Electricity Distribution

nationalgrid

Company Directive

STANDARD TECHNIQUE: CA2A/2

Relating to Jointing Configurations for 11kV Cables

Policy Summary

This Standard Technique document details the Jointing Configurations required for jointing 11kV Cables.

This ST has not been written as a training document. It is not intended to be exhaustive in content and you must refer to your supervisor if you require training or instruction.

You shall work safely and skilfully, utilising the training/instruction you have already received, relating to the contents of this document and its cross-references.

You must make sure that you understand your job instructions and that you have the necessary tools and equipment for the job.

Author: Peter White

Implementation Date: May 2016

Approved by:

Policy Manager

Date: 17 May 2016

All references to Western Power Distribution or WPD must be read as National Grid Electricity Distribution or NGED

IMPLEMENTATION PLAN

Introduction

Losses strategy added to the document. Plus the various number ST documents added to the different joint types e.g. Straight joints – ST: CA2V/3.

Main Changes

Document has been modified to take into account the WPD losses strategy and the harmonization of the 11kV cables within the company.

Impact of Changes

None.

Implementation Actions

Team managers to disseminate the information to their respective 11kV Jointers.

Implementation Timetable

This Standard Technique can be implemented with immediate effect.

Document Revision & Review Table		
Date	**Comments**	**Author**
May 2016	Losses strategy added to the document. Plus the various number ST documents added to the different joint types e.g. Straight joints – ST: CA2V/3.	Peter White
March 2013	The changes that have been made to this document are the inclusion of all the 11kV cables and the associated general requirements which have over the years been used in the Midlands Areas and not used in the South Wales and South Western areas, thus providing a unified common document applicable to the whole company. Rectification of known typographic errors.	Peter White

ST: CA2A/2 11kV CABLE JOINTING CONFIGURATIONS

This Standard Technique document details the various jointing configurations which are possible within the WPD standard practices for 11kV jointing. It should be noted that because of the need to ensure adequate clearances in joints, the materials must not be used in any other manner than those laid down.

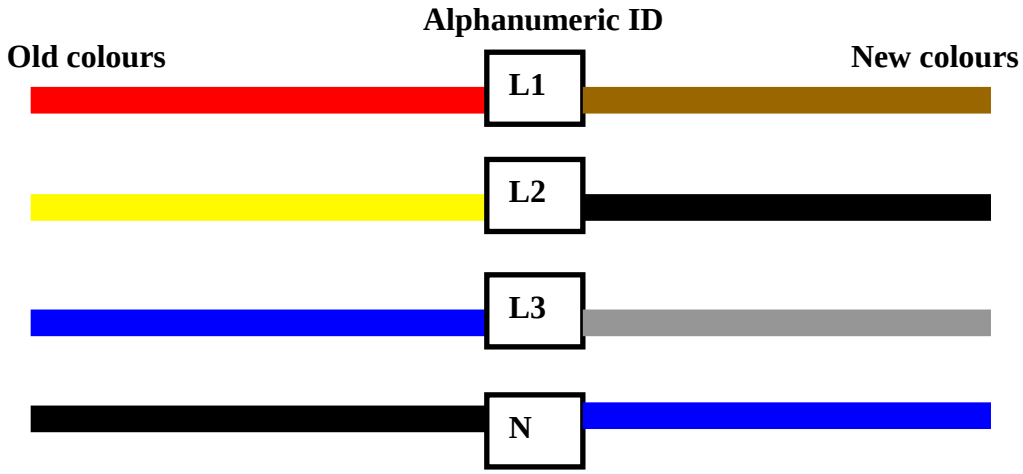
If a jointing procedure not covered in the 11kV Jointing Manual is required, advice should be obtained from the Policy Manager, Avonbank, Bristol.

As from 1st March 2015 WPD have changed the specification of Approved cable sizes. These changes will affect all new installations and are aimed at reducing cable losses in accordance with the WPD Losses Strategy. This means that the 95mm² triplex and single core cables are now removed from general use, they can only be used for padmounts and the repair of faults in 95mm² circuits.

This Standard Technique document is an overview of the jointing configurations and for details of an individual joint, the appropriate jointing procedure should be consulted.

