

## **GUIDANCE FOR WORKING IN PROXIMITY TO LIVE CONDUCTORS - REDUCING THE RISKS**

*This document is for Relevant Electrical Standards document only.*

### **Disclaimer**

*NGG and NGET or their agents, servants or contractors do not accept any liability for any losses arising under or in connection with this information. This limit on liability applies to all and any claims in contract, tort (including negligence), misrepresentation (excluding fraudulent misrepresentation), breach of statutory duty or otherwise. This limit on liability does not exclude or restrict liability where prohibited by the law nor does it supersede the express terms of any related agreements."*

### **TABLE OF CONTENTS**

PURPOSE AND SCOPE .....	1
<b>PART 1 – GUIDANCE .....</b>	<b>1</b>
1 GENERAL .....	1
2 DESIGN PRINCIPLES .....	2
3 DESIGN GUIDANCE FOR ACCESS FROM GROUND LEVEL OR PERMANENT PLATFORM .....	3
4 DESIGN GUIDANCE FOR ACCESS BY TEMPORARY FIXED-HEIGHT PLATFORM .....	5
5 DESIGN GUIDANCE FOR ACCESS BY MEWP .....	7
6 FORMS AND RECORDS .....	10
<b>PART 2 - DEFINITIONS AND DOCUMENT HISTORY .....</b>	<b>10</b>
7 DEFINITIONS .....	10
8 AMENDMENTS RECORD .....	13
<b>PART 3 - GUIDANCE NOTES AND APPENDICES .....</b>	<b>14</b>
APPENDIX A - GUIDANCE FOR DESIGNERS .....	14

### **PURPOSE AND SCOPE**

These guidelines have been prepared for information and may be used by designers as an indication of designs that will be considered acceptable by NGET. Following these guidelines does not, however, absolve the designers of their responsibilities for their design under CDM regulations.

### **PART 1 – GUIDANCE**

#### **1 GENERAL**

Designers are obliged to comply with all relevant health and safety legislation, particularly the designers' duties under the Construction (Design and Management) Regulations 1994 (CDM). In applying the principles of prevention and protection to the reduction of risk, designers' considerations should include the hazards of working in proximity to exposed live HV conductors (including 'oversailing' conductors) during construction, operation, maintenance, repair, replacement or demolition of electrical/mechanical equipment and civil structures.

If the designer does not eliminate hazards presented by exposed live HV conductors from the design, there is an obligation on the designer to show, by risk assessment, that the design has complied with the principles of prevention and protection, as required by CDM, in some other way. The following hierarchy of risk control shall be considered when selecting alternative control measures.

The preferred hierarchy of risk control principles are:

- Eliminate risk altogether
- Substitute equipment or activities with less hazardous ones
- Combat risk at source by engineering control measures
- Reduce risk by suitable safe systems of work
- Minimise risk by the use of Personal Protective Equipment.

[Reference NGET's National Health & Safety Standard NS-MP1]

## 2 DESIGN PRINCIPLES

**2.1** It is essential that the Safety Distances (specified in the NGET's Safety Rules Handbook) to exposed live HV conductors are not infringed either deliberately or accidentally during any work activity.

**2.2** In order to comply with 2.1 above, designers will need to establish appropriate minimum design clearances. These must take into account not only the immediate requirements of the work activity but also additional factors relating to the means of access and working methods. An indicative, but not exhaustive, list of factors to be considered when considering whether clearances are sufficient include the possibility of a Mobile Elevated Work Platform (MEWP) running out of control, passage of cranes through substations, the use and handling of scaffold poles and setting up enclosures over cable sealing ends.

The clearances recommended in these guidelines may not, in some circumstances, be sufficient to adequately mitigate hazards and designers must be prepared to use risk assessment principles to test their design decisions.

**2.3** Designers must take account of relevant UK legislation, NGET's Safety Rules and relevant Technical Specifications (formerly NGTS's) when considering methods of performing work activities. The procedures defined in the NGET's National Safety Instructions (NSIs) must also be considered (although other procedures that meet the legal/Safety Rule requirements may be accepted at the discretion of NGET).

**2.4** It is NGET policy to eliminate from new substation construction:

- a) Oversailing conductors (as far as is reasonably practicable).
- b) Conductors in proximity.
- c) Situations where work activities must be carried out above exposed HV conductors that are live.

**2.5** In assessing what is reasonably practicable, designers may wish to use the ALARP (As Low As Reasonably Practicable) principle outlined in NGET's National Health & Safety Standard NS-MP1 and 'Tolerability of Risk From Nuclear Power Stations', (HSE Books, 1992).

A higher priority should be placed on eliminating oversailing conductors from routine work activities than from non-routine work activities. Furthermore, a higher priority should be placed on eliminating oversailing conductors where access is intended to be by MEWP (where there is a significant risk of accidentally moving out of the operating area as a result of misjudgement or mechanical failure) than from where access is by temporary fixed-height platform.

Note: The specification by the designer of a temporary fixed-height platform in place of a MEWP will not always be acceptable to NGET. Refer to Appendix A for application limitations.

- 2.6** Practically, it is impossible to eliminate exposed live HV conductors from a substation during work (with the exception of GIS substations). TS 2.1(RES) specifies the following maximum outage conditions:

The design of the substation shall permit installation, extension, operation and maintenance (preventive and corrective) with a maximum of one circuit (including any circuit requiring intervention) and one busbar section out of service simultaneously.

