MNT/013/001 – Code of Practice for Avoidance of Danger from Overhead Electric Lines during Vegetation Management Activities

1. Purpose

This document provides guidelines on the safe working practices which are to be adhered to whilst carrying out vegetation management activities in proximity to Northern Powergrid's overhead network, at all voltages. These guidelines should be used in accordance with the Energy Networks Associations (ENA) publication Engineering Recommendation G55/4 – Safe Tree Working in Proximity to Overhead Electric Lines.

This document supersedes all previous codes of practice in place for vegetation management activities including Safety Code of Practice E3 and Procedure P68.

This document supersedes the following documents, all copies of which should be destroyed.

Document Reference	Document Title	Version	Published Date
MNT/013/001	Code of Practice for Avoidance of Danger from Overhead Electric Lines during Vegetation Management Activities	1.0	September 2012
MNT/013/001	Code of Practice for Avoidance of Danger from Overhead Electric Lines during Vegetation Management Activities	2.0	September 2014
MNT/013/001	Code of Practice for Avoidance of Danger from Overhead Electric Lines during Vegetation Management Activities	3.0	June 2020

1.1. Background

Routine vegetation management activities are outsourced to service providers utilising a framework contract agreement. As part of the terms and conditions of the framework contract service providers are required to carry out works to national standards in accordance with ENA specifications and guidelines. All staff employed by approved service providers should hold the relevant arboriculture certification. Northern Powergrid operates a suite of authorisation codes that each contractor is also required to pass before being able to carry out vegetation management works on our network. In addition to the routine work direct labour may be requirement to carry out minor works during post fault restoration activity and shall hold the appropriate authorisation codes.

The risk of injury associated with any task may be minimised with a work plan based on risk assessment; the use of competent staff; the provision of suitable equipment and the application of safe working procedures. The code of practice details the actions that should be taken when preparing tree work in proximity to overhead network to ensure that the risk of an incident is minimised.

2. Scope

2.1. In Scope

The approach set out in this document is recommended for all tree work carried out in proximity to Northern Powergrid's overhead network by approved framework contractors or direct labour. In particular the code of practice details the procedures to be followed when cutting vegetation that is in the vicinity zone, live zone or has the potential to breach either the vicinity or live zone.

All service providers will adhere to this code of practice whilst operating within a framework contract on behalf of Northern Powergrid.

2.2. Out of Scope

Any third party not in the employment of Northern Powergrid wishing to carry out tree work in proximity to live electrical equipment.

2.3. Table of Contents

3. Code of Practice

3.1. Introduction

This document is intended as a supplement to ENA Engineering Recommendation G55/4 and details the processes and requirements issued by Northern Powergrid to its service providers to allow them to work safely and efficiently whilst carrying out vegetation management activities in proximity to our overhead network. This document supersedes any previous code of practices, documentation and training material issued.

The processes and detail included within the document will cover the following:

- Minimum competency requirement of contracted staff working on our network,
- The documentation required when carrying out tree work and
- The Control procedures in place to ensure safe working practices

The document will also be used in accordance with the relevant Northern Powergrid training courses for vegetation management authorisation codes.

3.2. ENA Engineering Recommendation G55/4

The purpose of ENA G55/4 was to provide a common basis for safe working practices for tree work in proximity to any DNO's equipment. It sets out to differentiate between works carried out by or on behalf of DNO's and works carried out by third parties not in their employ. The primary focus of this document is to provide detailed advice to ENA Member Companies. Third parties will be steered towards existing publications for guidance.

ENA G55/4 also provides guidance in the establishment and use of management procedures to achieve the safest possible working practices. It takes into account developments in a maturing vegetation management industry and seeks to avoid any confusion in relating to the referenced documents. ENA G55/4 was issued as a replacement for the previous version of G55/3 with the significant changes being as follows:

- To incorporate the contents of SHE Standard 04 into Annex B of G55/4 relating to the "Rationale for adopting the distances for LV live zone".
- To incorporate references to key related documents including *SHE Standard 04 'G55/3 Live Zone LV & HV Distance'*, *BS EN 50110-2, Work at Height Regulations*, *Wildlife & Countryside Act, ENA EREC G56 and ENA EREC G96.*
- The definition for "lightly insulated conductor" and "non-insulated conductor" added.
- Requirements that DNO's must meet the Electricity at Work Regulations, need to categorise and re-asses trees in relation to the overhead line and must have an approved method of carrying out the work safely.
- The method for the categorisation of trees has been amended to emphasise the position of the crown of the tree as well as the branches. With a requirement that "No person shall work above any live conductor." amended to "No person shall work in a position vertically above the vicinity zone of any live conductor".
- Caution note added that this does not preclude working above the height of a live conductor outside the Vicinity Zone but such work shall ensure that there is no possibility of any part of the equipment and/or the operative could breach the Vicinity Zone and a caution note added to emphasise the importance of ensuring that the conductors are 'effectively insulated' before adopting this work procedure.
- Requirement that DNO's have monitoring systems to ensure the requirements of EREC G55 are achieved, made mandatory.

