

1. SCOPE

This section of the Energy Networks Live Working Manual details the procedure for the approval of safety equipment for the purposes of compliance with the ScottishPower Safety Rules (Electrical and Mechanical) 4th Edition and associated Codes of Practice and Safety Instructions and lists the **Approved** equipment. Appendix A&B, to this document provide a list of equipment **Approved** for **Live** work. These lists were correct at the time of going to print. For the latest version of these lists refer to the version of this document held on the intranet.


2. ISSUE RECORD

This is a **Reference** document. The current version is held on the Energy Networks Intranet Document Library.

It is your responsibility to ensure you work to the current version.

Issue Date	Issue No	Author	Amendment Details
Feb 2007	5	Jack Neilson	1. Update to Insulated rubber glove specification due to changes in BSEN 60903 (2003), Removal of category (M), now part of the standard manufacture and test process. 2. Inclusion of Approved Neon Mains tester for confirming polarity at the service position. 3. Inclusion of Kewtech to manufacturers list of "Clip on Ammeters" & Martindale to manufacturers list of "Insulation testers".
April 2010	6	Phil Currie	Page 8 MEWP for LV Live working amended
June 2013	7	Phil Currie	Test lamps updated, T-P22/3, TAG 5000 and voltage pen added

3. ISSUE AUTHORITY

Author	Owner	Issue Authority
Name Phil Currie Title Operational Compliance Manager	Name Phil Currie Title Operational Compliance Manager	Name Ewan McMillan Title Health & Safety Director  Date... 14-6-2013.....

4. REVIEW

This is a **Reference** document which has a 5 year retention period after which a reminder will be issued to review and extend retention or archive. The proposed revision date can be viewed in the Live Working Manual Document Index DOC-00-236.

5. DISTRIBUTION

This document is part of the EN Live Working Manual maintained by Document Control and has a maintained distribution list.

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7. DEFINITIONS

Terms printed in bold type are as defined in the ScottishPower Safety Rules (Electrical and Mechanical) 4th Edition

8. PROCEDURE FOR OBTAINING APPROVAL

- 8.1 Equipment for **Live** working or testing shall be **Approved** by the Asset Risk Manager.
- 8.2 The **Approved** items of equipment shall be listed as Appendix A & B of this document. For the latest versions of these lists refer to the version of this document held on the intranet.
- 8.3 Where an item of equipment was in use before this Issue of LWM 8.1 (now OPSAF-12-024) and is not on the **Approved** list, the details shall be notified to the Asset Risk Manager who may sanction its continued use until the approvals procedure has been gone through.
- 8.4 A list of **Approved** tools specifically for use in work associated with OPSAF-12-011 (previously LWM 4.1 Low Voltage Cable Jointing) are listed in Appendix B. These tools shall be used in conjunction with the procedure specified in OPSAF-12-011 and the **Approved** jointing procedure.

9. APPENDICES

9.1 Appendix A

Equipment	Specification / Approval	Approved Types (Manuf. Type Ref.: Catalogue No. etc.)
<p>HV Voltage Indicator</p>	<p>Voltage indicator being:-</p> <p>(a) Type Approved in accordance with Engineering Recommendation G9/6, and</p> <p>(b) Separately Approved for use in ScottishPower.</p>	<p><u>Edgcumbe Instruments</u> The following types are Approved for use on metal-clad switchgear and overhead lines.</p> <p>(i) Type No. 254/11 and 254A/11, system voltage 11kV, with modified earth terminal assembly. Type No. 254/33 and 254A/33, system voltage 33kV, with modified earth terminal assembly.</p> <p>(Notes:- Not in current production; 254A supplied modified).</p> <p>Bent-end adaptor, extension piece and proving unit also Approved for above types.</p> <p>(ii) Type No. 256A system voltage 11kV, Type No. 257A, system voltage 33kV.</p> <p>(iii) Type No. 256B, system voltage 11kV</p> <p>(iv) Type No. 257B, system voltage 33kV <u>Note</u> - Suffix 'B' denotes modified and tested unit for wet weather application.</p> <p>Bent-end adaptor, extension piece and proving unit and repeater unit also Approved for types in (ii) and (iii) above.</p>

