National Grid UK Electricity Transmission plc

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NATIONAL SAFETY INSTRUCTION and Guidance

NSI 33
THE ADDITION/REMOVAL OF EQUIPMENT TO/FROM THE ELECTRICITY TRANSMISSION SYSTEM

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# DOCUMENT HISTORY

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<th>Issue</th>
<th>Date</th>
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<th>Author(s)</th>
<th>Approved By (Title)</th>
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<tr>
<td>1</td>
<td>April 2014</td>
<td>Renamed and reformatted as “National Safety Instruction and Guidance” which replaces NSI 33 Issue 6.</td>
<td>NSI Review Group</td>
<td>ETAM Operations North Manager Mike Dean</td>
</tr>
<tr>
<td>2</td>
<td>April 2016</td>
<td>Annual review; document amended as detailed below and minor text changes as highlighted in yellow.</td>
<td>NSI Review Group</td>
<td>ETAM Operations North Manager Matt Staley</td>
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# KEY CHANGES

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<tbody>
<tr>
<td>4.4</td>
<td>Corrections to section references and addition of words to clarify process.</td>
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# THE ADDITION/REMOVAL OF EQUIPMENT TO/FROM THE SYSTEM

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1 Purpose and Scope

To apply the principles established by the Safety Rules and provide guidance on National Safety Instruction 33, to achieve Safety from the System for personnel when adding Plant or removing Equipment to/from the System, and when changes in Name or Nomenclature for existing circuits or Equipment are required.

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.

National Grid Safety Rule R.1.2, requires that Equipment shall only be added to or removed from the System in accordance with an Approved procedure. This document as the Approved procedure defines when National Grid Electricity Safety Rules apply or cease to apply. Where Equipment is to be added to or removed from a System subject to the application of National Grid Electricity Safety Rules, this procedure must be followed.

When Equipment is to be added to or removed from a System subject to a third party's Safety Rules and where National Grid undertakes the role of Control Person (Safety), the principles of this procedure must be followed in conjunction with the third party’s safety management system.

This procedure defines a safe system of working when adding Plant or removing Equipment to/from the System, and when changes in Name or Nomenclature for existing circuits or Equipment are required. This procedure provides a method of formally identifying the existence of Equipment to the Off Site Control Person.

Construction sites are covered by this procedure where there is to be temporary or permanent connection of Earthing, LV, or Mechanical services which require the interface to be managed.

OVERVIEW

When Plant is brought onto a National Grid operational site the requirements of National Grid Electricity Safety Rules shall apply with regard to the movement of large objects and any potential proximity to HV Equipment. Before Plant can be connected or is readily connectable to the HV System it must be formally identified as HV Equipment.

The Local Control Person in conjunction with the Senior Authorised Person(s) are responsible for the safety aspects of new Plant entering site until it is declared as part of the National Grid System and defined as Equipment.

The Control Person has no responsibilities for the Plant until after it has been declared as HV Equipment. This two-stage process described recognises both Control Person's responsibilities.

The Site Responsibility Schedule shall be amended to identify each Control Person’s responsibility following the addition/removal of Equipment to/from the System.

The process of declaring an item of Plant as HV Equipment has also to be co-ordinated with the requirements of the Operation Diagram, Site Responsibility Schedule and the Management Systems of the Control Person taking responsibility for the HV Equipment.
# 2 Definitions

