Bringing energy to your door

Electricity Specification 314

Issue 8 February 2024

12kV and 7.2kV 21.9kA Switchgear for Distribution Substations

Amendment Summary

ISSUE NO. DATE	DESCRIPTION
Issue 8 **February 2024**	This document has been reviewed and new template applied. Only a minor change has been made to add Natural Origin Gasses into Section 9 for clarity. Section 21 updated to include ES001. Prepared by: Matthew Kayes Approved by: Policy Approval Panel and signed on its behalf by Paul Turner, PAP Chairperson.

Contents

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1 Scope

This Electricity Specification (ES) covers the requirements for ring main equipment, switches, fuse-switches and switch-fuses or circuit breakers for use in distribution substations on the 250MVA 11kV and 6.6kV electricity distribution network of Electricity North West Limited.

2 General Design Features

Switchgear shall comply with the stated Energy Networks Association (ENA) Technical Specification (TS) 41-41 except where varied by this Specification. Equipment that complies with ENA TS 41-26 and TS 41-36 previously approved for use in Electricity North West Limited will also be considered.

The Tenderer shall complete the conformance declaration sheet in Appendix B.

3 Definitions

Approval	Sanction by the Electricity North West Limited Plant Policy Manager that specified criteria have been satisfied
Contract	The agreement between Electricity North West Limited and the Contractor for the execution of the Works including therein all documents to which reference may properly be made in order to ascertain the rights and obligations of the parties under the said agreement.
Contractor	The person or person's firm or company, including personal representatives, successors and permitted assigns, who's Tender has been accepted by Electricity North West Limited.
Specification	The Specifications and schedules (if any) agreed by the parties for the purpose of the Contract.
Sub-Contractor	Any person (other than the Contractor) named in the Contract for any part of the Works or any person to whom any part of the Contract has been sub-let with the consent in writing of the Electricity North West Limited Plant Policy Manager, and the legal representatives, successors and assigns of such person.
Supplier	Any person or person's firm or company who supplies goods to Electricity North West Limited or to its Contractor.
Tender	An offer in writing to execute work or supply goods at a fixed price.
Tenderer	The person or person's firm or company, including personal representatives, successors and permitted assigns, invited by Electricity North West Limited to submit a Tender.
Words	Words importing persons shall include firms and corporations; words importing the singular only, also include the plural, and vice versa where the context requires.

Work	All materials, labour and actions required to be provided or performed by the Contractor under the Contract.
Writing	Any manuscript, typewritten or printed statement under seal or hand as the case may be.

4 General Requirements for Approvals and Testing

4.1 Product not to be Changed

Compliance with this clause shall be in accordance with ES001.

4.2 Electricity North West Limited Technical Approval

Compliance with this clause shall be in accordance with ES001.

4.3 Quality Assurance

Compliance with this clause shall be in accordance with ES001.

4.4 Formulation

Compliance with this clause shall be in accordance with ES001.

4.5 Identification Markings

Compliance with this clause shall be in accordance with ES001.

4.6 Minimum Life Expectancy

The minimum life expectancy of all products covered by this Specification is 40 years.

4.7 Product Conformity

Compliance with this clause shall be in accordance with ES001.

4.8 Confirmation of Conformance

The Tenderer shall complete the conformance declaration sheets in Appendix A. Failure to complete these declaration sheets may result in an unacceptable bid.

5 Requirements for Type and Routine Testing

Compliance with this clause shall be in accordance with ES001.

5.1 Requirement for Type Tests at Suppliers Premises

Compliance with this clause shall be in accordance with ES001.

5.2 Requirement for Routine Tests at the Supplier's Premises

Compliance with this clause shall be in accordance with ES001.

5.3 Requirements for On-Site Tests

These will normally be included within the scope of on site commissioning but may be included if appropriate.

6 Ratings

Ring Main Equipment

- Ring Switches 7.2kV and 12kV, 21.9kA for 3 seconds, 630A. rated normal current
- Tee-off Circuit
    - Switch-fuse. 7.2kV and 12kV
    - Fuse-Switch 7.2kV and 12kV, 21.9kA for 3 seconds.
    - Circuit breaker 7.2kV and 12kV, 21.9kA for 3 seconds.

A rated normal current of at least 200A is required.

Full protection characteristics shall be submitted with the offer.

