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NR/L3/ELP/29987

Module 5

Particular Actions to be Taken by the Infrastructure Maintainer

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1 Purpose

Compliance with this module will preserve the integrity of the 25 kV a.c. electrification system and promote its safe operation through requirements for actions by the Infrastructure Maintainer.

NOTE: Further requirements for working on or about the electrified lines are contained in the Rule Book Module AC (GE/RT8000/AC and Handbook HB16 (GE/RT8000/HB16)).

2 Scope

This module states the requirements for particular actions to be taken by the Infrastructure Maintainer on or about 25 kV a.c. electrified lines.

It is applicable to Network Rail personnel and to Network Rail's contractors.

To provide a consistent approach to working on or about 25 kV a.c. electrified lines, Train Operating Companies may, as best practice, apply this standard to infrastructure they control.

This Standard also includes:

- Work on or about any future sections of electrification on Network Rail controlled infrastructure and areas required to adopt a process for securing points of disconnection to form points of isolation to use the Supplementary Isolation Process (Module X).
- Planning of isolations, testing and earthing of overhead line equipment on Network Rail controlled infrastructure equipped with 750V d.c. overhead line system (Sheffield Tram Train - Module Y).
- Planning of isolations, testing and earthing of overhead line equipment on Network Rail controlled infrastructure equipped with 1500V d.c. overhead line system (Sunderland Metro Systems Operating Area – Module Z).

3 Management of Staff Training and Competence

3.1 General

The general responsibilities of employers, persons on or about the electrified lines and Electrical Control Operators are stated in Module 1.

The Infrastructure Maintainer shall brief persons under their supervision of the danger from live OLE and from live pantographs and other roof-mounted equipment on trains.

The Infrastructure Maintainer shall restrict access to the equipment and into switching station buildings, housings and compounds to only those persons so authorised in accordance with local instructions.

In accordance with the Lifesaving Rules, all staff working adjacent to sealing ends, on risers, bare feeders and associated overhead line feeder disconnectors are to be trained, competent and authorised for this purpose.

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In areas equipped with an autotransformer feeder system, the Infrastructure Maintainer shall arrange for their staff to be aware of the feeding arrangements and to understand the particular risks arising from the presence of the autotransformer feeders and associated equipment.

In areas where the Network Rail OLE abuts or is adjacent to the Network Rail (High Speed 1 Ltd), the Rail For London Infrastructure Limited (Elizabeth Line) or South Yorkshire Supertram Limited (Sheffield Supertram) lines, the Infrastructure Maintainer shall arrange for their staff to be aware and conversant with the interface isolation procedure.

In areas where the OLE is in close proximity to other electrification, the Infrastructure Maintainer shall arrange for persons under their control to be aware of the danger from other electrification systems, and where necessary to be conversant with isolation practices.

Note: Other electrification systems include Network Rail (High Speed 1 Ltd), the Rail For London Infrastructure Limited (Elizabeth Line), or South Yorkshire Supertram Limited (Sheffield Supertram), d.c. third and fourth rail systems and tram systems.

4 Overhead Line Equipment Masts and Structures

4.1 General

The requirements concerning attachments to the OLE and structures and also excavation or other work likely to affect the 25 kV a.c. electrification equipment are stated in Module 4.

5 Actions to be Taken in Relation to Emergency Switch-Offs

5.1 Initial Implementation

In an emergency switch-off scenario, the Electrical Control Operator (ECO) shall switch off the electricity supply from:

- a) all electrical sections between neutral sections, or
- b) all electrical sections between a neutral section and the end of the electrified line, or
- c) all electrical sections (or part sections) in the affected area, provided that a minimum of one remote earth shall be applied to any electrical section or subsection where access is required. This shall be in accordance with the ECR instructions.

If the affected area includes SMOS distribution equipment, the ECO shall de-energise the busbars of the SMOS.

5.2 Actions Following the Initial Implementation

Pending the arrival of the Infrastructure Maintainer's Nominated Person or other suitable staff, and in accordance with electrical control instructions, where remotely controlled earthing devices are installed for this purpose, the ECO may operate them to the earth position.

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When an emergency switch-off has been implemented and all immediate actions to deal with the circumstances on site have been effected, and if the emergency is likely to be prolonged, the ECO shall arrange for the attendance of an Infrastructure Maintainer's Nominated Person and other suitable staff so that the OLE in the affected area can be isolated and earthed and an overhead line permit issued, after which the power may be restored to the unaffected area. The ECO shall advise all persons concerned accordingly.

