NATIONAL SAFETY INSTRUCTION and Guidance

NSI 13
WASHING HIGH VOLTAGE INSULATORS USING PORTABLE WASHING EQUIPMENT

Copyright National Grid plc 2014 ©, all rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means electronic, mechanical, photocopying, recording or otherwise, without the written permission of National Grid obtained from the issuing location.

The contents of National Grid documents are based on the needs of National Grid and the conditions under which it operates. It shall not therefore be assumed that the contents stated therein necessarily meet the particular circumstances and requirements of other organisations. The principles set out in this document are for information only and therefore National Grid is not liable to any third party for any loss or damage resulting from reliance on the contents. It is the responsibility of such external organisations to check that the document is the latest version and is appropriate for their purposes.
KEY CHANGES

<table>
<thead>
<tr>
<th>Section</th>
<th>Amendments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title Page</td>
<td>Title of NSI changed to reflect the scope of the NSI “Using Portable Washing Plant”</td>
</tr>
<tr>
<td>5.8</td>
<td>Wording changed to allow for underslung insulators.</td>
</tr>
</tbody>
</table>
## WASHING HIGH VOLTAGE INSULATORS

### CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Purpose and Scope</td>
<td>1</td>
</tr>
<tr>
<td>2  Definitions</td>
<td>1</td>
</tr>
<tr>
<td>3  Dangers</td>
<td>1</td>
</tr>
<tr>
<td>4  Equipment Identification</td>
<td>2</td>
</tr>
<tr>
<td>5  General Requirements</td>
<td>2</td>
</tr>
<tr>
<td>5  Additional Requirements For Washing 400kv Insulators</td>
<td>3</td>
</tr>
<tr>
<td>Appendix A - Authorisation Matrix for Contractors Personnel</td>
<td>4</td>
</tr>
</tbody>
</table>
1 Purpose and Scope

To apply the principles established by the Safety Rules and provide guidance on National Safety Instruction 13, to achieve Safety from the System for personnel using portable equipment to wash Live 132kV and 275kV insulators and Isolated 400 kV insulators in open type substations.

The layout of this guidance note reflects that of legislative codes of practice, where the rule (or mandatory obligation) is identified by a green panel on the left-hand side. The guidance follows after the rule and is identified by a blue panel.

Within National Grid, guidance notes hold equivalent status of an Approved Code of Practice (ACOP) in law. If not followed, you will be required to demonstrate that your safe system of work is of an equal or higher standard.

2 Definitions

Terms printed in bold type are as defined in the Safety Rules.

3 Dangers

The main Dangers to personnel washing insulators in substations containing Live Equipment are electric shock or burns due to

- the washing equipment becoming Live
- electrical flashover.
4 Equipment Identification

4.1 Equipment on which washing is to be carried out must be readily identifiable. Where necessary a means of identification shall be fixed to it which will remain effective throughout the course of the work.

5 General Requirements

5.1 The Control Person (Operation) must be informed before the start of washing and also when it is complete.

5.2 The setting up and positioning of the equipment and the carrying out of the work must be done by a Competent Person. He must wear Approved rubber gloves and suitable protective clothing. He may be accompanied by another Person for training purposes who is similarly equipped. There must be effective communication between them during the course of the work.

5.3 Only Approved washing equipment must be used. This equipment must have fitted to it a device to monitor the purity of the water. The monitoring device must sound an audible alarm should the conductivity exceed that shown in 5.6. In addition an automatic cut-out device must operate to prevent further washing. The automatic cut-out device must be tested prior to washing commencing.

5.4 The equipment must have a nozzle which breaks the water jet into a spray before reaching the insulator being washed.

5.5 The nozzle, the metal operating platform and any other metal parts of the equipment must be bonded together and the equipment Earthed by a suitable earthing lead which is not less than 65mm² copper equivalent in cross-section.

5.6 The conductivity of the water used must not exceed 200 micro siemens/cm at 25°C. The conductivity of the water must be checked by a Competent Person daily before washing commences and when the source of water changes.
5.7 The equipment and the Competent Person(s) carrying out the work must be not less than 6m (20ft) away from the insulator(s) being washed and care must be taken that
   a) no other Live conductor at a lesser distance is inadvertently sprayed
   b) not more than one phase is washed by the same jet
   c) no two insulators less than 6m (20ft) apart which are at different potentials are washed by the same jet
   d) at no time during the washing must the operator step off the Earthed metal operating platform or accept materials from, or make physical contact with, any individuals not in the same Earthed environment
   e) washing is carried out in such a manner that any overspray shall fall only on clean insulation.

5.8 Washing must be carried out starting at the earth end and working towards the Live end of insulators.

5.9 Water washing must be discontinued
   a) in the event of a local lightning risk
   b) if the ambient temperature is below 0ºC
   c) in the event of wind speeds being too high to enable the operator to control the jet.

6. ADDITIONAL REQUIREMENTS FOR WASHING 400KV INSULATORS

6.1 Each 400 kV circuit on which washing is to be carried out, must be Isolated from the HV System before washing commences. There is no need for Points of Isolation to be established.

6.2 A Senior Authorised Person must determine, dependent upon the proximity of adjacent Live 400 kV Equipment, the need for any special working arrangements which may include defining the extent of the working area.
Appendix A - Authorisation Matrix for Contractors Personnel

Contractors appointment under this NSI shall be limited to the following sections.

<table>
<thead>
<tr>
<th>Contractor Personnel</th>
<th>Person</th>
<th>Competent Person</th>
<th>Authorised Person</th>
<th>Senior Authorised Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sections</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>