



**ENERGY FIJI LIMITED**

**TECHNICAL SPECIFICATION FOR VERTICAL FUSE SWITCH  
DISCONNECTORS**

**MR 94/2024**

## Revision History & Document Control

Rev No.	Notes	Prepared By	Reviewed & Approved By	Date of Issue
1	Prepared by	Rajiv Singh		24/12/19
2	Reviewed by	Naomi Baleca		15/03/24

## Next Scheduled Revision

This technical specification is due for review in January 2027.

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# 1. INTRODUCTION AND SCOPE OF WORK

Energy Fiji Limited [EFL] is responsible for generation, transmission and distribution of electricity in Viti Levu, Vanua Levu, Ovalau and Taveuni in Fiji. By the end of 2019, EFL had 199,020 customers. This includes residential, commercial and institutional customers.

EFL is requesting proposal for the Preferred Supplier to supply item listed below for EFL's operations to carryout repair, construction and maintenance of Power line Network in Fiji.

The preferred Supplier arrangement will be for a period of 3 (three) years from the date of signing of the contract.

This document outlines the technical requirements for vertical fuse switch disconnectors for use in EFL's low voltage (415V AC) distribution network.

The items covered by this specification are listed below:

No.	Stock Code	Item Description	Rating/ Operating	Supplier Code
1	I05079	Vertical Fuse Switch Disconnecter	160A – Single Pole Operation	SL00-3X/185/F
2	I02881	Vertical Fuse Switch Disconnecter	400A – Single Pole Operation	SL2G-3x/3A
3	I02882	Vertical Fuse Switch Disconnecter	400/630A – Single Pole Operation	SL2-3x3/3A
4	I02883	Vertical Fuse Switch Disconnecter	630/800A – Three Pole Operation	SL3-3x/3A
5	I05076	Vertical Fuse Switch Disconnecter	630/800A – Three Pole Operation	SL3-3X3/3A
6	I05082	Vertical Fuse Switch Disconnecter	1000A – Three Pole Operation	SL3- 3X3/1000/HA/TM3
7	I00860	Parallel Vertical Fuse Switch Disconnecter (1)	1250A – Three Pole Operation	SL3-3X6/1250/HA
8	I00861	Parallel Vertical Fuse Switch Disconnecter (2)	1250A – Three Pole Operation	SL3- 3X6/1250/ST/110/HA

**Table 1.1: Items Covered Under this Specification**

This Specification covers the general requirements of design, manufacture, testing, supply and delivery of vertical fuse switch disconnectors to be used in EFLs medium voltage distribution network.

# **1 INSTRUCTIONS TO BIDDERS**

## **1.1 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 pole-mounted and platform-mounted transformers.

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

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

## **1.2 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 where relevant) 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.

## **1.3 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.

## **1.4 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.

## **1.5 Site Visits**

Bidders can visit existing EFL networks by making arrangements to visit existing EFL installations. Bidders are required to familiarize themselves with the existing EFL installations so the solutions they offer does not require modification to existing poles and support infrastructure.

## **1.6 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.

## **1.7 Clarification of Bidding Documents**

A prospective bidder requiring any clarification of the bidding documents may notify EFL in writing by email, addressed to:

Jitendra Reddy  
Manager Procurement, Inventory & Supply Chain  
2 Marlow Street,  
Suva, Fiji  
Phone: +679 331 3333 Ext 2320 or  
Mobile: +679 999 2400  
Email: [JReddy@efl.com.fj](mailto: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.

## **1.8 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.

## **1.9 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.

## **1.10 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.

## **1.11 Bid Currencies**

Prices shall be quoted in a single currency only.

## **1.12 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.

## **1.13 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.

## **1.14 Sealing and Marking of Bids**

Due to the Covid19 restrictions on movements, bidders are encouraged to bid via Tender link Portal.

## **1.15 Deadline for Submission of Bids**

Bids must be received by EFL at the address specified above no later than **1600 hours (Fiji Time) 24<sup>th</sup> April 2024**.

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.

## **1.16 Late Bids**

Any bid received by EFL after the deadline for submission of bids prescribed above will be rejected.

## **1.17 Modification and Withdrawal of Bids**

The bidder may modify or withdraw its bid after bid submission, provided that written notice of the modification or withdrawal is received by EFL prior to the deadline for submission of bids.