*Informative: A section of busbar is taken to be a part of either the main or reserve busbars or a mesh corner. Associated busbar section and busbar coupler circuits may be considered to be part of the busbar section.*

Substation designs shall be based on these requirements.

- 2.7** When considering clearances from roadways to exposed live conductors for vehicle access, designers must take into account the largest load that may reasonably foreseeably need to be moved on that roadway. The designer shall also identify the proposed access/egress route for the replacement of the largest single unit of equipment installed on site (e.g. transformer or quadrature booster) taking into account all substation voltages crossing that route.

Where a transformer has failed, this will already have resulted in depletion of one circuit at a substation. It would not, therefore, be an acceptable design solution to require further circuits to be switched out to provide clearance for transporting the failed or replacement units across site.

- 2.8** Guidance for designers can be categorised according to the nature of the work activity and the type of access intended by the designer. This guidance is summarised in the table in Appendix A

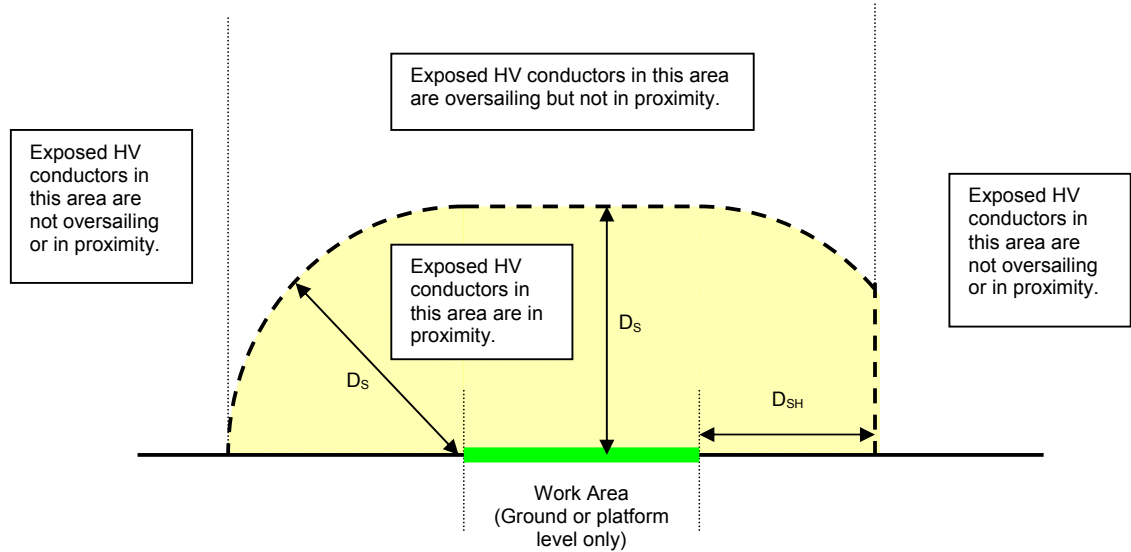
### **3 DESIGN GUIDANCE FOR ACCESS FROM GROUND LEVEL OR PERMANENT PLATFORM**

The design objective is to allow personnel to move freely around the substation at ground level and to safely use:

- a) any permanently installed access platforms, or
- b) mobile steps which have been specifically designed to access specific plant or equipment whilst live.

Conductors in proximity to any reasonably foreseeable work area shall be eliminated by ensuring that the appropriate design clearance for safety  $D_S$  (as specified in Table 1) has been achieved from all exposed live conductors.

Conductors that are not in proximity but still oversail the work area shall be accepted by NGET (since elimination is not considered reasonably practicable) and the designer will not be required to take any measures to avoid them.



$D_s$  is the design clearance for safety (section clearance) specified in TS2.1 (RES).

The reduced horizontal design clearance for safety  $D_{SH}$  may be utilised in the substation design where the designer can demonstrate that it would not be reasonably practicable to incorporate the specified vertical clearance.

The above diagram has been simplified for clarity and no means is shown of defining the boundary of the work area. In practice, the work area would need to be bounded by a handrail or fence. A handrail is only acceptable for an elevated platform and designers must consider the possibility of the rail being used as a step – a minimum vertical clearance of  $D_s$  must therefore be allowed from the top of the handrail to any exposed live conductor. The required minimum horizontal clearance is  $D_s$  (or  $D_{SH}$ ). Where an earthed fence or barrier meeting the requirements of protection class IP2X as defined in IEC 60529 (and which is not readily climbable) is provided then the minimum horizontal clearance to an exposed live conductor may be reduced to minimum or type tested phase to earth electrical clearance. The required vertical clearance is  $D_s$  from floor level of the work area. Where a non-IP2X fence or barrier (which is not readily climbable) is provided then minimum clearances are as shown in the diagram above. Fences that are climbable must be treated as handrails.

- 3.1 Reasonably foreseeable work areas shall be taken to include any part of the substation at ground level or any part of a permanently installed access platform, except where access to the area is specifically restricted (e.g. fenced compounds around capacitor banks).
- 3.2 The designer must consider whether any hazards are present which may not have been adequately controlled by the use of standard design clearances and, where necessary, carry out a specific risk assessment. Any additional prevention and protection measures identified by this specific risk assessment must be implemented.
- 3.3 In areas where conductors in proximity cannot be eliminated then access shall be limited as specified in TS 2.1(RES) Clause 4.4. Such a limitation will not be accepted by NGET where access is required for switching, routine inspections/patrols or fault finding on secondary equipment.

