



**PREFERRED SUPPLIER OF COMPRESSION
DEAD ENDS**

ENERGY FIJI LIMITED

MR 76/2022

Revision History & Document Control

Rev no.	Notes	Prepared By	Reviewed By	Date of Issue
1	Prepared by	AMITESH CHANDRA		April 2022

Next Scheduled Revision

This technical specification is due for review in April 2025 (date to be amended accordingly).

TABLE OF CONTENT

Revision History & Document Control	2
Next Scheduled Revision.....	2
1.0 Introduction	5
2.0 References.....	6
2.1 Applicable Standards	6
3.0 System Conditions	6
3.1 Environmental Conditions	6
3.2 System Conditions.....	7
4.0 Design and Construction	7
4.1 General	7
5.0 Quality Assurance	8
6.0 Occupational Health & Safety Requirements.....	8
7.0 Performance and Testing.....	8
7.1 General	8
7.2 Type Testing for Tension Fittings	8
7.2.1 Mechanical Strength Type Tests	9
7.2.2 Electrical Heating Cycle Type Test.....	9
7.3 Routine Testing	9
7.4 Batch Test.....	9
7.4.1 Verification of Dimensions.....	9
7.4.2 Mechanical Test.....	9
7.4.3 Hardness Test	9
7.4.4 Galvanizing Tests	9
7.5 Witnessing of Tests	10
7.6 Certificate of Compliance	10
8.0 Additional Requirements- Mandatory	10
8.1 Marking and Dimensions	10
8.2 Packaging	10
8.3 Storage	10
9.0 Technical Information to be supplied.....	10
10.0 Stock Availability	11
11.0 Product Warranty Period	11
12.0 Environmental Considerations.....	11

13.0 Reliability..... 12

14.0 Samples 12

 14.1 Production Samples..... 12

 14.2 Sample Delivery 12

15.0 Training..... 12

16.0 Appendix..... 13

 16.1 Price Schedule 13

 16.2 Technical Details 13

1.0 Introduction

Energy Fiji Limited [EFL] is responsible for generation, transmission and distribution of electricity in Viti Levu, Vanua Levu, Ovalau and Tavuni in Fiji. By the end of 2021, EFL had 210,831 customers. This includes residential, commercial and institutional customers.

The Energy Fiji Limited (EFL) is requesting proposal for the Supply of Compression Dead Ends c/w Jumper Terminal to carryout repair, maintenance and Construction 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. The award of this Tender may be split and awarded to more than one successful bidder.

This document outlines the technical requirements for Compression Dead for use in EFL’s transmission network.

The items covered under this specification are tabulated below.

No.	Stock Code	Item Description	Stranding
1	I05365B	ACSR/GZ -Lime	30/7/3.5
2	I05245A	ACSR/GZ Grape	30/7/2.5
3	New Item	ACSR/GZ Wolf	30/7/2.59
4	I05240	ACSR/AZ Corn	30/7/2.50
5	New Item	AAAC Neon Conductor	19/3.75
6	New Item	ACSR Horse	12/7/2.79
7	New Item	ACSR Hyena	7/4.39 7/1.93

This Specification covers the general requirements supply compression dead ends c/w jumper terminal to be used on overhead transmission systems.

2.0 References

2.1 Applicable Standards

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 1112	ISO metric hexagon nuts, including thin nuts, slotted nuts and castle nuts
AS 1154 (All Parts)	Insulator and conductor fittings for overhead power lines
AS 1214	Hot - dip galvanized coatings on threaded fasteners
AS 1237	Plain washers for metric bolts, screws and nuts for general purposes General plan
IEC 61284	Overhead lines - Requirements and tests for fittings.
AS 62271.301	High Voltage Switchgear and controlgear of terminals
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
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 EFL for resolution.

3.0 System Conditions

3.1 Environmental Conditions

The compression dead shall be suitable for installation 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

Nominal Voltage	33kV
System Highest Voltage	36kV
System Frequency	50Hz
Number of Phases	3
Rated Continuous Current(Amps)	400 Amps
System Earthing	Solidly Earthed, Low-impedance earthed
Impulse Withstand Voltage (peak)	200kV
Power Frequency Withstand Voltage	70kV (peak)
Short Circuit Level	16kA for 1 sec

4.0 Design and Construction

4.1 General

Energy Fiji Limited, in its transmission network employs compression dead ends at 132kV and 33kV voltage levels.