Equipment	Specification / Approval	Approved Types (Manuf. Type Ref.: Catalogue No. etc.)
HV Voltage Indicator (Contd.)		<u>Karl Pfisterer</u> <u>Fameca</u> Following types Approved for use on overhead lines and open type apparatus only (i.e. <u>excludes</u> metal-clad switchgear). Karl Pfister - Type KPT 1.2 - System Voltage 6/33 kV Fameca – Type SL200-68170 11kV proximity tester <u>Note</u> - Must be used with at least two fibreglass insulating rods (2.4m minimum).
HV Voltage Measuring and Phasing Out Devices	As for HV Voltage Indicators.	<u>Edgcumbe Instruments</u> :- as for HV Voltage Indicators
HV Proving Units	As for HV Voltage Indicators.	
HV Phasing Device	IEC 61-481.	<u>Fameca TAG 5000 wireless phasing device</u>
Phase Comparator, Phasing Out Device	Unit Used for Phasing Out on New Generation HV Switchgear	<u>Pfisterer Phase Comparator</u> Various suppliers
HV Fault Locating Unit	Unit Used for Locating HV Faults	<u>Victor T120A</u> <u>Manufactured by Bicotest</u> Various Suppliers
LV Voltage Indicators and Proving Units	Devices being:- (a) Type Approved in accordance with Engineering Recommendation G9/6, and/or (b) Separately Approved for use in ScottishPower.	<u>John Drummond (Engineers) Ltd.</u> <u>(now produced by Martindale)</u> Type No. MTL7, system voltage 80 to 500 volts, for use with heavy duty double filament lamps only. Type No. MTL9c, system voltage 80 to 500 volts, for use with heavy duty double filament lamps only. Type Nos. MTL20 and MTL20B, sealed units, LED indication of 50, 100, 200 and 400V AC/DC. Maximum working voltage 500VAC, 750VDC. Note: MTL20B gives blue LED indication of 400V measurement. <u>Various Manufacturers e.g</u> <u>Seaward</u> <u>Martindale</u> <u>Drummond</u> Test lamp proving unit portable or fixed

Equipment	Specification / Approval	Approved Types (Manuf. Type Ref.: Catalogue No. etc.)
Neon Mains Tester	Unit used to identify polarity at the service position in conjunction with Approved LV voltage indicators	Neo-Electrical Industries Neo Ltd.
LV "Polarity Test Pen" with accompanying "Test Pen Checker".	To be used to indicate if a voltage is present. Not to be used as an alternative to a test lamp for proving not-live as required within safety procedures.	EA Technology – Polarity Test Pen and Test Pen Checker comes as a kit, product code PTK1
Test Probes for Drummond Test Lamps Type MLT		John Drummond (Engineers) Ltd. (now produced by Martindale) John Drummond (Engineers) Ltd Part No: MP18: 1013 Black
Crossarm Leakage Detector	Detector manufactured under licence from Electricity Association. ScottishPower Approval for use in HV Live Line Working and for detection of damaged or punctured insulators up to 11.5kV.	<u>Seaward</u> CARL MARK II Cat No. 131 A190
<u>Cable Locating Devices</u> (Signal Injection Devices and Main Detectors)	National Joint Utilities Group - NJUG No. 3 - Cable Locating Devices	(i) <u>General Purpose for Excavation Work</u> <u>Radiodetection Ltd.</u> - CAT and signal generator GENNY. (ii) <u>Cable Identification as PSSI 5</u> Phase to Phase Lee Vaughan Cable Identifier, BICCO TEST (BIMEC), Whitley Cable Identifier <u>Phase to Earth</u> Pulsed 50Hz Injection Equipment with Magnetic Detector (iii) <u>Single Core Cables</u> Radiodetection Ltd RL200 Cable Identifier (iv) Bauer Polarised Locator Type – KSG 80 (v) Foster Type – AFG 50
<u>Cable Fault Location Equipment</u>	HDW Brenngerat Fault Burner Unit <u>Biccotest</u> Fault Burner Unit <u>Biccotest</u> Pulse Echo Unit <u>Biccotest</u> Thyrister Thumper <u>Biccotest</u> Faultman Hand Held Unit	HDW Brenngerat Howardtswerke-Deutsche Werft fault Burner Type – T91/13.5/10kV <u>Biccotest</u> Type – T121 Fault Burner <u>Biccotest</u> Type – T433M Pulse Echo <u>Biccotest</u> Type – T207 Thyrister Thumper <u>Biccotest</u> Type – T511 Faultman Hand Held Unit

