

**UNHCR**United Nations High Commissioner for Refugees
Haut Commissariat des Nations Unies pour les réfugiés

Terms of Reference

This short version of the Engineering (E) Specification is written according to UNHCR needs and requirements.

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UNHCR Malaysia's Branch Office in Kuala Lumpur is a compound consisting few of the building including office premise, interview cabin, cafeteria, guard house and etc. These building was constructed about 45 years ago and it has undergone several renovations and modification on the Electrical System.

The following information is related to the scope of work, Design intent, Installation standard, equipment and material standard guideline and requirements for Rental Genset work on the related UNHCR's buildings.

Objectives: -

- To back up the Main Switch Board during TNB power outage.
- Ensure all the electrical installation is in compliance to the statutory standard.
- Ensure all the load that related to safety and security can be function during the power outage
- New As build drawing and O&M manual for future maintenance.

1) SCOPE OF WORKS (SOW)

1.1 INTENT

- a) Supply and install 400kVA rental genset at site c/w AMF panel located inside the canopy and others related work that are required for completion of the installation work.
- b) To coordinate and liaise closely with the respective electrical contractor for the completion of the installation work.
- c) It is the intent of this Specification to define the scope of works relating to the supply, delivery, installation, testing and commissioning of equipment and materials to the project site
- d) All work carried out must conform to these standards and must include all components required to install such equipment and materials on Site.

1.2 DESCRIPTION OF WORK (GENERAL)

- a) The contractor is required to supply and install new rental genset c/w the necessary accessories.
- b) To supply and install new neutral earthing and earthing system for the new genset.
- c) To modify and extend the existing genset roofing to suit the new genset size.
- d) To submit all the necessary documents to Energy Commission Malaysia, Department of Environment (DOE) and others related authorities in Malaysia for their approval.

1.3 DESCRIPTION OF WORK (GENERATOR PREVENTIVE MAINTENANCE)

- a) The contractor shall provide all materials, supervision, labor, tools, and equipment to perform preventive maintenance. All personnel working in the vicinity shall wear and /or use safety protection while work is performed. Any questions or injuries shall be brought to the attention of the Safety Associate.

If any discrepancies are found with the generator systems that are not covered under this scope of work, the contractor must provide the following:

- 1. Detailed report noting the discrepancy found.
- 2. Bill of Materials (BOM) to include component name, quantity, part, and price for any repair material required and material lead time.
- 3. Price quote for repair labour.

At a minimum, the following work must be completed:

Notes:

- Contractor should submit review, worksheet/checklist that will be used for performing maintenance service.
- Contractor must immediately be made aware of any condition discovered that could result in equipment failure.
- Test and inspection report shall be submitted to UNHCR upon completing of work.

Maintenance Interval Schedule (Standby Generator)

Notes:

- Generators experiencing periods of prime usage and those operating in severe environments may require more frequent maintenance.
- Before each consecutive interval is performed, all maintenance from the previous intervals must be performed.

A. Monthly Preventative Schedule

1. Conduct visual inspection around generator.

- Check for evidence of leaks, damage, loose or missing hardware.
- Inspect engine and generator wiring harness for wear and damages.
- Inspect supports and spring isolators for soundness and stability.
- Inspect unit for corrosion.
- Hoses and Clamps - Inspect/Replace If needed.
- Belts - inspect/Adjust/Replace if needed.
- Inspect all fuel, oil, and water piping for secure mounting.
- Inspect exhaust piping and muffler Insulation.

2. Batteries

- Battery charger - inspect operation and clean.
- Battery electrolyte level and specific gravity - Check and adjust. Add distilled water as needed
- Perform battery load test.
- Clean battery terminals and lugs (apply grease on terminal connections).

3. Fluids and Filters

- Cooling System Coolant Level - Check and adjust.
- Coolant conditioner (DCA/SCA) - Check and adjust to specs.
- Jacket Water Heater - Check proper operation.

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- Engine Oil Level - Check and add if needed.
- Fuel/water separators - Drain water.
- Engine Air Cleaner Service Indicator - Check, clean filter If needed.

4. Generator Room

- Fuel tanks - Inspect and treat fuel if needed, check fuel level, drain water and sediment.
- Automatic fuel system -Check operation and control panel.
- Space Heater/Room exhaust fan - Check for proper operation.
- Air intake/exhaust - Ensure nothing obstructs airflow; louvers are free and operate properly.
- Exhaust condensate trap - drain condensate.

5. Control Panel

- Electrical Connections - Check tightness
- Clean and remove dust from panel.
- Clean and remove dust.
- Inspect seals.
- Note date of last battery change. (Replace if 2 years or older).
- Tighten connections.
- Check for hot spots.

6. Additional

- Ensure Generator/ATS is left in proper position for automatic start and transfer.
- Clean generator and generator room. Wash radiator if necessary.
- Annotate date, hours and maintenance in Generator log, fill out maintenance checklist and report deficiencies to COR.
- Perform any additional maintenance task as recommended in the manufacture's operation and maintenance manuals.
- Submit Service Inspection and Test Report to Safety Advisor.

7. Annual Schedule

1. Conduct Semi-Annual PM service
2. Engine Air Cleaner Elements - Replace
3. Engine Crankcase Breather - Clean.
4. Engine Oil Sample - obtain and perform analysis. Submit report to COR.
5. Engine Oil and Filter - Replace.
6. Fuel Filters and Water Separators Replace.



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7. Obtain fuel sample at day tank and storage tank for analysis.
 8. Radiator - Clean (pressure wash). NEC GEN SETS PM REV 2.2017
 9. Intake louvers and ducts - Inspect/Clean (pressure wash).
 10. Fan Drive Bearing - Lubricate.
 11. Magnetic Pickups - Clean/inspect.
 12. Cooling system Coolant Sample - obtain
 13. Cooling System Supplemental Coolant Additive (SCA) - Test/Add
 14. Coolant filter - Change if applicable
 15. Crankshaft vibration Damper - Inspect
 16. Engine Protective Devices - Check
 17. Engine valve Lash - Inspect/Adjust
 18. Clean and lubricate fuel pump linkages if applicable.
 19. Fan bearing - inspect/Grease.
 20. Clean dust and vacuum all the controls, meters, switching mechanism components, interior buswork, Remote Start control panel, Annunciator and connecting lugs of the ATS.
 21. Inspect/check buswork and supporting hardware for carbon tracking, cracks, corrosion, or any type of deterioration.
 22. Check all control wiring and power cables (especially wiring between or near hinged door) for sign of wear and deterioration.
 23. Check the cabinet interior for loose hardware - tighten connections.
- Disposal of used oil, fuel, battery and other toxic substances. The Contractor is responsible for proper disposal of toxic/hazardous substances. All material shall be disposed of according to Government and Local law. After proper disposal the contractor must show proof of authorized disposal of these toxic/hazardous substances.

2) OTHERS REQUIREMENT

2.1 OTHERS RELATED SCOPE OF WORKS

- a) The contractor shall arrange for Factory Acceptance Test for major equipment supplied. Factory Acceptance Test shall be witnessed by the Client, Contract Administrator and/or mutually agreed third party.
- b) The works must include for cost of factory testing, test reports, insurances, transport and freight charges, shop drawings, shop visits, the supply and delivery to site of two (2) years spare parts for the equipment.



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- c) The works must include securing, assembling, collecting, and distributing to the Contractor the Maintenance and Operations Manual, and must include but not limited to catalogues, manufacturing drawings and data, factory testing and test reports, warranty certificates, spare part lists, maintenance and operation procedures and the like and forwarded to the Contractor in sufficient quantities (a least 4 sets) for binding.
- d) The contractor must be responsible to receive the equipment and materials supplied by the Client and Contractor on site, including hoisting, moving to permanent positions, or storing into temporary stores and installing them at designated positions on site.
- e) The cost of all equipment, materials as well as all packing costs, import and export permits, shipping and transportation costs, handling costs, port charges, duties and taxes imposed on locally available and/or locally assembled equipment and materials, import duties, sales tax and surtax, import licenses, permits, custom clearances and costs of all kind associated with the procurement of the equipment and materials will be the responsibility of the contractor.

2.2 RECEIVING, STORAGE AND HANDLING

- a) Upon arrival of any equipment and materials on site, the Contractor must jointly inspect all items in the inventory list to ascertain that all items are account for. Any equipment and materials found missing, faulty, damaged and or not in satisfactory condition must be duly recorded and reported to the Contract Administrator for a decision to repair or replace such equipment and materials at the Subcontractor's costs.
- b) The Contractor must comply with the contractor's written instructions for rigging, unloading, handling and transportation of the equipment and materials.
- c) The Contractor must provide all hoisting facilities, including any tools and manpower to open up any crates, cartons and any other packing for inspection, including repacking and repackaging as required.

2.3 DESIGN CODES AND STANDARDS

- a) All equipment and materials must be in accordance with the Specification and requirements and be in accordance with the latest standards and complying with the Rules and Regulations as per in the tender specification.

And shall be follow as per below authorities' requirement: -

- i. Jabatan Keselamatan & Kesihatan Pekerja (DOSH)
- ii. Tenaga Nasional Berhad (National Electricity Board)

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- iii. Jabatan Bomba dan Penyelamat Malaysia (Fire Services Department)
- iv. Suruhanjaya Tenaga Malaysia
- v. And all other authorities having jurisdiction over the manufacturer of the equipment and materials

2.4 EQUIPMENT AND MATERIAL APPROVAL

- a) The Contractor shall submit to the Engineer, if requested full and comprehensive manufacturing details for any item of plant, to assess its technical suitability and application for which it has been offered. This information shall include constructional details, and drawings performance graphs or curves assembly the test data as may be necessary.
- b) Each item of equipment shall be a standard factory product of an established, reputable, approved manufacturer. All similar equipment shall preferably be of the same manufacture, type class and finish, unless otherwise specified.
- c) Where manufacturer's catalogue numbers or types are specified or shown on Drawings, they are generally intended to be used as a guide, and are not intended to take precedence over the basic duty and performance specified or shown. In all cases, the duty with the particular characteristic of the equipment offered for approval shall be verified.
- d) Where no alternative materials or equipment are noted in the Specification or on Drawings, and where the words "equal", "approved", "or equivalent", etc. do not appear, the exact make and model specified must be furnished and installed.
- e) No alterations will be permitted in the list of manufacturers and suppliers committee by the Contractor without the written approval of the Engineer.
- f) Should the Contractor install materials and/or equipment other than by the approved manufacturer of supplier, such items may be rejected on site. All such rejected items should be removed from the site as soon as possible and be replaced by approved items at no cost to the Employer.
- g) The Contractor must submit for the approval of the Engineer; prior to commencing installation, a sample of all accessories, fittings and apparatus which are proposed to be employed in the work, and only such items as have been approved may be installed. Failure to comply with this provision will result in the unconditional rejection of such items.

2.5 EQUIPMENT DEVIATIONS

- a) The dimensions and rating of equipment specified herein or indicated on the Drawings are intended to establish the outlines and characteristics of equipment furnished by the particular manufacturers specified.
- b) Where such approval deviation requires a different quantity and/or quality and arrangement of architectural or structural materials, or a different quantity and/or quality and arrangement of piping, wiring, conduit and equipment from that specified or shown on the Drawings, the -Contractor shall furnish and install any such additional piping, structural supports, installation, controllers, motor, starters, electrical wiring and conduit, and any other additional materials and equipment required by the system at no additional cost to the Employer.

2.6 SHOP DRAWINGS

- a) Prior to equipment fabrication, the Contractor shall provide at his own expense without delay, detailed, dimensioned shop drawings in triplicate, no smaller than 1:100 scale, showing the following submit to the Engineer approval.
- b) The construction, size, arrangement, operation clearance, performance characteristics, and capacity of all specialties together with sufficient engineering data to indicate substantial compliance with the Specifications.
- c) Sleeves, inserts, outlets and proposed conduiting, cable trays, piping and ductwork installation layouts, particularly in areas where these are to be installed adjacent to the work of other trades or where structural or architectural consideration may make installation difficult.
- d) Detailed layout drawings of plant rooms, no smaller than 1:25 scale showing all valves (manual and automatic, including spindles and handwheels) control equipment and electrical isolators.
- e) Adequate sectional drawings for the works to be installed.
- f) During preparation shop drawings, the Contractor shall check and coordinate the drawings of all trades and consult all relevant parties the actual space conditions and establish location and levels and include the same of the shop drawings.
- g) Upon receipt of the shop drawings, the Engineer shall with reasonable time either approve the drawings or indicate where he desires alteration. Disapproved drawings shall be corrected and resubmitted in triplicate for approval. The Engineer will not indicate all errors in the submitted and/or submitted shop drawings and it is the Contractor's responsibility to recheck all disapproved drawings before resubmission.
- h) Upon approval, three (3) additional sets of prints of the shop drawings shall be provided by the Contractor for endorsement by the Engineer. One set will be returned to the

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Contractor for record purposes, and the other sets will be retained by the Engineer, the Owner and for site reference.

- i) The Contractor shall be responsible and shall pay for all alterations necessary to the work done due to the any discrepancies, error or omissions in the prints and/or drawings even if the shop drawings had been endorsed by the Engineer, provided that such discrepancies, errors or omissions are not due to inaccurate information given to the Contractor.
- j) Approval rendered on Shop Drawings shall not be considered as a guarantee of measurements of site conditions. Where Drawings are approved, such approval does not in any way relieve the Contractor from his responsibility nor the necessity or furnishing material or performing the work required by the Drawings and Specifications as intended.

