

CONDUCTOR BUNDLES AND EARTHWIRES FOR OVERHEAD LINES

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PURPOSE AND SCOPE

This document details the preferred conductor bundles and earthwires to be used on National Grid overhead lines. It is applicable to all lines employing current 132 kV, 275 kV, and 400 kV tower designs.

PART 1 – POLICY

1 PREFERRED CONDUCTOR TYPES

All new conductor erected on National Grid overhead line towers should be AAAC, meeting the requirements of TS 3.04.37. The only exceptions are described below.

1.1 132 kV Towers

132 kV towers are typically strung with 'Lynx' 175mm² ACSR. While this conductor is currently accepted as standard, consideration should be given to the use of a similarly sized AAAC.

1.2 High Temperature Conductor

Where an AAAC bundle will not give sufficient thermal rating for L2 or L8 towers, 620mm² 'Matthew' GZTACSR or 591mm² 'Curlew' ACC may be used.

1.3 Repairs

Where new lengths of conductor are required to be jointed into an existing line, this should be carried out on a like-for-like basis.

1.4 Earthwires

All overhead lines shall be constructed with an overhead earthwire to mitigate the impact of lightning strikes, such that the resultant probability of a strike to a phase conductor is less than 1 event per 100km of line per annum. However, it is recognised that there are situations where the presence of an earthwire (downleads or increased risk of introducing circulating currents) is undesirable and if the risk associated with circuit unavailability is considered too high, especially for sensitive areas of the network consideration should be given to the use of alternative mitigation measures such as the installation of line surge arrestors on top phase insulator sets or in the case of circulating currents installation of an insulated earthwire arrangement shall be installed.

In situations where an earthwire (excluding downleads) cannot be installed in accordance with the requirements above or for operational reasons an existing earthwire is removed then this shall be detailed via a deviation submission in accordance with UKBP TP188.

The preferred earthwire type is OPGW type containing a minimum of 24 fibres as specified in TS 3.04.37. For standard construction OPGW should be installed regardless of the current

need for provision of optical services in order to allow for future flexibility. The need for fibre in earthwire for non-standard construction (such as large river crossing spans) should be evaluated on a scheme specific basis. Preferred phase conductor bundles

The preferred conductor bundles for each of National Grids tower designs are given in Appendix A Table 1. Conductor bundles that are likely to require significant structural modifications to the relevant tower design are indicated with an asterisk (*) and appear in **bold** type.

Horizontal bundle spacing for each conductor is defined by tower design and voltage in TS 3.04.37.

1.5 Rated Temperature

The nominal rated temperature for each bundle / tower combination is given in Appendix A Table 1. It should be noted that, subject to the requirements of PS(T)017, higher rated temperatures are often possible.

PART 2 - DEFINITIONS AND DOCUMENT HISTORY

2 DEFINITIONS

AAAC – All Aluminium Alloy Conductors.

ACSR – Aluminium Conductor Steel Reinforced

GZTACSR – Gap-Type ZT-Aluminium Conductor Steel Reinforced

ACC – Aluminium Composite Conductor

OPGW – Optical Ground Wire

3 AMENDMENTS RECORD

Issue	Date	Summary of Changes / Reasons	Author(s)	Approved By (Inc. Job Title)
1	October 2004	New Document	Sven Hoffmann Asset Policy	Mike Dean Asset Strategy Manager
2	April 2016	Updated to include new tower and conductor designs. PST 074 incorporated into the document	Dave Bedford Policy Development Engineer	Mark Waldron Acting Policy Manager