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

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commissioning</td>
<td>The preparation for and energising of <strong>Equipment</strong> for the first time. This is a two-stage process consisting of Stage 1 Commissioning and Stage 2 Commissioning. Further information is available in TP106 “Equipment Commissioning and Decommissioning”.</td>
</tr>
<tr>
<td>Commissioning Engineer</td>
<td>Responsible for defining the arrangements for achieving safety from the <strong>System</strong>, to manage the implementation of UK/BP/SE 301 – “Managing Safety Interfaces” requirements (including Operations Diagrams) and to confirm the adequacy of the health and safety file on completion.</td>
</tr>
<tr>
<td>HV System Change Certificate (HVSCC)</td>
<td>A certificate used to notify contractors and National Grid Operating Units when adding <strong>Plant</strong> or removing <strong>Equipment</strong> to/from the <strong>System</strong>, and changes in name or Nomenclature for existing circuits or <strong>Equipment</strong>. On the completion of Part 6 the changes defined in Part 3 become effective. The Local Control Person’s copy of the document shall be the definitive document. The Control Person’s copy of the document shall have printed names in Part 6, backed up with logged statements.</td>
</tr>
<tr>
<td>Notification of Change Certificate (NCC)</td>
<td>A certificate used to notify Contractors and National Grid Operating Units, of a change to the original date on an existing HVSCC.</td>
</tr>
<tr>
<td>Occupier</td>
<td>The person having control over the premises and who regulates and controls the work that is done at that location.</td>
</tr>
<tr>
<td>Occupiers Representative</td>
<td>The person identified by the Occupier who shall discharge the duties and responsibilities of the Occupier on the premises.</td>
</tr>
<tr>
<td></td>
<td>On National Grid Operational sites this will normally be the Delivery Manager or Team Leader.</td>
</tr>
<tr>
<td></td>
<td>On National Grid non-operational sites it will be a representative of the party who regulates and controls the work associated with the premises and within the parameters of the location. i.e. Locations occupied by staff that Property are responsible for the facilities and site maintenance.</td>
</tr>
<tr>
<td>Control Person</td>
<td>The <strong>Control Person (Operations)</strong> and <strong>Control Person (Safety)</strong> for the <strong>HV System</strong> as defined in the Site Responsibility Schedule. Where authorisations allow, this may be done by the Local Control Person.</td>
</tr>
<tr>
<td>Local Control Person</td>
<td>A <strong>Senior Authorised Person (SAP 1 and/or 2 and 3)</strong> acting as the Control Person (Operation) and Control Person (Safety) for <strong>LV</strong> and mechanical <strong>Equipment</strong>. Where <strong>Equipment</strong> is to be transferred to a <strong>CPS1</strong> the Local Control Person shall be an SAP1.</td>
</tr>
<tr>
<td><strong>Operations Diagram</strong></td>
<td>The series of National Grid issued diagrams which define the following information: (Ref. TP 119 Operation Diagrams)</td>
</tr>
<tr>
<td>------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Sheet 1</td>
<td>S/S single line diagram</td>
</tr>
<tr>
<td>Sheet 2</td>
<td>S/S Technical Data Sheet</td>
</tr>
<tr>
<td>Sheet 3</td>
<td>S/S Gas Zones</td>
</tr>
<tr>
<td>Sheet 4</td>
<td>S/S Gas Zone Alarm Schedule</td>
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<tr>
<td>Sheet 5</td>
<td>S/S Oversailing Hazard Schedule</td>
</tr>
<tr>
<td>Routes</td>
<td>National Routes</td>
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<tr>
<td>OHL</td>
<td>OHL Colours (Technical Data)</td>
</tr>
<tr>
<td>Routes</td>
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</tr>
<tr>
<td>Routes</td>
<td>National Routes</td>
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<tr>
<td>Routes</td>
<td>OHL Colours (Technical Data)</td>
</tr>
<tr>
<td>Routes</td>
<td>Oversailing Conductors Schedule</td>
</tr>
</tbody>
</table>

| **Plant**              | Electrical and/or Mechanical items, which are not part of the System and Disconnected from the System. |

| **System Connection Form** | A document used to formally authorise connection of Plant subject to the control of another party’s Safety Management System to the System. See appendix C. |

| **Isolation Request Form** | This document is used to define, secure and maintain safety precautions across the interface of two Safety Management Systems. See appendices D & E. |

3 **Dangers**

The Danger(s) to Personnel arising out of inadequate management of adding Plant or removing Equipment to/from the System, and when changes in Name or Nomenclature for existing circuits or Equipment are required in substations and Overhead Lines are electrocution, burns, impact from release of pressure and effects on eyes arising from:-

- Failure to establish or maintain safety precautions on Equipment due to addition to the System without the Control Person’s knowledge.
4 HV Procedure

4.1 Removal Of HV Equipment

A permanent physical disconnection (greater than the Safety Distance) between the Equipment and the HV System shall be established while the Equipment is part of the HV System, the Equipment will then be declared as being removed from the HV System. The former HV Equipment will then become Plant. Part A of an HVSCC shall be completed and issued for this purpose.

