



MR 93 /2026

**PREFERRED SUPPLIER for
INTELLIGENT ELECTRONIC DEVICES
(IEDs)
for
POWER SYSTEM PROTECTION and CONTROL**

**ENERGY FIJI
LIMITED**

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REVISION HISTORY & DOCUMENT CONTROL

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1 INTRODUCTION AND SCOPE OF WORK

Energy Fiji Limited (EFL) is the primary electricity provider in Fiji, responsible for the generation, transmission, and retail of electricity across the four (4) main islands of Vitilevu, Vanualevu, Ovalau & Taveuni. Formerly known as the Fiji Electricity Authority (FEA) which was established under the Electricity Act in 1966, it was corporatized in 2018 to operate as a public company limited by shares.

The Vitilevu Integrated System (VLIS) is the largest system of the four power systems operated by the Energy Fiji Limited which produces about 90% of the entire capacity of energy annually.

The VLIS consists of four hydro power stations and ten thermal power stations, which are linked via 132 kV or 33 kV transmission systems, or 11kV interconnectors. The Wailoa, Nadarivatu and Wainikasou hydro power stations are located in the centre of the island. 132 kV steel tower transmission lines connect Wailoa and Nadarivatu power stations to the 132 kV backbone network, which spans from Cunningham to Vuda, with switching stations in Wailoa and Nadarivatu.

The Wainikasou hydro power station is connected to the Wailoa switching station via a 33 kV transmission line and a 132/33 kV step-up transformer at Wailoa. The Nagado Power station is connected to the 33 kV sub-transmission network in the Western region of VLIS.

132/33 kV substations are situated at Vuda in Western Region and at Cunningham in Western Region. These are connected to strategically located 33/11 kV zone substations via 33 kV sub-transmission lines or underground cables.

The Northern power system consists of four independently operating power systems spread over three islands - Vanua Levu, Ovalau and Taveuni.

The Labasa and Savusavu power systems are on the island of Vanua Levu, the Ovalau power system is on Ovalau whilst the Taveuni power system is on the island of Taveuni

EFL is seeking tender bids from reputable manufacturers and suppliers for design, manufacture, testing and supply of intelligent electronic devices (IEDs) for electrical protection and control of its electricity generation, transmission and distribution networks.

The Bidder shall state any non-compliance with the specification in the tender submission using the forms in the Appendices. EFL reserves its right to accept or reject any non-compliance.

2 INSTRUCTIONS TO BIDDERS

2.1 Eligible Bidders

This invitation is open to all Bidders who have sound Financial Background, and have previous experience in design, manufacture, testing and supply of such intelligent electronic devices (IEDs).

Bidders shall provide such evidence of their continued eligibility satisfactory to EFL as EFL shall reasonably request. Bidders who are not manufacturers of such devices and accessories shall provide evidence of agency.

Bidders shall not be under a declaration of ineligibility for corrupt or fraudulent practice.

2.2 Eligible Materials, Equipment and Services

The materials, equipment, and services to be supplied under the Contract shall have their origin from reputable companies as specified by EFL and from various countries and all expenditures made under the Contract will be limited to such materials, equipment, and services. Upon request, bidders may be required to provide evidence of the origin of materials, equipment, and services.

For purposes of this Contract, "services" means the works and all related services including design services.

For purposes of this Contract, "origin" means the place where the materials and equipment are mined, grown, produced or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing or substantial or major assembling of components, a commercial recognized product results that is substantially different in basic characteristics or in purpose or utility from its components.

The materials, equipment and services to be supplied under the Contract shall not infringe or violate any industrial property or intellectual property rights or claim of any third party.

2.3 One Bid per Bidder

Each bidder shall submit only one bid. A bidder who submits or participates in more than one bid will cause all those bids to be rejected.

2.4 Cost of Bidding

The bidder shall bear all costs associated with the preparation and submission of its bid and EFL will in no case be responsible or liable for those costs.

2.5 Site Visits

No site visits are required for this project/tender.

2.6 Contents of Bidding Documents

The bidder is expected to examine carefully the contents of this Bidding document. Failure to comply with the requirements of bid submission will be at the bidder's own risk. Bids which are not substantially responsive to the requirements of the bidding documents will be rejected.

2.7 Clarification of Bidding Documents

A prospective bidder requiring any clarification of the bidding documents may notify EFL in writing by fax (hereinafter the term "fax" is deemed to include electronic transmission such as facsimile, cable and telex), or email addressed to:

Jitendra Reddy

Manager Strategic Procurement and Inventories

2 Marlow Street, Suva, FIJI.

Phone: 679 3224 320 Facsimile: 679 331 6773

Email: jreddy@efl.com.fj

EFL will respond to any request for clarification which it receives earlier than 10 days prior to the deadline for submission of bids.

2.8 Amendment of Bidding Document

At any time prior to the deadline for submission of bids, EFL may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, modify the bidding documents by issuing addenda.

2.9 Language of Bid

The bid, and all correspondence and documents related to the bid, exchanged between the bidder and the EFL shall be written in the English language.

2.10 Bid Prices

Unless specified otherwise, Bidders shall quote for the entire facilities on a "single responsibility" basis such that the total bid price covers all the Supplier's obligations mentioned in or to be reasonably inferred from the bidding documents in respect of the design, manufacture, including procurement and subcontracting (if any), testing and delivery.

Bidders shall give a breakdown of the prices in the manner and detail called for in this bidding document, or any issued addenda.

Bids shall be given on **CIF** basis. The point of delivery shall be EFL's Navutu Depot in Lautoka. The term CIF shall be governed by the rules prescribed in the current edition of Incoterms, published by the International Chamber of Commerce, Paris.

EFL has a marine insurance cover for items it is required for purchase for its project and operational works. Bidders are required to comment if the marine insurance component is covered in their bids

2.11 Bid Currencies

Prices shall be quoted in a single currency only.

2.12 Bid Validity

Bids shall remain valid for a period of **120 days** from the date of Deadline for Submission of Bids specified in Sub-Clause 21.1.

2.13 Format and Signing of Bids

The bidder shall provide one electronic copy of the Technical and Financial proposals on EFL's electronic tender hosting website, <https://www.tenderlink.com/efl>

The bid shall contain no alterations, omissions or additions, except those to comply with instructions issued by EFL, or as necessary to correct errors made by the bidder, in which case such corrections shall be initialed by the person or persons signing the bid.

The uploaded bid will be treated as final.

2.14 Deadline for Submission of Bids

Bids must be received by EFL at the address specified above no later than 1600 hours (Fiji Time) Wednesday September 16th 2026.

EFL may, at its discretion, extend the deadline for submission of bids by issuing an addendum, in which case all rights and obligations of EFL and the bidders previously subject to the original deadline will thereafter be subject to the deadlines extended.

2.15 Late Bids

Any bid received by EFL after the deadline for submission of bids prescribed above will be rejected and returned unopened to the bidder.

2.16 Modification and Withdrawal of Bids

No bid may be modified by the bidder after the deadline for submission of bids.

2.17 Rejection of One or All Bids

EFL reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids, at any time prior to award of Contract, without thereby incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidder or bidders of the grounds for the rejection.

2.18 Process to be Confidential

Information relating to the examination, clarification, evaluation and comparison of bids and recommendations for the award of a contract shall not be disclosed to bidders or any other persons not officially concerned with such process. Any effort by a bidder to influence EFL's processing of bids or award decisions may result in the rejection of the bidder's bid.

2.19 Clarification of Bids

To assist in the examination, evaluation and comparison of bids, EFL may, at its discretion, ask any bidder for clarification of its bid. The request for clarification and the response shall be in writing or by fax, but no change in the price or substance of the bid shall be sought, offered or permitted except as required to confirm the correction of arithmetic errors discovered by EFL in the evaluation of the bids.

2.20 Compliance with Specifications

The tender shall be based on the equipment and work specified and shall be in accordance with the Technical Specification. It should be noted that unless departures from specifications are detailed in Schedules of the Technical Specification, the tender would be taken as conforming to the Specification in its entirety. The Bidder shall tender for the whole of the Works included in the Specification.

3 GENERAL CONDITIONS OF CONTRACT

The General Conditions of Contract shall be based upon AS 4912 – 2002 General Conditions of Contract for Periodic Supply of Goods.

The Conditions of Contract comprises two parts:

1. Part 1 – General Conditions; and
2. Part 2 – Conditions of Particular Application

4 CONDITIONS OF PARTICULAR APPLICATION

1. Interpretation and Construction of Contract

Add the following:

“Bid has the same meaning as tender.”

Replace

“Base contract sum means the sum of the products ascertained by multiplying the quantities of goods stated in Item 13 by the corresponding unit prices, excluding any additions or deductions which may be required to be made under the Contract.”

With

“Contract sum means:

- (a) Where the Purchaser accepted a lump sum, the lump sum;*
- (b) Where the Purchaser accepted unit prices, the sum of the products ascertained by multiplying the quantities of goods and the corresponding unit prices in the schedule of unit prices; or*
- (c) Where the Purchaser accepted a lump sum and unit prices, the aggregate of the sums referred to in paragraphs (a) and (b),*

Excluding any additions or deductions which may be required to be made under the Contract.”

7. Assignment

Replace “7. Assignment” with “7. Assignment and Subcontracting”

Add “7.1 Assignment” after “7. Assignment and Subcontracting”

Add the following after paragraph 7.1 Assignment. “7.2 Subcontracting

The Supplier shall not subcontract any part of the Contract without the prior written approval of the Purchaser, which approval shall not be unreasonably withheld. Any sub subcontracting shall not relieve the Supplier from any liability or obligation under the Contract. The Supplier

shall if requested by the Purchaser provide copies of the proposed subcontract documents without prices.”