The compression dead ends and jumper terminals shall be capable of being compressed with a standard hydraulic compression machine. The inside of each aluminum tube and internal faces of other aluminum fitting shall be coated with oxide inhibiting grease to improve electrical contact. The design of Bimetallic Fittings shall be such as to eliminate any effect arising from galvanic corrosion which impairs the performance of the fitting.

The compression dead end body shall be made up of Aluminum alloy and Dead-end eye galvanized to be of forged steel. Other accessories supplied shall be designed to AS/NZS 4680 standards. This includes Bolts and Nuts, Flat Washers, Spring Washers etc.

5.0 Quality Assurance

Tenderers are required to submit evidence that the design and manufacture of the compression dead end 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.

6.0 Occupational Health & Safety Requirements

Tenderers are required to submit copies of certification to occupational health and safety management system, such as AS4801 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 compression dead ends, which will be used in this project, and details of agencies who carry out regular inspections at these factories.

7.0 Performance and Testing

7.1 General

Prior to delivery, the units shall have completed the type, routine and accuracy tests and inspections from a NATA Certified Lab 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.

7.2 Type Testing for Tension Fittings

The following are minimum AS and IEC Standards requirements provided for testing of specific compression dead ends and all test reports shall be provided with the bids for verification by EFL.

Test	Test Conditions	Criteria
1) Holding strength test for full tension fittings (mandatory)	1) Preload to 50% CBL	a) No slip between fitting and conductor at test load.
2) Hardness Test	2) Test load 90% CBL for 1 min	b) No Failure at test load
3) Electrical heat cycle test (optional)		c) Load and nature of failure recorded. a) Temperature of fitting not to exceed temperature of the conductor

		b) no local heating, burning or fusing of any part of the fitting or conductor.
--	--	--

Note:

- For steel compression fitting, it is not necessary to cut open the fittings.
- For all types of conductors, the temperature shall be less than 170 degrees C.

7.2.1 Mechanical Strength Type Tests

Test to be performed in accordance to AS1154.1-2009 standard or any latest edition of the standard.

7.2.2 Electrical Heating Cycle Type Test

Test to be performed in accordance to AS1154 standard or any latest edition of the standard.

7.3 Routine Testing

Tension fitting that are castings or have welded joints that are stressed in service are subjected to a tensile force of 50% MFL for 1 min. Fittings are considered to have passed the test if there is no breakage, cracking or distortion that can be seen by a normal or corrected vision without the aid of magnification or measurement.

7.4 Batch Test

7.4.1 Verification of Dimensions

The dimensions of the fittings shall be verified as specified in clause 1.6 of the AS1154.1-2009 standard or any latest edition of the standard.

7.4.2 Mechanical Test

The holding strength test specified in Clause 3.3.1 shall be used except that the test need not be continued until failure occurs.

7.4.3 Hardness Test

The Test shall be carried out on all samples to verify that the batch has hardness consistent with the type test.

7.4.4 Galvanizing Tests

Galvanized coatings shall comply with the requirements of Clause 1.4.5.

7.5 Witnessing of Tests

The Bidder shall make allowance for two EFL's Engineers to witness the type tests. All costs such as Air fares, Accommodation, Meals for the witnessing of such type tests shall be borne by the Bidder.

The Bidder shall also make allowance for witnessing of routine tests by two EFL Engineers.

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

7.6 Certificate of 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.

8.0 Additional Requirements- Mandatory

8.1 Marking and Dimensions

Identification details as indicated below shall be permanently marked on the Compression Dead-end. The hardware fitting shall also be marked with the same except for year of manufacture and shall be corrosion proof. Markings and dimensions shall follow the section 8 of AS 1154.1 standards.

- a) Manufacture's Identification.
- b) Minimum failing load in kN.
- c) Year of manufacture.

8.2 Packaging

The supplied compression dead end shall be appropriately packaged to avoid damage during transportations and storage and fit for use. The vendor shall be responsible for nominating standard pack quantities and standard packs shall be clearly marked with the following:

- a) Manufacture's name
- b) Manufacture's part reference number
- c) EFL stock code
- d) Compliance standards
- e) Batch number
- f) Tension Fitting description
- g) Package weight

8.3 Storage

The equipment shall be capable of being stored without deterioration within the temperature range of 10°C to 40°C for no less than 24 months.