Under circuit outage conditions that permit access to the restricted area, exposed HV conductors of other circuits which may remain energised shall not be in proximity to that area.

**3.4** The use of mobile steps for operational access in substations is non-preferred. Where the use of such access is agreed by NGET, then the designer shall ensure that clearances ( $D_S$ ) as defined in Table 1 are provided from the platform level in any position in which the steps might reasonably foreseeably be located.

Details, including a dimensioned drawing, of the steps on which the design is based shall be recorded in the site Health & Safety file.

**4 DESIGN GUIDANCE FOR ACCESS BY TEMPORARY FIXED-HEIGHT PLATFORM**

**4.1** The design objective is to allow for safe erection, use and dismantling of the temporary fixed-height platform without exceeding the specified maximum outage criteria.

**4.2** The presence of oversailing and/or proximity conductors shall be identified as follows:

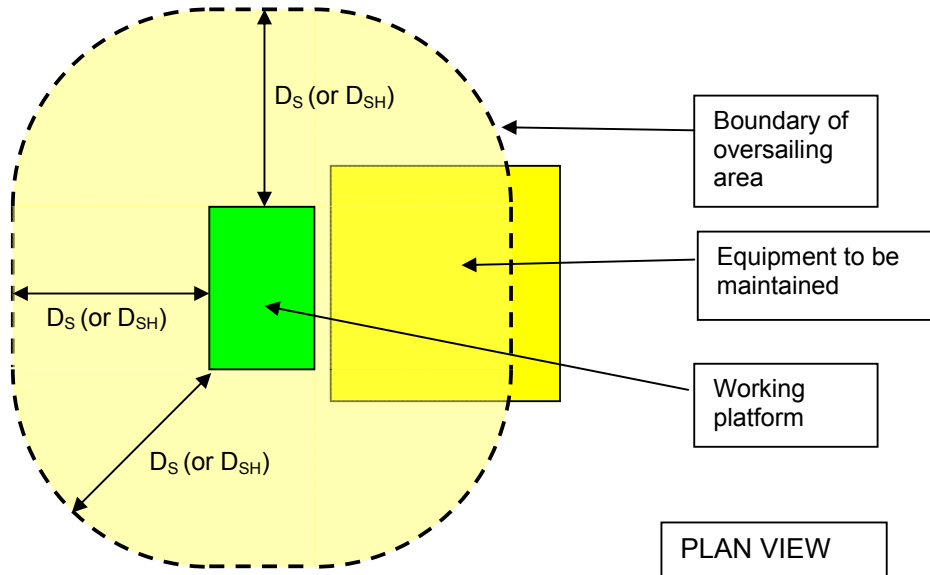
- a) Identify (in plan view) the position (or positions) of the temporary platform required to carry out the work activity.
- b) Plot an area around the platform with its perimeter measured  $D_S$  from the edge of the platform (where  $D_S$  is the design clearance for safety specified in Table 1 and in TS 2.1(RES).

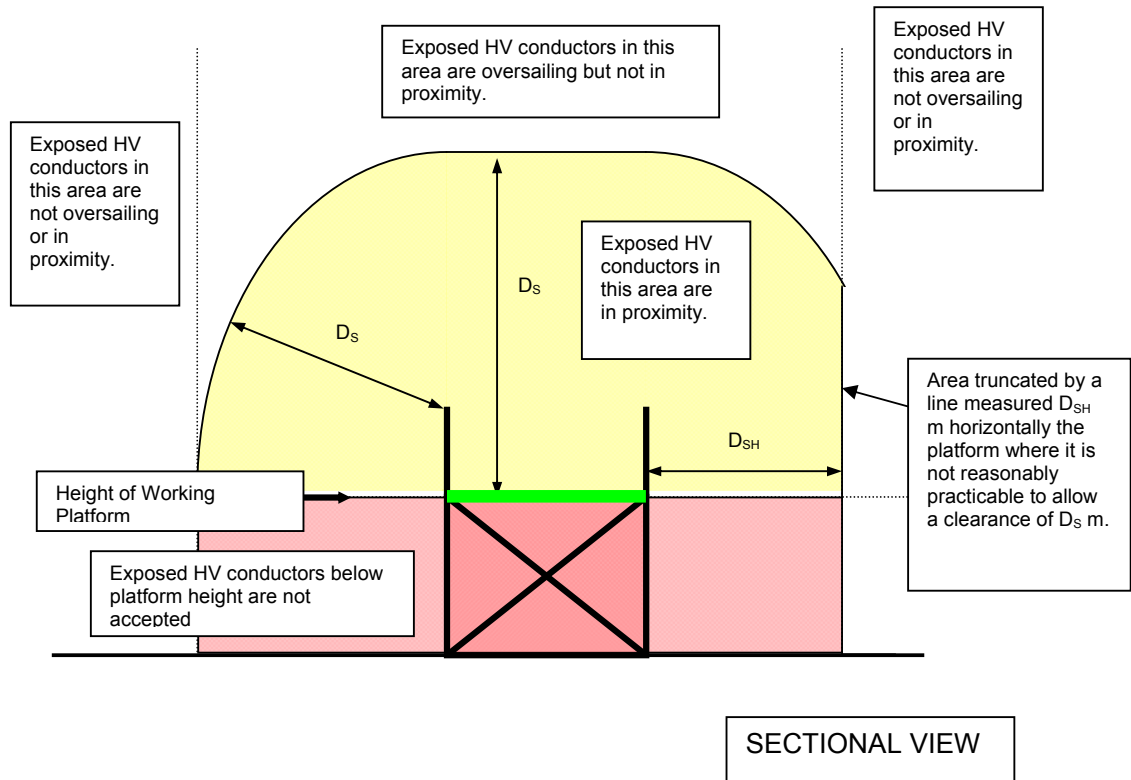
Note: The reduced horizontal design clearance for safety  $D_{SH}$  may be utilised in the substation design where the designer can demonstrate that it would not be reasonably practicable to incorporate the specified vertical clearance.