Metal Enclosed Extensible Switch, Switch-Disconnector and Earthing Switch Combinations

- 7.2kV and 12kV, 21.9kA for 3 seconds 630A, rated normal current

Metal Enclosed Automatic Switch-Fuse Equipment

- 7.2kV and 12kV, 200A rated normal current

Metal Enclosed Automatic Fuse-Switch Equipment

- 7.2kV and 12kV, 200A rated normal current

Metal Enclosed Circuit Breakers for Controlling Feeders and Distribution Transformers

- 7.2kV and 12kV, 21.9kA for 3 seconds, 200A and 630A rated normal current.

Rating plates shall show the actual ratings to which the equipment is certified not that of the system on which it will operate.

7 Protection

7.1 Automatic Switch-Fuse Equipment

Fuse links complying with Electricity North West Limited ES334 shall be used to provide short circuit protection of the distribution transformer circuit.

Fuse-links will be supplied under a separate contract.

7.2 Circuit Breakers

Overcurrent and earth fault protection shall be provided in the following manner:

7.2.1 Circuit Breakers and Controlling Distribution Transformers

Current transformer release, including provision for time fuse-links to ENA TS 12-6 to control both the overcurrent and earth fault characteristics.

7.2.2 Circuit Breakers Controlling Feeders and HV Metered Connections

Self-powered relay with provision for standard inverse, very inverse and extremely inverse definite minimum time curves as per IEC 60255-3. The relay shall comply with ENA TS 48-5 and have a current Notice of Conformity Certificate issued by the ENA Protection Assessment Panel. Copies of Approvals Certificates and Notices of Conformity shall accompany the Tender.

7.3 Protection Testing Facilities

The AC protection wiring shall include suitable access points in the form of approved terminals, to enable secondary injection protection testing to be carried out.

Provision shall be made for a suitable test facility, in order that the spill current in the neutral circuit of the Current Transformers (CT) can be measured via an instrument during testing.

8 Cable Terminations

8.1 General

Termination arrangements are to be suitable for unfilled enclosures generally to ENA TS 12-11. A drawing of each design of cable box offered is required with the Tender, with sufficient detail to enable a technical assessment of the design to be made. A report of the dielectric tests carried out on each design is also required.

The high voltage connection bushings shall comply with BS EN 50180 Table 14 Type C complete with stud suitable for use with separable connectors.

Separable connectors will be supplied by Electricity North West Limited.

Ring cables will normally be either three single cores or one 3-core up to 300mm^2 and tee-off cables one 3-core up to 185mm^2. The single core cable entry through the gland plate of the cable box shall be sealed by a heat shrink feedthrough, which will be supplied by Electricity North West Limited. The Tender shall provide a gland plate predrilled to a dimension which will be confirmed by the Electricity North West Limited Underground Cables Manager. If single cores are to be routed individually into the cable box then a brass gland plate shall be fitted, supplied with three stuffing glands to a dimension which will be confirmed by the Electricity North West Limited Underground Cables Manager.

As a special order Electricity North West Limited wish to use three single core 400mm^2 cables. The single cores are to be routed individually into the cable box via a brass gland plate which shall be supplied fitted, along

with three stuffing glands to a dimension which will be confirmed by the Electricity North West Limited Underground Cables Manager.

Three designs of ring cable termination are required.

(a) Vertical straight enclosure which will be regarded as the standard arrangement.

(b) An angled design to permit cables entry external to the plinth.

(c) In addition to the above the option of vertical top entry is also required. The Tenderer shall confirm the availability of this option.

Jointing lugs, heat/cold shrink termination kits or separable connectors will be supplied by Electricity North West Limited. Each bushing palm shall be supplied with a 30mm long x M12 brass screw, brass nut, two brass flat washers and one phosphor bronze lock washer. Gaskets are not required.

8.2 Earthing Bar

An Earthing Bar shall be provided and positioned at the bottom of each cable box. The bar shall be tested to a fault rating of 21kA.

The bar is to be constructed from flat copper and minimum dimensions are 30mm wide x 8mm deep x 250mm long. A 90 degree bend is to be positioned at 160mm / 90mm along the length.

Drilled holes are to be made along the bar. The long section requires 3 x 12.5mm and 2 x 9.6mm holes evenly spaced. The short length requires 1 x 10.5mm hole at a position of 15mm from the edge of the bar.

Corresponding fixing holes are to be drilled into the cable box to allow Earth Bar mounting using the spacing washers. (As shown in Appendix B).