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



## **1.18 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.

## **1.19 Process to be Confidential**

- 2.19.1. 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.
- 2.19.2. 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.
- 2.19.3. Lowest bid will not necessarily be accepted as successful bid.

## **1.20 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, 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.

## **1.21 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.

## 2. REFERENCES

### 2.1. Applicable Standard

The item shall be designed, manufactured and tested in accordance with the latest edition of the Standards specified below and all amendments issued prior to the date of closing of tenders except where varied by this specification.

AS/NZS IEC 60947.1	Low-voltage switchgear and controlgear - Part 1: General rules
AS/NZS IEC 60947.3	Low-voltage switchgear and controlgear – Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units
IEC 60695-2-10	Fire hazard testing - Part 2-10: Glowing/hot-wire based test methods - Glow-wire apparatus and common test procedure
IEC 60695-2-11	Fire hazard testing - Part 2-11: Glowing/hot-wire based test methods - Glow-wire flammability test method for end-products
IEC 60529	Degrees of protection provided by enclosures (IP code)
IEC 60269.1	Low voltage fuses – Part 1: General requirements
IEC 60269.2	Low-voltage fuses - Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application)
IEC 60112	Procedure for the determination of the proof tracking index and the comparative tracking index
AS/NZS ISO:9001	Quality Management Systems – model for quality assurance in design, development, production, installation and servicing
AS ISO/IEC 17025	General requirements for the competence of testing and calibration laboratories

Should inconsistencies be identified between standards and/or this specification, the tenderer shall immediately refer such inconsistencies to the EFL for resolution.

### 3. SERVICE CONDITIONS

#### 3.1. Environmental Conditions

The vertical fuse switch disconnectors shall be suitable for installation indoors and shall be designed to withstand the following service conditions.

Description		Conditions
Atmosphere Pollution Level	:	Very heavy (IEC 60815)
Ambient Temperature	:	Peak: 40°C 24 Hour Average: 30°C Annual Average: 22°C Minimum: 10°C
Relative Humidity (Average)	:	85%
Rainfall	:	Annual Average: 2663mm
Isokeraunic (Thunder day) level	:	60 thunder days per year
Seismic	:	To a maximum of 7 on the open-ended Richter Scale

Note: Fiji is situated in a region where cyclones are experienced frequently. All plant and equipment shall be designed and constructed to withstand these extreme conditions.

#### 3.2. System Conditions

Nominal Voltage	240/415 V
System Highest Voltage	660 V
System Frequency	50Hz
Number of Phases	1 or 3
System Earthing	Effectively Earthed
Impulse Withstand Voltage (peak)	-
Power Frequency Withstand Voltage	15 kV (rms)

## **4. DESIGN AND CONSTRUCTION**

### **4.1. General**

This Specification comprises general, technical and performance requirements for vertical fuse switch disconnectors.

### **4.2. 160A NH Strip Type Vertical Fuse Switch Disconnector**

The strip-type fuse switch disconnector (FSD) shall fulfill the requirements of the IEC standards mentioned under clause 2.1 of this specification.

The FSD shall have a rated current of 160A if fitted with fuse links. The Fuse switch shall be single pole individual operated in a three pole vertical fuse switch disconnector.

The actuator with the fuse holder and the handle shall be made of polyamide with reinforced fiberglass. The device base/carrier shall be made of fiberglass reinforced polyester (thermosetting plastic).

The fuse-holding contacts and all current-carrying parts shall be made from 99.9% Copper. The fuse-receiving contacts and the busbar contacts shall be silver plated, all other copper parts shall be tin plated with a thickness not less than 3.5µm.

Other than current-carrying parts (except fixing parts) shall be made from of suitable insulating material with a glow-wire temperature according to the mentioned standards in clause 2.1. The insulation materials shall be halogen-free and self-extinguishing according to UL94 (V2 or better).

The FSD shall be provided with suitable terminals to connect 3 core 10 - 95 sq.mm XLPE aluminium/copper cable per phase using M8 bolt type connection using crimping type adequate cable lugs. The required torque values for the terminal screw shall be directly indicated in the terminal area.

The connection between main busbar and fuse switch shall be made by busbar only and not by cables.

The FSD shall be capable of taking a maximum of 160 A size 00/000 HRC fuses or any lower ratings. The FSD shall meet utilization category AC22B without means of arc chutes.