- c) Any exposed HV conductor that crosses this area (at any height) will be considered to be oversailing.

Note: Exposed conductors which are not live by virtue of the isolation procedures necessary to carry out the work activity are excluded from this definition.

- d) Any exposed HV conductor that crosses this area at a distance  $\leq D_S$  (measured vertically or at any angle) from any part of the floor of the fixed-height platform will be considered a conductor in proximity.





*The diagrams above have been simplified for clarity. When preparing designs, designers must consider the possibility of the platform handrail being use as a step. Unless alternative control measures are proposed a minimum vertical clearance of  $D_s$  must thus be allowed from the top of the handrail to any exposed live conductor.*

- 4.3** The designer must consider whether any hazards are present which may not have been adequately controlled by the use of standard design clearances and, where necessary, carry out a specific risk assessment. Any additional prevention and protection measures identified by this specific risk assessment must be implemented.

Additional risks to be considered might be erection of temporary platforms and, where applicable, handling long objects such as scaffold poles. Possible variations in the location of the temporary platform must also be considered.

- 4.4** Where a design does not eliminate oversailing conductors, this may still be acceptable. In these cases the designer will be required to demonstrate:

- a) That the conductors are not in proximity, and
- b) That it is not reasonably practicable to eliminate the oversailing condition or to further increase the clearance from the working platform.
- c) That a suitable and sufficient risk assessment of the design has been documented and implemented.

- 4.5** Where designers intend temporary fixed-height platforms to be used for fault investigation of secondary equipment or routine maintenance then details shall be included in the site Health & Safety file of the height, size and location of the platform on which the design is based together with any special requirements for erection or dismantling.

The Health & Safety file must also contain details of access arrangements for reasonably foreseeable non-routine work activities (e.g. repair/replacement of major substation components) where the access requirements are critical to the substation design. These details must include requirements for additional circuit outages beyond those that would be assumed from the electrical diagram of the substation.

## 5 DESIGN GUIDANCE FOR ACCESS BY MEWP

- 5.1 The design objective is to allow for safe use of a MEWP without exceeding the specified maximum outage criteria. Because of the risk of misjudgement or mechanical failure, NGET consider it necessary to provide an additional design margin when allowing clearances for use of a MEWP. As a minimum, designers must ensure that their design does not require any part of the MEWP or of the operator's body to infringe the 'vicinity zone' (as defined in BS EN 50110) surrounding exposed HV conductors which remain energised during the work activity.

*Designers should note that the minimum clearances to exposed live conductors suggested in these guidelines provide a margin to allow for misjudgement or mechanical failure.*

- 5.2 The presence of oversailing/proximity conductors shall be identified as follows:

- a) Identify (in plan view) the area that will be traversed by the platform of the MEWP during the work activity. Also identify the area occupied by the MEWP base unit and that area which will be traversed by any overhanging parts of the MEWP (e.g. booms). Together, these areas form the MEWP operating area.
- b) Plot an additional area around the MEWP operating area with its perimeter measured  $D_A$  from the edge of the area (where  $D_A$  is the horizontal design clearance for safety specified in TS 2.1(RES) + 2 m).

Note:  $D_A$  incorporates safety distance + personal reach + 2 m margin and thus exceeds the vicinity zone perimeter clearance  $D_V$  suggested in some other documents such as draft IEC 61936.

- c) Any exposed HV conductor that crosses this area (at any height) will be considered to be oversailing.