Accessories to be provided with the bar:

- 3 x M12 zinc plated steel bolts 30mm in length
- 3 x M12 zinc plated steel hexagonal nuts
- 6 x M12 zinc plated steel washers
- 3 x M12 zinc plated steel single coil spring washers
- 2 x M8 zinc plated spacing washers
- 2 x M8 zinc plated steel bolts 50mm in length
- 4 x M8 zinc plated steel hexagonal nuts
- 4 x M8 zinc plated steel washers
- 2 x M8 zinc plated steel single coil spring washers
- 1 x M10 zinc plated steel bolt 30mm in length

- 1 x M10 zinc plated steel hexagonal nut
- 2 x M10 zinc plated steel washers
- 1 x M10 zinc plated steel single coil spring washer

8.3 Jointing Access – Ring Main Equipment in Unit Substation Application

It shall be practical to joint the left hand circuit cable box with access only from the front or from below, with the maximum size low voltage fuse cabinet mounted on the left of the unit. Such access includes use of the cable trench.

9 Filling Medium

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The insulating and arc extinguishing medium shall be either SF_6, Oil, Vacuum or Natural Origin Gasses. Where Tenderers offer alternative types of switchgear then prices and technical data on both shall be supplied. The tee-off may be controlled by fuse-links or a circuit breaker.

9.1 Gas

Any necessary gas filling shall be supplied. A gas filling valve is required, and it shall be a quick-acting coupling to BS 7198: Part 1: 1989 Series B Size 6.3, suitably protected to prevent inadvertent gas loss.

A permanently fitted pressure monitoring device is required.

9.2 Oil

Electricity North West reserves the right to supply the first fill of oil.

9.3 Vacuum

Electricity North West Limited will accept Vacuum technology within Distribution Switchgear providing it meets the clauses within this specification. Tenderers shall submit full technical details at the time of Tender including the ENA Notice of Conformity.

10 Metering

Metering may be required on ring main equipment, switch-fuses, fuse-switches or circuit breakers. If fitted it shall comply with the following requirements.

A current transformer is to be provided in R and B phases with a ratio as specified in the enquiry and with an output of 7.5VA Class 0.5s to BS EN 60044-1. For CTs associated with 200A units the ratio shall be 100/50/5. For CTs associated with 630A units the ratio will be 400/200/5.

The thermal and mechanical rating of the current transformers shall not be less than that corresponding to the rating of the switchgear to which they are connected.

The overcurrent rating shall be 13.1kA and 21.9kA (as applicable) for 0.5 second. Space for a third CT in Y phase shall be available if required.

Discrete connections for S1, S2 and S3 shall be available for each CT at the metering multicore termination point. CT connections shall not be "commoned" together.

All wiring shall be in 2.5mm^2 stranded copper cable and shall be ferruled and numbered in accordance with ENA TS 50-19.

It shall be possible to connect to earth the S2 and S3, where applicable, connections via an accessible isolatable earth link.

A three phase, three limb, star connected voltage transformer complete with LV fuse links having a ratio of 11000/110V or 6600/110V with a rated voltage factor of 1.9, a rated time of 30 seconds, and a rated burden of 100VA Class 1.0 in accordance with BS EN 60044-2, shall be provided. The LV fuse links shall be in accordance with BS 88-6 type F1 and rated at 16A.

The secondary winding of the VT shall be earthed on the LV side on L2 unless otherwise instructed by Electricity North West Limited and the star point shall not be earthed, unless otherwise instructed by Electricity North West Limited.

Earth connections shall be visible and provided via an isolatable earth link. The earth link shall be clearly labelled.

The secondary fusing shall be in accordance with BS88. Unless otherwise instructed there shall be 16A fuses in L1 and L3 with a link provided in L2.

All wiring shall be in 2.5mm^2 stranded copper cable and shall be ferruled and numbered in accordance with ENA TS 50-19.

Voltage and current transformers for metering purposes shall be in accordance with ES501. Test certificates shall be provided in accordance with ES501.

When voltage transformers used for metering purposes have two secondary windings additional secondary fuses may be required (in accordance with ES501).

Preferably, the metering unit shall be arranged to mount on the rear flange and provide a flange and bushings suitable for a standard box shell or for direct connection to a transformer.

A mixture of non-oil filled switchgear and oil filled metering units shall not be allowed.

