable to the Contractor such sum or sums of money as may, in the opinion of the Engineer, but sufficient to meet such liability. The opinion of the Owner shall be final in regard to all matters arising under this clause.
- 57.9 Safety instructions issued by the HSE (Health Safety and Environment) authorities/ such authorized personnel of GIPCL shall be adhered by the Contractor.
- 57.10 The Owner reserves the right to suspend part or whole of the works at any stage of execution. During suspension, the Contractor shall adequately protect the Works and materials. Restart of work shall be undertaken strictly as per written instructions of the Owner without automatic entitlement to extension of time or cost.

58.0 NIGHT WORK

- 58.1 The Contractor may work during the night hours to complete the work. Engineer may consider granting permission for working during night hours, if he considers it essential in order to complete the work in the stipulated time, on a specific request by the Contractor. Night work shall not entitle the Contractor to any extra payment. Where night work is in progress sufficient lights shall be provided by the Contractor at his cost, to safeguard the workmen and the public and he shall take suitable precautions to prevent accidents. Excavated areas shall be barricaded and provided with red lights as a caution to prevent accidental falls.

59.0 SUBLETTING OF CONTRACT

- 59.1 The contract is not transferable. No part of the contract shall be sublet without the written permission of the Chief Engineer/Projects.

60.0 CONTRACT QUALITY ASSURANCE

- 60.1 The Contractor shall submit immediately after the issue of LOI, the Quality Assurance Programme containing the overall quality management and procedures which he proposes to follow in the performance of the works during various phases as detailed in relevant clauses of the "Technical Specification and Scope of supply and Work" covered in this Specification and this Quality assurance programme will be reviewed by the OWNER.

61.0 PENALTY FOR THE VIOLATION OF FACTORY ACT & RULES



61.1 The contract is liable for termination, if any of the provisions of the factory act and the rules there-under is violated. Contractors obligations to ensure security for the project shall be complied with.

62.0 FIELD ENGINEERING CLARIFICATIONS

62.1 The Contractor shall provide all necessary field engineering clarifications to the Owner/Purchaser for the overall engineering/startup of equipment supplied by the Contractor.

63.0 CLEANING AND SERVICING

63.1 Upon completion of the work, the Contractor shall remove from the vicinity of the work all plant, buildings, rubbish unused materials, concrete forms and other materials, belonging to him or used under his discretion, during construction and in the event of his failure to do so, the same will be removed by the Purchaser and the relevant expenditure recovered from the Contractor.

63.2 The Contractor shall ensure that, inside of all tubes, pipes, valves, fittings and actuators shall be free from dirt and loose scales by thoroughly blowing and/or flushing or servicing before being erected.

64.0 IMPLEMENTATION AND FIELD QUALITY PLANS

64.1 It will be the responsibility of the Contractor to ensure that the erection of the equipment supplied by the Contractor is being carried out according to the quality plans and standard manufacturing practice/instructions as given by the manufacturer. In case of any deviations noticed in performing the erection in accordance with such quality plan etc., the Contractor shall forthwith inform the Owner/Purchaser of such deviations. However the Contractor shall be fully responsible for any consequential liability.

64.2 The contractor shall ensure quality norms in VRFB, PCS, Transformers and other auxiliaries as per the requirements of IECG/Chief Electrical Inspector of Gujarat/CEA.

65.0 TOKENS FOR LABOUR

65.1 The Contractor must issue tokens to his workers in the prescribed form and subject to such conditions as pre-scribed by the Owner in charge and enter the list of persons holding such tokens in a separate register. The Contractor must maintain details of the men employed by him for each work in this register. This register must be produced for inspection by the GIPCL's officers as and when required.

65.2 Except on specific permission of the Engineer in charge shall the Contractor's workmen enter into the parts of the BESS Plant, where they have normally no works to do. Any violation of this condition by the Contractor's workmen will be considered as trespass and dealt with accordingly.

65.3 The Contractor will be held responsible for the theft of any materials belonging to the GIPCL if found detected in the Sub Contractor's Lorries plying within the BESS Plant.