Having ascertained that all affected persons are fully aware of, and are keeping within, the limits of the appropriate part of the switched-off area, the ECO may then reduce the area of the emergency switch-off to between the earthing devices and neutral sections or terminal end.

5.3 Management of the Emergency Switch-Off

On arrival on site, the Nominated Person shall make themselves known to the person(s) to whom the emergency switch-off was granted and both or all shall contact the ECO and confirm that the Nominated Person is now in charge of the switch-off.

The Nominated Person shall make themselves known to and liaise closely with the Rail Incident Officer and emergency services senior officer, as necessary.

The Nominated Person shall establish the safe working limits for the overhead line permit necessary to allow the emergency to be dealt with and an estimated time to clear the emergency. They shall contact the ECO to:

- a) arrange for the isolation and earthing of the OLE in accordance with Module 7; **and**
- b) arrange for signal protection of the site. The ECO shall contact the Signaller as necessary.

The Nominated Person shall issue an overhead line permit to themselves or the Rail Incident Officer, as necessary, and advise the details of Part 2 of the Form B to the ECO.

The Form C shall be issued for the OLE in accordance with Module 7, clause 19.

5.4 Shortening of the Emergency Switch-Off

The ECO and Nominated Person shall agree Form B limits for the shortened isolation and which disconnectors are to be operated to effect the shortened isolation.

The ECO shall then operate, or arrange to have operated by persons so authorised, the appropriate disconnectors, in accordance with Module 7. The ECO and Nominated Person shall exchange details for the shortened isolation in accordance with Module 7.

The ECO shall carry out such switching as is necessary to re-energise the unaffected sections.

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The ECO shall issue a superseding Form AE for the (sub)section(s) to remain isolated and cancel the Form AE between neutral section(s), earthing device(s) or terminal end.

When confirmation has been received from Network Rail Route Control that all emergency service personnel and members of the public are clear, the Nominated Person shall cancel the existing overhead line permit and issue overhead line permits to other railway personnel or arrange with the ECO for the sections to be made live as appropriate and for the Signaller to be advised.

5.5 Management of Emergency Switch-Off for DNO Infrastructure

In an emergency (e.g. fire, natural disaster, major rail incident etc.), it may be necessary to request an emergency switch-off of an affected DNO substation or incoming feeds to Network Rail infrastructure.

The Rail Incident Officer and emergency services senior officer shall come to an agreement that an emergency switch-off of the affected DNO infrastructure is required.

The Rail Incident Officer shall contact the ECO, who shall then request an emergency switch-off of the infrastructure from the DNO, providing local information such as location and incident description as and when required.

If the DNO agrees to an isolation of their infrastructure, their competent representative shall confirm to the ECO that an emergency switch-off has been granted and provide a description of the isolation details.

Following resolution of the emergency, the Rail Incident Officer and emergency services senior officer shall agree to cancel the DNO emergency switch-off. The Rail Incident Officer shall communicate this to the ECO, who will request a cancellation of the emergency switch-off with the DNO. The competent DNO representative shall confirm cancellation of the emergency switch-off to the Rail Incident Officer, ECO and emergency services senior official.

6 Work Arising at Short Notice Necessitating Isolation and Earthing of Overhead Line Equipment

In exceptional circumstances, work of an urgent nature that cannot be published in the Weekly Operating Notice, Isolation Planning Form (IPF), supplementary planning publication which can be performed completely or in stages between the passage of trains, may be carried out with the prior agreement of the Network Rail Operations Department concerned without the pre-planning arrangements stated in Module 6.

In such circumstances, the allocated Nominated Person shall complete an isolation details form (IDF), as required by Module 6 clauses 5.6 & 5.7.

In such a case, a representative of the Infrastructure Maintainer shall be in charge on site and shall communicate with the ECO, advising them of the nature of the work and its location, the line(s) concerned and the structure numbers between which it is required to carry out the work; also the length of time required for the work or the stages of the work.

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In areas equipped with the autotransformer feeder system, the representative of the Infrastructure Maintainer in charge on site shall agree with the ECO any additional OLE switching arrangements to make the autotransformer system safe.

7 Removal of Objects From and Near to the Overhead Line Equipment

Removal of objects shall only be undertaken by staff trained and certificated in the use of live line tools conforming to, and used in accordance with, Network Rail standard NR/L2/CTM/014.

