

## Company Directive

### STANDARD TECHNIQUE: SD8A/3

#### Relating to Revision of Overhead Line Ratings

##### Policy Summary

This Standard Technique contains all overhead line ratings used within WPD at all voltages.

These ratings are to be used when designing or operating any overhead line within the WPD electricity distribution network.

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**Implementation Date:** February 2020

**Approved by**

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**Date:**

5 February 2020

Target Staff Group	Control Engineers, Planners, PSD Engineers, Network Strategy Engineers and other staff with Network Design and assessment responsibilities. Staff responsible for maintaining databases containing overhead line ratings.
Impact of Change	AMBER - All databases containing overhead line ratings will need to be updated. Staff undertaking system studies will need to familiarize themselves with the new seasonal boundaries and the guidance relating to choice of exceedance when determining which rating to apply.
Planned Assurance checks	Database owners will be contacted 4 months after the issue of this document to confirm that the necessary changes have been made.

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

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## IMPLEMENTATION PLAN

### Introduction

This Standard Technique provides guidance on the ratings to be applied to all overhead lines within WPD.

### Main Changes

This document has been re-written to comply with the new issue of ENA ER P27, which is due to be published shortly. The new document reflects learning from a recent WPD NIA project, revising the probabilistic rating calculation, the assumed seasonal boundaries and their associated weather conditions, and the recommended exceedance levels to use when applying ratings.

### Impact of Changes

While the new issue of P27 highlights some areas where ratings have improved (e.g. summer season), there are others (notably in the winter) where ratings have been reduced. The impact of these reductions has been largely mitigated through the use of separate “pre-fault” and “post-fault” ratings, allowing higher exceedance levels to be applied compared to those given in ST:SD8A/2. Overall, initial studies have indicated that the impact of the new, standard ratings will be minor, although parts of the network that are already close to becoming overloaded may see reinforcement requirements accelerated. The new seasonal boundaries will provide the opportunity to better match ratings with load data during system studies.

<b>Target Staff Group</b>	<b>Control Engineers, Planners, PSD Engineers, Network Strategy Engineers and other staff with Network Design and assessment responsibilities. Staff responsible for maintaining databases containing overhead line ratings.</b>
<b>Impact of Change</b>	<b>AMBER - All databases containing overhead line ratings will need to be updated. Staff undertaking system studies will need to familiarize themselves with the new seasonal boundaries and the guidance relating to choice of exceedance when determining which rating to apply.</b>

### Implementation Actions

Teams responsible for databases and design tools shall ensure that any stored overhead line ratings are updated in line with this document – PowerOn (DSO Systems), PSSE Database, PVCR, DINIS (Network Strategy), WinDebut (DSO Development), and any other systems or tools that may apply. Where a specific system is not capable of storing or referencing the full set of ratings associated with a conductor, the person responsible for use of the system shall select the appropriate rating values to use.

There is no requirement to undertake any new system studies solely as a result of the issue of this document, however all system studies undertaken from the implementation date of this Standard Technique shall use the ratings it contains.

### Implementation Timetable

Affected databases shall be updated within 3 months of issue of this document.

## REVISION HISTORY

Document Revision & Review Table		
Date	Comments	Author
08/01/2020	<ul style="list-style-type: none"> <li>Document re-written ahead of new issue of ENA ER P27, highlighting:</li> <li>Harmonisation of WPD ratings with P27</li> <li>New seasonal boundaries and default weather conditions</li> <li>Revised probabilistic function linking base deterministic rating to probabilistic ratings</li> <li>Revised guidance on acceptable exceedance values to be used for ratings</li> <li>The introduction of “pre-fault” and “post fault” ratings to voltages lower than 132kV</li> <li>Appendices added summarising the probabilistic rating calculation method and the probabilistic risk model used to derive acceptable exceedance values</li> </ul>	Sven Hoffmann
16/04/2013	<ul style="list-style-type: none"> <li>New Section 5 covering dynamic line ratings</li> </ul>	Sven Hoffmann
19/03/2013	<ul style="list-style-type: none"> <li>Section 2 Conditions for Adopting Ratings – Clarification of when the ratings in this document should be used.</li> <li>Section 4.3 Inclusion of ‘conductor’ in sentence.</li> </ul>	Mike Chapman

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## **1. INTRODUCTION**

- 1.1. The thermal rating of an overhead line conductor is the maximum amount of current that can safely be carried without the conductor exceeding its design temperature. During operation a conductor is heated by the current flowing through it and by radiation from the sun. Cooling is provided by the wind and by radiation from the conductor surface. Net heat gain is relative to the ambient temperature.
- 1.2. Prior to the introduction of The Electricity (Overhead Lines) Regulations in 1970, ratings for overhead lines were deterministic – calculated from worst-case, fixed assumptions for weather conditions (high ambient temperature, high solar radiation, and low wind speed). When the 1970 regulations were introduced, however, a probabilistic (statistical) approach was permitted, resulting from the new requirement that overhead line clearances be maintained for a conductor's likely maximum temperature. This requirement continues today under the Electricity Safety, Quality, and Continuity Regulations (ESQCRs). Probabilistic ratings for the UK distribution networks were formally introduced in 1986, with the publication of Engineering Recommendation P27.
- 1.3. WPD, however, adopted a mixed approach with summer ratings matching the probabilistic ones presented in P27 but with the ratings for other seasons being derived from older, deterministic assumptions that gave higher ratings than P27. This was justified by WPD-specific design policies that provided greater clearances than those required by national standards.
- 1.4. With the research underpinning the approach of P27 being over 30 years old, a review of the method used to determine probabilistic ratings was recently undertaken. WPD's NIA (Network Innovation Allowance) project "Improved Statistical Ratings for DNO Overhead Lines" was closed in July 2018 and has since been used to review ENA ER P27. Although still in draft form, ENA ER P27 Issue 2 is due for publication later this year, and contains some significant changes.
- 1.5. With a new P27 imminent, it was decided to review WPD's approach to ratings and to update this Standard Technique in line with the new, national document.