66.0 PURCHASER'S LIEN ON EQUIPMENTS

66.1 The Purchaser shall have lien on all equipment including those of the Contractors brought to the site for the purposes of erection, testing and commissioning of the plant. The Purchaser shall continue to hold the lien on all such equipment till final acceptance of plant. No material brought to the site shall be removed from the site by the Contractor and / or his Sub-Contractors without the prior written approval of the Engineer.



67.0 INSPECTION, TESTING AND INSPECTION CERTIFICATES

67.1 The provisions of the clause entitled "Inspection, Testing and Inspection Certificates" under the Technical Conditions of the Contract shall also be applicable to the erection portion of the works. The Engineer shall have the right to re-inspect any equipment though previously inspected and approved by him, at the Contractor's works, before and after the same are erected at site. If by the above inspection, the Owner rejects any equipment the Contractor shall make good for such rejections either by replacement or modifications/ repairs as may be necessary, to the satisfaction of the Engineer. Such replacements shall also include the replacements or re-execution of such of those works of other Contractor and/ or agencies, which might have got damaged or affected by the replacements or re-work done to the Contractor's work.

68.0 ANNUAL AVAILABILITY AND PERFORMANCE TEST PROCEDURE AT SITE

68.1 Annual Performance Test (APT) Obligation:

- a) The Contractor shall carry out an Annual Performance Test (APT) at the end of each year of the O&M period in accordance with IEC 62933-2-1 (Electrochemical based energy storage systems — Unit parameters and testing methods — Battery systems). The APT shall demonstrate the following minimum performance parameters:
- b) Rated Discharge Power at POI: minimum 20 MW (net, including auxiliary consumption).
- c) Rated Energy Output: minimum 120 MWh per full charge-discharge cycle at rated power (net at POI).
- d) Round-Trip AC-AC Efficiency (RtE): minimum 70% (yearly average measured at POI).
- e) Annual Average Availability: minimum 95% for the test year.
- f) Minimum Dispatchable Capacity: as per the year-wise capacity retention schedule specified in the SCC.

68.2 Test Procedure:

- a) The APT shall be witnessed by the Owner / Engineer and a NABL-accredited Third-Party Inspector appointed by the Owner.
- b) The Contractor shall submit the test programme and test procedure document at least thirty (30) days before the scheduled APT date, for Owner's approval.
- c) Test boundary conditions, instrumentation, data acquisition protocol, and measurement uncertainty analysis shall be as per IEC 62933-2-1.
- d) Completed test results with analysis shall be submitted to the Owner within fifteen (15) days of test completion.
- e) If APT results indicate non-compliance with any guaranteed parameter, the Contractor shall identify the root cause, rectify the deficiency, and re-test within sixty (60) days at its own cost. Failure to meet the guaranteed parameters in the re-test shall result in LD recovery.

69.0 PHOTOGRAPHS AND PROGRESS REPORT

69.1 The monthly progress report detailing out the progress achieved on all erection activities as compared to the schedules. The report shall also indicate the reasons for the variance between the schedule and actual progress and the action proposed for correction wherever necessary.

69.2 The Contractor shall furnish three (3) prints each; of photographs showing milestone activity at site to the Owner. Photographs shall be taken as and when required and shall be submitted quarterly for progress review. Photographs shall be adequate in size and number to indicate various stages of erection. Each photograph shall contain the date, the name of the Contractor and the title of the photograph.



69.3 In addition to the above, the erection of critical equipment is to be video-graphed and provided to the Purchaser in the Compact Disc (CD)/USB Pen drive for future reference.

70.0 A WRITTEN STATEMENT BY THE CONTRACTOR STATING THAT HE WILL FULLY MEET THE REQUIREMENTS OF THE SPECIFICATION SHALL BE GIVEN IN THE AGREEMENT SIGNED BY THE CONTRACTOR

70.1 The Contractor shall submit the following before the commencement of work:

- a) To furnish details of special precautions and instructions to be followed and checklist for erection, testing and commissioning of the plant.
- b) To furnish all required drawings, documentation for assembly, erection, testing and commissioning of the plant. Instructions regarding storage, handling, precautions etc., and checklists at various stages till the plant is installed.
- c) Time schedule for design, manufacture, testing and shipment is to be furnished, taking into account the time schedule given by GIPCL.

71.0 Safety and security of material and equipment during contract period is the responsibility of the contractor.

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