Provision shall be made for termination of multicore cables. As a minimum, 1 x 20mm gland shall be provided and a blanked off hole to take a 25mm gland.

11 Provision for Remote Control

Due to the introduction of remote control it will be necessary to have the optional additional facility of operating any of the ring or tee-off switches from a remote panel. Therefore, all units shall either be manufactured with actuator and auxiliary contacts fitted or have available as an optional add-on unit fixed onto factory fitted mountings and electrical connection facilities.

Where active network power flow monitoring is required the T-off Circuit Breaker shall be automation ready on delivery for control by the same panel as the ring switches. This will be a separate commodity code for this item along with the requirements of Section 20.4.

The actuator shall be electrically powered and provide both the required switching action and electrical indication facilities. ES391 gives further details on the actuators. Where the add-on option is offered the unit may be ordered with the actuator fitted at the time of delivery.

Alternatively, it may be required to fit an actuator as an in-service upgrade at some time after commissioning. On-site fitting shall comprise simple bolt on additions to factory installed mountings and the electrical connection shall be to pre-installed harnesses fitted with suitable plug or socket terminations. On-site dismantling and modification is precluded.

The Tenderer shall, at the time of Tender provide details of suitable actuators, relays and remote control panels. The Tenderer shall also provide details of any available pre-wiring, which will allow for the fitting of actuators at a later date.

11.1 Power Supplies

The actuators shall be electrically driven from a battery power source. Protection of the prime mover circuit is required. A battery life of 10 years, minimum, is required. Battery charger supplies may be derived from the local low voltage network, power VTs or solar panels. Chargers shall include a charger fail alarm output to the RTU.

Batteries shall have sufficient capacity to remain operational for two weeks following a charger supply failure in accordance with the following duty cycle: Quiescent for 336 hours and then successfully complete an OPEN, 3 second wait, CLOSE, 3 second wait, OPEN, 3 second wait, duty cycle.

11.2 Approval of Retrofit Actuators

Retrofit actuators shall be of a type previously approved by the Electricity North West Limited Plant Policy Manager.

12 Internal Arc Tested Equipment

Units offered that have completed internal arc testing in accordance with ENA TS 41-26, 41-36 or 41-41 will be expected to be supported by test evidence, from a recognised Short Circuit Testing Station, of the ability of a unit to vent in a safe and predictable manner in the event of an internal arc occurring.

Manufacturers will also be expected to provide guidance information on the correct positioning of the unit within the substation enclosure so as not to invalidate the tests. This guidance shall include the following for each type of switchgear offered.

- The arrangements of the enclosure in which internal arc testing was carried out, highlighting differences from those specified in ENA TS 41-36 Figure 4 or ENA TS 41-41 Section 6.101 - Figure AA.4 of BS EN 62271-200, with the distance between the 1047 rear of the switchgear and the rear wall reduced to 800 mm, shall be used for testing multi panel indoor switchgear.

- Drawings showing the venting volumes required for fault ratings up to 21.9kA.

- A drawing of the interface trunking that shall be attached to the vent on the switchgear suitable for connection to Electricity North West Limited standard trunking with external cross section of 342mm by 342mm.

A copy of this information shall be included with the Tender and an additional copy shall be sent to the Electricity North West Limited Plant Policy Manager.

13 Handling of SF_6 and Decontamination Procedures

In certain situations it will be necessary to access enclosures where sulphur hexafluoride (SF_6) has been used for insulation and/or arc extinction, e.g.

- Switchgear modification to correct manufacturing or material defect.
- Examination following failure.
- Examination following leak of SF_6.
- Maintenance.
- Disposal of switchgear at end of life.

Whilst Electricity North West Limited has a procedure for safe decontamination of enclosures containing SF_6 it is not envisaged that Electricity North West Limited will undertake such work except in an emergency. The original equipment manufacturer, its successor or a suitable contractor, will be expected to assist as necessary in any such work and consequent actions.

When the equipment reaches the end of its working life it will have to be decontaminated and disposed of safely. It is important that this is considered in the design of the equipment. Tenderers will be expected to show that there is available a detailed procedure by which each type of switchgear offered under this Tender may be safely de-gassed and decontaminated prior to disposal at the end of its life. This applies to enclosures that have contained SF_6 as an insulator as well as those where SF_6 has been used as an arc interrupting medium.

It is a requirement of this Specification that Tenderers have procedures and safe working practices in place to:

(a) Decontaminate the equipment and site as necessary and recover switchgear for examination/disposal as required.