4.2 Change Of Circuit Name Or Nomenclature

When HV circuit names or Equipment nomenclature change, the appropriate Operation Diagrams shall be updated. Part B of an HVSCC shall be completed and issued for this purpose.

4.3 Addition Of Plant

Prior to any physical connection being made between the HV System and Plant, the Plant shall be declared as part of the HV System and defined as HV Equipment. Part C of an HVSCC shall be completed and issued for this purpose.

Note: completion of matrix in Part 3 N/A required for sections not used.

4.4 OHL. Towers and Conductors

The same principles as 4.1, 4.2, and 4.3 shall apply to OHL conductors. When Equipment (i.e. new conductors) are applied to a tower, the tower shall be made subject to HV Electricity Safety Rules. Subsequent addition of conductors to the other side of the tower will require those conductors to be declared as Equipment via the issue of a HVSCC after the addition of the first conductors and towers but prior to the subsequent conductors becoming readily connectable to the system.

Where a risk assessment defines that cross jumpering of Over Head Line double circuits is required, the action to add cross jumpers (inter circuit conductors) and the removal of jumpers to form a disconnected circuit will be defined on the HVSCC on completion of the cross jumpering.

When Equipment is transferred from the Electricity Safety Rules of National Grid to or from the Safety Management System of another company the Site Responsibility Schedule (Ref TP136 “Responsibility Schedules”) shall be updated and signed by all interested parties prior to the transfer. Part D of the HVSCC should be used to define the Equipment and control party at the start and finish of the process.
4.6 Temporary Removal Of Equipment From The System

Equipment temporarily removed from the System, e.g. for workshop repair, return to manufacturers etc, shall be considered to be not subject to the requirements of the HV Electricity Safety Rules from the time of removal from the normal position until the time of return or replacement. E.g. circuit breakers are not subject to HV Electricity Safety Rules when in the Refurb Centre.

A HVSCC is not required. On-site procedures shall define how residual dangers will be managed.

4.7 Testing

Where there is a requirement for testing to be carried out there is no requirement for test leads to be declared as part of the system providing they are part of a discrete test instrument.

4.8 Time Scales

Where due to unforeseen circumstances the timescales for an HVSCC cannot be adhered to, all relevant parties must seek the agreement of the Transmission Network Control Centre Manager before Part 2 of the certificate can be completed.

5 EARTHING, LV & MECHANICAL PROCEDURE

5.1 Addition Of Earthing, LV Or Mechanical Plant Not Involving Third Parties

Prior to any physical connection being made between Earthing, LV and Mechanical Plant, these items shall be declared by the Local Control Person as part of the System and defined as Equipment using one of the following options:

- The Plant will become part of the System immediately prior to first connection.
- The Plant will become part of the System immediately after cancellation of the Safety Document that has been issued for the purpose of Connection of the new Equipment.

Prior to the connection being established the Local Control Person shall ensure that site drawings and records of the System are updated and that all relevant individuals made aware of the changes.
5.2 Establishing Earthing, LV And Mechanical Plant Connections With A Third Party

Prior to establishing any temporary or permanent physical connection between Earthing, LV or Mechanical Plant agreement to the connection shall be sought from the third party’s site representative.

- The agreement to the connection shall be formally recorded via the ‘System Connection Form’ in appendix B of this document.

- The Local Control Person must inform the third party site representative of any Potential hazards which will be Introduced following the establishment of the connection.

- By signing the ‘System Connection Form’ the third party is agreeing to manage any potential hazards associated with work on plant under their control. The third party’s safe system of work should be applied for work on plant in the designated work area (e.g. CDM).

- To ensure that the work to establish the connection can be undertaken safely an ‘Isolation Request Form’ (appendix D of this document) or an equivalent document will be implemented by the third party to maintain isolation or to confirm that back energisation is not possible.

- Site Specific Risk Assessment and Method Statements shall detail the methods of work.

