

ENERGY FIJI LIMITED

TECHNICAL SPECIFICATION FOR DESIGN, MANUFACTURE, TESTING AND SUPPLY OF HV FUSE LINKS

MR 04/2021

Revision History & Document Control

Rev No.	Notes	Prepared By	Reviewed & Approved By	Date of Issue
1	Prepared by	Rajiv Singh		25/08/20
2	Issued for internal Review			26/08/20
3	Comments from ULSSP		ULSSP	06/09/20
4	Issued for review by Network Team			18/11/20
5	Issued for tender			11/01/21

Next Scheduled Revision

This technical specification is due for review in January 2023.

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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 2020, EFL had 205,580 customers. This includes residential, commercial and institutional customers.

EFL is requesting proposal for the Preferred Supplier to supply item listed below for EFL's consumption 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 Striker Pin fuse links for use in EFL's distribution networks.

The items covered by this specification are listed below:

No.	Stock Code	Item Description	
Striker Pin Fuse Links			
1	New Item	20A 11kV Striker Pin Fuse Link	
2	New Item	31.5A 11kV Striker Pin Fuse Link	
3	New Item	63A 11kV Striker Pin Fuse Link	
4	New Item	125A 11kV Striker Pin Fuse Link	

Table 1.1: Items Covered Under this Specification

This specification covers the general requirements of design, manufacture, testing, supply and delivery of Striker Pin fuse links to be used in EFLs distribution networks.

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 1033.2	High voltage fuses (for rated voltages exceeding 1000V) Part 2 - Current-limiting (Powder-filled) type
IEC 60282-1	High-voltage fuses- Part 1: Current-limiting fuses
AS 2650	High voltage a.c switchgear and control gear - common requirements
AS 1856	Electroplated coatings- silver
AS 2700	Color standards for general purpose.
AS 4169	Electroplated coatings- tin and tin alloys
AS ISO/IEC 17025	General requirements for the competence of testing and calibration laboratories
AS/NZS ISO:9001	Quality Management Systems - model for quality assurance in design, development, production, installation and servicing

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 item shall be suitable for using outdoors 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. Equipment may be installed in coastal environments and in conditions where special protection measures against corrosion will be required. Bidders are required to provide details of such protective measures for protection against corrosion.

3.2. System Conditions

	System Voltages
Particulars	11kV
Nominal System Voltage	11kV
Highest (Equivalent) System Voltage	12kV
System Frequency	50Hz
Number of Phases	3
Impulse Withstand Voltage (peak)	28kV
Power Frequency Withstand Voltage	95kV (peak)

4. DESIGN AND CONSTRUCTION

4.1 HV Fuse Links

4.1.1 Requirement

The fuse-links shall have the following ratings and comply with the Australian Standard AS1033.2 or an equivalent international standard. The fuse-links shall be used primarily for protection of delta connected three phase distribution transformer.

4.1.2 Ratings

Rated Voltage	12KV
Rated Current	Refer table below
Rated Breaking Current	40KA (minimum)
Rated Frequency	50Hz
Fuse Classification	Full Range
Rated Insulation level of Fuse- holder	95kV BIL

Full range fuses are specified above but fuses of other classification will be considered.

4.1.3 Fuse Link Application

The HV fuse sizes currently used by EFL for the protection of distribution transformers (with delta connected primary) are listed below.

Transformer Three Phase KVA	Fuse Rating (A) for 12kV Transformer	Typical Fuse Rating for LV
100	16	125
200	25	200 per circuit
315	31.5	200 per circuit
500	50	200 per circuit
750	63	200 per circuit
1000	80	200 per circuit

The fuse links offered shall be capable of withstanding magnetizing inrush currents specified for distribution transformers rated to full load current for 0.1 seconds and 25 times the transformer rated full load current for 0.01 seconds and discriminate with the secondary fuse links specified.

The fuse links shall be capable of withstanding 125% of the transformer rated full load current continuously and periodic over-loads up to 150% of the transformer rated full load current without any performance degradation.