9. Warranties

Replace “9. *Designated Items*” and its contents with the following

“9. Warranties

9.1 Ownership

The Supplier represents and warrants that:

- a) It is the legal and beneficial owner of the goods; and*
- b) that upon payment of the contract sum no person other than the Purchaser will be entitled to hold any interests in, or hold any encumbrance over, the goods.*

9.2 Supplier’s Warranty

The Supplier represents and warrants that the goods will upon delivery: a) comply in all respects with the Contract;

- b) be suitable for the purpose stated in Item 5; c) be of merchantable quality;*
- d) conform to any sample provided by the Supplier and approved by the Purchaser.*
- e) in the absence of any specific provision of the Contract, meet any relevant Australian Standard and industry best practice;*
- f) be free of design defects;*
- g) be, unless otherwise agreed, new.*

If the Supplier is in breach of any of the warranties in this clause 9, the Purchaser may, in addition to the Purchaser’s other rights and remedies, at any time give 7 days’ written notice to the Supplier to rectify such breach, and if the Supplier fails to comply with such notice, the Purchaser may employ others to carry out works required to satisfy the warranty. The cost thereby incurred shall be moneys due and payable to the Purchaser.

The representation and warranties in this clause survive the completion or earlier termination of the Contract and each warranty in this clause is independent of, and is not limited by, reference to any other warranty.

The Supplier shall obtain all warranties relevant to the goods from manufacturer or suppliers or as otherwise specified in the Contract, including any warranties that are provided by any sub-contract and ensure that the Purchaser has the benefit of those warranties. “

19. Delivery

Add the following to 19.1 Date and Place for Delivery, at the end,

“The Supplier must ensure that all goods are properly, safely and securely packaged and labeled for identification and safety as follows:

- a) the goods must be individually packaged for transport so that they are protected from all reasonably foreseeable condition which might cause corrosion, deterioration or physical or bearing damage during handlings and transport. All packaging and preservation materials must be supplied by the Supplier; and*
- b) each package must be clearly and indelibly inscribed with the Purchaser's name, the address of the delivery place, the Purchaser's contract number and any safety warnings for the contents.”*

24. Payment

Under 24.1 Invoices and Time for Payment, make the following change.

Replace

“Within 14 days after receiving an invoice under this Sub-clause, the Purchaser shall pay to the Supplier the amount then due to the Supplier pursuant to the Contract.”

28. Dispute Resolution

Replace “28.2 Conference” and contents with the following:

“28.2 Conference

Within 14 days after receiving a notice of dispute, the parties shall confer at least once to resolve the dispute or to agree on methods of doing so, including, but not limited to, mediation, conciliation, binding expert determination and arbitration, of the whole or any part of the dispute. Where arbitration is agreed method of resolution, the arbitration shall be conducted in accordance with the rules of Item 38(b) and the arbitrator, unless otherwise agreed, shall be nominated by the President of the Fiji Institute of Engineers.

At every such conference, each part shall be represented by a person having authority to agree to such resolution or methods. All aspects of every such conference except the fact of occurrence shall be privileged.

If the dispute has not been resolved nor a method of resolution agreed within 56 days of service of the notice of dispute, that dispute shall be dealt with in accordance with subclause 28.3.”

Replace “28.3 Arbitration” and contents with the following

“28.3 Elevation of Disputes

If the parties are unable to resolve the dispute or agree a method of resolution in accordance with sub clause 28.2:

- a) the dispute shall be referred to the Chief Executive Officer, or a duly authorized representative, of the Purchaser and the Chief Executive Officer/Managing Director, or a duly authorized representative, of the Supplier to resolve the dispute or agree on a method of resolution;*
- b) the individuals referred to in sub clause 28.3 (a) shall meet within 14 days after referral of the dispute in an effort to resolve the dispute or agree a method of resolution;*
- c) if the individuals referred to in sub clause 28.3 (b) are unable to resolve the dispute but agree at that meeting on a method of resolution, they shall also nominate a timeframe for the commencement and conclusion of the method of resolution; and*
- d) if the individuals so referred to in sub clause 28.3(b) are unable to resolve the dispute or agree a method of resolution, each within 14 days of the dispute being referred, either parts may give written notice to the other stating that the parties have been unable to resolve the dispute or agree a method of resolution.*

Where arbitration is the agreed method of resolution, the arbitration shall be conducted in accordance with the Rules stated in Item 38(b) and the arbitrator, unless otherwise agreed, shall be nominated by the President of the Fiji Institute of Engineers.”

Replace “28.4 Summary Relief” and the contents with the following:

“28.4 Instituting Proceedings

Neither party shall proceed to resolve a dispute by instituting court proceedings until issuing to, or receiving from, the other party, a notice in accordance with sub clause 28.3(d).”

Add the following after 28.4 Institutional Proceedings

“28.5 Summary Relief

Nothing herein shall prejudice the right of a party to institute proceedings to enforce payment due under the Contract or to seek injunctive or urgent declaratory relief.”

Annexure A

Replace Annexure A Part A with the form provided in Schedule B.

5 REFERENCES

5.1 Applicable Standards

The IEDs shall be designed, manufactured and tested in accordance with the following engineering standards and their respective amendments issued prior to the date of closing of tenders except where varied by this Specification.

Table 1.0 Specification

IEC 60068	Environmental Testing (All Parts)
IEC 60255-1:2009	Measuring relays and protection equipment – Part 1: Common requirements
IEC 60255-12:1980	Electrical relays – Part 12: Directional relays and power relays with two input energizing quantities
IEC 60255-13:1980	Electrical relays – Part 13: Biased (percentage) differential relays
IEC 60255-21-1:1988	Electrical relays – Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment – Section One: Vibration tests (sinusoidal)
IEC 60255-21-2:1988	Electrical relays – Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment – Section Two: Shock and bump tests
IEC 60255-21-3:1993	Electrical relays – Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment – Section 3: Seismic tests
IEC 60255-24:2013	Measuring relays and protection equipment – Part 24: Common format for transient data exchange (COMTRADE) for power systems
IEC 60255-26:2013	Measuring relays and protection equipment – Part 26 Electromagnetic compatibility requirements
IEC 60255-27:2013	Measuring relays and protection equipment – Part 27 Product safety requirements

IEC 60255-121:2014	Measuring relays and protection equipment – Part 121: Functional requirements for distance protection
IEC 60255-127:2010	Measuring relays and protection equipment – Part 127: Functional requirements for over/under voltage protection
IEC 60255-149:2013	Measuring relays and protection equipment – Part 149: Function requirements for thermal electrical relays
IEC 60255-151:2009	Measuring relays and protection equipment – Part 151: Function requirements for over/under current protection
IEC 60255-3-3	Classification of groups of environmental parameters and their severities – stationary use at weather protected locations
IEC 60834-1:1999	Teleprotection equipment of power systems – Performance and testing – Part 1: Command systems
IEC 60870	Telecontrol equipment and systems – All parts
IEC 61000-4	Electromagnetic compatibility (EMC) – All parts
IEC 61850	Communication networks and systems for power utility automation – All Parts
IEC 62439-3	Industrial communication networks – High availability automation networks – Part 3 Parallel Redundancy Protocol (PRP) and High-availability Seamless Redundancy (HSR)
IEC C37.90-1989	IEEE Standard for Relays and Relays Systems Associated with Electric Power Apparatus
IEC C37.90.1-2012	IEEE Standard for Surge Withstand Capability (SWC) Tests for Relays and Relay Systems Associated with Electric Power Apparatus
IEEE C37.90.2-2004	IEEE Standard for Surge Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers
IEEE C37.90.3	IEEE Standard Electrostatic Discharge Tests for Protective Relays
IEEE C37.94	IEEE Standard for N times 64 kbps Optical Fiber Interfaces between Teleprotection and Multiplexer Equipment
IEEE C37.111	IEEE/IEC Measuring relays and protection equipment – Part 24: Common format for transient data exchange (COMTRADE) for power systems
IEEE C37.118	IEEE Standard for Synchrophasors for Power Systems
ISO 9001	Quality Systems Model for Quality Assurance in Design, Development, Production, Installation and Servicing

Should inconsistencies be defined between Standards and this Specification, this Specification will take precedence. However, significant inconsistencies shall be referred to EFL for resolution.

5.2 Applicable Laws

The Bidder warrants (without limiting any other warranties or conditions implied by law) that all Goods have been produced, sold and delivered to EFL in compliance with all applicable

laws (including all workplace health and safety and electrical safety legislations and codes of conduct).

5.3 Service Conditions

The IEDs shall be suitable for installation in stand-alone cabinets or on low voltage compartments of high-voltage indoor switchgear, in substation and power station buildings. The typical service conditions are as follows:

Table 2.0

Height above sea level:	Not exceeding 1000 m
Atmosphere:	Saliferous, corrosive and dusty
Ambient temperature:	Peak: 40°C
	24 Hour Average: 30°C
	Annual Average: 22°C
	Minimum: 10°C
Relative Humidity (Average):	90%
Annual Average Rainfall:	1900mm
Wind Speed:	Sustained: 55 m/s
Isokeraunic Level:	60 Thunder days per year
Seismic:	To a maximum of 7 on the open-ended Richter Scale

Note: All plant and equipment shall be rust proof, vermin proof and weather proof and designed to be suitable for a damp, tropical climate, which may be experienced simultaneously.

All ferrous parts shall be treated to provide acceptable surface finish and protection. The manufacturer shall provide full details of the surface finish provided.

The equipment shall include everything necessary or usually supplied for the operation, whether directly specified or not.

The insulation level shall be in accordance with the technical requirements stated. All insulation shall be of a type and quality that will give normal life expectancy without deterioration.

6. DESIGN AND PERFORMANCE CRITERIA

6.1 General

The IEDs shall be designed in accordance with standard industry practice and comply with all aspects of these specifications.

The IEDS shall be free of a requirement for planned maintenance. They shall include self-monitoring.

The IED shall be designed to operate over a wide temperature range, from -10deg C to 70 deg C, in tropical climate with high humidity. The IEDs shall not employ any method of forced cooling.

The IED may be installed in a polluted environment; therefore, the internal electronic components shall have protective coating to prevent premature failure of components, or malfunctioning in such harsh operating conditions.

The IEDs will typically be installed either on 11kV or 33kV switchgear low-voltage compartment or in 19U racks, in substations and switching stations.