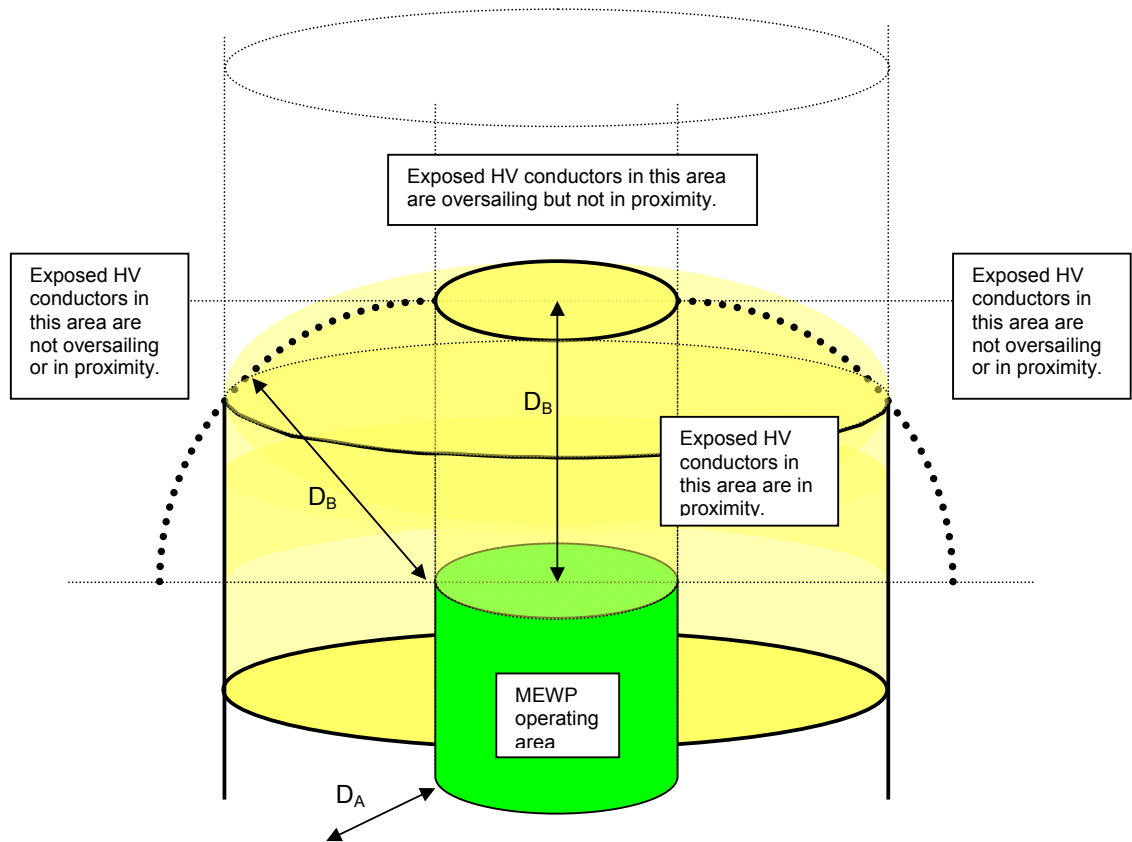
Note: Exposed conductors which are not live by virtue of the isolation procedures necessary to carry out the work activity are excluded from this definition.

- d) The vertical dimension of the MEWP operating area will be determined by the maximum height that the base of the MEWP platform is required to reach to carry out the work activity. Unless otherwise defined, this height will be taken to be the maximum height of the equipment being maintained.
- e) Any exposed HV conductor that crosses the zone at a distance  $\leq D_B$  (measured vertically or at any angle) from any part of the MEWP operating area will generally be considered a conductor in proximity, (where  $D_B$  is the vertical design clearance for safety specified in TS 2.1(RES) + 2 m).

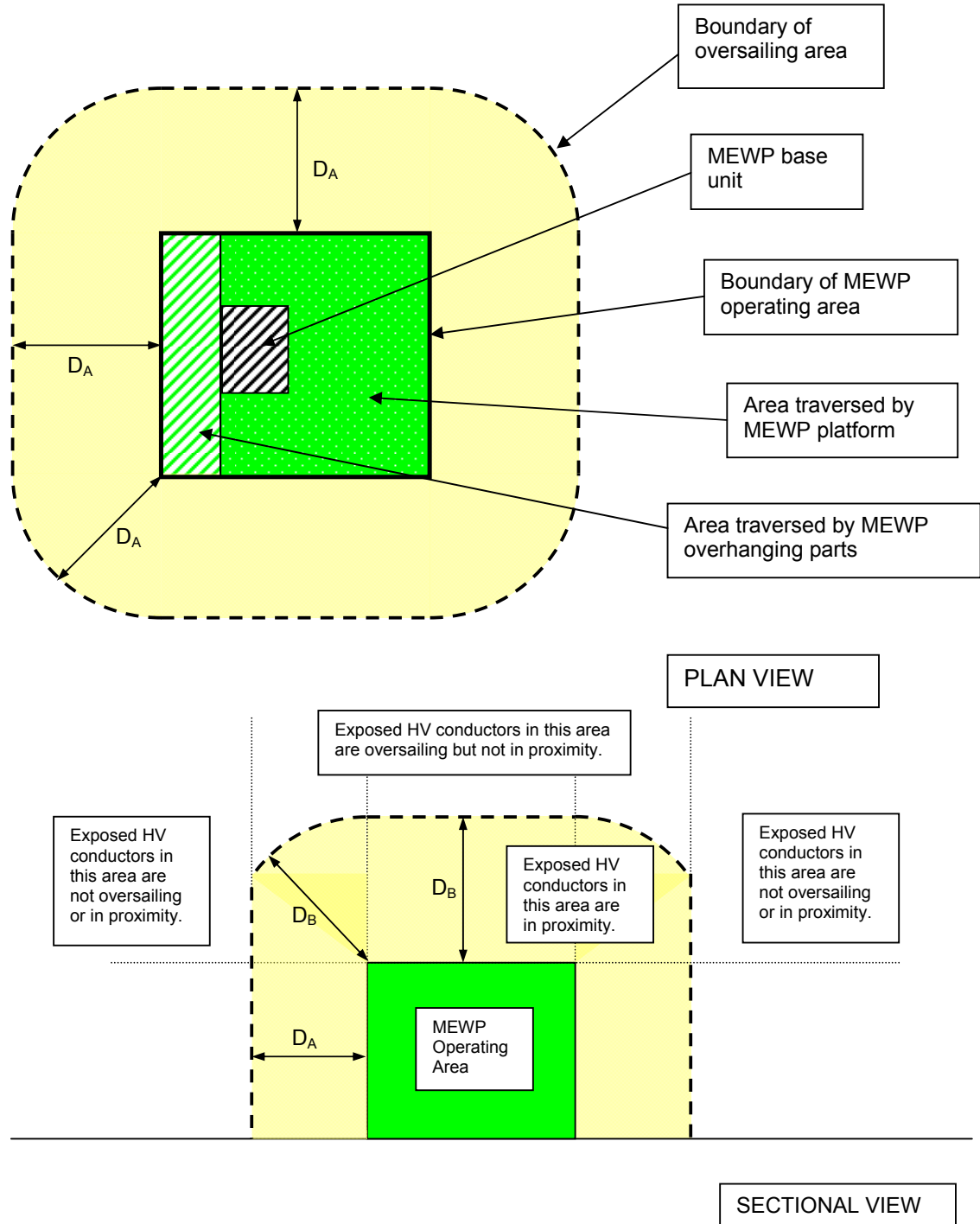
Note: In some cases it may be acceptable to consider different platform operating heights in parts of the MEWP operating area (e.g. the area traversed by overhanging parts of the MEWP). Designers using this approach must, however, demonstrate that it is not reasonably practicable to design on the basis of a uniform worst-case MEWP operating area height.