NOTE 1: Removal may be undertaken with the OLE switched off but not earthed.

NOTE 2: Where justified and the risks assessed, the object may be removed with the OLE live.

If the object cannot be safely removed, the OLE shall be isolated and earthed and an overhead line permit issued to enable removal to take place in accordance with Module 7.

Those staff so certificated who are going to remove the object from the OLE shall:

- a) contact the ECO and inform the ECO that they have arrived on site; **and**
- b) arrange for the OLE to be switched off if appropriate; **and**
- c) obtain permission from the ECO to attempt to remove the object from the OLE; **and**
- d) inform the ECO that either the object has been removed from the OLE or that it is not possible to remove the object from the OLE; **and**
- e) inform the ECO whether any damage has been done or whether any further action needs to be taken.

NOTE 3: If the electricity is to be switched off, the ECO will agree with the Operations Control, the signal box Supervisor or Signaller (whichever is appropriate) that the electricity may be switched off from the complete sections without blocking them.

8 Use of Cranes, Plant and Equipment or Similar Apparatus Capable of Being Extended

Whenever such plant or equipment has to be used on or near to the electrified lines, the work shall not commence until the OLE has been isolated and earthed and an overhead line permit obtained, or where the outcome from a risk assessment in accordance with Modules 2 and 3 provides a method whereby the work may be carried out without an isolation.

Whenever possible, work shall be carried out without interfering with the OLE. If this equipment has to be adjusted or removed, the adjustment or removal shall be done by only the Infrastructure Maintainer's staff or competent contractor's staff in accordance with Network Rail standards NR/L2/CTM/014 and NR/L2/CTM/028.

Even though the OLE has been isolated and earthed and an overhead line permit received, avoid damaging the OLE, connections or supports. If any damage is caused it shall be reported immediately to the ECO quoting the nearest OLE structure number.

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9 Bonding and the Traction Return Circuit

The actions to be taken by the Infrastructure Maintainer in respect of bonding, including the reporting and repair of defective bonds, interrupted continuity of running rails, alterations to the permanent way and use of on-track machines necessitating the removal of bonds, shall be in accordance with Module 4.

10 Emergency Sluicing of the Line

The Infrastructure Maintainer's representative shall act in accordance with Module 4 clause 8.2.

11 Examination of Overhead Line Equipment Following an OLE, Pantograph or Traction Supply Incident

11.1 Action to be Taken Following the Tripping of the Traction Supply

If damage to the OLE is suspected, the Signaller, in consultation with the ECO, shall:

- a) arrange to have an examination of the line(s), **and**.

NOTE: This will be either an examination undertaken using a train or an examination on foot.

- b) protect the line in accordance with the Signalling Regulations; **and**
- c) come to a clear understanding of the line(s) to be examined and the type of examination of the OLE to be undertaken.

If the examination confirms that there is no damage or irregularity affecting the OLE, trains may be allowed to pass through the affected area.

All subsequent trains shall be stopped, and the driver informed of the circumstances and instructed to proceed cautiously over the affected portion of line, at a speed not exceeding 20 mph.

Except when an on-train fault has occurred which does not affect the OLE in any way, the ECO shall additionally arrange for the OLE on all lines concerned to be examined by Infrastructure Maintainer's staff.

When the Infrastructure Maintainer's staff are examining the OLE, normal working shall not be resumed by the Signaller until the examination is completed and they have been advised that the Infrastructure Maintainer's staff are satisfied that no defect exists with the OLE.

11.2 Movement of Failed Trains

If a train has a damaged pantograph, or evidence exists that part of the train or its load other than the pantograph has been in contact with the OLE, then it shall be moved only if:

- a) the OLE has been switched off and authority given by a member of the Infrastructure Maintainer's staff for the train to be moved to a location away from the OLE for the defect or damage to be repaired; **or**

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- b) the defect has been repaired, or made safe, by a competent technical representative of the train operating company who has declared the train fit to move; **or**
- c) it is necessary to move the train in emergency.

12 Working on Structure Mounted 25 kV Auxiliary Supplies Transformers and Associated Voltage Regulators

The requirements for isolation and earthing of, and the carrying out of work on, this equipment are stated in Modules 7 and 11.

13 Working on Structure Mounted Earthing Devices or Harmonic Dampers

The requirements for isolation and earthing of, and the carrying out of work on, this equipment are stated in Modules 7 and 11.