(b) Decontaminate the equipment on site or some other location as required to carry out modifications.

(c) Decontaminate the equipment prior to disposal.

Tenderers shall provide the following information:

(a) Mass of SF_6 in kg for each type and variant of switchgear offered.

(b) Details of procedures for handling new and contaminated SF_6.

(c) Details of procedures for decontaminating failed SF_6 equipment and the associated sites/substations.

(d) Details of procedures for decontaminating SF_6 equipment prior to carrying out modifications.

(e) Details of the procedure by which each type of switchgear offered under this Tender may be safely de-gassed and decontaminated prior to disposal at the end of its life. This shall cover enclosures (a) where SF_6 is used as an insulator and (b) where SF_6 is used as an arc interrupting medium.

14 Drawings and Maintenance Instructions

General arrangement drawings shall be submitted with the Tender. These drawings shall include overall dimensions, headroom for erection and/or operation, withdrawable space where appropriate, and positions of main and multicore cables.

On receipt of an order the Contractor shall submit drawings at an early stage on in an AutoCAD (.dwg) and Adobe Acrobat (pdf) format and one paper print maximum size A1 of all diagrams to the Electricity North West Limited Plant Policy Manager.

A copy of all installation, operation and maintenance manuals shall be submitted with the Tender. These manuals shall, preferably, be in Adobe Acrobat (pdf) format.

If the switchgear is of a type not previously supplied to Electricity North West Limited, one unit will be required to be delivered to the Electricity North West Limited Training Centre, free of charge, for the purposes of training. The Tenderer will also be required to provide training for Electricity North West Limited instructors on the operation of the unit.

15 Voltage Sensing

It is possible that in the future protection systems may be used which will require a voltage input. Tenderers shall provide details of any voltage sensing equipment associated with their switchgear including its capabilities and method of installation.

16 Voltage Check and Phase Identification

Facilities shall be provided to allow voltage detection and phase comparison with the adjacent switch or circuit breaker as per section 1.5.201.3 of ENA TS 41-36 or 6.103.202.10 of ENA TS 41-41. The method of connection to this system shall be via a 4mm banana socket. Tenderers shall provide details of all compatible phase comparators.

17 Disposal of Switchgear and/or its Components

Tenderers shall provide details on how to dispose of the switchgear and/or its components to ensure compliance with the various waste management regulations [Environmental Protection Act 1990 (Part II); Hazardous Waste Regulations 2005; Environmental Permitting Regulations 2016;]

18 Manual Handling

Tenderers shall supply a Risk Assessment on the manual handling required for installation and operation of the switchgear.

19 Failure, Modes, Effect and Cause Analysis (FMECA)

Tenderers shall carry out a FMECA or equivalent study for each type of equipment offered. A copy of this study shall be provided with the Tender documents.

20 Additional Requirements

20.1 Ring Main Equipment

20.1.1 Supports

Ring main units shall be designed for bolting directly to the flange of a unit substation transformer. An alternative design for a free standing unit shall also be available. If unit substation transformer application requires the fitting of additional parts it shall not be necessary to remove the support intended for free standing use. Attention is particularly drawn to the maximum overturning moments shown in ENA TS 35-1 Part 3 Fig 6 which will ensure the stability of the transformer. If it is essential to remove part of the support structure for jointing access it shall be safe to do so when the unit is mounted on a transformer.

A support structure suitable for non unit substation transformers may also be required.

20.1.2 Addition of Remote Trip Feature to the Switch-Fuse or Circuit Breaker

As an optional extra the manufacturer may be called upon to supply a shunt trip coil to operate the fuse-switch trip mechanism complete with provision for terminating a 4 core 7/0.67 PVCSWAPVC cable.

20.1.3 Addition of Earth Fault Indicator (EFI) CT's

All ring main units shall be supplied with 500/1 EFI CT's fitted as standard in both cable boxes for future fitting of an Electricity North West Limited Approved EFI.

The small wiring shall be fed to a terminal rail along with a 3 pole shorting link housed within the small wiring compartment.

All wiring shall be in 2.5mm^2 stranded copper cable and shall be ferruled and numbered in accordance with ENA TS 50-19.

20.2 Metal Enclosed Extensible Switch, Switch-Disconnector and Earthing Switch Combinations

20.2.1 Busbar Section Switch

Switches for busbar section duties shall be basically as those specified for feeders, but shall have facilities for earthing and testing of each section of busbars with the other section live at normal working voltage.