## **2. ENA ER P27 Issue 2 - BASIS OF RATING CALCULATIONS**

- 2.1. The probabilistic rating of an overhead line is based on:
  - The conductor's rated temperature, also described as design or profile temperature. This is the conductor temperature at which electrical clearances are assessed
  - An assumed set of weather conditions (varied seasonally)
  - A desired "exceedance", or risk level

- 2.2. In order to establish a probabilistic rating, the weather conditions assumed do not have to represent the worst case – they are chosen to represent typical conditions that give rise to high conductor temperatures. These conditions, when applied to standard heat-balance equations together with the conductor’s rated temperature, define a “base” rating that can then be scaled up or down according to the desired exceedance. An empirically derived function links this scaling factor with desired risk, and is provided in P27. It should be noted that this scaling factor function and the default, assumed weather conditions used in the calculation are intrinsically linked – using different weather conditions will invalidate the scaling function. Appendix A provides further details.
- 2.3. The exceedance, expressed as a percentage, represents the risk of a conductor exceeding its rated temperature when full, rated current is applied to it. So the 3% exceedance rating for a line built for a rated temperature of 50°C, for example, would result in a 3% probability of the conductor being warmer than 50°C with the full rating applied.
- 2.4. This general approach to probabilistic ratings remains unchanged, although the exact weather assumptions and the form of the empirically derived risk / rating function have changed in comparison to that used for ENA ER P27 Issue 1. While a range of factors will have contributed to these changes, the dominant issue is that of climate change – weather patterns and temperatures are measurably different today than 30 years ago.
- 2.5. This effect is most noticeable when it comes to seasonal boundaries. The original, 1986 Issue of P27 used three different seasons – Summer, Winter, and a combined Spring / Autumn. The recent NIA project indicated that a 4-season approach was more appropriate. The changes are described in the table below - the new seasonal splits better represent the variability of temperatures throughout the year, and the increased granularity allows for closer matching of ratings with load data for system studies.

<b>Month</b>	<b>Original Season (P27, 1986)</b>	<b>New Season (P27, 2019)</b>
January	Winter	Winter
February	Winter	Winter
March	Spring / Autumn	Intermediate (Cool)
April	Spring / Autumn	Intermediate (Cool)
May	Summer	Intermediate (Warm)
June	Summer	Summer
July	Summer	Summer
August	Summer	Summer
September	Spring / Autumn	Intermediate (Warm)
October	Spring / Autumn	Intermediate (Warm)
November	Spring / Autumn	Intermediate (Cool)
December	Winter	Winter

### 3. APPLICATION OF ENA ER P27 Issue 2

- 3.1. Ratings calculated from the methodology of P27 Issue 2, and tabulated in the Appendices of this Standard Technique, shall be applied to all overhead lines within WPD. The increased clearances for lines designed and constructed by WPD shall no longer be taken into account for rating purposes, primarily because lines are not maintained to these enhanced clearances.
- 3.2. In order to determine the appropriate exceedance levels against which to calculate ratings, the risk model of P27 has been applied, with the more conservative values recommended in P27 used. A full description of the risk model as applied by WPD is given in Appendix B.
- 3.3. Ratings for two different exceedances are presented, representing a “**variable load pre-fault**” and a “**post fault**” loading scenario.
- 3.4. The **variable load pre-fault** rating, corresponding to a 3% exceedance, should be used when lines are subject to the regular, everyday loads that flow through an intact network (including planned outages). Generally, loading levels will vary with overall demand and generation patterns, with the possibility of fairly prolonged peaks (2-3 hours) in the daily load cycle.
- 3.5. Occasionally, there will be circuits on the network that could be subject to sustained high loads. Examples of such circuits might include connection assets to a conventional generator or to an intensive, industrial load that operates round the clock. In these cases, the rating shall be reduced to 92% of the “**variable load pre-fault**” rating. This rating, referred to as the “**sustained load pre-fault**”, corresponds to an exceedance of 0.001%.
- 3.6. With the increasing use of smart and flexible solutions to HV network constraints, there will be circuits that are subjected to load profiles that will not correspond to the normal daily variation in overall generation and demand patterns. Systems such as ANM (Active Network Management) monitor the network in real time, and either dispatch or curtail load on an automated basis. To avoid an elevated risk of overhead line thermal limits being exceeded, such systems shall, when actively managing load, ensure that real-time loads do not exceed the **sustained load pre-fault** rating.
- 3.7. In addition to managed HV loads, LV loads are also predicted to deviate significantly from the currently assumed load duration curve, due mainly to the accelerating uptake of electric vehicles. In anticipation of future flexibility needing to be accommodated on LV networks, ABC ratings will now be based on the **sustained load pre-fault** rating, in order to safely accommodate high, sustained levels of demand.
- 3.8. The **post-fault rating**, corresponding to a 9% exceedance, may be used when lines are subject to increased loadings in the event of faults on adjacent circuits. They are intended to allow for the loading levels that are the immediate consequence of

faults, allowing operators time (up to 24 hours) to take appropriate actions to reduce loads to within pre-fault rating limits.

- 3.9. Covered conductors (BLL, BLX, PAS, CC) do not have an associated **post-fault rating** due to the risk of permanent damage to insulation in the event of a temperature excursion.
- 3.10. **Variable load pre-fault** and **post fault** ratings for profile temperatures of 50°C, 65°C, and 75°C are tabulated in Appendix C.

#### **4. CONDUCTOR PROFILE TEMPERATURES**

- 4.1. By default, all overhead lines will have a minimum profile temperature of 50°C. Prior to 1970 this was the maximum temperature allowed by regulations. After 1970, the new regulations allowed for higher profile temperatures although 50°C was still typically used as the default.
- 4.2. Where the profile temperature of a line is known, the ratings associated with that temperature shall apply.
- 4.3. Where the profile temperature is not known, or where there is doubt as to an assigned temperature, it shall be assumed as 50°C, and rated accordingly. If it is suspected that a higher rated temperature may apply, this shall be confirmed by a survey before ratings are increased to those applicable to the higher temperature.
- 4.4. The recommended maximum profile temperature for all conductors is 75°C. Higher temperatures may be permissible for AAAC subject to approval by the DSO Development Team. The only exceptions are HDPE covered conductor (BLL) which shall have a maximum profile temperature of 70°C, and the “gap-type” GTACSR which shall have a maximum profile temperature of 120°C.

#### **5. ALUMINIUM ALLOY CONDUCTORS**

- 5.1. Where lines are strung with All Aluminium Alloy Conductors (AAAC), there are a number of different grades of alloy that might apply. The two most common are “AL3” and “AL5”, while early AAAC (e.g. “Silmalec”) was “AL2”. The resistivities of AL2 and AL3 are similar enough that any differences in ratings are negligible. AL5 is of significantly lower resistivity resulting in higher ratings for a given size of conductor. Ratings are therefore only provided for AL3 and AL5 alloys.

- 5.2. Since 2003, WPD (South West and South Wales) has been specifying AL5 (see EE SPEC 85) for 100mm<sup>2</sup> “Oak” and larger conductors, with smaller conductors specified as AL3. Prior to 2003, AAAC in the South West and South Wales license areas shall be assumed to be AL3 unless it can be confirmed otherwise. The equivalent cut-off date in the Midlands license areas is 2011.
- 5.3. Where there is any doubt, AAAC shall be assumed to be AL3.