The IEDs shall not weigh any more than 20kg. Bidders shall provide the required technical particulars for each IED offered.

It is EFL's intention to limit the number of different types of IEDs used. To this end, Bidders are encouraged to supply IEDs from a limited number of their product families, and to standardize on specific IED types and model numbers within each family, with as few IED hardware and software variations as possible.

Bidders shall also provide accessories required including:

- Serial to fiber optic transceivers for short and long-distance communications, either for intra-substation or inter-substation communication
- Serial to Ethernet transceivers
- Serial cables in lengths of 2metres, 5metres, 7metres, 8metres and 10metres

6.2 Power Supply and Monitoring

The IED shall be designed to be operated with a power supply voltage of 110 Volts DC nominal. It shall be designed to be operated a range of 85 Volts to 125 Volts DC.

There shall be provision to monitor the power supply and report the power supply voltage variation either through internal settings or through external relay contacts.

The IEDs power supply shall have a quiescent burden of less than 50W.

6.3 Current Transformer Inputs

EFL uses a system where the current transformer secondary has a 1 Amp nominal. Therefore, the IED AC current input circuit shall be designed to operate with a 1 Amp nominal CT secondary for phase and earth fault. For sensitive earth fault current inputs, a rating of 0.05A shall be required.

In addition to this, the following shall apply:

- a) At least a thermal rating of 100 Amp for 1 second

- b) Wide measurement range, between 0.1 and 20 Amp secondary
- c) Low burden to the CT circuit, <0.15VA

The Bidder shall provide details of the hardware and software filtering applied to the IED's current inputs.

The current transformer input terminals shall be designed such to allow connection of round lugs with wires up to 4mm² CSA.

6.4 Voltage Transformer Inputs

EFL uses a system where the voltage transformer secondary has a 63.5 Volt nominal, phase to neutral, three-phase four wire system. The IED AC voltage input circuit shall be designed to operate with a continuous voltage of 67 Volt, phase to neutral.

In addition to this, the following shall apply:

- It shall have a measurement range of 365 Volt for 10 seconds.
- It shall have a low burden to the VT circuit, <0.15VA at 67 V

The supplier shall provide details of the hardware and software filtering applied to the IED's voltage inputs.

The voltage transformer input terminals shall be designed such to allow connection of round lugs with wires up to 2.5mm² CSA.

6.5 Control Inputs

The control inputs shall be designed to comply with IEC 61810-2:2005 or IEEE C37.90-2005.

The control inputs shall be opto-isolated inputs and shall be operated either by DC or AC. It shall be operated at a nominal voltage of 110Volts and shall have a pickup in the range 80%-120% and a drop-off below 75%.

The control inputs shall have adjustable pickup/dropout timers for input energization/de-energization debounce.

The control inputs shall draw <10mA of current at nominal operating voltage.

Whilst EFL has standard IED configurations, the offered IED shall have the capability for the number of inputs to be increased or decreased depending on EFL's requirements. This shall not require a separate device to be put in.

The control input terminals shall be designed such to allow connection of round lugs with wires up to 2.5mm² CSA.

6.6 Control Outputs

The control outputs shall be designed to comply with IEEE C37.90-1989. They shall have breaking and cyclic capacity as per IEC 60255.

The control outputs shall have a continuous carrying capacity of 6 Amps, making capacity of 30 Amps, and short time capacity of >50Amps for 1 second.

It shall have a breaking capacity of 0.30 Amps and shall be designed for at least 10,000 operations. It shall have a pickup/dropout time of < ¼ cycle.

The output contacts shall also have MOV protection of an appropriate rating.

Whilst EFL has standard IED configurations, the offered IED shall have the capability for the number of control outputs to be increased or decreased depending on EFL's requirements. This shall not require a separate device to be put in.

The control output terminals shall be designed such to allow connection of round lugs with wires up to 2.5mm² CSA.

6.7 Earthing

There shall be provision to earth/ground the chassis/frame of the IED to a common/station earth. Such earthing/grounding connection shall be clearly labelled.

6.8 Communications

The IED shall have sufficient communications interfaces to allow local and remote connection.

There shall be a serial or USB port on the front of the IED to allow connection to be established using a portable computer to access the IED.

There shall be sufficient serial, Ethernet and fiber optic ports to allow for data exchange from the IED.

The IED shall also have a number of communications protocols to allow for data to be extracted or written to the IED. It shall have DNP 3.0, IEC 61850, Modbus and ASCII. It shall also allow for telnet, FTP and SFTP connections to be established from one of the communication ports.

EFL may require synchrophasor data from the IEDs and therefore the IED shall have provision for synchrophasor data to be stored and sent to a synchrophasor data collector.

6.9 Time Synchronizing

The IED shall have an internal clock which can be programmed/set from either its driving software or the operator screen. The internal clock shall be powered from an internal battery which shall have a life expectancy of >10years in case the power supply to the IED is lost.

In addition to this, the IED shall have provision to be supplied a modulated or demodulated IRIG-B signal over either a Ethernet network or through a BNC connector. There shall be provision in the IED to select the source or prioritization of the IRIG-B signal.

6.10 Operator Screen

The IEDs shall be equipped with an on-board backlit display/operator screen. The display shall be designed to function correctly over the full operational life of the IED.

The display/operator screen shall allow the following:

- Viewing or modifying protection relay settings.
- Viewing disturbance records or events records
- Modifying software-controlled switches
- In some cases, display the bay configuration in a diagrammatic format
- Viewing fundamental and selected metering data
- Viewing relay status, such as the status of various critical internal components or converters

The operator screen shall be provided on the front face of the IED. It shall be water proof and have a surface which can be easily cleaned if dust accumulates on it.

The operator screen visibility and operation shall not be impaired over the specified operating temperature range.

6.11 Programmable Operator Controls

EFL may require programmable operator controls, through pushbuttons mounted on the front face of the IED (front being the same face as that with an operator screen) for certain applications. The IED shall have provision for the installation of such programmable operator controls where it is required.

Labelling of the operator controls shall also be possible.

6.12 Metering, Event Reporting and Special Reports

The metering records in the IED shall meet the highest accuracy levels. Current readings at fundamental frequency shall not have an error >0.5% in their recordings. Voltage readings at fundamental frequency shall not have an error >1% in their recordings.

The IED shall have the capability to record power system events and store them in its non-volatile memory. The event recording capability shall include:

- Recording of date and time of event with 1 msec resolution
- Summary of event, including status of any front panel indicators on the IED and fault location where applicable
- Individual sample of analog input with oscillography, at 4, 16, 32 or 128 samples per cycle Measured frequency at time of event
- Status of selected digital elements at 4 samples per cycle (Bidder shall provide this list) Settings that were active at the time of the event
- Programmable trigger conditions

The duration of the event report in the IED shall be adjustable, with a minimum duration of 15 cycles and maximum duration of 150 cycles.

Recordings shall be made available in COMTRADE format, as per IEC 60255-24.

The event reports shall be viewable in software supplied at no cost to EFL, by the Bidder.

The IED shall also produce special reports, for metering and recording purposes. Such special reports shall include harmonic metering, peak demand metering, load profile recording and current/voltage logging at fundamental frequency.

Selected IEDs shall be required to provide synchrophasor data in accordance with the IEEE C37.118 standard.

6.13 Frequency and Phase Rotation

The IEDs shall be required to operate at a nominal frequency of 50Hz. However, they shall be capable to operate and track frequency in the range 40Hz to 60Hz.

Selected IEDs will be required to track the rate at which the measured frequency is changing. The IEDs shall respond within 3 cycles to track the change in frequency. The IED shall be capable of tracking frequency changes in the range 0.1Hz/sec – 20Hz/sec.

6.14 Processing Capabilities and Storage

The IED shall be capable of sampling up to 128 samples per cycle for current and voltage inputs.

Processing at a rate of four (4) times per power system cycle, or faster, is required.

The IED shall have sufficient storage in non-volatile memory to store significant number of event data, metering data and other special data that may be of interest.

6.15 Self-Monitoring

The IEDs shall have a provision to self-monitor and report failures over designated communications ports, through front operator screen or through output contacts. In case of output contacts, voltage-free contacts shall be provided which shall dis-engage upon generation of an alarm or loss of supply to the IED.

6.16 Software Package

The Bidder shall supply driving software for accessing the IED.

Any cost of licensing shall be borne by the Bidder and shall be included in the supply of the IED. The driving software shall not be restricted in any way and shall allow EFL to fully utilize the IED. This shall include programming and testing the IED, carrying out diagnostic tests and trouble shooting to find cause of any failures.

Driving software for analysis of event files or special reports shall also be provided. The basic software for analysis of such files shall not be restricted in any way that will prevent EFL from analyzing the IED operations.

The Bidder is required to provide any special cables or connections with the IED that will be used to connect to the IED for programming and testing purposes.

There shall be a means to keep track of changes in the firmware if the firmware of a particular IED changes during the contract period. The Bidder shall ensure that any firmware upgrades to already purchased devices are issued at no cost to EFL, with clear instructions to upload the firmware to the IED. Any special tools required to do this shall be provided by the Bidder at their cost, including freight to EFL's nominated delivery place.

The Bidder shall provide a list of all software it produces with associated cost in its Bid that may be used in any way with the IEDS, be it for programming, testing, maintenance or recording. This shall not apply to any software or tools produced by others.

The Bidder shall also include the following in its offer:

- Supply of software with licenses for automatic collection of event data from IEDs, and any software for viewing the event data from IEDs across the network
- Software for collection and viewing phasor data from phasor measurement units
- Software or systems for IED asset management

6.17 Access Controls and Security

The IED shall have mechanisms for managing electronic and physical access. The IED shall have provision for unused communications ports to be disabled to prevent intrusion.

The IED shall support password setting and management and it shall allow limited functions at each access level. Passwords shall support alphanumeric characters and special characters and could be up to 12 letters long.

There shall be provision in the IED to log any activity in the IED, including changes being made to the configuration or settings. Such logs shall be saved in non-volatile memory.