Note: It is not generally necessary to take account of the possibility of staff climbing on the handrail of the MEWP platform. The 2 m margin is considered adequate

to manage this risk since it is considered unlikely that personnel will climb on the handrail whilst the platform is in motion.







**5.3** In determining the MEWP operating area, designers may base their design on a generic MEWP or a specific MEWP. Designs based on a generic MEWP are preferred.

A generic MEWP shall be taken to have the worst-case characteristics of MEWP types normally hired by NGET, details of which can be obtained from NGET's procurement section.

It is not intended that the designer should automatically take account of the full operating envelope of a generic or specific MEWP. It is sufficient to identify the required envelope of

operation to perform the work activity in determining the MEWP operating area. However, where the operating area of a MEWP is to be limited, it is important to identify the limits of operation in the site Health & Safety file.

- 5.4** The designer must consider whether any hazards are present which may not have been adequately controlled by the use of standard design clearances and, where necessary, carry out a specific risk assessment. Any additional prevention and protection measures identified by this specific risk assessment must be implemented.
- 5.5** Where a design does not eliminate oversailing conductors, this may still be acceptable. In these cases the designer will be required to demonstrate:
- a) That the conductors are not in proximity, and
  - b) That it is not reasonably practicable to eliminate the oversailing condition or to further increase the clearance from the MEWP operating area.
  - c) That a suitable and sufficient risk assessment of the design has been documented and implemented.
- 5.6** If a designer bases the substation design on the use of a MEWP then full details of the characteristics of this MEWP shall be provided in the site Health & Safety file

The Health & Safety file must also contain details of access arrangements for reasonably foreseeable non-routine work activities (e.g. repair/replacement of major substation components) where the access requirements are critical to the substation design. These details must include requirements for additional circuit outages beyond those that would be assumed from the electrical diagram of the substation.

## **6 FORMS AND RECORDS**

Not applicable.