## **6. RESTRICTED RATINGS**

- 6.1. It will occasionally be necessary to employ restricted ratings where specific constraints result in a line being unsuitable for application of the standard ratings tabulated in Appendix C.
- 6.2. While clearance issues are normally dealt with as any other defect, with specified rectification timescales, there will be occasions where those rectification timescales cannot be met in cases where significant, physical changes are needed to an overhead line which, for tower lines, can be very costly with long lead times. In these cases, a clearance-restricted rating may be applied in order to clear the defect. These ratings are tabulated in Appendix D.
- 6.3. Clearance-restricted ratings are applicable to TOWER LINES ONLY based on a maximum allowable temperature of 40°C. Prior to applying these ratings it shall be confirmed by survey that the line is clear for this temperature. Lines not clear for at least 40°C shall remain defective.
- 6.4. Older ACSR Lines with suspect or outdated compression joints (“Tate” indent-compression joints and “Noral” figure-of-eight joints) shall have their ratings restricted to those given in Table D.4.

## **7. DYNAMIC LINE RATINGS**

- 7.1. Probabilistic line ratings are necessarily conservative. As a result, there are numerous occasions when a line’s rating may be safely increased when, for example, wind speeds are significantly higher than assumed. The use of real-time data gathered at a specific line’s location could therefore be used operationally to continually update that line’s rating, allowing advantage to be taken of periods of more favourable cooling conditions. Such ratings are known as dynamic line ratings.
- 7.2. A system based on real-time weather data was successfully trialled on the Boston-Skegness 132kV line following the connection of a large offshore wind farm. The trial was conducted “off-line”, and verified the potential gains as well as the performance of the weather stations and their associated data communications infrastructure. Wind farm connections provide an ideal opportunity for the use of dynamic ratings, as their output is high when winds are high, and therefore when the real-time rating of a nearby line is also likely to be high.

- 7.3. The Boston-Skegness system is, to date, the only system that has been approved for use on WPD's network. It is important to note that the implementation of dynamic ratings requires careful consideration of both the suitability of the system itself for the line in question and of the condition of the physical assets to be monitored and/or dynamically rated.
- 7.4. With no "off the shelf" solution within WPD, any intended application of dynamic ratings should be referred to the DSO Development Team.

## **8. CONDUCTORS AND TEMPERATURES NOT REFERENCED**

- 8.1. Where a rating for a conductor / temperature combination is required and where this information is not contained in this document, the DSO Development Team shall be consulted.

## DERIVATION OF RATINGS

Probabilistic ratings are calculated by a two-stage process.

Firstly, a deterministic rating ( $I_{det}$ ) is calculated from a generic set of weather conditions (with ambient temperature varied seasonally, as presented in Table A1) and the conductor's rated temperature. Standard heat balance equations contained in CIGRE Technical Brochure TB601 are used.

Season	Summer	Inter_Warm	Inter_Cool	Winter
Associated Months	June July August	May September October	March April November	January February December
Ambient (°C)	14	11	6	4
Wind Speed (m/s)	0.5	0.5	0.5	0.5
Wind Attack Angle (°)	12	12	12	12
Solar Flux (W/m <sup>2</sup> )	0	0	0	0

**Table A1.**  
**Overhead Line Rating Seasonal Weather Parameters**

Once a deterministic rating has been calculated, it is factored according to the desired risk level (exceedance) by an experimentally determined function, tabulated in ENA ERP27 and in Table A2 below, to yield a probabilistic rating ( $I_{prob}$ ) as follows:

$$I_{prob} = I_{det} \times \sqrt{Ct}$$

Exceedance(%)	Ct	Exceedance(%)	Ct
0.001	0.909700	1	0.980850
0.002	0.911480	2	1.035050
0.005	0.913820	3	1.082400
0.01	0.915590	5	1.164000
0.02	0.917360	7	1.234150
0.05	0.919705	10	1.325700
0.1	0.922710	20	1.566500
0.2	0.929800	30	1.755800
0.5	0.950000	50	2.059600

**Table A2.**  
**Overhead Line Rating Scaling Factor (Ct)**

## P27 RISK MODEL FOR OVERHEAD LINE RATINGS

The acceptable exceedances given by issue 1 of ENA ER P27 were determined according to the methodology described in ENA ACE104. A key condition that this document sought to meet was that the annual probability of a line experiencing a temperature excursion should be limited to  $1 \times 10^{-6}$ . This is a highly conservative approach that does not fully represent the risk that DNO's are seeking to avoid: the risk of flashover occurring as a result of a thermal event. Issue 2 of P27 recommends that this is the risk that should be kept below  $1 \times 10^{-6}$ .

Within reason, simply having a conductor exceed its design temperature is typically of negligible consequence. A flashover, however, could have severe consequences. Broadly speaking, a flashover will occur if three conditions are met:

- 1) There must be an infringement of design clearances sufficient to result in the breakdown of the air. The probability of this occurring is described as P(Clear).
- 2) This clearance infringement must be to a "limit state" obstacle – for example the clearance requirement over a road caters for vehicles up to 5m in height. Such vehicles are generally only under an overhead line very briefly. The probability of such an obstacle being present is described as P(Obstacle).
- 3) The voltage on the overhead line conductor must be the highest catered for in the design of the line. "Normal" power frequency voltage is often not the voltage actually used to determine clearances and insulation requirements. At higher nominal operating voltages, for example, insulation is specified so as to cater for switching surges, with clearances designed to match. This probability of maximum voltage being present is described as P(Volts).

Further to (1) above, a clearance infringement requires two conditions to be met:

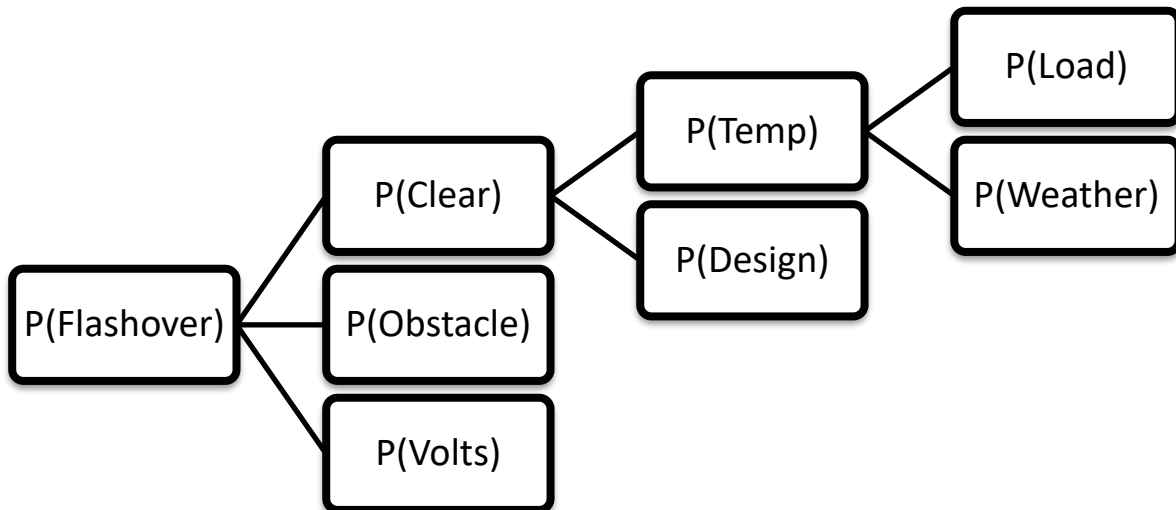
- 4) The conductor must exceed its design, profile temperature – the probability being described as P(Temperature).
- 5) The temperature rise must be sufficient to overcome any excess clearance available – the majority of overhead line spans, once constructed, afford greater clearances than those required simply due to the constraints placed on designers, such as where structures can be placed. This probability is described as P(Design).