1. BACKGROUND

Since 01/04/06 the British Standards BS EN 60446 document dictating the phase colours used in the various LV Mains cables has changed, this change is mandatory, the old and new colours along with the associated alphanumeric are shown on the graphic below: -



These new colours apply to all electrical industries, including the electrical utilities, it should be noted that the old colours are no longer allowed to be purchased and used on the WPD system. Therefore when working on the existing "old colours" care shall be taken in jointing the new colours to the old. To avoid confusion when jointing the existing old colour red shall be marked with the alphanumeric tape L1 and the new colour brown shall also be marked with alphanumeric tape L1 and then the two L1's shall be jointed together; to avoid confusion when jointing the existing old colour yellow shall be marked with the alphanumeric tape L2 and the new colour black shall also be marked with alphanumeric tape L2 and then the two L2's shall be jointed together; to avoid confusion when jointing the existing old colour blue shall be marked with the alphanumeric tape L3 and the new colour grey shall also be marked with alphanumeric tape L3 and then the two L3's shall be jointed together. This will ensure colour true jointing with no inadvertent crosses.

Any 11kV single core circuit that is laid shall be laid in a touching trefoil group of L1, L2 and L3, the three cables shall be cable tied or two complete turns of Gorilla gaffer (E 5 number 60928) taped every 1.5m in a straight run and every 1m when going around a corner, the cable ties to be used are E 5 number 35370.

If a second circuit is being laid in the same trench then there shall be a minimum centre to centre spacing of 300mm between the two touching trefoil groups of circuits, at no time shall a phase of one trefoil group be laid with the second trefoil group and visa versa.

BS EN 60446 - *Basic and Safety Principals for Man-Machine Interface, Marking and Identification (2007)* – Quote: - "The identification by colours, for identification of conductors, the following colours are permitted: - black, brown, red, orange, yellow, green, blue, violet, grey, white, pink, turquoise.

The identification by colour shall be used at terminations and preferably throughout the length of the conductor either by colour of the insulation or by colour markers. Additional marking, for example alphanumerical or numerals, are allowed, provided that the colour identification remains unambiguous."

Therefore at all times Jointers shall joint 'colour true', or if there is a mixture of old and new phase colours jointing shall be as indicated in the coloured graphic on page 2 of this document. The only dispensation for this is unless the Jointer has been instructed to do otherwise by their Team Manager.

2. STRAIGHT JOINTS – ST: CA2V/3.

Straight joints for all cables normally found on the WPD 11kV network are included.

2.1 EPR Triplex – EPR or XLPE Triplex

All sizes of EPR or XLPE triplex are to be straight jointed together using the Lovink K85 and K95 system.

2.2 **EPR Triplex – PICAS/PISAS**

All sizes of EPR triplex to PICAS/PISAS are to be straight jointed together using the Lovink K85 and K95 system.

2.3 **EPR Triplex – PILCSWA / PILCSTA**

All sizes of EPR triplex to PILCSWA / PILCSTA are to be straight jointed together using the Lovink K85 and K95 system.

2.4 **EPR Triplex – 3 Core XLPE cable**

All sizes of EPR triplex are to be straight jointed together using the Lovink K85 and K95 system.

2.5 **EPR Single Core 95mm² – EPR Single Core 95mm²**

95mm² EPR single core is to be straight jointed together using the Tyco cold shrink system.

This system may also be used to repair single core faults on 185 or 300mm² EPR.

2.6 **EPR Single Core 630mm² – EPR Single Core 630mm² or XLPE 630mm²**

630mm² EPR single core is to be straight jointed together using the Lovink K75 system.

2.7 **EPR Single Core 630mm² – PILC Single Core 500/630mm²**

630mm² EPR single core to 500/630mm² PILC is to be straight jointed together using the Lovink K75 system.

3. BRANCH JOINTS – ST: CA2M/4.

Branch joints for all cables normally found on the WPD 11kV network are included.

3.1 **EPR Triplex – EPR or XLPE Triplex**

All sizes of EPR triplex are to be branch jointed together using the Lovink KB85 and KB95 system.

3.2 **EPR Triplex – 3 Core XLPE cable**

All sizes of EPR triplex and 3 core XLPE are to be branch jointed together using the Lovink KB85 and KB95 system.

3.3 **EPR Triplex – PICAS/PISAS**

All sizes of EPR triplex to PICAS/PISAS are to be branch jointed together using the Lovink KB85 and KB95 system.