Equipment	Specification / Approval	Approved Types (Manuf. Type Ref.: Catalogue No. etc.)
<u>Cable Fault Location Equipment cont.</u>	<u>CSD</u> Telefault <u>CSD</u> Telefault <u>Kehui – Low Voltage Cable Fault Locator</u>	<u>CSD</u> Type – T240 Telefault <u>CSD</u> Type – SRS Telefault (Services) <u>T-P22 Cable fault locator</u> <u>T-P23 Cable fault locator</u>
<u>LV Fault Closing Device</u>	<u>Fuse Mate</u> - Unit used to provide operator with method of closing into a potential fault remotely	<u>Fuse Mate</u> Manufacturer – Kelman
	<u>Rezap</u> – Fully rated fault reclosing unit operated remotely.	<u>Rezap</u> Manufacturer – Kelman
Ladders (All insulated type for Distribution System use).	(i) ScottishPower Procurement Specification 1376/10,000 - Industrial Ladders, Steps, Trestles and Staging - Wood (ii) ScottishPower Procurement Specification 1376/10,001 - Industrial Ladders, Steps and Trestles - Inspection and Control (iii) ESI Technical Specification 13-1 - Portable Glass Fibre Ladder and Steps	Suppliers various in accordance with ScottishPower Procurement Specification 1376/10,000 to be marked as BS 1129 (1982) and supplied with a certificate by supplier.
Rubber Gloves for Electrical Purposes	(i) ScottishPower Procurement Specification 0619/10,000 - Rubber Gloves for Electrical Purposes BS EN 60903 (2003) CLASS 1 (ii) ScottishPower Procurement Specification 0619/10,002 - Wallet for Rubber Gloves (iii) OPSAF-12-025 - Rubber Gloves for Electrical Purposes	Reference ScottishPower Procurement Specification –
Insulated Tools - Hand Tools up to 1000V	(i) Engineering Recommendation G58/1 (SM) - Purchase, Use, Storage, Inspection and Maintenance of Hand Held Insulated Tools for Live Working. (ii) ESI Technical Specification - ESI 26-3 (SM) - Hand Held tools for Live Working up to 1000 Volts.	As Engineering Recommendation G58/1 (SM)