Further to (4) above, the temperature exceedance also requires two conditions to be met:

- 6) The conductor must be carrying a load current greater than the maximum current that would result in a zero exceedance – i.e. the load current must be greater than that determined by the absolute worst set of cooling conditions that a line might experience. This probability is described as P(Load).

- 7) Finally, the prevailing weather conditions must be insufficient to provide a real time rating greater than the load current. This probability is described as  $P(\text{Weather})$

Graphically, this risk model can be represented as follows:



**Figure B1.**  
**Overhead Line Rating Risk Model**

In the context of work undertaken in this project,  $P(\text{Weather})$  is the exceedance associated with a calculated rating.

While some generic assumptions could sensibly be made for  $P(\text{Obstacle})$ ,  $P(\text{Volts})$ , and  $P(\text{Design})$ , and while  $P(\text{Weather})$  can reliably be chosen using the methodology of ENA ER P27 Issue 2, the most variable and uncertain parameter above is  $P(\text{Load})$ .

Depending on the type of network,  $P(\text{Load})$  could be dependent on a variety of factors. At one extreme, a single circuit connecting a conventional generator could be subject to full load continuously, with  $P(\text{Load}) = 1$ . Alternatively, there could be a circuit on the EHV network that might only see maximum load after two circuit outages, where  $P(\text{Load})$  could be as low as  $10^{-3}$ .

## WPD Assessment of Appropriate Exceedances

In choosing the acceptable exceedances for WPD's ratings, the following values were used:

	<b>Sustained Load Pre-Fault Rating</b>	<b>Variable Load Pre-Fault Rating</b>	<b>Post-Fault Rating</b>
	0.001% Exceedance	3% Exceedance	9% Exceedance
<b>P(Load)</b>	1.0 (Sustained)	0.0833 (2hrs/day)	0.0137 (5days/year)
<b>P(Weather)</b>	0.00001	0.03	0.09
<b>P(Temp)</b>	$1.0 \times 10^{-5}$	$2.5 \times 10^{-3}$	$8.64 \times 10^{-3}$
<b>P(Design)</b>	0.02	0.02	0.02
<b>P(Clear)</b>	$2 \times 10^{-7}$	$5 \times 10^{-5}$	$1.73 \times 10^{-4}$
<b>P(Obstacle)</b>	0.02	0.02	0.02
<b>P(Volts)</b>	1.0	1.0	1.0
<b>P(Flashover)</b>	$4.0 \times 10^{-9}$	$1.0 \times 10^{-6}$	$4.92 \times 10^{-7}$

**Table B1.**  
**Overhead Line Rating Risk Model – Values Used**

While the values used indicate acceptable likelihoods of flashovers occurring, it is also worth noting the potential consequences in order to put those likelihoods into context. Table B2 indicates, for various exceedances, what the most extreme temperature excursion might be (noting that this is extremely unlikely) as well as the level of load as a percentage of that rating that is required for there to be any risk of an excursion at all.

So, for a 3% exceedance rating, a P(load) of 0.0833 (2hrs/day) corresponds to the amount of time a line is expected to be loaded above 92% of that 3% rating. Additionally, should the absolute worst combination of weather conditions occur while the line is loaded to 100% of its rating, the line could exceed its design temperature by up to 15°C.

Exceedance	Maximum Excursion Above Profile Temperature	Threshold for P(Load) - % of Full Rating
0.001%	Negligible	100%
1%	10°C	96%
3%	15°C	92%
6%	20°C	87%
9%	25°C	84%

**Table B2.**  
**Overhead Line Rating Risk Model – Temperature Rises and Risk Thresholds**

**RATING TABLES – Standard Ratings**

**TABLE C.1**

**Variable Load Pre-fault and Post-Fault Ratings (Amps)  
Hard Drawn Copper Conductors – Metric Sizes to BS 7884**

Conductor	Type	Temp. (°C)	Variable Load Pre-Fault Rating (A): e = 3%				Post-Fault Rating (A): e = 9%			
			Summer	Inter warm	Inter cool	Winter	Summer	Inter warm	Inter cool	Winter
16 mm <sup>2</sup> (3/2.65mm)	HDC	50	115	120	127	129	126	131	139	142
		65	135	138	144	147	147	151	158	169
		75	146	149	155	157	160	163	169	171
25 mm <sup>2</sup> (7/2.10mm)	HDC	50	147	153	162	165	161	167	177	181
		65	172	177	184	187	188	194	202	205
		75	187	191	198	200	204	209	216	219
32 mm <sup>2</sup> (3/3.75mm)	HDC	50	180	187	198	203	197	205	217	222
		65	211	217	226	230	231	237	247	251
		75	229	234	242	246	250	256	265	269
*38 mm <sup>2</sup> (7/2.64mm)	HDC	50	193	201	213	217	211	220	233	238
		65	227	233	243	246	248	255	265	269
		75	245	251	260	263	268	275	284	288
50 mm <sup>2</sup> (7/3.00mm)	HDC	50	228	237	251	256	249	259	274	280
		65	267	274	286	290	292	300	313	318
		75	290	296	306	310	317	324	335	340
70 mm <sup>2</sup> (7/3.55mm)	HDC	50	284	295	312	318	310	322	341	348
		65	333	342	356	361	364	374	389	395
		75	361	369	382	387	395	403	418	423
100 mm <sup>2</sup> (7/4.30mm)	HDC	50	364	378	400	408	398	413	438	447
		65	427	439	457	464	467	480	500	508
		75	464	474	490	497	507	518	536	543
125 mm <sup>2</sup> (19/2.90mm)	HDC	50	418	434	460	469	457	475	503	513
		65	491	504	525	533	537	552	575	583
		75	533	545	564	571	583	596	617	624
150 mm <sup>2</sup> (19/3.20mm)	HDC	50	475	493	522	533	520	540	571	583
		65	558	573	597	606	611	627	653	663
		75	606	619	641	649	663	677	701	710