3.4 **EPR Triplex – PILCSWA / PILCSTA**

All sizes of EPR triplex to PILCSWA / PILCSTA are to be branch jointed together using the Lovink KB85 and KB95 system.

4. STOP ENDS – ST: CA2N/5.

Stop Ends for all cables normally found on the WPD 11kV network are included.

4.1 **EPR Triplex or XLPE Triplex**

All sizes of EPR or XLPE triplex are to be stop ended using the Lovink K85 and K95 system.

4.2 **3 Core XLPE**

All sizes of 3 core XLPE cable are to be stop ended using the Lovink K85 and K95 system.

4.3 **PICAS / PISAS**

All sizes of PICAS / PISAS are to be stop ended using the Lovink K75 system.

4.4 **PILCSWA / PILCSTA**

All sizes of PILCSWA / PILCSTA are to be stop ended using the Lovink K75 system.

4.5 **EPR Single Core 70 & 95mm²**

95mm² EPR single core is to be stop ended using the Tyco cold shrink system.

4.6 **EPR Single Core 630mm²**

630mm² EPR single core is to be stop ended using the Lovink K75 system.

4.7 **PILC Single Core 500/630mm²**

500/630mm² PILC single core is to be stop ended using the Lovink K75 system.

5. TERMINATIONS – ST: CA2U/3.

Only terminations for 95/185/300mm² EPR triplex, 95mm² and 630mm² EPR single core are included in this Standard Technique.

5.1 Terminations for the following applications are included: -

(i) Indoor termination for dry cable boxes.
(ii) Outdoor pole and open busbar terminations.
(iii) Elbow disconnecting terminations ("Live break").
(iv) Compound filled cable box terminations.
(v) Outer cone separable connectors (Euromold interface C).

Note: - If an existing cable termination is compound filled then it should be noted that that compound cable termination can only be replaced by a Lovisil compound replacement as detailed in relevant Jointing Procedures 7.405 and 7.406 given in ST: CA2U. The use of Guroflex or other methods is not Approved.

6. LOOP JOINTS – ST: CA2O/4.

Loop joints for all cables normally found on the WPD 11kV network are included.

6.1 **EPR Triplex – EPR or XLPE Triplex**

All sizes of EPR or XLPE triplex are to be loop jointed together using the Lovink KB85 and KB95 system.

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6.2 **EPR Triplex – 3 Core XLPE cable**

All sizes of EPR or XLPE triplex are to be loop jointed together using the Lovink KB85 and KB95 system.

6.3 **EPR Triplex – PICAS / PISAS**

All sizes of EPR triplex to PICAS / PISAS are to be loop jointed together using the Lovink KB85 and KB95 system.

6.4 **EPR Triplex – PILCSWA / PILCSTA**

All sizes of EPR triplex to PILCSWA / PILCSTA are to be loop jointed together using the Lovink KB85 or KB95 system.

APPENDIX A

SUPERSEDED DOCUMENTATION

This Standard Technique is a revision of document ST: CA2A/1 dated April 2013 and replaces that document.

APPENDIX B

ASSOCIATED DOCUMENTATION

ST:CA2C, ST:CA2M, ST:CA2N, ST:CA2O, ST:CA2S, ST:CA2T, ST:CA2U, ST:CA2V.

APPENDIX C

IMPACT ON COMPANY POLICY

None, as this document has just been updated to incorporate losses strategy.

APPENDIX D

IMPLEMENTATION OF POLICY

For WPD staff Team Managers shall ensure that all relevant 11kV Jointing staff are aware of the changes to 11kV Jointing Manual of which this Standard Technique forms a major part. It can be implemented into all area of WPD with immediate effect. Managers shall ensure that all staff involved in the design, installation, maintenance and operation of the 11kV system are familiar with, and follow, the requirements of this document.

Independent Connection Providers (ICPs) shall follow the requirements of ST: CA2A/1 or of this document (ST: CA2A/2) for a period of up to 3 months from the issue of this document. After this date, all jointing works shall comply with ST: CA2A/2.

Where any difficulty is encountered in the application of this Standard Technique the author shall be notified who will determine whether a variation is appropriate.

APPENDIX E

KEY WORDS

Jointing configurations for 11kV.