The fuse switch disconnector shall be switchable without any special switching sequence. The fuse switch operation shall be hinge operated. The IP rating of the Fuse switch disconnector shall be IP30 from front side fitted with clamp and lateral covers at on operational status as per IEC-60529 Degrees of protection of enclosed equipment.

The device base/carrier made of fiber glass reinforced duroplastic (thermosetting plastic). Further each pair of fuse receiving contacts shall be provided with individual shrouds to prevent accidental touching when the switch top cover is removed.

It shall be possible to fix minimum 2 brackets on each side of the FSD to fix any touch protection covers on it.

Insulating parts of the FSD with purpose to retain current-carrying parts in position shall comply with the glow wire tests according to 8.2.1.1.1 of IEC60947-1 at a test temperature of 960 degree C. All other insulating parts of the FSD shall comply with the requirements of a glow wire test according to 8.2.1.1.1 of IEC60947-1 at a test temperature of 650 degree C according to IEC60695-2-10 and IEC 60695-2-11.

Each FSD shall have a description plate with dimensions not less than 40 x 30mm which is fixed at the switch top cover. It shall be clearly visible independently from the switch position of the FSD (OPEN/CLOSED).

### 4.2.1 Technical Characteristics

Size:	NH00
Rated operational voltage:	AC 415V
Rated operational current with fuse-links:	160A
Conv. free air thermal current with fuse-links:	160A
Busbar distance:	185mm
Utilization category:	AC-22B at 160A/400V
Rated conditional short-circuit current	120kA at 500V
Rated impulse withstand voltage:	8kV
Rated isolation voltage:	1000V
Maximum power dissipation of fuse-link:	12W
Rated frequency:	50-60Hz
IP-protection level:	IP2x

### 4.3. 400A Vertical Fuse Switch Disconnectors

The Fuse switch disconnector shall have a rated current of 400 Amps with HRC fuse and 630A with solid link. The Fuse switch shall be single pole individual operated in a three pole vertical fuse switch disconnector.

The fuse switch design be such that large arcs are not produced during switching and the contacts should have sacrificial electrodes to conduct and quench any arc away and reduce contact wear. No additional device like arc-chutes should be used for quenching of arcs. The fuse switch contacts shall be **Delta (four parallel line)** contact, should be made of 99.9% copper, silver plated with 3.5 to 5µm thickness. Other copper parts should be tin plated with 3.5 to 5 µm thickness. Other than current carrying parts, all other parts shall be made of suitable insulating material. The contacts shall have in built short circuit interlock to prevent pinch effect.

The Fuse switch disconnector shall have a Rated conditional short-circuit current of 120kA. The Rated short time withstand current  $I_{cw}$  of the Fuse switch disconnector is 10kA for 1 second. The utilization category of the Fuse switch disconnector shall be AC23B at a rated operational current  $I_e$  of 630A and rated operational voltage  $U_e$  of 415V. The rated impulse withstand voltage  $U_{imp}$  of the Fuse switch disconnector shall be 12kV with impulse withstand test voltage of  $U_{1.2/50\mu s}$  with a peak value of 20kV across the open main contacts of equipment suitable for isolation.

The Fuse switch disconnector shall be capable of taking a maximum of 400 A size 2 HRC fuses or any lower rating of size1.

The fuse switch disconnector shall be switchable without any special switching sequence. The fuse switch operation shall be hinge operated. The IP rating of the Fuse switch disconnector shall be IP30 from front side fitted with clamp and lateral covers at on operational status as per IEC 60529 Degrees of protection of enclosed equipment.

The fuse holder shall be made of polyamide 6.6 with reinforced fibre glass. The device base/carrier made of fibre glass reinforced duroplastic (thermosetting plastic). Further each pair of contacts shall be provided with individual shrouds to prevent accidental touching when the switch top cover is removed. The fuse holding contacts shall be designed to contact fuse blade at right angle.

**The fuse switch disconnector Parts of insulating materials necessary to retain current-carrying parts in position shall confirm to the glow wire tests of 8.2.1.1.1 of IEC60947-1 at a test temperature of 960 degree C and Parts of insulating materials not necessary to retain current-carrying parts in**

position eventhough in contact with them shall confirm to the requirements of a glow wire test of 8.2.1.1.1 of IEC60947-1 at a test temperature of 650 degree C according to IEC60695-2-10 and IEC 60695-2-11.