- The Local Control Person shall ensure that site drawings and records of the System are updated to show the connection point prior to the connection being made and that all relevant personnel made aware of the changes. In the case where the connection is of a temporary nature i.e. to facilitate testing as part of the commissioning process a hand amendment to the site diagram will be sufficient.

- The connection point becomes part of the National Grid System and effectively the boundary between two safety management systems.

- When using the System Connection Form Plant does not have to be declared as Equipment before the third party’s Plant is connected to the System.
5.4 Cancellation Of The ‘System Connection Form’

The ‘System Connection Form’ remains in force for the duration of the temporary connection or until the Plant is ready to be declared as Equipment. The ‘System Connection Form’ is cancelled by completing part 4. The form outlines the two options on cancellation.

- The original connection has been disconnected and the systems are no longer connected together.
- The Plant previously under the control of the third party has been added to the system as Equipment now under the control of the Senior Authorised Person acting as the Local Control Person.

The Local Control Person shall ensure that site drawings and records of the System are updated to show the connection point removed or to show the Equipment which has been added to the System.

5.5 Removal Of Earthing, LV / Mechanical Equipment

Following the physical disconnection being made between Earthing, LV and Mechanical Equipment, and the rest of the System those items will be declared as not being part of the System and defined as Plant, using one of the following options:

- The Equipment will become Plant after the last disconnection from the System.
- The Equipment will become Plant immediately after cancellation of the Safety Document that has been issued for the purpose of disconnecting the Equipment from the System.

Site Specific Risk Assessment and Method Statements shall detail the methods of work. The Local Control Person shall ensure that site drawings and records of the System are updated and relevant personnel made aware of the changes.

5.6 System Connection Form (Appendix B)

On Earthing, LV and Mechanical Plant, prior to a connection between the System and a third party’s system, the third party must confirm to the Occupier’s Representative that they have a Safety Management System in place to manage any hazards introduced by the establishment of the connection.

5.7 Isolation Request Form (Appendix D)

The third party shall have a Safety Management System formally agreed with the Occupiers Representative, to provide isolation if requested across the boundary between the two safety management systems.
6 Document Completion

This procedure needs to be read in conjunction with the relevant parts of TP106.

The Commissioning Engineer will be appointed by an appropriate manager. The Occupiers Representative has the responsibility to produce the relevant documents and certificates.

Where the Control Person Safety (HV) is not at the Transmission Network Control Centre the certificates must be amended as appropriate.

The same HVSSC shall be used for all related changes on the System that take place at the same time and locations. Changes to an HVSCC shall be controlled by reissuing the HVSCC with a new revision number. The defined changes will not become effective until Part 6 of the HVSCC has been completed.

Sections of the certificates shall be completed in the defined order.

The certificates shall be numbered from a register accessed via the Intranet.

The forms in appendices B and D shall be uniquely sequentially numbered from a register managed by the Commissioning Engineer.

Appendix A flow chart describes the process of completing a HVSCC.

Appendix C flow chart describes the process for completing System Connection Form.
APPENDIX A
H.V. SYSTEM CHANGE CERTIFICATE (HVSCC) Flow chart

Unless stated otherwise, the Commissioning Engineer has the responsibility to complete the actions shown.

* Amend if not TNCC Control Person (Safety)

Amend current Operations Diagram with changes to the System (TP 119)

10 weeks

Amend draft

Operations Diagram and requisition to be received by drawing office (see TP 119)

9 weeks

Give feedback to Commissioning Engineer

COMPLETE HEADER
Location, Certificate, Contractor/NATIONAL GRID Operating Unit, Contractor No.

COMPLETE PART 1
Time, Date, Define date to be returned in Section 2

COMPLETE PART 3
Defining changes and matrix defining Ops Diagram changes

1) Issue as draft to Occupier and TNCC Manager
   If subsequent draft state issue “x”
2) Attached “draft Operations Diagrams” defined in the matrix in Part 3

9 weeks

Has Occupier TNCC Manager confirmed acceptance by completing Part 2

Amend and issue draft Site Responsibility Schedules (Rev TP 119)

6 weeks

1) Define date for return in Part 4, issue as final to Occupier and TNCC Manager *, Contractors, National Grid Operational Units for signature in Part 4
2) Book details of the SCC in TOGA

4 weeks

Contractors, National Grid Operational Units, Occupier, TNCC *, complete Part 4

1) Commissioning Engineer signs Section 5 and sends to (TNCC Manager) *
2) Issue signed Site Responsibility Schedule
3) TNCC * confirm TOGA booking
4) Commissioning Engineer gives SAP the original

3 days

Implementation day

1) Control Person (Safety) and SAPs communicate to jointly declare changes in Part 3 effective
2) Control Person (Safety) and SAPs complete Part 6.