20.3 Metal Enclosed Automatic Switch-Fuse or Circuit Breakers for Controlling Feeders and Distribution Transformers

20.3.1 Non-extensible Switch-fuse or Circuit Breaker for Transformer Mounting

A switch-fuse or circuit breaker is required for connection to a transformer, with a transformer earthing switch, a circuit cable box and an incoming fully rated earth switch and test facility.

20.3.2 Addition of a Remote Trip Feature to a Switch-fuse or Circuit Breaker

As an optional extra the manufacturer may be called upon to supply a shunt trip coil to operate the switch-fuse trip mechanism complete with provision for terminating a 4 core 7/0.67 PVCSWAPVC cable.

20.4 Active Network Power Flow Monitoring (PFM)

All High Voltage Metered Ring Main Units and Extensible Metered Circuit Breakers shall be supplied from the factory with the ability to actively monitor in real time Amps, Volts, KW and KVArs in either direction. The Tenderer shall submit full details on how this will be achieved with their Tender return.

As a minimum it shall comprise of the following items: -

- Additional CT's or sensors dedicated for the PFM use with separate terminals and shorting links in a box separate to the Metering ones. The rating of the CTs shall be as per Section 10 of this specification.
- Additional connections to the Voltage Transformer on the metering unit, clearly identified as for PFM use only.

There is also the option for the Tenderer to provide their own RTU and control box pre-fitted onto the frame of the switchgear to incorporate all the Automation functions (ring switches and T-off CB etc), PFM functions and EFI requirements. The full details and options including mounting arrangements shall be submitted with the Tender return. A sample of said RTU may be required for testing purposes which shall be supplied as part of the Tender Award.

NOTE: It is expected in all cases that the RTU will calculate the PFM readings from the CTs and VTs and feed the results back to the Network Management Hub Network Management System.

21 Documents Referenced

DOCUMENTS REFERENCED	
Environmental Protection Act 1990	
Hazardous Waste Regulations 2005	
Environmental Permitting Regulations 2016	
IEC 60255-3	Electrical Relays. Single Input Energising Quantity Measuring Relays with Dependent or Independent Time
BS 88-6	Cartridge Fuses for Voltages up to and Including 1000Vac and 1500Vdc
BS 7198	Hydraulic Fluid Power Quick-Action Couplings
BS EN 50180	Specification for Bushings above 1kV up to 36kV and from 250A to 3,15kA for liquid filled transformers.
BS EN 60044-1	Instrument Transformers – Part1: Current Transformers.
BS EN 60044-2	Instrument Transformers – Part 2: Inductive Voltage Transformers.
BS EN 62271-200	A.C. metal-enclosed switchgear and controlgear for rated voltages above 1kV and up to and including 52kV.
ENA TS 12-6	Time Fuse Links (for use with Current Transformer Releases on Circuit Breakers).
ENA TS 12-11	Indoor and Outdoor Cable boxes for switchgear (for service at nominal system voltages of 6.6, 11 and 33kV).
ENA TS 35-1 Part 3	Distribution Transformers – close coupled.
ENA TS 41-26	Distribution Switchgear for Service up to 36kV (cable connected).

ENA TS 41-36	Distribution Switchgear for service up to 36kV (cable and overhead conductor connected).
ENA TS 41-41	Ground Mounted Distribution Substation 12 to 24 kV Rated RMU & Extensible Switchgear.
ENA TS 48-5	Environmental Test Requirements for Protection Relays and Systems.
ENA TS 50-19	Standard Numbering for Small Wiring.
ES001	Electricity North West Limited Main Specifications.
ES334	LV and HV Fuses.
ES391	Actuators for Long & Crawford Switches Type T4GF3 & J4 for Distribution Automation.
ES501	Metering Current and Voltage Transformers

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22 Keywords

Distribution; Switchgear; RMU (Ring Main Unit); Switch; CT; VT;

Appendix A

A1 Schedule A – List of Sub-Contractors

NAME OF SUB-CONTRACTOR	ITEM TO BE SUPPLIED

Name of Tenderer _____

A2 Schedule B – Technical Schedule

(to be completed by the tenderer)

A2.1 General

State Approval Notice/Notice of Conformity/Report Nos. held for the equipment offered.

What evidence is available to show the equipment is suitable for use on a 21.9 kA system?