Equipment	Specification / Approval	Approved Types (Manuf. Type Ref.: Catalogue No. etc.)
HV Live Line Tools	ESI Technical Specification - ESI 26-2 - Insulated Tools for Live Working on HV Overhead Lines	Ref. Power Systems Live Working Manual Section 5.3 section 15.
HV Break-Safe Loadbreak & Pick-Up Tool	15kV 185amp Approved for single phase switching incorporating Rubber Glove and Short Stick Working	<u>Horizon Utility Supplies</u>
HV Temporary Air Break Switch	Approved Cat.1 11kV Fault Make Break capability (Temporary only)	<u>Horizon Utility Supplies</u>
Towable or vehicle mounted MEWP with Insulated Bucket	Approved for Live LV working within the Energy Networks	Nifty Lift (Milton Keynes) 140 & 120T Other MEWPs that have an insulated bucket with a manufactures certificate of test to BS EN 61057 standard.
Notices	ScottishPower Procurement Specification 0629/10,000 Safety Signs and Notices. <ul style="list-style-type: none"> • Danger Live Apparatus • Testing in Progress • Caution 	As Approved Product List in ScottishPower Procurement Specification 0629/10,000.
Key Safes	MSP 1.8 (OPSAF –11-010)	Keyways Master Key Systems Ltd., 18 The Square, Hale Barns, Cheshire QA15 8ST (Phone 061-980-6655) (Fax 0161-904-0768)
HV Portable Earthing Devices Primary Earths and Drain Earths	(i) MSP No. 1.6. (OPSAF-11-008) (ii) ESI Technical Specification - 41-21 - Portable Earthing for Open Type HV Apparatus in Substations (iii) ESI Technical Specification 43-81 - Portable Earthing for HV Overhead Lines up to and including 66kV.	<u>Bowthorpe EMP Ltd.</u> <u>P. & B. Engineering Company Ltd.</u> <u>CCL Systems Ltd.</u> <u>AUS Limited</u> <u>Horizon Utility Supplies</u>
LV Portable Shorting / Earthing Devices	MSP No. 1.6 (OPSAF-11-008) O/H line work only	<u>P. & B. Engineering Ltd.</u> <u>Campbell York</u> <u>Bowthorpe EMP Ltd.</u> <u>AUS Limited</u> <u>Horizon Utility Supplies</u>

Equipment	Specification / Approval	Approved Types (Manuf. Type Ref.: Catalogue No. etc.)
Insulated Mats	Rubber Mats shall be in accordance with BS 921	Various suppliers to BS 921
Insulated Materials for Live Line Working Screening.	(i) <u>O/H Lines</u> - LV Live Line Working. (ii) <u>LV Boards, Pillars and Underground Link Boxes and Cables</u> Specification for plastic sheeting as ACE Report No. 21 (1969), Section 2.1.2	Lecsafe - Plastolene 946 conductor shrouding tested to 13kV - various sizes to catalogue numbers. Lecsafe - corrugated plastic tube tested to 20kV 16mm and 32mm inside diameter. Lecsafe Ltd., Old Mill Road, Portishead, Bristol, Avon BS20 9BX Sahlins - Clydesdale, - Polythene shroud for conductors Sahlins - Clydesdale Limited, Instal House, 3 Sunbeam Road, Woburn Industrial Estate, Kempston, MK42 7BZ LECSAFE - Plastolene 946 BODDINGTON - Neoprene Rubber* - VDE Spec. 0680 *NOTE: 100mm wide strips for LV cable jointing purposes.
Insulated Cap Shrouds for Control and Relay Terminals	As tested by ScottishPower Technology Division based on VDE 0680, Part 1, Section 3.11 and ASTM F1742-96	Supplied by GEC PD8282 type shrouds
Insulated HV vermin control shrouds	GVR, Transformers (universal) Pole box, conductors, int. insulators	Plastic Dip Mouldings 4 Ailsa Place Irvine Horizon Utility Supplies
Attaching Clamps (Insulated) for shrouding/screening	Lam, spring-loaded safety clamp Spec ; DIN57680 71/72 Part Nos. 8035 and 8035S	Boddington Ltd., Dunmow Industrial Estate, Chelmsford Road, Great Dunmow, Essex CM5 1HF
Approved Roping-off Equipment	Reference Power Systems Safety Instruction No. 6.	
Protective Clothing and Equipment for SF ⁶	Reference DOM 1.4.6 (SWG-14-003)	
LV Supply Leads for Temporary Connection	13A power take off, clip-on leads incorporating a circuit breaker.	Suggested supplier – <u>John Drummond (Engineers) Ltd.</u> (now produced by Martindale)