The fuse links shall be able to clear a phase to neutral fault on the secondary terminals of the transformer in less than 1.5 seconds, in order to limit damage to the transformer in the event of such fault. (The average impedance voltage of the standard EFL distribution transformer at the rated current may be assumed as 4%)

The current-time characteristics of the fuse-links offered shall be submitted with the tender in (MS Office) Excel format.

These shall include the minimum melting time-current curves, maximum clearing time-current curves and current limiting data showing the extent of current limiting. A table of (current -time) data defining the above curves should also be included with the tender in (MS Office) Excel format.

Fuse links shall be suitable for mounting in any orientation.

4.1.4 Striker

The fuse-links shall be fitted with a striker for indication purposes and to initiate three phase tripping of the circuit being protected. The mechanical characteristics of the striker shall be in accordance with the heavy duty type of AS1003.2. The energy rating of the striker shall be $2J\pm1J$.

4.1.5 Marking

Markings provided on the striker fuse shall be in accordance with Clause 6.9.3 of AS 1033.2.

5. PERFORMANCE AND TESTING

5.1. General

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 received or installed.

All testing shall be undertaken by an AS ISO/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.

5.2. Testing - HV Fuse Links

Test certificates of the type tests for the striker fuse as per AS1033.2, and the power dissipation test (AS1033.2) shall be provided with the tender. The routine and batch test certificates shall be submitted with each delivery.

The sample test certificate for the time current characteristics provided with the tender shall include the minimum melting time characteristics and the total clearing time characteristics. A table of (current -time) data defining the above curves shall also be included with the tender in (MS Office) Excel format.

Current limiting data showing the extent of current limiting should be included.

5.3. Acceptance Tests

The EFL may carry out acceptance test on product to prove it conforms to the requirements of this Specification and AS/NZS standards. Any product showing evidence of failure to comply with the requirements of this specification will be liable to rejection.

5.4. Witnessing of Tests

The bidders shall make allowance for witnessing of routine tests on a batch of fuse links by two EFL Engineers at least once during the contract period. The return-air travel, accommodation, meals and other expenses related to routine test witnessing shall be borne by the bidder. Such costs shall be included in the cost of fuse link units.

The Supplier shall give EFL not less than four (4) weeks' notice of when each and every type test will be carried out. Such witnessing shall be required once in the contract period, upon purchase of the first unit. A copy of inspection and test plan shall be submitted to EFL with the bid submission, which shall be used in the factory.

5.5. Test Certificates

Two certified copies of all test results shall be supplied to EFL for every product that will be supplied under the contract. Electronic copies shall also be submitted.

All test certificates shall include the manufacturer's serial number. On allocation, the corresponding EFL transformer number or stock code, the order number, contract number, item number, specification number and guaranteed losses must be added to the certificate, or attachment to the test report.

The successful bidder(s) shall be required to setup an online portal for recording and sharing of all test reports over the duration of the contract. EFL, at time of contract execution, shall provide a list of

personnel who shall be allowed to access this portal from EFL. Each test report shall be stored by its serial number and shall be accessible to EFL via this online portal at any time. The cost of setup, hosting and maintenance of this portal shall be borne by the successful bidder(s).

5.6. Compliance

The Supplier shall state in writing that their offer complies with the relevant Standards and this specification. If the Supplier is offering product 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 product 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/ HSE 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.

Bidders are required to provide the Material Safety Datasheet (MSDS) of the product.

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

9. QUALITY REQUIREMENTS

Tenderers are required to submit evidence that the design and manufacture of the fuse links is 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. OCCUPATIONAL HEALTH AND SAFETY SYSTEMS

Tenderers are required to submit copies of certification to occupational health and safety management system, such as AS 4801 or to equivalent international standard ISO 45001. Such information is deemed mandatory bid submission and lack of it will result in disqualification of bid.

Bidders are also required to submit evidence of certification to ISO 14001.

In addition to this, Bidders also need to submit health and safety plans implemented in factories for design, manufacture and testing of the transformers, which will be used in this project, and details of agencies who carry out regular inspections at these factories.