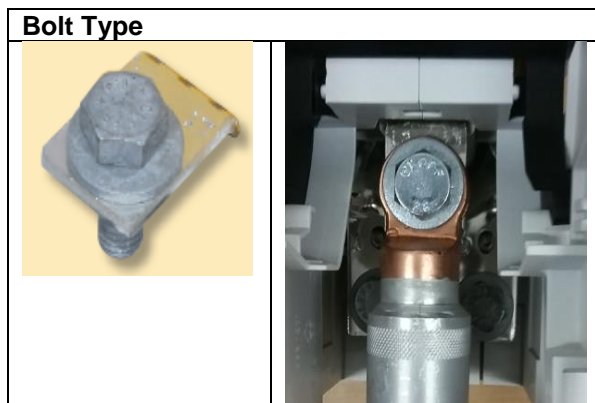
Insertion and removal of the HRC fuse shall be protected against accidental touch (finger proof protected). Switching on and off with HRC fuse links under load condition shall be performed with single hand operation, with low switching force and wear free contacts. The fuse blown indicator shall be clearly visible in top and middle of fuse through fuse switch integral polycarbonate transparent windows without need of any additional indicator. The fuse switch shall have self-closing two orifice per contact for measuring voltage across the contact. The voltage measurement shall be possible without fuses being inserted in the contact. Standard voltage probes/ tester shall be able to be inserted in the orifice without opening any of the fuse switch window or opening the fuse switch itself. The connection between main bus bar and fuse switch by bus bar only and not by cables.

### 4.3.1 Technical Characteristics

Size:	NH3
Rated operational voltage:	AC 415V
Rated operational current with fuse-links:	400A
Conv. free air thermal current with fuse-links:	400A
Busbar distance:	185mm
Utilization category:	AC-22B at 630A/400V
Rated conditional short-circuit current	120kA
Rated impulse withstand voltage:	10kV
Rated isolation voltage:	1000V
Maximum power dissipation of fuse-link:	30W
Rated frequency:	50-60Hz
IP-protection level:	IP2x

### 4.3.2 Bolted Type Cable Termination

The fuse switch disconnecter shall be provided with suitable terminals to terminate 3 core 25 - 300 sq.mm XLPE Aluminum/copper cable per phase using M12 bolt type connection using crimping type bimetallic sockets as shown below in the sample picture.



#### 4.4. 630A Vertical Fuse Switch Disconnectors

The strip-type fuse switch disconnector (FSD) shall fulfill the requirements of the IEC standards mentioned under clause 2.1 of this specification.

The FSD shall have a rated current of 630A if fitted with fuse links. The Fuse switch shall be single pole individual operated in a three pole vertical fuse switch disconnector.

**Customer option:** By request of the customer the device shall be all three phases gang operated in a three pole vertical fuse switch disconnector. It shall have one-hand-operation.

The actuator with the fuse holder and the handle shall be made of polyamide with reinforced fiberglass. The device base/carrier shall be made of fiberglass reinforced polyester (thermosetting plastic).

The fuse-holding contacts and all current-carrying parts shall be made from 99,9% Copper. The fuse-holding contacts shall be silver plates, all other copper parts shall be tin plated with a thickness not less than 3,5 µm.

Other than current-carrying parts (except fixing parts) shall be made from of suitable insulating material with a glow-wire temperature according to the mentioned standards in clause 2.1. The insulation materials shall be halogen-free and self-extinguishing according to UL94 (V2 or better).

The FSD shall be provided with suitable terminals to connect 3 core 25 - 300 sq.mm XLPE aluminum/copper cable per phase using M12 bolt type connection using crimping type adequate cable lugs.

**Customer option:** By request of the customer the device shall be provided with v-type aluminium clamps, made completely from aluminium, to connect 3 core 70 - 300 sq.mm XLPE aluminium/copper cable per phase. The clamp shall be equipped with a shear head screw which ensures the prescribed torque without using a torque wrench. After shearing of the head, the clamp shall have the possibility to loose and to retighten with the same tool as for initial tightening

The connection between main bus bar and fuse switch by bus bar only and not by cables.