Equipment	Specification / Approval	Approved Types (Manuf. Type Ref.: Catalogue No. etc.)
Fused Insulated Test Leads and Probes for use with Approved Measuring Instruments	In accordance with HSE Guidance Note GS38	Various Manufactures to specification.
Phase Rotation Meter	Manufactured to specification: IEC-1010—1 or Equivalent Cat III – Relates to distribution mains, feeders and branch circuits. Cat IV – Relates to primary supply levels, overhead and underground utility services to a service.	Various Manufactures to specification. e.g <u>Robin</u> <u>SEI</u> Note :- This list is not exhaustive and any equipment shall be assessed to determine it is fit for purpose prior to purchase. Note: All units must be supplied with the Approved fused leads
Earth Loop Impedance Tester	Manufactured to specification: IEC-1010—1 or Equivalent Cat III – Relates to distribution mains, feeders and branch circuits. Cat IV – Relates to primary supply levels, overhead and underground utility services to a service.	Various Manufactures e.g <u>Robin</u> <u>Seaward</u> <u>Metrohm</u> <u>Megger</u> Note :- This list is not exhaustive and any equipment shall be assessed to determine it is fit for purpose prior to purchase. Note: All units must be supplied with the Approved fused leads
Insulation & Continuity Testers	Manufactured to specification: IEC-1010—1 or Equivalent Cat III – Relates to distribution mains, feeders and branch circuits. Cat IV – Relates to primary supply levels, overhead and underground utility services to a service.	Various Manufactures e.g <u>Robin</u> <u>Seaward</u> <u>Metrohm</u> <u>Martindale</u> <u>Megger</u> <u>Fluke</u> Note :- This list is not exhaustive and any equipment shall be assessed to determine it is fit for purpose prior to purchase. Note: All units must be supplied with the Approved fused leads

Equipment	Specification / Approval	Approved Types (Manuf. Type Ref.: Catalogue No. etc.)
Multimeter	Manufactured to specification: IEC-1010—1 or Equivalent Cat III – Relates to distribution mains, feeders and branch circuits. Cat IV – Relates to primary supply levels, overhead and underground utility services to a service.	Various Manufacture e.g <u>Fluke</u> <u>Robin</u> <u>AVO</u> Note :- This list is not exhaustive and any equipment shall be assessed to determine it is fit for purpose prior to purchase. Note: All units must be supplied with the Approved fused leads
Clip On Ammeter	Manufactured to specification: IEC-1010—1 or Equivalent Cat III – Relates to distribution mains, feeders and branch circuits. Cat IV – Relates to primary supply levels, overhead and underground utility services to a service.	Various Manufacture e.g <u>Soar</u> <u>Prova</u> <u>Robin</u> <u>Kewtech</u> <u>Biddle</u> <u>Heme</u> <u>Eurism</u> <u>Ferranti</u> <u>Megger</u> Including High Current and Large Opening CT Accessories Note :- This list is not exhaustive and any equipment shall be assessed to determine it is fit for purpose prior to purchase. Note :- Where applicable fused leads will be provided.
Socket Polarity Tester Fuse Finder	<u>Neon Indicator</u> 13A Plug-in Type Device used to identify circuits controlled by fuse or circuit breaker	Various manufacturers e.g Martindale Greenbotham, Hinley Buxworth, Stockport SK12 7EF 0663-732435
Specialist Instruments	<u>RPM</u> Reliable Power Quality Meter <u>VoCul</u> Voltage and Current Logger <u>Harmonic Analyser</u> Circuit Harmonic Analyser <u>Powerscope</u> Disturbance Recorder <u>Flickermaster</u>	<u>Reliable Power Meter</u> <u>Ferranti</u> <u>Harmonic Analyser</u> Circuit Harmonic Analyser <u>BMI Powerscope</u> Type – 0808 Disturbance Recorder <u>EA Technology</u> Type - Flickermaster
“	<u>Supply Quality Monitor</u>	<u>EA Technology</u> Type – Supply Quality Monitor