## **PART 2 - DEFINITIONS AND DOCUMENT HISTORY**

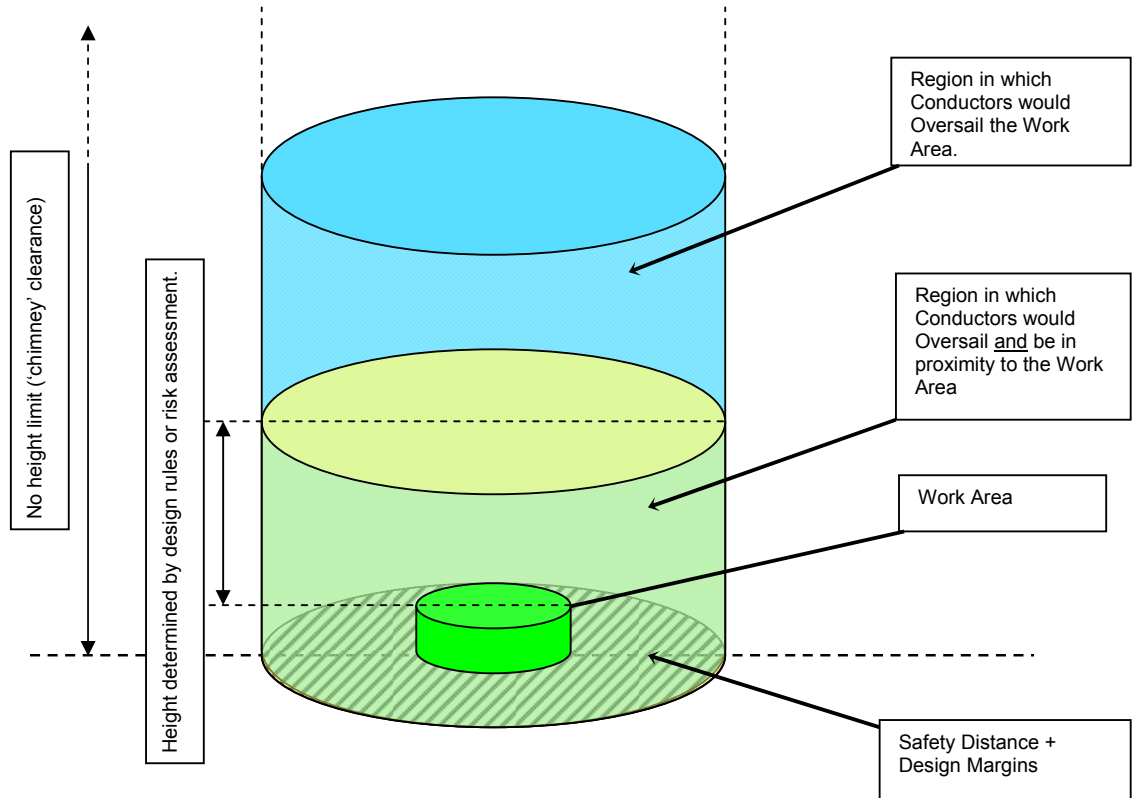
### **7 DEFINITIONS**

#### **7.1 Oversailing Conductors**

Are exposed HV conductors which are above or in proximity to any reasonably foreseeable work area and which would normally remain energised during such work activities.

#### **7.2 Conductors in proximity**

Are exposed HV conductors with insufficient clearance to a reasonably foreseeable work area to avoid danger and which would normally remain energised during work activities.



**7.3 Design Clearance for Safety (Vertical) [ $D_S$ ]**

The sum of the relevant Safety Distance (from the NGET’s Safety Rules) and the maximum vertical reach of a person (taken to be 2.4 m) previously known as Section Clearance.

**7.4 Design Clearance for Safety (Horizontal) [ $D_{SH}$ ]**

The sum of the relevant Safety Distance (from the NGET’s Safety Rules) and the maximum horizontal reach of a person (taken to be 1.5 m).

Note: The horizontal reach dimension adopted in NGET substation design practice is 100 mm greater than that specified in BS7354.

**7.5 Design Clearance for MEWP Operation (Horizontal) [ $D_A$ ]**

The sum of the relevant Safety Distance (from the NGET’s Safety Rules), a margin to allow for operator error or equipment maloperation (2m) and the maximum horizontal reach of a person (taken to be 1.5m).

Note: The Safety Distance + 2 m margin, when measured from an exposed live conductor, defines the boundary of the Vicinity Zone (as specified in BS EN 50110). The design philosophy is that neither the MEWP, any part of the operators body or any object held by the operator should infringe the Vicinity Zone.

**7.6 Design Clearance for MEWP Operation (Vertical) [ $D_B$ ]**

The sum of the relevant Safety Distance (from the NGET’s Safety Rules), a margin to allow for operator error or equipment maloperation (2 m) and the maximum vertical reach of a person (taken to be 2.4 m).

Values of  $D_A$ ,  $D_B$ ,  $D_S$  and  $D_{SH}$  for NGET system voltages are tabulated in Table 1 below.

<b>Nominal System Voltage (kV)</b>	<b>11/22/33</b>	<b>66</b>	<b>132</b>	<b>275</b>	<b>400</b>
NGET Safety Rules, Safety Distance	0.8	1.0	1.4	2.4	3.1
Design Clearance for Safety (Vertical) [D <sub>S</sub> ]	3.2	3.4	3.8	4.8	5.5
Design Clearance for Safety (Horizontal) [D <sub>SH</sub> ]	2.3	2.5	2.9	3.9	4.6
Design Clearance for MEWP Operation (Vertical) [D <sub>B</sub> ]	5.2	5.4	5.8	6.8	7.5
Design Clearance for MEWP Operation (Horizontal) [D <sub>A</sub> ]	4.3	4.5	4.9	5.9	6.6
Minimum Height of Conductors Above Roadways **	5.8	6.0	6.7	7.0	7.3

**Table 1 - Values of minimum clearances (mtrs) for NGET system voltages**

*\*\* Informative: Values given above are based upon the Electricity Safety, Quality & Continuity Regulations 2002. TS 2.1(RES) also permits a value based upon the maximum vehicle height + 0.5m + safety distance. Actual values to be used shall be the greater of the two values.*

### **7.7 Non-Primary System Work**

Any work in a substation which is not directly associated with equipment forming part of the NGET system.

## 8 AMENDMENTS RECORD

<b>Issue</b>	<b>Date</b>	<b>Summary of Changes / Reasons</b>	<b>Author(s)</b>	<b>Approved By (Inc. Job Title)</b>
1	October 2014	New document.	Richard Poole Network Engineering	GCRP

### 8.1 Procedure Review Date

3 years from publication date.