9.0 Technical Information to be supplied

To enable the EFL to fully evaluate the compression dead ends 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 in PDF copies and AutoCAD
- 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 compression dead ends
 - Materials from which the tension fitting is made
- Dimensions of dies to be used.
- Recommend bolt tightening torque

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

10.0 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 compression dead ends will depend on EFL's project works and for operation and maintenance purposes. An estimate MOQ of the item is outlined in the table below but as a preferred supplier, the successful bidder will be required to carry a consignment / safety

No.	Stock Code	Item Description	Stranding	Quantity
1	I05365B	ACSR/GZ -Lime	30/7/3.5	100
2	I05245A	ACSR/GZ Grape	30/7/2.5	150
3	New Item	ACSR/GZ Wolf	30/7/2.59	50
4	I05240	ACSR/AZ Corn	30/7/2.50	50
5	New Item	AAAC Neon Conductor	19/3.75	50
6	New Item	ACSR Horse	12/7/2.79	50
7	New Item	ACSR Hyena	7/4.39 7/1.93	50

stock at times to meet EFL's demand within the contract period.

11.0 Product Warranty Period

The bidder is 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.

12.0 Environmental Considerations

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

13.0 Reliability

Suppliers are required to comment on the reliability of the equipment and the performance of the materials tendered for a service life of 35 years under the specified system and environmental conditions.

14.0 Samples

14.1 Production Samples

Samples of items may be required during the tender assessment period. Samples would normally only be required from tenderers who have previously not supplied the items to the Purchaser.

14.2 Sample Delivery

When samples are required, production samples shall be delivered freight free (Delivery Duty Paid (DDP)), suitably packaged and labelled including reference to the Tender Number.

15.0 Training

Training material in the form of drawings, instructions and/or audio visuals shall be provided for the items accepted under the offer.

This material shall include but is not limited to the following topics:

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

16.0 Appendix

16.1 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.

Stock Code	Item Description	Stranding	Quantity	Unit Price	Currency	Total Price
I05365B	ACSR/GZ -Lime	30/7/3.5	100			
I05245A	ACSR/GZ Grape	30/7/2.5	150			
New Item	ACSR/GZ Wolf	30/7/2.59	50			
I05240	ACSR/AZ Corn	30/7/2.50	50			
New Item	AAAC Neon Conductor	19/3.75	50			
New Item	ACSR Horse	12/7/2.79	50			
New Item	ACSR Hyena	7/4.39 7/1.93	50			
Factory Acceptance Testing (2 x EFL Engineers)						
					Total	

Bidders are to clearly indicate the currency of bid.

16.2 Technical Details

The schedule shall be completed and submitted with the offer. Note the following instructions while completing the schedules:

- The schedule is provided as a separate attachment;
- The bidders are required to complete the schedule in excel format and submit with the bid;
- All data provided in the schedule shall be reflected in the original datasheets provided;
- The units specified in the schedule shall be strictly followed;
- The price schedule as per clause 16.1 is also attached in the excel sheet for completion.

(Note these are mandatory requirement)

Submission Requirements

All tenderers are required to complete and submit a copy of the submission requirements with their bid submissions.

Requirements	Response from Bidders
Completed Price schedule as per appendix 1	
Witnessing included as part of bid. (Yes/No)	
Validity of bid (90 days required) (Yes/No)	
Payment conditions.	
Delivery Term. (CIF preferred)	
Price review period after award of tender. (months)	
Bidders company profile outlining financial, technical and production capabilities.	
Detailed reference list of power utility customers already using equipment offered during the last 5 years with particular emphasis on units of similar design and rating.	
Quality management system used in the production of compression dead end, attached certificate.	
Health, Safety and Environmental plans.	
Detailed receiving, handling and storage details.	
Minimum warranty period from time of acceptance of compression dead end.	
Sample inspection and test plan.	
Typical installation manual for compression dead end.	
Disposal method after service life.	
Complete dimensional drawing (AutoCAD Drawings)	
List of Type test certificates provided. (As per Clause 6.1 from Accredited Testing Lab)	
Sample routine test certificates.	

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>

This is due to COVID 19 restrictions on movements. Therefore, 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 20th April, 2022.

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.

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.