\* 38mm<sup>2</sup> is not a metric standard size – this conductor is identical to 0.058in<sup>2</sup> to BS 125

**TABLE C.2**

**Variable Load Pre-fault and Post-Fault Ratings (Amps)  
Hard Drawn Copper Conductors – Imperial Sizes to BS 125**

Conductor	Type	Temp. (°C)	Variable Load Pre-Fault Rating (A): e = 3%				Post-Fault Rating (A): e = 9%			
			Summer	Inter warm	Inter cool	Winter	Summer	Inter warm	Inter cool	Winter
0.025 in <sup>2</sup> (3/2.64mm)	HDC	50	115	119	126	129	125	130	138	141
		65	134	138	144	146	147	151	157	160
		75	145	149	154	156	159	163	168	171
*0.04 in <sup>2</sup> (3/3.37mm)	HDC	50	157	163	173	177	172	178	189	193
		65	184	189	197	200	201	207	216	219
		75	199	204	211	214	218	223	231	234
0.05 in <sup>2</sup> (3/3.73mm)	HDC	50	180	187	198	202	197	204	216	221
		65	211	216	226	229	231	237	247	251
		75	228	234	242	245	250	255	264	268
0.075 in <sup>2</sup> (7/2.95mm)	HDC	50	223	231	245	250	244	253	268	274
		65	261	268	280	284	286	293	306	311
		75	283	289	300	304	310	317	328	332
0.1 in <sup>2</sup> (7/3.45mm)	HDC	50	274	285	302	308	300	312	330	337
		65	322	331	344	350	352	362	377	383
		75	349	357	369	374	382	390	404	409
0.15 in <sup>2</sup> (7/4.22mm)	HDC	50	355	369	390	398	388	403	427	436
		65	417	428	446	453	456	468	488	495
		75	452	462	478	484	495	505	523	530
0.2 in <sup>2</sup> (19/2.95mm)	HDC	50	427	443	469	479	467	485	513	524
		65	502	515	537	545	549	564	587	596
		75	545	556	576	583	596	609	630	638

\* 0.04in<sup>2</sup> is not a standard size

**TABLE C.3**

**Variable Load Pre-fault and Post-Fault Ratings (Amps)**  
**All Aluminium Conductors (AAC) – Metric Sizes to BSEN 50182**

Conductor	Type	Temp. (°C)	Variable Load Pre-Fault Rating (A): e = 3%				Post-Fault Rating (A): e = 9%			
			Summer	Inter warm	Inter cool	Winter	Summer	Inter warm	Inter cool	Winter
25 mm <sup>2</sup> Gnat (7/2.21mm)	AAC	50	122	126	134	137	133	138	147	150
	AL1	65	143	147	153	155	156	160	167	170
		75	155	158	164	166	169	173	179	181
50 mm <sup>2</sup> Ant (7/3.10mm)	AAC	50	188	196	207	212	206	214	227	232
	AL1	65	221	227	237	240	242	249	259	263
		75	240	245	254	257	262	268	278	281
100 mm <sup>2</sup> Wasp (7/4.39mm)	AAC	50	297	308	326	333	325	337	357	365
	AL1	65	349	358	373	379	382	392	408	415
		75	379	387	401	406	414	423	438	444
150 mm <sup>2</sup> Hornet (19/3.25mm)	AAC	50	385	400	424	432	422	438	463	473
	AL1	65	453	466	485	492	496	509	530	538
		75	493	503	521	527	539	551	569	577
250 mm <sup>2</sup> Cockroach (19/4.22mm)	AAC	50	543	564	596	609	594	617	652	666
	AL1	65	639	656	683	694	699	718	747	759
		75	695	710	734	744	760	777	803	813
300 mm <sup>2</sup> Butterfly (19/4.65mm)	AAC	50	616	640	677	691	674	700	740	756
	AL1	65	726	745	776	787	794	815	848	861
		75	789	806	834	844	863	882	912	923
400 mm <sup>2</sup> Centipede (37/3.78mm)	AAC	50	726	754	797	814	794	825	872	890
	AL1	65	856	878	914	928	936	961	1000	1015
		75	931	951	983	995	1018	1040	1075	1089

**TABLE C.4**

**Variable Load Pre-fault and Post-Fault Ratings (Amps)**  
**All Aluminium Alloy Conductors (AAAC) – AL3 Alloy Metric Sizes to BSEN 50182**

Conductor	Type	Temp. (°C)	Variable Load Pre-Fault Rating (A): e = 3%				Post-Fault Rating (A): e = 9%			
			Summer	Inter warm	Inter cool	Winter	Summer	Inter warm	Inter cool	Winter
25 mm <sup>2</sup> Almond (7/2.34mm)	AAAC	50	122	127	134	137	133	139	147	150
	AL3	65	143	147	153	156	157	161	168	170
		75	155	159	164	166	170	173	180	182
40 mm <sup>2</sup> Fir (7/2.95mm)	AAAC	50	165	171	181	185	180	187	198	202
	AL3	65	193	199	207	210	212	217	226	230
		75	210	214	222	225	229	234	243	246
50 mm <sup>2</sup> Hazel (7/3.30mm)	AAAC	50	191	198	210	214	208	217	229	234
	AL3	65	224	230	239	243	245	251	262	266
		75	243	248	257	260	266	271	281	285
60 mm <sup>2</sup> Pine (7/3.61mm)	AAAC	50	214	222	235	240	234	243	257	263
	AL3	65	251	258	269	273	275	282	294	299
		75	273	279	289	292	298	305	316	320
100 mm <sup>2</sup> Oak (7/4.65mm)	AAAC	50	298	310	328	335	326	339	358	366
	AL3	65	351	360	375	381	383	394	410	416
		75	381	389	402	408	416	425	440	446
150 mm <sup>2</sup> Ash (19/3.48mm)	AAAC	50	393	408	431	441	430	446	472	482
	AL3	65	462	474	494	501	506	519	540	549
		75	502	513	531	537	549	561	580	588
175 mm <sup>2</sup> Elm (19/3.76mm)	AAAC	50	435	451	477	487	475	494	522	533
	AL3	65	512	525	547	555	560	575	598	607
		75	556	568	587	595	608	621	643	651
200 mm <sup>2</sup> Poplar (37/2.87mm)	AAAC	50	472	490	519	530	517	536	567	579
	AL3	65	556	571	594	603	608	624	650	660
		75	604	617	638	647	661	675	698	707
250 mm <sup>2</sup> Sycamore (37/3.23mm)	AAAC	50	551	572	605	618	603	626	662	676
	AL3	65	649	667	694	704	710	729	759	770
		75	706	721	746	755	772	789	816	826
300 mm <sup>2</sup> Upas (37/3.53mm)	AAAC	50	619	643	680	694	678	703	744	759
	AL3	65	730	749	780	791	798	819	853	866
		75	794	811	838	849	868	887	917	928
500 mm <sup>2</sup> Rubus (61/3.50mm)	AAAC	50	848	880	930	950	928	963	1018	1039
	AL3	65	1000	1026	1068	1084	1094	1123	1168	1185
		75	1088	1111	1149	1163	1190	1216	1256	1272