A2.2 Ring Main Units

Are extra parts required for transformer mounting?

YES/NO.

If YES give full details.

Does the ring main unit provide a stable assembly when mounted on a 315kVA transformer?

YES/NO.

If NO what additional support is necessary and where does this support lie on the foundation plan Drawing No

A2.3 Other Equipment

Is busbar cable box handed or is it suitable for fitting either end of busbars?

Handed/Either

Could you supply a compatible outdoor circuit breaker?

If so, state type reference and ratings.

A3 Schedule C1 – List of 359mm (Normal) Long Fuse Links Tested in the Ring Main Unit or Other Switch-Fuse Units

MANUFACTURER	TYPE DESIGNATION	FREE RATING A	IN UNIT RATING A	ASTA22 CERT NO	TEMP RISE CERT NO
12kV					
7.2kV					

Name of Tenderer _____

A4 Schedule C2 – List of 359mm (Nominal) Long Fuse Links Tested in Other Fuse-Switch Units

MANUFACTURER	TYPE DESIGNATION	FREE RATING A	IN UNIT RATING A	ASTA22 CERT NO	TEMP RISE CERT NO
12kV	**kA**				
7.2kV	**21.9 kA**				

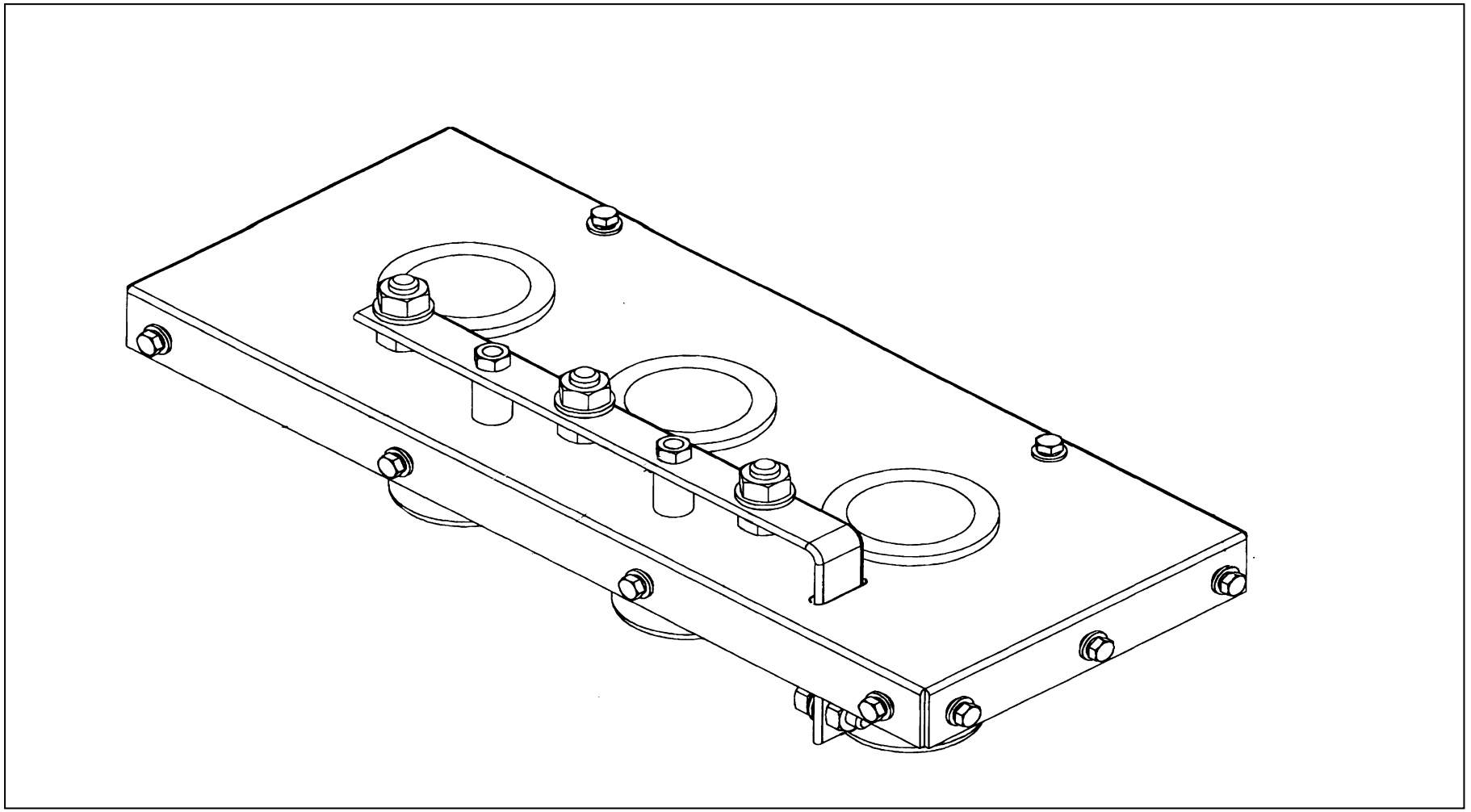
Name of Tenderer _____

A5 Schedule C3 – Circuit Breaker – Details of Protection Relay

MANUFACTURER	TYPE DESIGNATION	PROTECTION FUNCTIONS	ENA NOTICE OF CONFORMITY CERTIFICATE No.

Name of Tenderer _____

Appendix B – Earthing Bar and Gland Plate Example



Appendix C – Conformance Declaration

SECTION-BY-SECTION CONFORMANCE WITH SPECIFICATION

The Tenderer shall declare conformance or otherwise for each product/service or range of products/services, section-by-section, using the following Conformance Declaration Codes.

Conformance Declaration Codes:

N/A =	Clause is not applicable/appropriate to the product/service.
C1 =	The product/service conforms fully with the requirements of this clause.
C2 =	The product/service conforms partially with the requirements of this clause.
C3 =	The product/service does not conform to the requirements of this clause.
C4 =	The product/service does not currently conform to the requirements of this clause, but the manufacturer proposes to modify and test the product in order to conform.

Manufacturer:

Product/Service Description:

Product/Service Reference:

Name:

Company:

Signature:

SECTION-BY-SECTION CONFORMANCE			
Section	**Section Topic**	**Conformance Declaration Code**	**Remarks * (must be completed if code is not C1)**
2	**General Design Features**		
4.1	**Product not to be Changed**		
4.2	**Electricity North West Technical Approval**		
4.3	**Quality Assurance**		
4.4	**Formulation**		
4.5	**Identification Markings**		
4.6	**Minimum Life Expectancy**		
4.7	**Product Conformity**		
5.1	**Requirements for Type Tests at the Supplier's Premises**		
5.2	**Requirement for Routine Tests at the Supplier's Premises**		
5.3	**Requirement for On Site Tests**		
6	**Ratings**		
7.1	**Protection – Automatic Switch Fuse Equipment**		
7.2	**Protection – Circuit Breakers**		

7.3	**Protection Testing Facilities**		
8.1	**Cable Terminations – General**		
8.2	**Earthing Bar**		
8.3	**Jointing Access – Ring Main Equipment in Unit Substation Application**		
9	**Filling Medium**		
9.1	**Gas**		
9.2	**Oil**		
9.3	**Vacuum**		
10	**Metering**		
11	**Provision for Remote Control**		
11.1	**Power Supplies**		
11.2	**Approval of Retrofit Actuators**		
12	**Internal Arc Tested Equipment**		
13	**Handling of SF_6 and Decontamination Procedures**		
14	**Drawing and Maintenance Instructions**		
15	**Voltage Sensing**		
16	**Voltage Check and Phase Identification**		

17	**Disposal of Switchgear and/or its Components**		
18	**Manual Handling**		
19	**Failure, Modes, Effect and Cause Analysis**		
20.1.1	**Ring Main Equipment – Supports**		
20.1.2	**Addition to Remote Trip Feature to the Switch-Fuse**		
20.2.1	**Busbar Section Switch**		
20.3.1	**Non-Extensible Switch-fuse for Transformer Mounting**		
20.3.2	**Addition of a Remote Feature to a Switch-fuse**		
20.4	**Active Network Power Flow Monitoring**		
Schedule A	**List of Sub Contractors**		
Schedule B	**Technical Schedule to be Completed by the Tenderer**		
Schedule C1	**List of 359mm (Nominal) Long Fuse Links Tested in the Ring Main Unit**		
Schedule C2	**List of 359mm (nominal) Long Fuse Links Tested in other Fuse-Switch Units.**		
Schedule C3	**List of 359mm (nominal) Long Fuse Links Tested**		

	in other Fuse Switch Units		

Additional Notes: