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SCOPE OF WORKS

Upgrade of Main Electrical Distribution System

CAAF Headquarters, Namaka, Nadi

1.0 Background

The main electrical distribution system at the Civil Aviation Authority of Fiji (CAAF) Headquarters in Namaka, Nadi, is over 30 years old. Key components are obsolete, no longer supported by the original manufacturers, and parts are not readily available in the local market.

CAAF intends to upgrade the Main Distribution Board (MDB) and the associated electrical distribution infrastructure in order to improve safety, reliability, efficiency, maintainability, and operational continuity, and to ensure compliance with current Australian / New Zealand and Fiji electrical standards.

This Scope of Works (SOW) sets out the technical and contractual requirements for the design, supply, installation, testing, commissioning and handover of the upgraded system. It forms part of the tender documentation issued by CAAF and shall be read together with the Tender Notice and any subsequent addenda issued through the procurement portal.

2.0 Objectives

The objectives of this project are to:

- Replace the existing Main Distribution Board (MDB) with a modern, fully compliant electrical distribution system.
- Undertake a comprehensive load assessment and load balancing across CAAF Headquarters.
- Verify whether the existing standby generator capacity is sufficient to carry the required facility load and, where it is not, recommend and implement an essential / non-essential load distribution strategy.
- Improve the distribution of electrical loads to each CAAF department through new sub-distribution boards, lighting and power circuits, compliant cable containment, and verified earthing and bonding.
- Improve safety, reliability, maintainability, and future expansion capacity of the electrical system.
- Achieve full compliance with AS/NZS electrical standards, Fiji Electrical Safety Standards, and CAAF internal safety and operational requirements.

3.0 Scope of Contractor's Responsibilities

The Contractor shall be responsible for the design, supply, installation, testing, commissioning, documentation and handover of the upgraded electrical distribution system. As part of the tender submission, the Contractor shall provide a comprehensive proposal that includes:

- Phased programme of works (Planning, Consultation, Implementation, Commissioning and Formal Handover).
- Detailed timeline / programme from contract award to Practical Completion.
- Bill of Quantities (including makes, models, types, quantities, unit rates and lump-sum prices).
- Proposed drawings (including SLD and circuit designations).

3.1 Site Assessment, Verification and Data Collection

The Contractor shall:

- Inspect and document the existing electrical distribution system, including the MDB, existing sub-boards (if any), feeders, protective devices, cable routes, and major loads.
- Verify and record nameplate details and operating characteristics for major equipment (air-conditioning, server rooms, printers / copiers, kitchen loads, pumps, and any specialised equipment).
- Confirm the configuration and condition of existing backup sources and interfaces, including the standby generator and any UPS systems.
- Identify any defects, non-compliances or safety concerns observed during the assessment and bring these promptly to the attention of CAAF.

3.2 Load Calculation and Load Schedule (Whole-of-Building)

The Contractor shall:

- Complete a comprehensive load calculation for the entire facility, presenting both connected load and demand load for:
    - loads supplied directly from the MDB;
    - loads on each departmental Sub-Distribution Board;
    - generator-supplied loads and transfer arrangements;
    - any critical or UPS-supported circuits.
- Provide a Load Schedule (by circuit and department) showing, at minimum: circuit identifier, description, phase allocation, breaker rating, cable size, connected load, demand load, and Essential / Non-Essential classification.
- Demand factors and diversity assumptions shall be in accordance with AS/NZS 3000 and clearly stated.

3.3 Electrical Design and Engineering

The Contractor shall provide a complete design package signed off by a licensed electrical engineer, including:

- New MDB design with clear segregation of Essential and Non-Essential distribution sections.
- A Single Line Diagram (SLD) reflecting the final arrangement, including the generator interface / ATS and all outgoing feeders.
- A protection coordination and discrimination study covering the MDB and Sub-Distribution Boards.
- Provision for future expansion (minimum 25% spare ways and spare capacity at the MDB and at each Sub-Distribution Board).
- Compliance statement against AS/NZS 3000, AS/NZS 61439 and any other relevant standards listed in Section 8.

3.4 Supply, Installation and Commissioning of New Main Distribution Board

The Contractor shall:

- Safely isolate, disconnect and remove the existing MDB and associated obsolete components, in coordination with Energy Fiji Limited (EFL) where required.
- Supply and install a new MDB, manufactured in accordance with AS/NZS 61439, comprising as a minimum: **(Preferred Brands – Schneider, ABB, Siemens, Eaton)**
    - Main incoming circuit breaker and suitably rated outgoing circuit breakers;
    - Separate busbar arrangements / compartments for Essential and Non-Essential loads;
    - Surge Protective Devices (SPD) with status indication;
    - Energy metering and monitoring (kWh, kW, V, A, PF, frequency) at the MDB;
    - Phase, neutral and earth indicator lights;
    - Durable circuit identification labels and laminated circuit schedules.

- Reconnect and reroute circuits in accordance with the agreed Load Schedule and the Essential / Non-Essential classification.
- MDB switchgear shall be sourced from a tier-1 manufacturer (e.g. Schneider, ABB, Siemens, Eaton or equivalent) to ensure long-term spares availability and after-sales support. Tenderers proposing alternative makes shall justify equivalence.

3.5 Standby Generator Capacity Verification and Load Strategy

The Contractor shall:

- Provide a written confirmation stating whether the standby generator can:
  - carry full facility demand reliably; and / or
  - carry essential demand reliably with appropriate margin.
- Where the generator cannot support the full facility demand, recommend and implement:
  - essential circuits to remain supplied during a mains outage;
  - non-essential circuits to be automatically or manually shed;
  - the proposed implementation method (segregation at MDB, dedicated essential sub-distribution boards, and / or load shedding controls).

3.6 Departmental Sub-Distribution Boards

The Contractor shall:

- Supply and install new Sub-Distribution Boards for each identified department or area, sized for the calculated demand load with not less than 25% spare capacity for future expansion.
- Provide correct protective devices (MCB, RCD, RCBO as applicable) with appropriate selectivity and discrimination.
- Ensure feeder sizing, terminations and phase allocation support proper load balancing across all three phases.
- Apply clear, durable labelling consistent with the MDB labelling convention.

3.7 Lighting and Power Circuits

The Contractor shall:

- Supply and install all required lighting circuits (including switching, controls, occupancy / daylight sensors where specified, and emergency lighting interconnections where applicable).
- Supply and install all power circuits, including general power outlets, dedicated circuits (e.g. server room, air-conditioning outlets, heavy appliances) and any special circuits identified in the Load Schedule.
- Replace and / or upgrade associated cabling, conduits, trunking, junction boxes, terminations and accessories as required to deliver a complete, safe and compliant installation.

3.8 Load Balancing

The Contractor shall:

- Balance loads across all three phases at the MDB and across each Sub-Distribution Board such that phase imbalance does not exceed 10% under normal operating conditions.
- Provide a "before and after" phase loading summary and confirm compliance with the design intent.

3.9 Cable Trays and Containment

The Contractor shall:

- Supply and install cable trays, ladders and supports to carry three-phase feeder cables from the MDB to all Sub-Distribution Boards.

- Ensure containment is mechanically sound, neatly installed, properly supported, and compliant with AS/NZS 3000 and relevant cable management standards.
- Maintain segregation between power, data and ELV cabling in accordance with applicable standards.

3.10 Earthing, Grounding and Bonding

The Contractor shall:

- Inspect the existing earthing and bonding system for the main building, MDB and major circuits.
- Test and verify earth electrode resistance, earth continuity and equipotential bonding, and rectify any deficiencies identified.
- Upgrade the earthing and bonding systems where required to achieve compliance with AS/NZS 3000 and provide test results as part of commissioning documentation.

4.0 Testing, Commissioning and Acceptance

The Contractor shall complete, as a minimum, the following testing and commissioning activities and submit the results to CAAF:

- Insulation resistance testing of all new circuits.
- Polarity, continuity and earth fault loop impedance testing.
- Functional testing of breakers, indicators, metering and control systems.
- Verification of Essential / Non-Essential segregation and backup power operation, including generator changeover tests.
- Load balancing verification and reporting.
- Final commissioning report, signed by a licensed electrical engineer, including "as-built" updates.

Acceptance and certification of Practical Completion will be subject to:

- Successful completion of all required tests.
- Submission and CAAF acceptance of all certificates and documentation.
- Completion of a final walk-through and CAAF sign-off.

Vender to provide built drawings in PDF and Editable CAD, O & M manuals, training records, manufacturer's warranties commissioning certificates signed by a Licensed electrical engineer.

5.0 Deliverables

The Contractor shall provide the following deliverables as part of the contract:

- Scope Completion time line.
- Approved design package, including SLD, Load Schedule, protection coordination report, and Essential / Non-Essential segregation approach.
- Installed and commissioned MDB and all Sub-Distribution Boards, lighting circuits and power circuits.
- Test results, commissioning records, and compliance certificates signed by a licensed electrical engineer.
- As-built drawings, in PDF and editable CAD (DWG) format, and final circuit schedules.
- Operation and Maintenance (O&M) manuals, and an asset register of all installed equipment.
- Manufacturer warranty documentation for all major equipment, with minimum periods as set out in Section 9.
- Training session(s) for CAAF maintenance personnel, including written training records and operating procedures.
- Signed handover certificate.

6.0 Programme and Timeframes

The Contractor shall complete all works to Practical Completion within maximum 8 weeks of contract award. The Contractor's tender shall include a fully resourced Gantt chart or programme of works showing critical path, key milestones, and proposed shutdown windows.

Liquidated damages for delay will be specified in the Contract.