**TABLE C.5**

**Variable Load Pre-fault and Post-Fault Ratings (Amps)**  
**All Aluminium Alloy Conductors (AAAC) – AL5 Alloy Metric Sizes to BSEN 50182**

Conductor	Type	Temp. (°C)	Variable Load Pre-Fault Rating (A): e = 3%				Post-Fault Rating (A): e = 9%			
			Summer	Inter warm	Inter cool	Winter	Summer	Inter warm	Inter cool	Winter
100 mm <sup>2</sup>	AAAC	50	304	316	335	342	333	346	366	374
Oak	AL5	65	358	368	383	389	392	402	419	425
(7/4.65mm)		75	389	397	411	416	425	434	449	455
150 mm <sup>2</sup>	AAAC	50	401	416	441	450	439	455	482	492
Ash	AL5	65	472	484	504	512	516	530	552	560
(19/3.48mm)		75	512	524	542	549	561	573	593	600
175 mm <sup>2</sup>	AAAC	50	444	461	488	498	485	504	533	544
Elm	AL5	65	522	536	558	567	571	587	611	620
(19/3.76mm)		75	568	580	600	607	621	634	656	664
200 mm <sup>2</sup>	AAAC	50	482	501	530	541	527	548	579	591
Poplar	AL5	65	568	583	607	616	621	637	664	674
(37/2.87mm)		75	617	630	652	660	675	689	713	722
250 mm <sup>2</sup>	AAAC	50	563	584	618	631	616	639	676	690
Sycamore	AL5	65	663	680	708	719	725	744	775	786
(37/3.23mm)		75	721	736	761	771	788	805	833	843
300 mm <sup>2</sup>	AAAC	50	632	656	694	709	692	718	759	775
Upas	AL5	65	745	765	796	808	815	837	871	884
(37/3.53mm)		75	810	828	856	866	886	905	936	948
500 mm <sup>2</sup>	AAAC	50	865	898	949	969	946	982	1039	1060
Rubus	AL5	65	1020	1047	1089	1106	1116	1145	1192	1210
(61/3.50mm)		75	1110	1134	1172	1187	1214	1240	1282	1298
570 mm <sup>2</sup>	AAAC	50	933	968	1023	1044	1020	1059	1119	1142
Sorbus	AL5	65	1100	1129	1174	1192	1203	1235	1285	1304
(61/3.71mm)		75	1197	1222	1263	1279	1309	1337	1382	1399
700 mm <sup>2</sup>	AAAC	50	1072	1113	1176	1201	1173	1217	1287	1313
Araucaria	AL5	65	1266	1299	1351	1371	1385	1421	1478	1500
(61/4.14mm)		75	1377	1407	1454	1472	1507	1539	1590	1610

**TABLE C.6**

**Variable Load Pre-fault and Post-Fault Ratings (Amps)**  
**Aluminium Conductor Steel Reinforced (ACSR) – to BSEN 50182**

Conductor	Type	Temp. (°C)	Variable Load Pre-Fault Rating (A): e = 3%				Post-Fault Rating (A): e = 9%			
			Summer	Inter warm	Inter cool	Winter	Summer	Inter warm	Inter cool	Winter
25 mm <sup>2</sup> Gopher (6/2.36mm + 1/2.36mm)	ACSR	50	116	121	128	131	127	132	140	143
		65	136	140	146	148	149	153	159	162
		75	147	151	156	158	161	165	171	173
30 mm <sup>2</sup> Weasel (6/2.59mm + 1/2.59mm)	ACSR	50	131	136	144	148	144	149	158	161
		65	154	158	165	167	168	173	180	183
		75	166	170	176	178	182	186	193	195
40 mm <sup>2</sup> Ferret (6/3.00mm + 1/3.00mm)	ACSR	50	159	165	175	178	174	180	191	195
		65	186	191	199	202	203	209	218	221
		75	201	206	213	216	220	225	233	236
50 mm <sup>2</sup> Rabbit (6/3.35mm + 1/3.35mm)	ACSR	50	182	189	202	206	200	207	221	225
		65	215	221	230	233	235	241	251	255
		75	233	238	246	249	255	260	269	273
60 mm <sup>2</sup> Mink (6/3.66mm + 1/3.66mm)	ACSR	50	205	213	225	230	225	233	246	252
		65	241	248	258	262	264	271	282	287
		75	261	267	277	280	286	292	303	306
75 mm <sup>2</sup> Raccoon (6/4.09mm + 1/4.09mm)	ACSR	50	239	247	261	267	261	271	286	292
		65	278	286	299	304	305	313	327	333
		75	303	310	321	325	332	339	351	355
100 mm <sup>2</sup> Dog (6/4.72mm + 7/1.57mm)	ACSR	50	289	299	316	322	316	327	345	352
		65	336	345	358	364	367	377	392	398
		75	363	371	384	391	397	406	420	428
150 mm <sup>2</sup> Dingo (18/3.35mm + 1/3.35mm)	ACSR	50	388	403	426	435	424	441	466	476
		65	455	467	487	494	498	511	532	540
		75	494	505	522	529	540	552	571	578
175 mm <sup>2</sup> Lynx (30/2.79mm + 7/2.79mm)	ACSR	50	439	456	482	492	480	498	527	538
		65	516	529	551	559	564	579	603	612
		75	559	572	591	599	612	625	647	655
175 mm <sup>2</sup> Caracal (18/3.61mm + 1/3.61mm)	ACSR	50	428	444	470	480	468	486	514	525
		65	502	516	537	545	550	564	587	596
		75	545	557	576	583	596	609	630	638
200 mm <sup>2</sup> Jaguar (18/3.86mm + 1/3.86mm)	ACSR	50	467	485	513	524	511	531	562	573
		65	549	564	587	596	601	616	642	652
		75	596	609	629	637	652	666	688	697
400 mm <sup>2</sup> Zebra (54/3.18mm + 7/3.18mm)	ACSR	50	749	778	822	839	820	851	899	917
		65	880	903	939	953	963	988	1028	1043
		75	956	976	1008	1021	1045	1067	1103	1117

**TABLE C.7**

**Variable Load Pre-fault and Post-Fault Ratings (Amps)**  
**Gap-Type Thermal Aluminium Conductor Steel Reinforced (GTACSR)**