**PART 3 - GUIDANCE NOTES AND APPENDICES**

**APPENDIX A - GUIDANCE FOR DESIGNERS**

	<b>Access from ground level or permanent platform **</b>	<b>Access by temporary fixed-height platform (e.g. pre-form/pole &amp; clip scaffold).</b>	<b>Access by MEWP</b>
<b>Switching or Routine Inspections/ Patrols</b>	Only method of access accepted by NGET's	Not accepted	Not accepted
	Safe access must be provided without the need for circuit outages.	N/A	N/A
	Oversailing conductors acceptable. For design guidance on avoiding conductors in proximity see Section 3.	N/A	N/A
<b>Access to Secondary Equipment</b> (e.g. control/interlocking circuits) for Fault Investigation	Preferred method of access.	Access by small pre-form scaffold platform ( $\leq 1.8\text{m}$ ) may be accepted where access by permanent platform is not reasonably practicable.	Not generally acceptable. Designers must be able to justify this design decision.
	Safe access must be provided without the need for circuit outages.	Safe access must be provided without the need for circuit outages.	Safe access must be provided without the need for circuit outages.
	Oversailing conductors acceptable. For design guidance on eliminating conductors in proximity see Section 3.	Oversailing conductors acceptable. For design guidance on eliminating conductors in proximity see Section 4.	Oversailing conductors are not acceptable except where it is not reasonably practicable to eliminate them. For design guidance on eliminating conductors in proximity see Section 5.

	<b>Access from ground level or permanent platform **</b>	<b>Access by temporary fixed-height platform (e.g. pre-form/pole &amp; clip scaffold).</b>	<b>Access by MEWP</b>
<b>Routine Preventive Maintenance</b> (any routine work activity specified in the manufacturers operating & maintenance instructions).	Preferred method of low-level access	Acceptable for low-level access ( $\leq 3.6m$ ) and for high-level access in situations (such as indoor substations) where MEWP access cannot reasonably practicably be provided.	Preferred method of high-level access in all substations.
	The design shall be based on minimum circuit outages (i.e. a requirement for additional 'proximity' outages will generally not be acceptable).	The design shall be based on minimum circuit outages (i.e. a requirement for additional 'proximity' outages will generally not be acceptable).	The design shall be based on minimum circuit outages (i.e. a requirement for additional 'proximity' outages will generally not be acceptable).
	Oversailing conductors acceptable. For design guidance on eliminating conductors in proximity see Section 3.	Oversailing conductors are not acceptable except where it is not reasonably practicable to eliminate them. For design guidance on eliminating conductors in proximity see Section 4.	Oversailing conductors are not acceptable except where it is not reasonably practicable to eliminate them. For design guidance on eliminating conductors in proximity see Section 5.
<b>Fault Repair/ Erection/ Extension/ Replacement /Demolition</b>	Acceptable method of access.	Acceptable for low-level access ( $\leq 3.6m$ ) and for high-level access in situations where MEWP access cannot reasonably practicably be provided.	Preferred method of high-level access in all substations.
	Required circuit outages must not exceed the maximum conditions as detailed in TS 2.1(RES)	Required circuit outages must not exceed the maximum conditions as detailed in TS 2.1(RES)	Required circuit outages must not exceed the maximum conditions as detailed in TS 2.1 (RES)
	Oversailing conductors acceptable. For design guidance on eliminating conductors in proximity see Section 3.	Oversailing conductors are not acceptable except where it is not reasonably practicable to eliminate them. For design guidance on eliminating conductors in proximity see Section 4.	Oversailing conductors are not acceptable except where it is not reasonably practicable to eliminate them. For design guidance on eliminating conductors in proximity see Section 5.

	<b>Access from ground level or permanent platform **</b>	<b>Access by temporary fixed-height platform (e.g. pre-form/pole &amp; clip scaffold).</b>	<b>Access by MEWP</b>
<b>Vehicle Access</b> (to defined roadways within the substation)	Safe access should generally be provided without the need for circuit outages.	N/A	N/A
	Oversailing conductors acceptable. Conductors in proximity shall be eliminated by providing a minimum vertical clearance from the roadway to live conductors of either: <ul style="list-style-type: none"> <li>• Minimum height above ground of overhead lines as defined in the Electricity Safety, Quality &amp; Continuity Regulations 2002.</li> <li>• Max vehicle height + 0.5m margin + Safety Distance</li> </ul> Whichever is the greatest.		
<b>Non Primary System Work</b> (i.e. all reasonably foreseeable work in a substation, including repairs, other than work on primary system equipment).	Preferred means of low-level access.	Acceptable	Not generally acceptable for routine work activities. Acceptable for non-routine work activities.
	Safe access should generally be provided without the need for circuit outages.	Safe access should generally be provided without the need for circuit outages.	Safe access should generally be provided without the need for circuit outages.
	Oversailing conductors acceptable. For design guidance on eliminating conductors in proximity see Section 4.	Oversailing conductors are not acceptable except where it is not reasonably practicable to eliminate them. For design guidance on eliminating conductors in proximity see Section 5.	Oversailing conductors are not acceptable except where it is not reasonably practicable to eliminate them. For design guidance on eliminating conductors in proximity see Section 6.

\*\* Includes mobile steps, although they are non-preferred.



© National Grid 2014

© 2014 Copyright owned by National Grid Electricity Transmission plc, all rights reserved.

No part of this publication may be reproduced in any material form (including photocopying and restoring in any medium or electronic means and whether or not transiently or incidentally) without the written permission of National Grid Electricity Transmission plc, except:

1. To the extent that any party who is required to comply (or is exempt from complying) with the provisions under the Electricity Act 1989 reasonably needs to reproduce this publication to undertake its licence or statutory duties within Great Britain (or any agent appointed so as to act on that party's behalf); and
2. In accordance with the provisions of the Copyright, Design's and Patents Act 1988.