11. 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 fuse links 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	Approximate 3-Year Stock Movement	
Striker Pin Fuse Links				
1	New Item	20A 11kV Striker Pin Fuse Link	20	
2	New Item	31.5A 11kV Striker Pin Fuse Link	20	
3	New Item	63A 11kV Striker Pin Fuse Link	20	
4	New Item	125A 11kV Striker Pin Fuse Link	20	

12. PRODUCT WARRANTY PERIOD

The bidders are required to provide the warranty period as part of the proposal. A minimum warranty period of 24 months from time of dispatch from factory will be preferred.

13. INFORMATION TO BE SUPPLIED BY THE BIDDER

13.1. Documentation to be supplied with the tender

To enable the EFL to fully evaluate the fuse links 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)

- Sectional view, showing the General constructional feature
- Complete dimensional drawing

- List showing similar product supplied to or on order for other utilities in Australia or New Zealand or the Oceania region for the past 5 years
- Type test certificates
- Sample routine test certificates
- End of service life disposal methods
- Product drawing/datasheet and catalogs
- 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 fuse links
- I²t time-current characteristics curves shall be provided with the offer including raw data in MS excel format.

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

13.2. Samples

As the items in this tender are new, 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
- EFL Stock code affixed on the respective items
- Any supporting data on features or characteristics

For this tender, the bidders are required to provide samples for each item as per the above requirement supplied to the following address within the first week of tender closing date for verification and approval.

c/f Mohammed Imnaz Ahmed Supply Chain Officer Energy Fiji Limited J P Bayle Road Navutu Lautoka

13.3. 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

All training material and product-related documentation shall also be put on the online portal where the test results will be stored for EFL staff to view at any time.

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

14. APPENDIX

14.1. Price Schedule

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

No.	Stock Code	Item Description	Unit Price (CIF)	Currency of Bid
Striker Pin Fuse Links				
1	New Item	20A 11kV Striker Pin Fuse Link		
2	New Item	31.5A 11kV Striker Pin Fuse Link		
3	New Item	63A 11kV Striker Pin Fuse Link		
4	New Item	125A 11kV Striker Pin Fuse Link		

Bidders are to clearly indicate the currency of bid.

14.2. Technical Details - 11kV Striker Pin Fuse Links

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)

Units	Bidders Response
kg	
Yes/No	
Yes/No	
Yes/No	
Yes/No	
kA	
kA	
A	
W	
J	
	kg kg Yes/No KA KA W

Thickness of plating	
Fuse end fittings details:	
Material of Castings	
Plating Material	
Thickness of Plating	

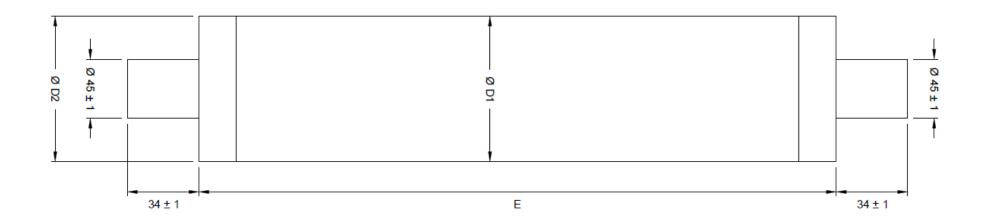
Name of Tenderer: _____

Signature of Tenderer: _____

Date: _____

14.3. Typical Dimensions for Striker Pin Fuse Links

Provided below are fuse dimensions for 11kV striker pin fuse links:



Length (E)	Diameter (D1)	Diameter (D2)
292 mm	Range of 50mm to 62mm	Range of 53mm to 65mm

14.4. Tender Submission - Mandatory Requirement

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 (180 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 biding 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 fuses, attached	
certificate.	
Bidder agrees with the requirements of AS 4912-2002; General	
conditions of contract for periodic supply of goods (Parts 1 and 2)	
Material safety datasheet to be provided for all items	
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	ltems	Country of Manufacture	Manufacturer of product	Brand Offered	Manufactured to standards	ISO Certification of Manufacturer	Lead Time of Delivery
Striker P	Pin Fuse Links						
New	20A 11kV Striker Pin						
Item	Fuse Link						
New	31.5A 11kV Striker Pin						
Item	Fuse Link						
New	63A 11kV Striker Pin						
Item	Fuse Link						
New	125A 11kV Striker Pin						
Item	Fuse Link						