6.18 Protection, Control and Monitoring Functions

Schedule 3 outlines the protection, control and monitoring functions required from different types of IEDs which may be used in various applications. EFL requires the following as a minimum:

- Distribution feeder protection (11kV, 6.6kV) with at least four settings groups, station service transformer protection
- Two-winding transformer main/unit protection and back-up protection in separate devices
- 33kV sub-transmission line main/unit protection and back-up protection in separate devices
- 132kV transmission line main-1 and main-2 protection in separate devices
- 11kV, 33kV busbar high-impedance differential protection
- Low-impedance busbar protection
- 3-winding transformer protection or main and earthing transformer combined - main/unit and backup protection in separate devices
- Arc-flash protection device
- 11kV or 33kV capacitor bank protection device

6.19 Automation and Logic Functions

The IEDs shall include programmable logic functions for a wide range of user-configurable protection, monitoring, and control schemes. Logic shall have the ability to use protection/control elements, math functions, comparison functions, and Boolean logic functions.

The IED shall include a number of local control switches, remote control switches, latching switches, and programmable display messages in conjunction with a local display panel in the IED. The IED shall be capable of displaying custom messages. Input signals to the IED shall have settable assertion levels.

The Bidders shall provide full details of such IEDs which have automation capabilities.

Bidders shall also offer logic processors and automation devices which shall be capable of operating serial and Ethernet networks and have the following:

- Provide the following protocols-
 - ❖ Client/Server: DNP3 serial, DNP3 LAN/WAN, IEC 61850 MMS, Modbus® RTU, Modbus TCP, IEEE C37.118, IEC 60870-5-101/104
 - ❖ Peer-to-Peer: IEC 61850 GOOSE transmit and receive messages, Parallel Redundancy Protocol
- Shall allow for fast processing and be usable in fast-load shedding schemes (be able to perform computations and initiate action in less than 10ms)
- Support IEC 61131-3 programming environment
- Shall support synchrophasors on all available

6.20 Design Reviews and Factory Inspections

The Bidder shall make allowance for one EFL Engineer to visit the factory where the IEDs are manufactured to hold meetings on design, manufacture and testing of the IEDs. The EFL Engineer will be required to carry out factory inspections and review designs where necessary. Such factory inspections shall be carried out once a calendar year for the period of contract.

7.0 TESTING

7.1 Test Requirements

Prior to delivery, the units shall have completed the type, routine and accuracy tests and inspections as required by the relevant international and Australian standards. The passing of such tests shall not prejudice the right of EFL to reject the Equipment if it does not comply with the Specification when installed.

All testing shall be undertaken by an IEC 17025 accredited test house. The Bidder shall submit evidence showing IEC 17025 compliance. A formal report covering the outcome of the different tests shall be made available to EFL.

7.2 Testing Obligations

All equipment offered shall be fully type tested at the time of tendering and type test certificates shall be included with the tender regardless of whether such equipment has previously been supplied to EFL. Where equipment is offered of a similar design to that previously tested, consideration may be given to accepting previous type test reports.

Bidders shall state if such tests exist. Bidders may be requested (during the tender evaluation period) to substantiate their claims with written engineering evaluation. Such evaluation shall provide all relevant details so that EFL can establish the validity of existing type tests.

If there are any differences between the plant tested and that offered, the Bidder shall state clearly all the differences and shall include in his tender the particulars of identification detailed in relevant IEEE and IEC Standards.

7.3 Type Tests

Category	Type of Test	Requirement
Electromagnetic Compatibility Emissions	Emissions	IEC 60255-22-6:2001 IEC 61000-4-6:2008
Electromagnetic Compatibility Immunity	Conducted RF Immunity	IEC 60255-22-6:2001 IEC 61000-4-6:2008
	Digital Radio Telephone RF Immunity	ENV 50204:1995
	Electrostatic Discharge Immunity:	IEC 60255-22-2:2008 IEC 61000-4-2:2008 IEEE C37.90.3-2001
	Fast Transient/Burst Immunity	IEC 60255-22-4:2008 IEC 61000-4-4:2004
	Power Supply Immunity	IEC 60255-11:2008 IEC 61000-4-11:2004 IEC 61000-4-29:2000
	Radiated Radio Frequency Immunity	IEC 60255-22-3:2007 IEC 61000-4-3:2008 IEEE C37.90.2-2004
	Surge Withstand Capability Immunity	IEC 60255-22-1:2007 IEEE C37.90.1-2002
Environmental	Cold	IEC 60068-2-1:2007
	Damp, Heat, Cyclic	IEC 60068-2-30:2005
	Dry Heat	IEC 60068-2-2:2007
	Vibration	IEC 60255-21-1:1988 IEC 60255-21-2:1988
Safety	Dielectric	IEC 60255-5:2000 IEEE C37.90-2005
	Impulse	IEC 60255-5:2000 IEEE C37.90:2005
	IP Code	IEC 60529:2001 + CRDG:2003
	Product Safety	C22.2 No. 14 - 95 UL 508

7.4 Routine Tests

The Bidder shall provide a list of routine tests that will be carried out on the IEDs. This shall include:

- Check of relay hardware and internal components
- Communications port tests
- Equipment calibration tests
- Functional checks

Samples of any Inspection and Test Plans used for routine tests shall be submitted with the Bid.

7.5 Witnessing of Tests

The Bidder shall make allowance for two EFL Engineers to carry out inspection of the manufacturing and testing environment once a year, the first straight after contract award, and to witness selected type tests and routine tests which shall be requested to be performed. All costs for the witnessing of such type tests shall be borne by the Bidder.

Where applicable, the Bidder shall give EFL not less than four (4) weeks' notices of when each and every type test will be carried out.

7.6 Test Certificates

An electronic copy and one printed copy of all test reports are to be provided to EFL. Type test reports shall be submitted once only, or whenever they are repeated.

8.0 RELIABILITY

8.1 Service Life

Bidders are required to comment on there liability of the equipment and the performance of the materials offered for a service life of over 30 years under the specified system and environmental conditions.

Details of the IED's service history shall be submitted with the tender documentation, in accordance with the following:

- i. how many in service, where and for what period; and
- ii. customer names, email addresses and telephone numbers.

8.2 Spare Parts and Maintenance

The Supplier shall supply a list of recommended spare parts, special tools and appliances required for the whole of life operation and maintenance of the clock installation, in accordance with the following:

- i. only components that are unique and deemed to be necessary (i.e. it is expected that EFL will require the component during the duration of the contract) should be listed, with associated unit costs;
- ii. the product code for each component on the list shall be indicated;
- iii. a brief description of the function of each component on the list shall be provided;
- iv. prices shall be quoted for each component on the list.

The list, together with prices, shall be indicated in the appropriate schedule. The Supplier must also provide details (if required) of the recommended maintenance and the frequency at which it must be carried out. Details of the manufacturers repair capability and options shall be provided.

8.3 Evidence in Support of Reliability

The Supplier shall submit the mean time between failures (MTBF) of the clocks unit and its components including the recommended maintenance regime and maintenance tasks and intervals. This regime shall be based on the mean time between failure (MTBF) and the critical failure modes identified by the failure mode, effects and criticality analysis (FMECA) of the equipment. Details substantiating the FMECA analysis shall be included in the offer.

Such comments will include evidence in support of the reliability and performance claimed including information on Failure Mode and Effect Analysis.

9.0 ENVIRONMENTAL CONSIDERATIONS

Bidders are required to comment on the environmental soundness of the design and material used in the manufacture of the items offered. In particular, comments should address such issues as recyclability and disposal at end of service life.

EFL will require, after the evaluation and award of the Tender, to visit the Supplier's factory for compliance checks on various Environmental protection practices in the design, manufacturing, testing and supply of IEDs. The Bidder shall make allowance for such visits, at their cost.

The supplier must provide with the offer, full details, including composition and toxicological information, regarding the health and safety aspects of all the materials offered in their offer or supplied equipment regardless of content.

Recommended procedures must be provided for the safe handling, safe operation and maintenance of products supplied. The means of disposal of the materials must be clearly stated.

Material safety data sheets (MSDS) must be provided for materials that are supplied and subject to safety considerations in handling and use.

All equipment, packaging and all other accessories provided shall be asbestos free.

The above information is required as part of the offer and will be reviewed as part of the tender process.

10.0 PACKAGING AND MARKING

The packaging of items by the Bidder must ensure that they are capable of being delivered undamaged giving due consideration to the quantity, distance of transportation and the preferred method of handling at each location.

The Bidder shall take all necessary precautions to ensure safe handling of all IED units and associated accessories supplied. The packing shall be such as to protect the components against corrosion and damage during normal handling, transportation and storage. Packing shall be such as to permit easy identification of the components without their removal from the packing.

Each package shall bear the following information on its outer surface:

- i. product description;
- ii. product code or part number;
- iii. the gross mass, in kilograms;
- iv. name of manufacturer and contact details;
- v. number of components of each type in the container;
- vi. address of the destination;
- vii. EFL's purchase order number and

If the product is supplied by a third-party supplier (e.g. importers, agents, etc.) the container shall also bear the following information on the outside of the container:

- i. name of the third-party supplier;
- ii. contact details of the third-party supplier.

11.0 QUALITY SYSTEM REQUIREMENTS

Bidders are required to submit evidence that the design, manufacture and testing of the IEDs are in accordance with ISO 9001.

Documentary evidence shall be provided concerning the level of Quality System Certification associated with the supplier and or manufacturer. This documentation shall include the Capability Statement associated with the Quality System Certification.

EFL may require, after the evaluation and award of the Tender, to visit the Supplier's factory for compliance checks on various quality management practices in the design, manufacturing, testing and supply of IEDs.

12.0 OCCUPATIONAL HEALTH AND SAFETY SYSTEMS

Bidders are required to submit copies of certification to occupational health and safety management system, such as ISO 45001 or to equivalent international standard. Such information is deemed mandatory bid submission and lack of it will result in disqualification of bid.

In addition to this, Bidders also need to submit health and safety plans implemented in workshops for assembling and testing protection and control panels, which will be used in this project.

13.0 STOCK AVAILABILITY

The bidder is to advise if there will be any consignment stock-holding.

14.0 PRODUCT WARRANTY PERIOD

The Bidder is required to provide a minimum product warranty period of ten (10) years from the date of dispatch from the factory.

15.0 INFORMATION TO BE SUPPLIED BY THE BIDDER

15.1 Documentation to be Supplied with the Bid

To enable EFL to fully evaluate the IED(s) offered, the Bidder will submit the following information with their tender:

- Dimensioned general arrangement drawings of IEDs, in metric units
- A schedule of drawings with all drawings provided
- Description of the principle of operation.
- Typical schematic diagrams for all items.
- Type test certificates for all equipment offered.
- List of tools and spares for maintenance and operation
- Typical installation and maintenance manuals
- End of service life disposal method
- Instruction, installation, operating and maintenance manuals.

- Evidence of quality management systems used in manufacture, testing and supply
- Evidence of Health, Safety and Environmental plans
- Evidence of financial ability to provide the level of service and support
- Origin of materials used in manufacture of the IEDs
- Detailed procedure for receiving, handling, lifting and storage
- Names and resumes of key team members who will be assigned to work with EFL upon successful award of the three-year supply contract (if Bidder is successful).
- A list of all departures of the tender from this Technical Specification
- Any other documentation as recommended by the Bidder.

Where sub-contractors are used, the Bidder shall provide the above information for the sub-contractors as well. Bidders may be asked to provide additional information during tender assessment period or following award of contract.

All information shall be provided in the English language.

The Bidder must exercise reasonable diligence in the design of items in order to satisfy EFL's specific integration requirements between the Bidder's offered item and EFL's requirement for the item to be utilized.

15.2 Samples

Samples of typical units may be required during the tender assessment period. Sample will be required only from Bidders who have previously not supplied IEDs to EFL.

When samples are required, production samples shall be delivered freight free, suitably packaged and labelled including reference to the Tender Number and purchase order number.

EFL may at its discretion either purchase the samples at the tendered price or return the samples to the respective Bidder after the contract has been awarded.

15.3 Training

The Supplier shall provide comprehensive annual training courses to enable EFL personnel to program, operate, diagnose faults and fully maintain the offered IEDs. The language medium for the training courses shall be English.

Training sessions shall be delivered at EFL's Navutu Depot and Suva Head Office, to an audience of 25 persons at each location. This shall include engineers and technicians and cover at least:

- Handling and Storage
- Configuration and programming
 - ❖ RTAC
 - ❖ Distance Protection
 - ❖ Line Differential / Transformer Differential
 - ❖ Generator Protection
 - ❖ Transformer Protection
 - ❖ Busbar Protection
- Installation, testing and commissioning
- Maintenance program
- Fault finding and troubleshooting
- Environmental performance
- Electrical performance
- Mechanical performance
- Disposal

Training material in the form of drawings, instructions and audio visuals shall be provided for all the items offered and accepted by EFL

Note: The Bidder can cover the cost of the training as part of the supply or provide a separate cost for the training.

15.4 Tools and Handling Equipment

The successful bidder shall be required to provide all necessary tools and special handling equipment to handle the IEDs in EFL stores and in the field. Two sets of tools and special handling equipment shall be provided.

15.5 Value-Adding Services

The successful bidder(s) shall be required to provide value-adding services, such as assisting with engineering to integrate the devices in the networks and troubleshooting.

SCHEDULE A: LIST OF EXPERIENCE, PERSONNEL & FINANCIAL STATEMENTS

Previous Experience

The Bidder is to submit a list of Projects worked under with a similar scope, in chronological order of year completed.

Client	Scope and Description	Quantity of Units Supplied	Contact Person

Personnel

The Bidder is to submit list of personnel who will be allocated to work with EFL for the contract period and also provide their resumes in its bid.

Name	Designation	Duration of Employment with Company	Years of Experience

Financial Statements

The Bidder shall also submit pass three years audited financial statements and records showing its financial ability to undertake this project.

SCHEDULE B: AS 4912 ANNEX A (TO BE SUBMITTED BY BIDDER)

Item		
1	Purchase (Clause 1)	Energy Fiji Limited
2	Purchaser's Address	2 Marlow Street, Suva
3	Supplier (Clause 1)	Supplier to provide
4	Supplier's Address	Supplier to provide
5	Stated purposes (clause 1 definition of acceptable)	As stated in tender specifications and/or purchase order

6	a) Jurisdiction (legislative requirements)	Fiji
	b) Governing Law	Laws of Fiji
7	a) Currency (clause 1(g))	Supplier to state
	b) Place of payments (clause 1(g))	Same as item 2
	c) Place of Business of bank (clause 1(c) – definition of security)	
8	Term (clause 1)	3 years
9	The Goods clause 1	As stated in tender specification
10	Minimum purchase order quantity subclause 2.2 (a)(i)	One (1)
11	Minimum reorder intervals subclause 2.2 (a)(i)	Not applicable
12	Maximum purchase order quantity subclause 2.2 (b)(ii)	Supplier to state
13	Minimum quantity to be ordered during term subclause 2.2 (a)(ii)	Not applicable
14	Maximum quantity to be ordered during term subclause 2.2 (b)(ii)	Not applicable
15	Supply lead time subclause 2.3 (c)	Supplier to provide
16	Supplier's security	Not applicable
17	Purchaser's security	Not applicable
18	Purchaser - Supplied documents (subclause 6.2)	As stated in tender specification
19	Supplier – supplied documents (subclause 6.3)	As stated in tender specification
20	Time for Purchaser's direction about documents (sub clause 6.3 (b))	14 days
21	Legislative requirements those expected (subclause 10.1)	Not applicable
22	Reference date (subclause 10.2 (b))	Date of closing of Tender
23	Time by which insurance cover of goods is to be effected (subclause 13.1)	Time at which order is placed
24	Public and product liability insurance (subclause 13.2)	Supplier to provide
25	Qualifying causes of delay, causes of delay for which EOTs will not be granted	Not Applicable
26	Liquidated damages, rate (subclause 17.5)	0.5% per day up to 10% of the purchase order value
27	Delay Damages	As assessed by EFL
28	Date for completion of acceptance testing (subclause 18.1 and 21.1)	As stated in tender specification
29	Party responsible for unloading the goods (subclause 19.1)	Supplier
30	a) When risk in the goods passes (subclause 20.1)	At time of acceptance by Purchaser

	b) Time at which ownership of the good passes to the Purchaser (subclause 20.2)	Upon payment of the purchase order value
31	Period for Purchaser's notice that goods at rejected (subclause 21.1)	14 calendar days
32	Period for Purchaser's notice accepting or rejecting Supplier's proposal (subclause 21.4)	14 calendar days
33	Defects liability period (clause 22)	24 months
34	Invoice (subclause 24.1) Time for invoice	Within 30 days of delivery
35	Interest rate on overdue payments (subclause 24.3)	Nil
36	Supplier's default (subclause 25.2 (c))	28 days
37	Arbitration (subclause 28.3) d) Person to nominate an arbitrator	President of Fiji Institute of Engineers
	e) Rules for arbitration	Laws of Fiji
38	The Supplier's liability is limited as follows (clause 29)	Purchase order value
39	The Purchaser's liability is limited as follows (clause 29)	Purchase order value

SCHEDULE C: REQUIRED PROTECTION, CONTRAL AND MONITORING FUNCTIONS

The offered IED' shall be used for various functions. Listed below are the key protection, control and monitoring functions required in IEDs for various applications. EFL expects that more than one model /type of IED may be required depending on the application type.

Note: All SEL Relays or Equivalent offered has to have ethernet or fiber for communication purposes.

IED Application	Required Protection, Control and Monitoring Functions
6.6kV, 11kV Distribution Feeder Protection, 33kV Sub-transmission Line Backup Protection, 33kV/11kV transformer backup protection	• Multiple level, Phase, negative sequence, residual and neutral overcurrent protection elements with user programmable pickup, time-multiplier or time delay settings, IEC operating curves • Directionality with all overcurrent elements, where direction can be selected by the user • Six levels of under and over-frequency protection elements • Voltage Elements – the IED shall incorporate phase and phase-to-phase under- and overvoltage elements as well as sequence overvoltage elements for protection and control. • Rate of change of frequency elements • Circuit breaker failure detection function • Communications assisted tripping schemes • Four levels of power elements with user programmable direction and level settings • Second harmonic blocking element • Auto-Reclosing Control - The IED shall incorporate a four-shot recloser with four independently set open time intervals. Independently set reset times from reclose cycle and from lockout shall be available. User programmable timers, latch bits, display functions and counters • High-impedance fault detection
Two-winding or Three-Winding Transformer Protection (33kV/11kV or 33kV/6.6kV),	• Transformer Differential Protection – the IED shall include a single, three-phase low-impedance current differential element with adaptive restraint/operate slope characteristics. • Negative-Sequence Differential Protection - the IED shall include negative-sequence differential protection for turn-to-turn fault detection within the transformer. The negative-sequence differential element shall detect turn-to-turn faults as low as two percent of the total winding. • Transformer Inrush and Overexcitation Detection – the IED shall incorporate 2nd, 4th, and 5th harmonic blocking. In addition, 2nd and 4th harmonic restraint shall be provided. This restraint and blocking elements may be used independently, or in combination to prevent restrained differential element operation during inrush or overexcitation conditions. An independent fifth-harmonic element shall be included to warn of transformer overexcitation conditions. Wave-shape-based inrush detection addresses inrush conditions that contain low 2nd and 4th harmonic content.

	• Unrestrained Differential Protection – the IED shall include unrestrained differential protection to provide rapid tripping for internal faults. • External Faults - the IED shall detect an external fault and enter into a high-security mode. • CT Phase Angle Compensation – the IED shall incorporate full “round-the-clock” current compensation, in 30-degree increments, to accommodate virtually any type of transformer and CT winding connection. • Combined Currents. The IED shall incorporate elements to provide overcurrent protection based on summation of currents from combinations of the ST, TU, UW, and WX transformer winding inputs to the IED. • Restricted Earth Fault Protection. The IED shall provide three separate restricted earth fault (REF) protection elements for the detection of ground faults in wye-connected windings. • Breaker Failure Protection – the IED shall include internal breaker failure protection with retrip functions for each of the terminals, and be selectable to also accept external breaker failure protection. • Overcurrent Protection - the IED shall include phase, negative-, and zero-sequence overcurrent for both instantaneous and time-overcurrent elements. Torque control capability shall be provided for the inverse-time overcurrent elements. Adaptive time-overcurrent elements shall be provided that allow operate quantity selection and programmable time-delay and pickup settings. • Current Unbalance – the IED shall provide current unbalance elements for detecting phase current unbalance as compared to the average phase current. • Voltage Elements – the IED shall include three-phase over- and undervoltage elements as well as negative- and zero-sequence overvoltage elements. • Synchronism Check – the IED shall include a synchronism-check element. The synchronism-check function shall incorporate slip frequency, maximum angle difference, breaker close time, and allows different sources of synchronizing voltage. • Volts/Hertz Elements – the IED shall provide a single V/Hz element with two separate characteristic curves for protection during loaded and unloaded transformer operation. • Frequency Elements – the IED shall include two levels of over- and underfrequency settings for each set of three-phase voltage inputs (six elements total). The
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	frequency elements shall maintain pickup accuracy from 40.0 to 70.0 Hz. • Frequency Tracking – the IED shall provide frequency tracking from 40.0 to 65.0 Hz when voltage inputs are provided to the IED. • External Devices – the IED shall not need external devices. All configuration and logic shall be realized in the IED software.
Two-terminal or three-terminal 33kV sub-transmission line protection	• Current Differential Protection – the IED shall compare local and remote phase and sequence currents to provide operation in less than one cycle and it shall also operate for unbalanced faults with currents below line charging current. The IED shall have provision to be unaffected by CT saturation either at local or remote end(s). Differential protection shall be disabled via programmable logic condition to accommodate switching operations without requiring settings change or settings group change. • Distance Protection - the IED shall incorporate at least four zones of phase and ground mho distance and quadrilateral ground distance protection for use if potentials are available. Two zones shall be settable for either forward or reverse direction. Both positive-sequence memory polarized and compensator-distance phase distance elements shall be available. The IED shall detect CCVT transients and block the operation of underreaching Zone 1 distance elements during the transient period. In some instances, sub-cycle tripping will be required, to 1ms. • Power swing detection and blocking - the IED shall detect stable and unstable power swings. • Load encroachment logic • Communications assisted tripping schemes • Tapped Load Coordination - the IED shall selectively coordinate with inverse-time overcurrent protection on a tapped load using total current from all line terminals. • Synchronism Check – the IED(s) shall include two synchronism-check elements with separate maximum angle settings. The synchronism-check function shall incorporate slip frequency and close angle settings and allow different sources of synchronizing voltage • Multiple level, Phase, negative sequence, residual and neutral overcurrent protection elements with user programmable pickup, time-multiplier or time delay settings, IEC operating curves • Six levels of under and over-frequency protection elements

	• Voltage Elements. The relay shall incorporate phase and phase-to-phase under- and overvoltage elements as well as sequence overvoltage elements for protection and control. • Rate of change of frequency elements • Circuit breaker failure detection function • Communications assisted tripping schemes • Four levels of power elements with user programmable direction and level settings • Second harmonic blocking element • Auto-Reclosing Control - The IED shall incorporate a four-shot recloser with four independently set open time intervals. Independently set reset times from reclose cycle and from lockout shall be available. User programmable timers, latch bits, display functions and counters
132kV Transmission Line Main Protection	• Current Differential Protection – the IED shall compare local and remote phase and sequence currents to provide operation in less than one cycle and it shall also operate for unbalanced faults with currents below line charging current. The IED shall have provision to be unaffected by CT saturation either at local or remote end(s). Differential protection shall be disabled via programmable logic condition to accommodate switching operations without requiring settings change or settings group change. • Distance Protection - the IED shall incorporate at least four zones of phase and ground mho distance and quadrilateral ground distance protection for use if potentials are available. Two zones shall be settable for either forward or reverse direction. Both positive-sequence memory polarized and compensator-distance phase distance elements shall be available. The IED shall detect CCVT transients and block the operation of underreaching Zone 1 distance elements during the transient period. In some instances, sub-cycle tripping will be required, to 1ms. • Power swing detection and blocking - the IED shall detect stable and unstable power swings. • Load encroachment logic • Communications assisted tripping schemes • Tapped Load Coordination - the IED shall selectively coordinate with inverse-time overcurrent protection on a tapped load using total current from all line terminals. • Synchronism Check – the IED(s) shall include two synchronism-check elements with separate maximum angle settings. The synchronism-check function shall

	incorporate slip frequency and close angle settings and allow different sources of synchronizing voltage • Multiple level, Phase, negative sequence, residual and neutral overcurrent protection elements with user programmable pickup, time-multiplier or time delay settings, IEC operating curves • Six levels of under and over-frequency protection elements • Voltage Elements. The relay shall incorporate phase and phase-to-phase under- and overvoltage elements as well as sequence overvoltage elements for protection and control. • Rate of change of frequency elements • Circuit breaker failure detection function • Communications assisted tripping schemes • Four levels of power elements with user programmable direction and level settings • Second harmonic blocking element • Auto-Reclosing Control - The IED shall incorporate a four-shot recloser with four independently set open time intervals. Independently set reset times from reclose cycle and from lockout shall be available. User programmable timers, latch bits, display functions and counters • Free-form logic programming capability for protection and automation • Synchrophasor data publishing capability
	• Distance Protection - the IED shall incorporate at least four zones of phase and ground mho distance and quadrilateral ground distance protection for use if potentials are available. Two zones shall be settable for either forward or reverse direction. Both positive-sequence memory polarized and compensator-distance phase distance elements shall be available. The IED shall detect CCVT transients and block the operation of underreaching Zone 1 distance elements during the transient period. In some instances, sub-cycle tripping will be required, to 1ms. • Power swing detection and blocking - the IED shall detect stable and unstable power swings. • Load encroachment logic • Communications assisted tripping schemes • Tapped Load Coordination - the IED shall selectively coordinate with inverse-time overcurrent protection on a tapped load using total current from all line terminals. • Synchronism Check – the IED(s) shall include two synchronism-check elements with separate maximum

132kV Transmission Line Second Main Protection	angle settings. The synchronism-check function shall incorporate slip frequency and close angle settings and allow different sources of synchronizing voltage • Multiple level, Phase, negative sequence, residual and neutral overcurrent protection elements with user programmable pickup, time-multiplier or time delay settings, IEC operating curves • Six levels of under and over-frequency protection elements • Voltage Elements. The relay shall incorporate phase and phase-to-phase under- and overvoltage elements as well as sequence overvoltage elements for protection and control. • Rate of change of frequency elements • Circuit breaker failure detection function • Communications assisted tripping schemes • Four levels of power elements with user programmable direction and level settings • Second harmonic blocking element • Auto-Reclosing Control - The IED shall incorporate a four-shot recloser with four independently set open time intervals. Independently set reset times from reclose cycle and from lockout shall be available. User programmable timers, latch bits, display functions and counters • Free-form logic capability for protection and automation • Synchrophasor data recording and publishing capability
	• Two-zone, positive-sequence impedance mho element for loss-of-field detection • 100% stator ground fault detection based on measurement of neutral overvoltage plus neutral and terminal third-harmonic voltage differential with settable sensitivity • DC field ground protection (64F) based on switched dc voltage injection method • Out-of-step protection based on single or double blinders • Overexcitation detection based on volts/hertz measurement • Negative-sequence overcurrent elements, including definite-time and inverse-time operating characteristics • Sensitive directional power elements with flexibility to provide ant motoring, over-power, or low-forward power indication • Two-zone compensator distance and voltage-restrained or voltage-controlled phase time-overcurrent element for backup protection

Synchronous Generator Protection	• Phase, residual, neutral, and negative-sequence instantaneous and definite-time overcurrent; and inverse-time residual and neutral overcurrent elements • Restricted earth fault (REF) protection element for the detection of ground faults in wye-connected windings. • Directional residual-ground overcurrent elements • Directional neutral overcurrent elements • Phase, phase-to-phase, positive-sequence, negative-sequence, and residual overvoltage elements, phase, phase-to-phase, and positive-sequence undervoltage elements, and synchronism-check voltage input over- and undervoltage elements. • Inadvertent energization protection • Unit breaker failure protection • Supervision of voltage-based protection functions by loss-of-relaying-potential detection logic • Over- and underfrequency elements and rate-of-change-of-frequency elements • Percentage restraint and unrestrained phase current differential elements with fixed or variable percentage, using one or two settable slopes. Second-, fourth-, and fifth-harmonic elements, with the choice of either harmonic blocking or harmonic restraint to prevent restrained differential element operation during inrush or overexcitation conditions. • Ground differential element • Full “round-the-clock” current compensation, in 30-degree increments, to accommodate virtually any type of transformer/generator and CT winding connection. • Synchronism-check element and autosynchronizer with speed control and voltage control outputs. • Thermal model element for overload protection and RTD-based thermal protection.
Busbar Protection (High-Impedance), 11kV, 33kV	• High-Impedance Differential Protection - the IED shall have three independent differential elements, each with two setting levels to provide for protection as well as open CT detection. The IED shall include MOVs with the ability to clamp the peak voltage below 2000 V. • Overcurrent Protection - the IED shall incorporate overcurrent elements to provide phase, negative-sequence, and residual current protection.
	• Differential Protection - the IED shall include six low-impedance current differential elements. • Directional Element - The IED shall include phase-comparator directional elements for each zone.

Busbar Protection (Low-impedance) – 132kV	• Check Zone - the IED shall include a single, dedicated check zone with its own adaptive differential element and settings. • Current Transformer Inputs - the IED shall accept CTs from different classes and a ratio mismatch of 10:1. Measuring quantities shall be on a phase-segregated basis and not from summation CTs. • Current Transformer Alarm - The IED shall include an element in each zone to detect CT open or short circuit conditions. • Breaker Failure Protection - the IED shall include internal breaker failure protection with retrip functions for each of the terminals, but be selectable to also accept external breaker failure protection. • Overcurrent Protection – the IED shall include both instantaneous and time-overcurrent elements for each of the 18 current inputs. Torque control capability shall be provided for the inverse-time overcurrent elements. • Voltage Elements - the IED shall include three phase over- and undervoltage elements as well as negative- and zero-sequence overvoltage elements • End-Zone Protection – the IED shall include the capability to provide protection for a fault between the open circuit breaker and the CT. • External Faults – the IED shall detect an external fault and enter into a high-security mode but not block the differential protection at any time. • Dynamic Busbar Replica – the IED shall, without external devices, use the disconnect contacts to create a replica of the busbar linking in order to assign the terminal currents to the correct differential elements. • Disconnect Monitor - the IED shall include logic to monitor the open/close operations of up to 48 disconnects (isolators) and provide individual alarms for each disconnect.
	• Voltage Differential Protection - the IED shall provide three phase-voltage differential protection with null compensation. The voltage differential protection shall provide three levels of settings for alarm, trip, and catastrophic failure conditions. • Neutral-Voltage Differential Protection – the IED shall provide neutral-voltage differential protection with null compensation. The neutral-voltage differential element shall calculate zero-sequence voltage from three phase-voltage inputs to the IED, and measure differential voltage with respect to a neutral-voltage input. The neutral-voltage differential protection shall provide three

Capacitor Bank Protection	levels of settings for alarm, trip, and catastrophic failure conditions. • Phase-Current Unbalance Protection – the IED shall provide phase-current unbalance protection with null compensation. The phase-current unbalance protection shall be capable of detecting as little as 20 mA of current unbalance on a 1 A CT secondary input. The phase-current unbalance protection shall provide three levels of settings for alarm, trip, and catastrophic failure conditions. • Neutral-Current Unbalance Protection – the IED shall provide neutral-current unbalance protection with null compensation. The neutral-current unbalance protection shall be capable of detecting as little as 20 mA of current unbalance on a 1 A CT secondary input. The phase-current unbalance protection shall provide three levels of settings for alarm, trip, and catastrophic failure conditions. • Instantaneous and Time Overcurrent Fault Protection – the IED shall provide overcurrent elements for phase, negative-sequence, and zero-sequence currents. • Voltage Protection Elements - the IED shall provide six overvoltage and six undervoltage elements with two level settings per element. Level 1 settings shall have definite-time delay capabilities. Input voltages to the elements shall be selectable from phase, zero-sequence, positive-sequence, negative-sequence, and maximum quantities. RMS and fundamental voltages shall be supported. • Frequency Protection Elements – the IED shall have six independent frequency elements with definite-time delay. The frequency elements shall have undervoltage supervision inputs. • Breaker Failure Elements – the IED shall have breaker failure protection with flashover detection. Breaker failure protection shall operate using subsidence detection logic to minimize coordination time requirements of downstream devices. • Automatic Control – the IED shall be capable of providing independent dead-band controllers. Each control shall be capable of either voltage, power factor, or VAR control.
Arc flash detection	• Arc-flash detection and arc-flash overcurrent –this function may reside in one of multi-function IEDs above or in a dedicated device. Fiber optic sensors and fiber optic cables shall be used for sensing in this scheme.
Annunciation & Display	• Configurable annunciator for local display of events • Configurable display window with programmable LEDs

	• Supports Boolean logic • Supports a wide range of communication protocols, including DNP3 and Modbus • At least two serial ports • Supports IRIG-B input • Remote control capability • Either hand reset or remote reset
Contact Extension or Contact Transfer	• Input/Output module which can perform auxiliary relay functions
Data gathering and storage	• Functions as a data concentrator • Stores various types of power system data for analysis and visualization • Able to be programmed to perform basic calculations • Supports (More than one device could serve this function and EFL encourages Bidders to provide list of equipment with options for various types of data concentrators)
Special Protection Scheme Device	• High-speed processing device • Ability to expand I/O and connect to at least 10 other IEDs via Ethernet or high-speed serial connection (configurable ports or port slots) • Can support IEC 61131 logic design • Can support IEC 61850 • Can support synchrophasor technology • Dual power supply source support capability
Phasor Data Concentrator	• Gather and store phasor measurement unit data
Fiber Optic Transceiver with IRIG B	• Apply for instrumentation, protection, automation, and other applications that benefit from economical fiber-optic links up to 4 km long.
Signaling transceivers (for upto 30km comms channel)	• Single-mode fiber-optic signaling transceivers for serial communication between protection relays over distances up to 30 km, supporting transparent transmission of protection and SCADA signaling.
Signaling Transceivers (Single-Mode Fiber-Optic, for up to 80 km Communication Channel) – Equivalent to SEL-2830	• Single-mode fiber-optic signaling transceivers for transparent serial communication over optical fiber with a minimum transmission distance of 80 km. The transceivers shall support protection signaling, relay-to-relay communication, teleprotection, and substation automation applications. The units shall provide electrical isolation between connected devices, be compatible with standard ST fiber-optic connectors and 9-pin serial (DB-9) interfaces, require no external power supply, and operate directly from the connected device. The transceivers shall be suitable for installation

	in utility substations and shall be equivalent to SEL-2830 in functionality and performance.
Ethernet Transceiver (Serial-to-Ethernet Communication Interface) – Equivalent to SEL-2890	• Ethernet transceiver for converting serial communication interfaces to Ethernet networks, enabling communication between protection relays, RTUs, and substation automation devices over TCP/IP networks. The transceiver shall support EIA-232 (RS-232) serial communication, 10BASE-T Ethernet connectivity, transparent serial data transmission, and reliable integration with SCADA, protection, and engineering access systems. The unit shall be powered directly from the connected device, require no external power supply, and be suitable for utility substation environments. The transceiver shall be equivalent to SEL-2890 in functionality and performance.
Remote Input/Output (I/O) Module – Equivalent to SEL-2515	• Provides remote monitoring and control of field devices through configurable digital input (DI), digital output (DO), analog input (AI), and analog output (AO) channels. • Enables expansion of substation automation and control systems by acquiring status, alarm, metering, and control signals from remotely located equipment. • Supports communication with protection relays, automation controllers, SCADA systems, and intelligent electronic devices (IEDs) using industry-standard communication protocols, including IEC 61850, DNP3, and Modbus (as applicable). • Supports high-speed acquisition and transmission of field data for monitoring, control, annunciation, and automation applications. • Suitable for utility substations, power generation, transmission, distribution, and industrial automation applications requiring remote data acquisition, equipment monitoring, and control. • Designed for seamless integration into distributed automation and substation control architectures, improving operational visibility, reliability, and system performance. • Shall be equivalent to SEL-2515 in functionality and performance.
Transformer Automation Controller (TAC) – Equivalent to SEL-2414	• Provides integrated transformer automation, including Automatic Voltage Regulation (AVR), Load Tap Changer (LTC) control, thermal monitoring, and transformer asset management. • Automatically regulates transformer voltage by controlling on-load tap changer (OLTC/LTC) operations based on configurable voltage setpoints, line-drop

	compensation, power flow direction, and time or inverse-time delay characteristics. • Supports automatic load sharing and parallel operation of transformers using leader/follower and current-angle paralleling schemes, including configurable intertap delay and operator-selectable control modes. • Monitors transformer thermal performance and loss of insulation using IEEE C57.91 and/or IEC 60076-7 thermal models, with support for RTD, thermocouple, analog, and digital inputs for temperature, oil level, pressure, and other transformer condition parameters. • Provides comprehensive transformer monitoring, including voltage, current, power, demand, energy, LTC operation records, oscillography, event recording, thermal history, and asset performance data for condition monitoring and maintenance planning. • Controls transformer cooling systems by automatically operating cooling stages based on calculated hotspot and oil temperatures, with cooling bank alternation to optimize equipment life and reliability. • Supports integration with protection relays, SCADA systems, and substation automation systems using industry-standard communication protocols, including IEC 61850, DNP3, Modbus, and IEC 60870-5-103 (as applicable). • Suitable for transmission, distribution, industrial, and utility substations requiring automated transformer voltage regulation, condition monitoring, thermal management, and asset optimization. • Shall be equivalent to SEL-2414 in functionality and performance.
SEL-2812 Fiber-Optic Transceiver (or approved equivalent)	Fiber-Optic Serial Communication Transceiver • Shall provide bidirectional EIA-232 serial communication over duplex multimode fiber-optic cable. • Shall simultaneously support IRIG-B time synchronization over the same fiber pair. • Shall support communication distances of up to 4 km over multimode fiber. • Shall operate at serial data rates up to 115.2 kbps, full duplex. • Shall be port powered from the connected EIA-232 device with no external power supply required. • Shall provide complete galvanic isolation between connected equipment to eliminate ground loops and protect against ground potential rise (GPR), electromagnetic interference (EMI), and radio-frequency interference (RFI).