The FSD shall be capable of taking a maximum of 630 A size 3 HRC fuses or any lower ratings. It shall be possible to taking fuse-links of size 1 or size 2 without any changes at the FSD.

##### 4.4.1 Additional Requirements

The FSD shall have two orifices per phase for measuring voltage across the contact. The voltage measurement shall be possible without fuses or solid links being inserted in the contact. Standard voltage probes/ tester shall be able to insert in the orifices if the FSD is closed and without any additional actions.

The single pole operated FSD shall be switchable without any special switching sequence.

Mounted on the busbar system in the maintenance position (all 3 phases disconnected) the FSD has the level IP 20. In this position it shall be not possible under any circumstances to get access to the busbar without using any tool. (It shall avoid accidental touch to live parts)

If the FSD is in mounting position (switch top cover is removed from the base part) the fuse-holding contact shall remain protected against accidental touch (IP1X).

The fixing elements of the switch top cover of the FSD, in particular their position (locked/unlocked) shall be visible through the transparent window in the handle, if no fuse-link is inserted.

It shall be possible to fix minimum 2 brackets on each side of the FSD to fix any touch protection covers on it.

The manufacturer shall confirm that the type-test-report provided with the offer is valid for the offered device and there are not made any changes at the offered device which could have influence of the values stated in the test-report.

Customer is authorized to make any tests in its own labs to make sure that the product properties and quality features stated by the customer will be fulfilled.

#### 4.4.2 Technical Characteristics

Size:	NH3
Rated operational voltage:	AC 415V
Rated operational current with fuse-links:	630A
Conv. free air thermal current with fuse-links:	630A
Conv. free air thermal current with JM-TM3 1250 solid-links:	800A
Busbar distance:	185mm
Utilization category:	AC-22B at 630A/400V
Rated conditional short-circuit current	80kA
Rated impulse withstand voltage:	12kV
Rated isolation voltage:	1000V
Maximum power dissipation of fuse-link:	48W
Rated frequency:	50-60Hz
IP-protection level:	IP2x

#### Sample Nameplate of 1000kVA Transformer

The following nameplate is for a 1000kVA transformer indicating the tap voltages: (provided for bidders reference)

Tap Position	Tap Connection	HV Volts	LV Volts
1	5-6	12100	433/250
2	6-4	11825	
3	4-7	11550	
4	7-3	11275	
5	3-8	11000	
6	8-2	10725	
7	2-9	10450	



## **5. PERFORMANCE AND TESTING**

### **5.1. Type & Routine Testing**

Type tests and routine tests shall be done in accordance with the requirements of **AS/NZS IEC 60947.1 & AS/NZS IEC 60947.3** and this specification. It shall be the responsibility of the supplier to perform or to have performed all the tests specified.

Copies of Type Test Certificates & Type Test Reports issued by a third party testing laboratory that is accredited to ISO/IEC 17025 shall be submitted with the tender for the purpose of technical evaluation. A copy of the accreditation certificate to ISO/IEC 17025 for the testing laboratory shall also be submitted (all in English language).

### **5.2. Acceptance Tests**

The EFL may carry out acceptance test on equipment to prove it conforms to the requirements of this specification. Any equipment showing evidence of failure to comply with the requirements of this specification will be liable to rejection.

### **5.3. Witnessing of Tests**

The EFL reserves the right to witness all testing. The Supplier shall give EFL reasonable notice of when testing will be carried out and two (2) EFL engineers to be invited to witness the testing. The return-air travel, accommodation, meals and other expense related to test witnessing shall be borne by the Bidder as a value adding service.

**Note the Factory Acceptance Testing (FAT) is a mandatory requirement by EFL.**

### **5.4. Compliance**

The Supplier shall state in writing that their offer complies with the relevant Standards and this specification. If the Supplier is offering equipment manufactured to an equivalent standard, full details of that standard must be given including a copy written in English.

## **6. RELIABILITY**

### **6.1. Service Life**

Bidders are required to comment on the reliability of the equipment and the performance of the materials offered for a service life of 35 years under the specified system and environmental conditions in clause 3.

### **6.2. Evidence in Support of Reliability**

Where the specified guaranteed service life is less than 35 years Suppliers are required to provide comment and submit evidence in support of the reliability and performance claimed including detailed information on Failure Mode and Effect Analysis.

## **7. ENVIRONMENTAL CONSIDERATIONS**

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

## **8. PACKAGING AND MARKING**

### **8.1 Packaging**

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.

Each packaged lot shall be marked with the following information:

- Manufactures Name
- Purchase Order Number
- Contact No.
- EFL Stock Code
- Item Description
- Applicable standards
- Pack Size
- Pack Weight

### **8.2 Marking**

The following information shall be marked indelibly and legibly on a nameplate permanently attached to the vertical fuse switch disconnectors in English language:

- Technical characteristics
- The manufacturer's name or trade mark
- The year of manufacture

## **9. QUALITY REQUIREMENTS**

Tenderers are required to submit evidence that the design and manufacture of the vertical fuse switch disconnectors are in accordance with AS/NZS ISO 9001 and shall include the Capability Statement associated with the Quality System Certification.

If the Tenderer is a non-manufacturing supplier, the documentary evidence shall include the quality system certifications of both the supplier and the manufacturer.

## **10. STOCK AVAILABILITY**

The bidder is required to show the size of his/her stock holding and the ability to meet the required estimate quantity per annum. The movement of the vertical fuse switch disconnectors will depend on the EFL's project works and for operation and maintenance purposes. An estimate movement of the item are outlined in the table below but it will not be purchase as a lump sum quantity at once. Hence, the successful bidder will be required to carry a consignment / safety stock at times to meet EFL's demand within the three year contract period.

No .	Stock Code	Item Description	Rating/ Operating	Supplier Code	Approximate 3 Year Stock Movement
1	I05079	Vertical Fuse Switch Disconnecter	160A – Single Pole Operation	SL00-3X/185/F	12
2	I02881	Vertical Fuse Switch Disconnecter	400A – Single Pole Operation	SL2G-3x/3A	14
3	I02882	Vertical Fuse Switch Disconnecter	400/630A – Single Pole Operation	SL2-3x3/3A	1
4	I02883	Vertical Fuse Switch Disconnecter	630/800A – Three Pole Operation	SL3-3x/3A	9
5	I05076	Vertical Fuse Switch Disconnecter	630/800A – Three Pole Operation	SL3-3X3/3A	6
6	I05082	Vertical Fuse Switch Disconnecter	1000A – Three Pole Operation	SL3-3X3/1000/HA/T M3	3
7	I00860	Parallel Vertical Fuse Switch Disconnecter (1)	1250A – Three Pole Operation	SL3-3X6/1250/HA	4
8	I00861	Parallel Vertical Fuse Switch Disconnecter (2)	1250A – Three Pole Operation	SL3-3X6/1250/ST/110/HA	14

## 11. PRODUCT WARRANTY PERIOD

The bidders are required to provide the warranty period as part of the proposal. A minimum warranty period of twenty-four (24) months from time of dispatch from factory shall be provided.

## 12. INFORMATION TO BE SUPPLIED BY THE BIDDER

### 12.1. Documentation to be supplied with the tender

To enable the EFL to fully evaluate the vertical fuse switch disconnectors offered, (in addition to the completed Specification Requirement and Guaranteed Performance schedule) the bidder shall submit the following information with their tender: **(Note these are mandatory requirements)**

- List showing similar equipment supplied to or on order for other utilities in Australia or New Zealand or the Oceania region for the past 5 years
- Typical arrangement drawings and full details of the dimensions including drawings for the accessories offered
- Type test certificates as per Clause 5.1
- End of service life disposal methods
- Evidence of Quality Management Systems used in the manufacturing process
- 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 vertical fuse switch disconnectors
- 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)

Bidders may be asked to provide additional information during tender assessment period or following award of contract.

## **12.2. Samples**

When requested, production samples of each item shall be submitted with the offer.

Each sample shall be delivered freight free (Delivery Duty Paid (DDP)), suitably packaged and labelled with the following information:

- Name of supplier and this contact number
- Tender number
- Any supporting data on features or characteristics

## **12.3. Training**

Training material in the form of drawings, instructions and/or audio visuals (in CD format) are required to be provided for the items accepted under the tender. The Tenderers shall allow the cost of production and delivery of training material in the tendered prices.

The training materials should include but not be limited to the following topics:

- Handling
- Storage
- Application
- Installation
- Maintenance
- Environmental performance
- Electrical performance
- Mechanical performance
- Disposal

**Offers of vendors who fail to furnish above particulars shall be rejected.**

## 13. APPENDIX

### 13.1. Price Schedule

Bidders are required to complete the following price schedule and submit with the offer. EFL requires the bidding prices to be in CIF incoterms.

No	Stock Code	Item Description	Rating/ Operating	Supplier Code	Unit Price (CIF)	Currency of bid
1	I05079	Vertical Fuse Switch Disconnecter	160A – Single Pole Operation	SL00-3X/185/F		
2	I02881	Vertical Fuse Switch Disconnecter	400A – Single Pole Operation	SL2G-3x/3A		
3	I02882	Vertical Fuse Switch Disconnecter	400/630A – Single Pole Operation	SL2-3x3/3A		
4	I02883	Vertical Fuse Switch Disconnecter	630/800A – Three Pole Operation	SL3-3x/3A		
5	I05076	Vertical Fuse Switch Disconnecter	630/800A – Three Pole Operation	SL3-3X3/3A		
6	I05082	Vertical Fuse Switch Disconnecter	1000A – Three Pole Operation	SL3-3X3/1000/HA/TM3		
7	I00860	Parallel Vertical Fuse Switch Disconnecter (1)	1250A – Three Pole Operation	SL3-3X6/1250/HA		
8	I00861	Parallel Vertical Fuse Switch Disconnecter (2)	1250A – Three Pole Operation	SL3-3X6/1250/ST/110/HA		
9	Factory Acceptance Testing (FAT) for 2 EFL Engineers					

Bidders are to clearly indicate the currency of bid.

## 13.2. Technical Details – Vertical Fuse Switch Disconnecter

This schedule shall be completed and submitted with the offer. A separate schedule shall be provided for each item offered: **(Note these are mandatory requirements)**

Particulars	Requirements	Bidders Response
Name of Manufacturer		
Origin of materials used for manufacturing of VSD		
Country of manufacture		
Manufactures type test certificate number		
Name of testing authority		
Testing authority accreditation certificate provided	Yes/No	
<b>General</b>		
Ability to operate in environmental and system conditions as per Clause 3.0 of this specification		
Complete dimensional drawing provided for vertical fuse switch disconnectors complete with accessories	Mandatory requirement	
Manufactured to <b>AS/NZS IEC 60947.1 &amp; AS/NZS IEC 60947.3</b>	Yes/ No	
<b>Materials</b>		
Material of actuator with the fuse holder and handle	Polyamide with reinforced fiberglass	
Material for device base/carrier	Fiberglass reinforced polyester (thermosetting plastic)	
Material for fuse holding contacts and all current carrying parts	99.9% copper	
Material for fuse-receiving contacts and bus-bar contacts	Silver plated	
All other copper parts	Tin plated with thickness not less than 3.5 µm	
<b>Operations</b>		
Insertion and removal of HRC fuses	Accidental touch protection shall be provided	
Switching ON/OFF with HRC fuse links under load conditions	To be performed with single hand operation	

	with low switching force and wear free contact	
Fuse blown indicator	Clearly visible in the top and bottom of fuse	
Fuse switch	Shall have self-closing two orifice per contact for measuring voltage across the contacts. Standard voltage probes/tester shall be able to be inserted.	
The connection between main bus-bar and fuse switch	Shall be by bus-bars only and not cables	
<b>Technical – 160A Vertical Fuse Switch Disconnectors</b>		
Operation	Single pole operated	
Size	NH00	
Rated operational voltage	AC 415V	
Rated operational current with fuse-links	160A	
Conv. free air thermal current with fuse-links	160A	
Busbar distance	185mm	
Utilization category	AC-22B at 160A/400V	
Rated conditional short-circuit current	120kA at 500V	
Rated impulse withstand voltage	8kV	
Rated isolation voltage	1000V	
Maximum power dissipation of fuse-link	12W	
Rated frequency	50-60Hz	
IP-protection level	IP2x	
Terminals	Suitable to connect 3 core 10-95 sqmm XLPE/ PVC AL/Cu cables	
<b>Technical – 400A Vertical Fuse Switch Disconnectors</b>		
Operation	Single pole operated	
Size	NH3	
Rated operational voltage	AC 415V	
Rated operational current with fuse-links	400A	
Conv. free air thermal current with fuse-links	400A	

Busbar distance	185mm	
Utilization category	AC-22B at 630A/400V	
Rated conditional short-circuit current	120kA	
Rated impulse withstand voltage	10kV	
Rated isolation voltage	1000V	
Maximum power dissipation of fuse-link	30W	
Rated frequency	50-60Hz	
IP-protection level	IP2x	
Terminals	Suitable to connect 3 core 25-300 sqmm XLPE Al/Cu cables	
<b>Technical – 630A Vertical Fuse Switch Disconnectors</b>		
Operation	Three pole operated	
Size	NH3	
Rated operational voltage	AC 415V	
Rated operational current with fuse-links	630A	
Conv. free air thermal current with fuse-links	630A	
Conv. free air thermal current with JM-TM3 1250 solid-links	800A	
Busbar distance	185mm	
Utilization category	AC-22B at 630A/400V	
Rated conditional short-circuit current	80kA	
Rated impulse withstand voltage	12kV	
Rated isolation voltage	1000V	
Maximum power dissipation of fuse-link	48W	
Rated frequency	50-60Hz	
IP-protection level	IP2x	
Terminals	Suitable to connect 3 core 25-300 sqmm XLPE Al/Cu cables	
<b>Packaging &amp; Weight</b>		
Packaging	1 in each cardboard box suitably labeled	
Weight of each unit	Not to exceed the lifting weight	



**Name of Tenderer:** \_\_\_\_\_

**Signature of Tenderer:** \_\_\_\_\_

**Date:** \_\_\_\_\_

### 13.3. Submission Requirements

All tenderers are required to complete and submit a copy of the submission requirements with their bid submissions. **(Note these are mandatory requirements)**

Requirements	Response from Bidders
Validity of bid (120 days required) (Yes/No)	
List of test reports/certificates provided. (As per Clause 5)	
Minimum warranty period offered for this product	
Completed price and technical schedules (Clause 13.1 and 13.2) (Yes/No)	
The bidding pricing to be in CIF incoterm.	
Currency of bid.	
Lead time of delivery after tender award.	
Bidders company profile outlining financial, technical and production capabilities.	
Disposal method after service life.	
Quality management system used in the production of VFD, attached certificate.	
<b>Material safety datasheet to be provided for all items</b>	
The bidder to include the following as part of the bid:	
Company profile	
Company registration details	
Company financial capability statement	
Reference list of customers the same product is supplied to and contact details for reference check	
If the bidder is the manufacturer, the ISO certification shall be provided	
If the bidder is only the supplier of the product, then both the manufacturer and supplier ISO certifications shall be provided	

Name of Tenderer: \_\_\_\_\_

Signature of Tenderer: \_\_\_\_\_

Date: \_\_\_\_\_

**Complete the following schedule as part of the bid: (Note these are mandatory requirements)**

Stock Codes	Item Description	Rating/ Operating	Supplier Code	Country of Manufacture	Manufacturer of product	Brand Offered	Manufactured to standards	ISO Certification of Manufacturer
I05079	Vertical Fuse Switch Disconnecter	160A – Single Pole Operation	SL00-3X/185/F					
I02881	Vertical Fuse Switch Disconnecter	400A – Single Pole Operation	SL2G-3x/3A					
I02882	Vertical Fuse Switch Disconnecter	400/630A – Single Pole Operation	SL2-3x3/3A					
I02883	Vertical Fuse Switch Disconnecter	630/800A – Three Pole Operation	SL3-3x/3A					
I05076	Vertical Fuse Switch Disconnecter	630/800A – Three Pole Operation	SL3-3X3/3A					
I05082	Vertical Fuse Switch Disconnecter	1000A – Three Pole Operation	SL3-3X3/1000/HA/TM3					
I00860	Parallel Vertical Fuse Switch Disconnecter	1250A – Three Pole Operation	SL3-3X6/1250/HA					
I00861	Parallel Vertical Fuse Switch Disconnecter (Tyree)	1250A – Three Pole Operation	SL3-3X6/1250/ST/110/HA					

**Name of Tenderer:** \_\_\_\_\_

**Signature of Tenderer:** \_\_\_\_\_

**Date:** \_\_\_\_\_

## 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 24<sup>th</sup> April, 2024.**

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](mailto: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.**