7.0 Standards and Compliance

All works shall comply, as a minimum, with the latest editions of the following standards and regulatory requirements:

- AS/NZS 3000 – Electrical Installations (Wiring Rules).
- AS/NZS 61439 – Low-voltage switchgear and controlgear assemblies.
- AS/NZS 3008.1.1 – Electrical installations – Selection of cables.
- AS/NZS 3017 – Electrical installations – Verification.
- AS/NZS 1768 – Lightning protection (where applicable to SPD selection).
- Relevant IEC 60364 series standards where applicable.
- Fiji Electrical Safety Standards and any related regulatory requirements.
- Energy Fiji Limited (EFL) supply and metering requirements.
- CAAF internal safety, security, and operational protocols.

8.0 Warranty and Defects Liability

- **Defects Liability Period:** minimum twelve (12) months from the date of Practical Completion, during which the Contractor shall rectify, at their cost, any defect or non-conformance arising from materials, workmanship or design.
- **Manufacturer Warranties:** minimum twenty-four (24) months on switchgear, MDB, SPDs and metering equipment, and minimum twelve (12) months on all other installed equipment.
- **Response Times:** the Contractor shall provide a minimum response commitment of forty-eight (48) hours for non-critical defects and four (4) hours for critical defects affecting essential supply.

9.0 Insurances and Statutory Compliance

Prior to commencement of works, the Contractor shall provide evidence of, and maintain throughout the contract, the following insurances and statutory registrations:

- Public Liability Insurance with a minimum cover of FJD 1,000,000 per occurrence.
- Workers' Compensation Insurance for all employees.
- Contractor's All Risks (CAR) Insurance, or equivalent project insurance, naming CAAF as an interested party where applicable.
- Valid Energy Fiji Limited (EFL) electrical contractor license.
- Licensed and registered electrician(s) for all electrical works in accordance with Fiji statutory requirements.
- Valid FRCS Tax Compliance Certificate, FNPF Compliance Certificate, Business Registration, and TIN.

10.0 Payment Schedule

Payments shall be made against verified milestones in accordance with the CAAF Finance and Procurement Manual. The indicative payment milestones are:

Milestone	Description	% of Contract
1	Mobilisation and submission of approved design package	20%
2	Delivery of MDB and major equipment to site	30%
3	Installation complete and commissioning commenced	25%
4	Practical Completion and acceptance of all deliverables	15%
5	Retention – released on issue of Defects Liability Certificate	10%

The above is indicative and will be confirmed in the executed Contract.

11.0 Contractor Requirements (Tenderer to Demonstrate)

Tenderers shall provide:

- Company profile and documented evidence of relevant experience in MDB / switchboard upgrades, load studies, and standby generator integration on operational sites.
- Evidence of qualified and licensed electrical personnel proposed for the works, including CVs of the project manager and lead electrical engineer.
- Proposed methodology, including a staged shutdown management plan to minimise downtime, a project safety plan, and a commissioning plan.
- References from at least two (2) previous clients for similar projects, with contact details.
- Warranty and defects liability proposal, response times, and details of after-sales technical support.

12.0 Site and Operational Constraints

CAAF Headquarters supports safety-critical aviation regulatory functions and operates during normal business hours, with some functions operating outside normal hours. The Contractor shall:

- Coordinate all planned outages with CAAF in advance and obtain written approval from CAAF before any shutdown is undertaken.
- Submit a staged cutover plan demonstrating how continuity of critical services (server room, security systems, regulatory office areas) will be maintained throughout the works.
- Schedule any works affecting the server room, ICT infrastructure or other critical systems outside of normal business hours, unless otherwise agreed in writing with CAAF.
- Maintain all work areas in a tidy and safe condition, with clear segregation of work areas and effective protection of CAAF staff and assets.
- Comply with CAAF site induction, security access, and PPE requirements.

13.0 Tenderer's Submission Requirements

Tenderers shall submit, as a minimum, the following information:

- Lump-sum price and detailed Bill of Quantities (with schedule of rates).
- Proposed timeline / programme of works (Gantt chart).
- Technical compliance statement against this Scope of Works, clearly identifying any deviations.
- Makes, models and full technical specifications for the MDB, breakers, SPDs, metering, Sub-Distribution Boards, and other major equipment.
- Work Method Statement, including shutdown plan.

- Testing and Commissioning Plan.
- Warranty and after-sales support proposal.
- Statutory and insurance documentation as listed in Section 10.

14.0 Optional Add-Ons

Tenderers are invited to provide separate priced options for the following additional items, which CAAF may elect to include:

- Energy monitoring per distribution section (Essential vs Non-Essential metering with remote read-out).
- Provision of additional spare breakers / ways and additional spare capacity beyond the minimum 25% specified in Section 4.3.
- Integration check, and where required, additional UPS provision for server / critical areas.
- Annual preventive maintenance contract for the upgraded system, post Defects Liability Period.

15.0 Correspondence

All correspondence relating to this tender or the resulting contract shall be addressed to the Chief Executive of the Civil Aviation Authority of Fiji and not to individual officers. Tender enquiries shall be submitted through the CAAF procurement portal.

— END OF SCOPE OF WORKS —