Name of Tenderer: _____

Signature of Tenderer: _____

Date: _____

14.5. Overall Evaluation Criteria

Tender Evaluation Criteria					
Category	Criteria				
Bid Responsiveness	General responsiveness of bid, compliance to submission requirements and documentation.				
Health, Safety & Environment	Assessment of Tenderer's compliance to health, safety and environmental requirements detailed within the technical specification. Past performance of Tenderers.				
Quality Assurance	Tenderer 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 Type test certification Comprehensiveness of proposal, composition of tenderer's team Ability to deliver on time / delivery timeframe Sample approval 				
Commercial Compliance	Assessment of the Tenderers operational risks including conflicts of interest. Tenderer 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	Tenderer must comply with all relevant Energy Fiji Limited safety and environmental procedures. This is indicated by the Tenderer signing the Form of Tender Schedule, acknowledging all applicable procedures. Tenderer must also comply with the requirements of Electricity Act (2017), Electricity Regulations (2019).				
Financial Stability	Assessment of Tenderer's current financial stability and ability to remain financially stable.				
Price Evaluation	 Base tendered prices; Total ownership cost; Other value adding options. 				

14.6. Tender Submission - Instruction to Bidders

The Energy Fiji Limited (EFL) ("The Employer") is requesting proposal for the Preferred Supplier for Tender No. MR 04/2021 for EFL's consumption to carryout repair, maintenance and Construction of Power Line Network in Fiji.

The bidder shall seal the original hard copy of the technical proposal, the original hard copy of the financial proposal and each copy of the technical proposal and each copy of the financial proposal in **separate envelopes** clearly marking each one as: "ORIGINAL ", "COPY NO. I "etc. as appropriate.

The bidder shall seal the original bids and each copy of the bids in an inner and an outer envelope, duly marking the envelopes as "ORIGINAL" and "COPY".

The inner and outer envelops shall be addressed to the Employer at the following address:

Jitendra Reddy UL Strategic Procurement & Inventory Management 2 Marlow Street, Suva, FIJI. Phone: 679 3224 185 Facsimile: 679 331 1882 Email: JReddy@efl.com.fj

The envelopes shall bear the following identification:

- Bid for: MR04/2021: Preferred Supplier for Design, Manufacture, Testing & Supply of HV Fuse Links
- DO NOT OPEN BEFORE 1600hrs 17th February 2021
- Address and contract details of bidder on the reverse of the envelope

It is mandatory for Bidders to upload a copy of their bid in the TENDER LINK Electronic Tender Box no later than 4:00pm, on Wednesday 17th February 2021. The uploaded tender bids shall be in two (2) separate files clearly labelled as Technical Proposal and Financial Proposal respectively.

Bids shall remain valid for a period of **180 days** after the date of opening of technical and financial proposals.

To register your interest and tender a response, view 'Current Tenders' at: https://www.tenderlink.com/efl

For further information contact The Secretary Tender Committee, by e-mail JReddy@efl.com.fj

Hard copies of the Tender bid will also be accepted after the closing date and time provided a soft copy is uploaded in the e-Tender Box and hard copy is dispatched to courier before the closing date and time. Please note courier submission date should be forwarded to EFL with your bid.

Tenders received after **4:00pm** on the closing date of **Wednesday 17th February 2021**:

- Will not be considered.
- Lowest bid will not necessarily be accepted as successful bid
- It is the responsibility of the bidder to pay courier chargers and all other cost associated with the delivery of the hard copy of the Tender submission including any Duties/Taxes. Hard copies of the Tender submission via Post Box will not be considered.

Extension of tender closing date: Bidders are to note that if they require extension on the tender closing date, they are required to request for an extension 3 working days prior to the initial tender closing date.