Equipment	Specification / Approval	Approved Types (Manuf. Type Ref.: Catalogue No. etc.)
Specialist Instruments cont.	<u>Power Disturbance Analyser</u> <u>High Speed Digital Recorder</u> <u>High Speed Thermal Recorder</u>	<u>Megger</u> Type – PDA1 Power Disturbance Analyser Type – PDA25 Power Disturbance Analyser <u>Omnicance</u> High Speed Digital Recorder <u>Micromovements</u> High Speed Thermal Recorder
“	<u>Paperless Voltage Recorder</u>	<u>EA Technology</u> Type – RO1 Paperless Voltage Recorder
“	<u>Power Analyser</u>	<u>CEWE</u> Power Analyser
“	<u>Scopemeter</u> <u>Phase Angle Meter</u>	<u>Phillips</u> Type – PM97 Scopemeter <u>GEC</u> Type – PA18L4X003 Phase Angle Meter
Abrasive Stones for Live LV Work	Crystalline Silicon carbide 20 square x 150 - Fine and course 13 square x 100 - Fine and course	Carborundum Abrasives Ltd.
Insulated Brushes Sash Tools for Live LV Work	Commodity Code Nos. 06033659 and 06033660	ScottishPower Stores
Vacuum cleaners for Live LV Work	As used for HV switchgear overhaul but with insulated hoses and cleaning tools. Filter required for inside of vacuum cleaner tank.	Numatic WV 575 Numatic International Broadwinsor Road Beaminster Dorset
Core separators for Live LV cable jointing	Insulated core separator Insulated core guard	Hepworth Ellis Patents Limited High Street Malton N. Yorkshire
Insulated end caps for Live LV cable cores	Insulated caps.	Sibelle or Plastic Dip Mouldings 4 Ailsa Road Irvine
Core positioning tool	Insulated core positioner	Ellis Patents Limited
Kennion Irvine Consac cable sheath cutting tool	N/A	AB Chance catalogue No. MK 111-1015-0101

Equipment	Specification / Approval	Approved Types (Manuf. Type Ref.: Catalogue No. etc.)
<p>Approved adaptors for the connection of generator cables to LV Apparatus</p> <p>(See Table A of LWM Section 2.4 for further information)</p>	<p>LVD400 fuse unit LVD401 fuse unit LDFT line drain connector PDFT panel mounted drain connector LVC screw in end cap fuse LVF overhead line clamp LVS....insulated G style clamp LVE rotary style clamp</p>	<p>Supplier:- ITT Cannon Jayes Close Viabes Estate Basingstoke Hants RG22 4BA 01256-311200</p>
<p>Pole Shrouding for poles that are being erected into Live conductors up to 11kV</p>	<p>22inx54inx1000 gauge clear plastic bags</p> <p>Hastings wrap around pole guards (dielectrically tested)</p> <p>A B Chance wrap around pole guards (dielectrically tested)</p> <p>White colour polypropylene wrap around pole cover</p>	<p>J R Reid Glasgow Rd Blantyre 01698 826000</p> <p>Horizon Utility Supplies 01934 838833</p> <p>Horizon Utility Supplies</p> <p>Horizon Utility Supplies</p>

9.2 Appendix B

Approved Tools List for Accessing and Working on Live LV Cables	
<ul style="list-style-type: none"> • Insulated Hack Knife • Insulated Pliers • Insulated Multigrips • Insulated Side Cutters • Insulated Core Cutters • Insulated Maxiwedge (Sicame) • Insulated Nut Spinner • Guarded Hacksaw • Insulated 4mm Allan Key (Angle & Tee Bar) • Insulated core separators • Insulated core guard • Fully insulated Junior hacksaw • Insulated Core Knife 	<ul style="list-style-type: none"> • Henley Series 7 Key • Continuity Strap • Insulated Handle Stripping Knife • Core Twisting Tools • 3/8 Drive Insulated Ratchet • 3/8 Insulated 4mm Allen Key • 1/2 Drive Insulated Ratchet • 1/2 Insulated Sockets • 1/2 Insulated Extension Bar • Insulated Straight Connector Holding Tool • Insulated Breach Connector Holders (95, 185, 300mm²)