	• Shall use ST fiber-optic connectors and be compatible with 50/125 µm or 62.5/125 µm multimode fiber. • Shall include LED indicators for Power, Transmit, and Receive status. • Shall provide configurable IRIG-B input/output selection for serial connector or dedicated IRIG-B interface. • Operating temperature shall be –40°C to +85°C. • The transceiver shall be SEL-2812 or approved equivalent.
Real-Time Automation Controller (RTAC) – SEL-3350 or Approved Equivalent	• Industrial-grade real-time automation and computing platform for utility and industrial applications. • Supports substation automation, data concentration, protocol conversion, monitoring, and control. • Integrates protection relays, IEDs, SCADA systems, and enterprise communication networks. • Supports industrial operating systems, virtualization, and secure communications. • Provides configurable Ethernet, serial, USB, and digital/analog I/O interfaces. • Suitable for substation automation, power system monitoring, control, and SCADA applications.
Satellite-Synchronized Network Clock SEL-2488 or Equivalent	• GNSS-synchronized network clock providing high-accuracy time distribution via NTP, PTP, IRIG-B, PPS, and frequency outputs for protection, automation, SCADA, synchrophasor, sampled values, and communication network applications.
RJ45-to-DB9 Serial Adapter Panel – SEL-2902 or Approved Equivalent	• RJ45-to-DB9 serial adapter panel for structured EIA-232 serial connectivity between automation controllers, communications processors, protection relays, and other intelligent electronic devices (IEDs), supporting organized cable management and simplified installation and maintenance.
Multimode Fiber-Optic Patch Cable (ST-ST) or Equivalent SEL-C807 or Equivalent	• 62.5/125 µm multimode duplex fiber-optic patch cable with ST connectors, supplied in customer-specified lengths for protection, automation, instrumentation, and SCADA communication applications.
USB-to-Serial Cable (SEL-C662) or Equivalent	• USB communication cable for connecting a PC to protection relays, automation controllers, IEDs, and communication devices with EIA-232 (DB-9) serial interfaces for configuration, commissioning, diagnostics, and data transfer.
EIA-232 Fiber-Optic Serial Interconnection Cable with IRIG-B or Equivalent	• Fiber-optic serial interconnection cable with EIA-232 (DB-9) connectors and IRIG-B support for connecting DTE devices through fiber-optic transceivers in protection, automation, and SCADA applications.

SUMMARY

No.	Item Description	Preferred Model of IED	or	Existing Model Number
1	11kV Feeder Protection & 33kV Sub-transmission Network, Backup Protection Relay	SEL-351S-7 Equivalent	or	0351S7XCD3F1322
2	Two Winding or Three Winding Transformer Protection (33kV/11kV or 33kV/6.6kV)	SEL-387E Equivalent	or	0387E014X1H2235
3	132/33kV Transformer Main Protection (3 Winding)	SEL-487E Equivalent	or	0487E32648XXC3X3H673XXX
4	33kV Sub-transmission Line Main Protection	SEL311L Equivalent	or	0311L7JEE3213252X
5	33kV Sub-transmission Line Main Protection	SEL-411L Equivalent	or	0411L126X1C8EEXH52323XX
6	132kV Transmission Line Second Main Protection	SEL421 Equivalent	or	04215611XC3X3H26XX X2X
7	Generator Protection Relay	SEL700G Equivalent	or	0700G11D1D9X72810431
8	Generator Protection Relay	SEL300G Equivalent	or	0300G30H221X112
8	High Impedance Busbar Protection Relay (11kV or 33kV)	SEL587Z Equivalent	or	0587Z02321H12XX
9	Low Impedance Busbar Protection Relay (132kV)	SEL487B Equivalent	or	0487B124X12XC1XD37NNXXX
10	Capacitor Bank Protection Relay	SEL487V Equivalent	or	0487V126111XC4X3H423XXX
11	Indoor Switchgear (11kV or 33kV) ARC Flash Protection Device	SEL751 Equivalent	or	751001DCD0X77831431
12	Annunciation Device	SEL2523 Equivalent	or	252301H13A0D1XX
13	Input Output Module	SEL2505 Equivalent	or	2505363XX
14	Data Gathering and Storage	SEL3555 Equivalent	or	3555#KDN2
15	Special Electrical Protection Scheme Device	SEL3555 Equivalent	or	3555#KDN2
16	Phasor Data Concentrator	SEL3555 Equivalent	or	3555#H7B7
17	Signaling transceivers (for within Substation)	SEL2812 Equivalent	or	2812MRX1 or 2812MTX1

18	Signaling transceivers (for upto 30km comms channel)	SEL2829M Equivalent	or	2829MX1
19	Signaling transceivers (for upto 80km channel)	SEL2830M Equivalent	or	2830MX1
20	Serial to Ethernet Transceivers	SEL2890 Equivalent	or	2890M0X
21	Remote I/O module providing eight (8) digital input contacts and eight (8) digital output contacts for remote monitoring, control, and substation automation applications.	SEL2515 Equivalent	or	New Item
22	Transformer Automation Controller (TAC) for automatic voltage regulation, OLTC control, transformer monitoring, thermal management, and SCADA integration.	SEL-2414 Transformer Automation Controller (TAC) or Equivalent		New Item - 241421D6X9X2XE11641
23	Fiber-optic communication transceiver for instrumentation, protection, automation, and SCADA applications with communication distances up to 4 km.	SEL-2812 Fiber-Optic Transceiver (or approved equivalent)		New Item
24	Industrial-grade real-time automation controller supporting substation automation, data concentration, protocol conversion, SCADA integration, monitoring, and control, with secure communications and configurable Ethernet, serial, USB, and I/O interfaces.	SEL-3350 Equivalent	or	New Item
25	GNSS-synchronized network clock providing high-precision time synchronization using NTP, PTP, IRIG-B, PPS, and frequency outputs for protection, automation, SCADA, synchrophasor, sampled values, and communication network applications.	SEL-2488 Equivalent	or	

26	RJ45-to-DB9 serial adapter panel for EIA-232 communication and structured interconnection of automation controllers, communications processors, protection relays, and IEDs.	RJ45-to-DB9 Serial Adapter Panel or Equivalent	New Item
27	62.5/125 μ m Multimode Duplex Fiber-Optic Patch Cable with ST Connectors	SEL-C807 or Equivalent	New Item
28	USB-to-Serial Cable USB communication cable for connecting a PC to automation, protection, and communication devices with USB-C interfaces for configuration, firmware updates, and data transfer.	(SEL-C662) or Equivalent	New Item
29	EIA-232 fiber-optic serial interconnection cable with DB-9 connectors and IRIG-B support for connecting DTE devices via fiber-optic transceivers, suitable for protection, automation, and SCADA applications.	EIA-232 Fiber-Optic Serial Interconnection Cable with IRIG-B or Equivalent	New Item

SCHEDULE D: SPECIFICATION REQUIREMENT FOR IEDS

Refer to technical schedule

SCHEDULE D: EVALUATION CRITERIA

Tender Evaluation Criteria	
Category	Criteria
Bid Responsiveness	General responsiveness of bid, compliance to submission requirements and documentation
Health, Safety & Environment	Assessment of Bidder's compliance to health, safety and environmental requirements detailed within technical specification. Past performance of Bidders. Manufacturer holds third party accreditation to ISO 14001 and ISO 45001.
Quality Assurance	Manufacturer holds third party Quality Assurance accreditation to ISO/AS/NZS 9001:2015. Bidder has Quality Management systems in place that are acceptable to Energy Fiji Limited.
Technical Compliance	Does the Tender meet Energy Fiji Limited's minimum technical requirements as outlined in the Technical Specification? • Design of equipment and all components • Performance of equipment and all components • • Sustainability and ease of operation • Reliability data • Independent accreditation and type test certification • Comprehensiveness of proposal, composition of Bidder's team • Risk management plan and mitigation of foreseeable risks • Past experience • Ability to deliver on time / delivery timeframe
Commercial Compliance	Bidder holds the required current insurance provisions and has provided evidence through valid insurance certificates of currencies. Has the Bidder submitted Departures to the Terms and Conditions? If so is it likely that Energy Fiji Limited will be able to negotiate agreement without undue delay? Assessment of the Bidders operational risks including conflicts of interest. Bidder must comply with statutory requirements, such as that enforced by FRCS, FNPF, FNU, etc. and provide evidence of compliance as required in the specifications.
Energy Fiji Limited Procedures	Bidder must comply with all relevant Energy Fiji Limited safety and environmental procedures. This is indicated by the Bidder signing

	the Form of Tender Schedule, acknowledging all applicable procedures. Bidder must also comply with the requirements of Electricity Act (2017), Electricity Regulations (2019).
Financial Stability	Assessment of Bidder's current financial stability and ability to remain financially stable.
Price Evaluation	• Base tendered prices; • Price escalation formula (foreign exchange and commodity-based rise and fall formula or similar review mechanism); • Other value adding options

SCHEDULE E: DEPARTURE FROM SPECIFICATIONS

The Bidder shall nominate the Clause or relevant section of the tender specification and describe the departure.

Tender Specification Reference	Departure

Where possible, the Tender shall refer to the specific clause of the tender specification.

TENDER CHECKLIST

The Bidders must ensure that the details and documentation mention below must be submitted as part of their tender Bid

Tender Number _____

Tender Name _____

1. Full Company / Business Name: _____

(Attach copy of Registration Certificate)

2. Director/Owner(s): _____

3. Postal Address: _____

4. Phone Contact: _____

5. Fax Number: _____

6. Email address: _____

7. Office Location: _____

8. TIN Number: _____

(Attach copy of the VAT/TIN Registration Certificate - Local Bidders Only (Mandatory))

9. FNPf Employer Registration Number: _____ **(For Local Bidders only) (Mandatory)**

10. **Provide a copy of Valid FNPf Compliance Certificate (Mandatory- Local Bidders only)**

11. **Provide a copy of Valid FRCS (Tax) Compliance Certificate (Mandatory Local Bidders only)**

12. **Provide a copy of Valid FNU Compliance Certificate (Mandatory Local Bidders only)**

13. Contact Person: _____

I declare that all the above information is correct.

Name: _____

Position: _____

Sign: _____

Date: _____

Tender submission

Bidders are requested to upload electronic copies via Tender Link by registering their interest at: <https://www.tenderlink.com/efl>

EFL will not accept any hard copy submission to be dropped in the tender box at EFL Head Office in Suva.

This tender closes at 4.00pm (1600hrs) on Wednesday 16th September, 2026.

For further information or clarification please contact our Supply Chain Office on phone **(+679) 3224360** or **(+679) 9992400** or email us on tenders@efl.com.fj

The bidders must ensure that their bid is inclusive of all Taxes payable under Fiji Income Tax Act. Bidders are to clearly state the percentage of VAT that is applicable to the bid prices.

The lowest bid will not necessarily be accepted as the successful bid.

The Tender Bids particularly the “Price” must be typed and not hand written.

Any request for the extension of the closing date must be addressed to EFL in writing three (3) working days prior to the tender closing date.

Tender Submission via email or fax will not be accepted.