Conductor	Type	Temp (°C)	Variable Load Pre-Fault Rating (A): e = 3%				Post-Fault Rating (A): e = 9%			
			Summer	Inter warm	Inter cool	Winter	Summer	Inter warm	Inter cool	Winter
265 mm <sup>2</sup>	GTACSR	75	699	714	738	747	764	781	807	817
Hen		85	749	762	784	793	819	834	858	867
(Special)		95	795	807	827	835	809	883	905	913

**TABLE C.8**

**Variable Load Pre-fault and Post-Fault Ratings (Amps)  
Cadmium Copper Conductors – Imperial Sizes to BS 672**

Conductor	Type	Temp. (°C)	Variable Load Pre-Fault Rating (A): e = 3%				Post-Fault Rating (A): e = 9%			
			Summer	Inter warm	Inter cool	Winter	Summer	Inter warm	Inter cool	Winter
0.017 in <sup>2</sup> (3/2.36mm)	Cad	50	91	94	100	102	99	103	109	111
	Cu	65	106	109	114	116	116	120	125	127
		75	115	118	122	124	126	129	134	136
0.022 in <sup>2</sup> / 16 mm <sup>2</sup> (3/2.67mm)	Cad	50	106	110	117	119	116	120	128	130
	Cu	65	124	128	133	135	136	140	146	148
		75	135	138	143	145	148	151	157	159
0.025 in <sup>2</sup> / 19 mm <sup>2</sup> (3/2.84mm)	Cad	50	115	120	127	129	126	131	139	142
	Cu	65	135	139	145	147	148	152	158	161
		75	147	150	155	158	161	164	170	172
0.035 in <sup>2</sup> (3/3.33mm)	Cad	50	141	146	155	158	154	160	170	173
	Cu	65	166	170	177	180	181	186	194	197
		75	180	184	191	193	197	201	208	211
0.04 in <sup>2</sup> (3/3.58mm)	Cad	50	152	158	168	171	167	173	183	187
	Cu	65	179	184	192	195	196	201	210	213
		75	195	199	206	209	213	218	225	228
0.05 in <sup>2</sup> (7/2.62mm)	Cad	50	174	181	191	195	190	198	209	214
	Cu	65	205	210	219	223	224	230	240	243
		75	222	227	235	238	243	249	257	261
0.075 in <sup>2</sup> (7/3.23mm)	Cad	50	228	237	251	256	250	259	275	280
	Cu	65	269	276	288	292	294	302	315	320
		75	292	299	309	313	319	327	338	342
0.1 in <sup>2</sup> (7/3.71mm)	Cad	50	273	284	301	307	299	311	329	336
	Cu	65	322	331	345	350	352	362	377	383
		75	350	358	370	375	383	392	405	411
0.15 in <sup>2</sup> (19/2.77mm)	Cad	50	359	372	394	403	392	407	431	440
	Cu	65	423	434	452	459	463	475	495	502
		75	460	470	486	493	503	514	532	539

**TABLE C.9**

**Variable Load Pre-fault Ratings (Amps)**  
**HDPE Covered Conductor, BLL – AL3 Alloy Conductor**

Conductor	Type	Temp. (°C)	Variable Load Pre-Fault Rating (A): e = 3%			
			Summer	Inter warm	Inter cool	Winter
50 mm <sup>2</sup>	BLL – AL3	60	195	201	210	214
		70	213	219	227	230
99 mm <sup>2</sup>	BLL – AL3	60	297	306	320	325
		70	325	333	346	350
120 mm <sup>2</sup>	BLL – AL3	60	336	346	362	368
		70	368	377	391	396
159 mm <sup>2</sup>	BLL – AL3	60	404	416	435	442
		70	443	453	470	477
185 mm <sup>2</sup>	BLL – AL3	60	447	461	482	490
		70	490	502	521	528
241 mm <sup>2</sup>	BLL – AL3	60	533	549	574	583
		70	584	598	620	629

**TABLE C.10**

**Variable Load Pre-fault Ratings (Amps)**  
**HDPE Covered Conductor, BLL – AL7 Alloy Conductor**

Conductor	Type	Temp. (°C)	Variable Load Pre-Fault Rating (A): e = 3%			
			Summer	Inter warm	Inter cool	Winter
50 mm <sup>2</sup>	BLL – AL7	60	203	209	219	223
		70	222	228	236	240
99 mm <sup>2</sup>	BLL – AL7	60	309	319	333	339
		70	339	347	360	365
120 mm <sup>2</sup>	BLL – AL7	60	350	361	377	384
		70	384	393	408	413
159 mm <sup>2</sup>	BLL – AL7	60	420	433	453	460
		70	460	472	489	496
185 mm <sup>2</sup>	BLL – AL7	60	466	480	501	510
		70	510	523	542	550
241 mm <sup>2</sup>	BLL – AL7	60	554	570	596	606
		70	607	621	644	653

**TABLE C.11**

**Variable Load Pre-fault Ratings (Amps)**  
**XLPE Compacted Covered Conductor, BLX / PAS / CC**

Conductor	Type	Temp. (°C)	Variable Load Pre-Fault Rating (A): e = 3%			
			Summer	Inter warm	Inter cool	Winter
50 mm <sup>2</sup>	CC – AL2	60	196	201	210	214
		75	222	227	235	238
95 mm <sup>2</sup>	CC – AL2	60	302	310	325	330
		75	343	351	363	367
120 mm <sup>2</sup>	CC – AL2	60	349	359	376	382
		75	397	406	419	426
185 mm <sup>2</sup>	CC – AL2	60	458	471	493	501
		75	522	534	551	559
“Hazel”	CC – AL3	60	234	240	252	256
		75	266	272	282	285

**TABLE C.12**

**Sustained Load Pre-fault Ratings (Amps)  
LV Aerial Bundled Conductor (ABC)**

Conductor	Type	Temp. (°C)	Sustained Load Pre-Fault Rating (A): e = 0.001%			
			Summer	Inter warm	Inter cool	Winter
4 x 25 mm <sup>2</sup>	LV ABC	75	103	106	111	113
4 x 35 mm <sup>2</sup>	LV ABC	75	124	129	135	138
4 x 50 mm <sup>2</sup>	LV ABC	75	149	154	162	165
4 x 70 mm <sup>2</sup>	LV ABC	75	186	192	202	206
4 x 95 mm <sup>2</sup>	LV ABC	75	226	233	246	251
4 x 120 mm <sup>2</sup>	LV ABC	75	260	269	284	290
2 x 25 mm <sup>2</sup>	LV ABC	75	124	128	134	136
2 x 35 mm <sup>2</sup>	LV ABC	75	150	155	162	165
2 x 50 mm <sup>2</sup>	LV ABC	75	180	186	195	198
2 x 70 mm <sup>2</sup>	LV ABC	75	225	232	243	248
2 x 95 mm <sup>2</sup>	LV ABC	75	274	283	297	302

**Notes:**

ABC ratings are calculated in accordance with the methodology presented in ERA Report 90-0386, with ambient temperatures adjusted to the new, standard seasonal temperatures of P27 with the appropriate Ct scaling factor applied to give the 0.001% exceedance rating. Conductor parameters are taken from ENATS 43-13.

ABC Ratings presented here apply to overhead line pole-top application only and shall not be used for under-eaves installations.

**RATING TABLES – Restricted Ratings**

**TABLE D.1**

**Clearance Restricted Ratings (Amps)**  
**All Aluminium Alloy Conductors (AAAC) – AL3 Alloy Metric Sizes to BSEN 50182**

Conductor	Type	Temp. (°C)	Variable Load Pre-Fault Rating (A): e = 3%				Post-Fault Rating (A): e = 9%			
			Summ er	Inter warm	Inter cool	Winter	Summ er	Inter warm	Inter cool	Winter
100 mm <sup>2</sup> Oak (7/4.65mm)	AAAC AL3	40	256	269	291	299	280	295	318	327
150 mm <sup>2</sup> Ash (19/3.48mm)	AAAC AL3	40	337	355	383	393	368	388	418	430
175 mm <sup>2</sup> Elm (19/3.76mm)	AAAC AL3	40	372	392	423	435	407	429	463	476
200 mm <sup>2</sup> Poplar (37/2.87mm)	AAAC AL3	40	405	426	460	472	443	466	503	517
250 mm <sup>2</sup> Sycamore (37/3.23mm)	AAAC AL3	40	472	497	536	551	516	544	587	603
300 mm <sup>2</sup> Upas (37/3.53mm)	AAAC AL3	40	530	559	602	619	580	611	659	677
500 mm <sup>2</sup> Rubus (61/3.50mm)	AAAC AL3	40	726	764	824	846	794	836	901	925

**TABLE D.2**

**Clearance Restricted Ratings (Amps)**  
**All Aluminium Alloy Conductors (AAAC) – AL5 Alloy Metric Sizes to BSEN 50182**

Conductor	Type	Temp. (°C)	Variable Load Pre-Fault Rating (A): e = 3%				Post-Fault Rating (A): e = 9%			
			Summ er	Inter warm	Inter cool	Winter	Summ er	Inter warm	Inter cool	Winter
100 mm <sup>2</sup> Oak (7/4.65mm)	AAAC AL5	40	261	275	297	305	286	301	325	334
150 mm <sup>2</sup> Ash (19/3.48mm)	AAAC AL5	40	344	362	391	401	376	396	427	439
175 mm <sup>2</sup> Elm (19/3.76mm)	AAAC AL5	40	380	401	432	444	416	438	473	486
200 mm <sup>2</sup> Poplar (37/2.87mm)	AAAC AL5	40	413	435	469	482	452	476	513	527
250 mm <sup>2</sup> Sycamore (37/3.23mm)	AAAC AL5	40	482	508	547	562	527	555	599	615
300 mm <sup>2</sup> Upas (37/3.53mm)	AAAC AL5	40	541	570	615	632	592	624	673	691
500 mm <sup>2</sup> Rubus (61/3.50mm)	AAAC AL5	40	740	780	840	863	810	853	919	944
570 mm <sup>2</sup> Sorbus (61/3.71mm)	AAAC AL5	40	798	840	905	930	873	919	990	1017
700 mm <sup>2</sup> Araucaria (61/4.14mm)	AAAC AL5	40	917	966	1041	1069	1003	1057	1139	1169

**TABLE D.3**

**Clearance Restricted Ratings (Amps)**  
**Aluminium Conductor Steel Reinforced (ACSR) – to BSEN 50182**

Conductor	Type	Temp. (°C)	Variable Load Pre-Fault Rating (A): e = 3%				Post-Fault Rating (A): e = 9%			
			Summ er	Inter warm	Inter cool	Winter	Summ er	Inter warm	Inter cool	Winter
175 mm <sup>2</sup> Lynx (30/2.79mm + 7/2.79mm)	ACSR	40	377	397	428	440	412	434	468	481
175 mm <sup>2</sup> Caracal (18/3.61mm + 1/3.61mm)	ACSR	40	367	387	417	429	402	423	457	469
200 mm <sup>2</sup> Jaguar (18/3.86mm + 1/3.86mm)	ACSR	40	401	423	456	468	439	462	499	512
400 mm <sup>2</sup> Zebra (54/3.18mm + 7/3.18mm)	ACSR	40	643	677	730	749	704	741	798	819

# TABLE D.4

## Jointing Restricted Ratings (Amps)

Conductor	Type	Temp. (°C)	Variable Load Pre-Fault Rating (A): e = 3%				Post-Fault Rating (A): e = 9%			
			Summ er	Inter warm	Inter cool	Winter	Summ er	Inter warm	Inter cool	Winter
175 mm <sup>2</sup> Lynx (30/2.79mm + 7/2.79mm)	ACSR	50	390	452	452	486	440	490*	510	530*
400 mm <sup>2</sup> Zebra (54/3.18mm + 7/3.18mm)	ACSR	50	650	700	700	800	650	700	700	800

**Note:** These ratings are unchanged from ST:SD8A/2, and assign the previous spring/autumn season rating to both the new Interwarm and Intercool season ratings. Ratings marked \* are further reduced from ST:SD8A/2 values as otherwise they would be higher than the unrestricted rating. These values have been determined by rounding the unrestricted rating down to the nearest 10A.

## **APPENDIX E**

### **SUPERSEDED DOCUMENTATION**

This document supersedes ST: SD8A/2 dated May 2013 which has now been withdrawn.

## **APPENDIX F**

### **RECORD OF COMMENT DURING CONSULTATION**

[ST: SD8A/3 - Comments](#)

## **APPENDIX G**

### **ASSOCIATED DOCUMENTATION**

The Electricity Safety Quality and Continuity Regulations (ESQCRs)

CEGB Standard 99312, Issue 9

\*ENA EREC P27 Issue 2 Current Rating Guide for High Voltage Overhead Lines Operating in the UK Distribution System

ENA TS 43-13 Aerial Bundled Conductors (ABC) Insulated with Cross Linked Polyethylene for Low Voltage Overhead Distribution

WPD Closedown Report – Improved Statistical Ratings for DNO Overhead Lines

\*In Final Draft but not published at time of issue of this ST

## **APPENDIX H**

### **KEY WORDS**

Overhead Line, Sustained, Variable, Pre-Fault, Post-Fault, Rating, Conductor, Temperature, Summer, Winter, Inter\_Warm, Inter\_Cool, Season, Exceedence, Deterministic, Probabilistic, Dynamic.