2.7 AS BUILD DRAWINGS

- a) As from the commencement of work the Contractor shall keep records of all deviations and changes from the Contract and from approved shop drawings. Approved shop drawings shall be updated regularly and accurately so as to keep records of all work as actually installed.
- b) At the discretion of the Engineer, the Contractor may be permitted to purchase a set of transparency prints and/or soft copy (ACAD Drawings) of the Drawings for the purpose of developing “As Built” drawings.
- c) On practical completion of each partial and/or overall Contract, two (2) sets of “As Built” drawings shall be submitted to the Engineer for approval and incorrect drawings have to be corrected and resubmitted accordingly. Upon approval, the Contractor shall provide at his own expense four sets of prints, one set transparent negative and a soft copy of ACAD Drawings to the Engineer. These prints are in addition to those required to be bound in the Operation and Maintenance Manual.
- d) The Contractor shall retain one set of “As Built” drawings for references during the Defects Liability Period and for subsequent record.

2.8 INSPECTION AND TESTS

- a) Every facility is to be provided to Engineer to inspect and/or test any plant and equipment installation when work is in progress. The Engineer reserves the right to reject plant and equipment found unsatisfactory in service.
- b) Test shall be carried out by the Contractor during installation to ensure that the equipment installed is capable of carrying out the guarantee of performance as stipulated in the Contract.



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Annex B - TORs

- c) All instruments, power and labour required for carrying out these tasks shall be the Contractor's responsibility.
- d) Such tests shall be carried out to the instruction of and in the presence of the Engineer. The rejection of any work shall not constitute grounds for an application for extension of time.

2.9 OPERATION AND MAINTENANCE MANUAL (O&M)

- a) Within one (1) month after Date of Practical Completion of the Works, the Contractor shall supply four (4) completely bound copies of approved, neatly set out, operating and maintenance manual covering all plants and equipment installed in this Contract. The manual shall clearly indicate in proper sequence, the operations and functions of all plant and equipment under all modes of operations.
- b) The manual shall provide complete information on maintenance required for each item of equipment, plant, or part thereof. The manual shall be supplemented by all necessary illustration, plant layouts, diagrammatic layout, full and single line wiring schematics.

2.10 MAINTENANCE

- a) The Contractor shall furnish comprehensive maintenance and service of equipment and machinery installed under this Contract for a period as specified in the Conditions of Tender during the Defects Liability Period
- b) The Maintenance Period shall commence from the date of the issuance of a Certificate of Practical Completion issued by the Engineer.
- c) If any defects are not remedied within a reasonable time after issued of instruction, the Employer or Contractor may proceed to do the work at the risk and expense, but without in any way relieving the Contractor of his responsibility under the Contract.
- d) Maintenance of services and equipment shall be carried out on visits to the site at regular monthly intervals and the Contractor shall submit for approval the proposed maintenance programme relevant to the Contract works.
- e) The maintenance shall include but not be limited to the functions set out.

2.11 TUITION

- a) The Contractor shall provide the service of a competent person to train the Employer's plant operators on the operation of the equipment and the whole system for a reasonable period as agreed with the Employer during the initial running of the system.

2.12 SITE INSTRUCTION

- a) The Contractor shall make good and rectify unsatisfactory work within seven (7) days upon receive of instructions from the Engineer or within such reasonable time as may in accordance with trade practice. Failure to comply with instructions within reasonable time will result in forfeiture of the right of further payment and furthermore the Engineer shall have the right to appoint others to carry out such work at the Contractor's expense without vitiating the Contract and/or relieving the Contractor of his contractual responsibilities.

2.13 SITE SUPERVISION

- a) The Contractor shall provide on or more qualified and competent persons on site during the progress of the Contract. Such personnel shall subject to the approval of the Engineer.
- b) The site personnel shall be authorised by the Contractor to receive and act on the instructions issued by the Engineer.
- c) Should at any time, the Engineer decide to withdraw the approval of any site personnel, the Contractor shall remove the personnel from the site and provide a suitable replacement who must be acceptable to the Engineer.
- d) The Contractor shall keep a Register of Workmen on site which shall contain the names and identity card numbers of all workmen employed by the Contractor.

3) DOCUMENTS TO BE SUBMITTED: -

1. Company profile, introducing the company history, past project with date, contract amount, scope of works, etc.
2. Latest 3 years audited financial statement
3. Registration of company form-9 or related
4. Form-24 and Form-49
5. List of key personnel staff with more than 5 years working experience
6. List of professional staff (degree holder or above)



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7. List of completed project indicating project name, client name, year, and contract value.