Distribute completed certificate
APPENDIX B
SYSTEM CONNECTION FORM (SCF)
(EARTHING, LV AND MECHANICAL)

This document formally authorises connection of Plant under the control of another party’s Safety Management System to the System

LOCATION.......................... NUMBER........................

PART 1 – DESCRIPTION

Plant and where it is connected to the System

PART 2 – SANCTION

I agree to the connection specified in Part 1 from ......... Hrs on .................

Name............................................ Signature........................................... Time............... Date........

National Grid Local Control Person

PART 3 – ISSUE

I agree to the connection onto the National Grid System as specified in Part 1 and accept, on behalf of the Company named below, responsibility for the Management of Safety within our control. The point of connection will always be part of the National Grid System.

Name............................................ Signature........................................... Time............... Date........

Company...........................................

PART 4 – CANCELLATION

The connection specified in Part 1 shall be:-

* 1.Disconnected as from ................. hrs. on .................

* 2. Plant added to the System under the control of the Senior Authorised Person acting as the Local Control Person

Declaration by the Company, associated with option 2

I confirm that all persons in my charge have been warned that the Plant specified in Part 1 will become part of the National Grid System and that no further work shall be done on or near to the Equipment unless it is sanctioned by a Senior Authorised Person in accordance with the requirements of the National Grid Electricity Safety Rules

Company

Name............................................ Signature........................................... Time............... Date........

National Grid

Name............................................ Signature........................................... Time............... Date........

Local Control Person

* Delete as appropriate
APPENDIX C
SYSTEM CONNECTION FORM

PART 1
National Grid Local Control Person & the third party will agree the description

PARTS 1 & 2
National Grid Local Control Person will complete

PART 3
The third party will complete

National Grid & third party retain a copy of the document, National Grid's copy is the master copy

Is Plant described in Part 1 to be added to the System

Yes
Complete PART 4 Item 2

No
Complete PART 4 Item 1
**APPENDIX D**

**ISOLATION REQUEST FORM (EARTHING, LV AND MECHANICAL EQUIPMENT)**

This certificate is used to define and secure and maintain safety precautions across the interface of two Safety Management Systems. A safety document is required prior to work commencing on the equipment. This form is not a safety document.

**LOCATION………………………**

**NUMBER……………..**

| Part 1 | Requester’s Plant/Equipment*
| identification
| * Delete as appropriate

| Part 2 | Requester’s work to be done

| Part 3 | Implementer’s precautions to achieve Safety across the boundary between two safety management systems.

| Part 4 | Implementer’s confirmation that the above Safety Precautions have been established and will not be removed until this document has been cancelled.
| Signature | Name
| Company Name | Time | Date

| Part 5 | Requester’s confirmation of receipt
| Signature | Name
| Company Name | Time | Date

**CLEARANCE**

| Part 6 | Requester’s confirmation that the above Safety Precautions in part 3 are no longer required.
| Signature | Name
| Company Name | Time | Date

**CANCELLATION**

| Part 7 | Implementer’s acknowledgement of cancellation
| Signature | Name
| Company name | Time | Date
APPENDIX E
ISOLATION REQUEST FORM (Flow Chart)

PART 1
Requester identifies Plant/Equipment to be worked on

PART 2
Requester details work to be done

PART 3
Implementer lists precautions to achieve safety across the safety management control boundary

PART 4
Implementer signs to confirm precautions to be maintained until document canceled

PART 5
Requester signs to confirm receipt of document. National Grid retain original Third Party given a copy

PART 6
Requester signs to confirm safety precautions no longer required

PART 7
Implementer signs to acknowledge cancellation of the document and precautions may be removed
Appendix F 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>