3.3. Competence of Persons

It is the responsibility of the approved contractor to ensure that all staff sent to work are suitably trained, qualified and assessed as competent in arboricultural work and electrical awareness. Utility arboriculture qualification, training and assessment should comply with a nationally recognised industry standard and certification available for inspection by Northern Powergrid.

The table below details the minimum competencies for carrying out works within this code of practice:

Minimum requirements for all surveying staff:	• Hold 003840 – "City & Guilds Level 4 Certificate of Competence in Utility Arboriculture Surveyor" • Hold 003841 – "City & Guilds Level 4 Certificate of Competence in ETR 132 Resilience Arboricultural Surveyor" (previously NPTC UA5) or • At least 2 years' experience with a proven track record
Minimum requirements for all cutting staff carrying out work on vegetation within the vicinity zone:	• Hold 003830 "City & Guilds Level 3 Certificate of Competence in Utility Arboriculture Basic Electrical Knowledge" (Previous NPTC UA1) • Hold 003831 – "City & Guilds Level 3 Certificate of Competence in Utility Arboriculture Tree Species Recognition, Growth Characteristics and Associated Hazards" (Previous NPTC UA2.2) and • Hold 003832 – "City & Guilds Level 3 Certificate of Competence in Utility Arboriculture Ground-based Pruning" (Previous NPTC UA2.2) • Hold 003833 "City & Guilds Level 3 Certificate of Competence in Utility Arboriculture Aerial Pruning" (Previous NPTC UA2.3 - cutting from within the tree" • Hold 003834 "City & Guilds Level 3 Certificate of Competence in Utility Arboriculture Assisted Tree Felling" (Previous part of NPTC UA2.2) • Hold 003835 "City & Guilds Level 3 Certificate of Competence in Utility Arboriculture Use of a Chainsaw from a Mobile Elevating Work Platform (MEWP)"
Northern Powergrid authorisation codes for carrying out tree works in within the vicinity zone:	• LV work requires W13.3 • HV work requires W13.6

In addition to the above contractors will be expected to have attended G55/4 familiarisation training with regards to the bespoke categorisation of trees and risk assessment documentation and processes.

3.4. Working Procedures

3.4.1. Live, Vicinity and Proximity Zone Distances

The categories of area where electrical equipment presents a danger when carrying out vegetation management are defined as Proximity, Vicinity and Line Zones.

The Proximity Zones are further categorised as detailed in ENA ER G/55:

- Proximity Zone 1 – within two tree lengths of any live equipment
- Proximity Zone 2 – within 9 m of any live equipment up to and including 66kV and/or 15 m of any live equipment greater than 66kV

The table below details the nationally agreed vicinity zone and live zone distances as referred to within this document and ENA Engineering Recommendation G55. The vicinity zone distances include the live zone.

System Voltage	Live Zone	Vicinity Zone
Up to and including 1kV	0.3m	1.0m
Up to and including 20kV	0.8m	2.0m
Up to and including 33kV	0.8m	2.5m
Up to and including 66kV	1.0m	3.0m
Up to and including 132kV	1.4m	3.5m

Table 1: Source: – ENA ERG55 Standard 04 – G55 Live Zone and Vicinity Zone Distance

3.4.2. Northern Powergrid Requirements

All works should be carried out utilising the Vegetation Management work prescription, as shown in Appendix 1a, for tree works adjacent to our overhead network. The table shown in Appendix 1a details the documentation and procedures that are required to carry out works in line with ENA Engineering Recommendation G55/4, broken down into each individual category of tree. Examples are also included in Appendix 1b showing the types of tree positions in question. The ENA Engineering Recommendation G55/4 should be referenced for a full detailed breakdown of each individual category of tree.

The table provides a breakdown of the work type that can be carried out for each type of category of tree as follows:

- Shutdown – all works to be carried out dead
- Live Work – works to be carried out within the vicinity zone, live zone or has the potential to breach the vicinity or live zone and control to be notified if required in line with appendix 1a
- Proximity Work – works carried out in proximity to the network with no requirement to inform control.

For each work type guidance is provided on the documentation required to be in place including live line justifications and Control notification processes.

3.4.3. Documentation

As part of the surveying process a justification for live tree cutting must be completed, using the live working justification flowchart for all feeders and substations. A copy of the flowchart is shown in Appendix 2, and follows a series of questions and pointers to identify a justification for carrying out the work live. If no justification can be found all works should be carried out dead.

In addition to the justification a risk assessment for tree works adjacent to overhead networks must be completed for each individual tree site. An example copy of the risk assessment is found in Appendix 3 however Service Providers may choose to set up an electronic version of the risk assessment, providing the relevant information is included. The risk assessment shall identify the category of tree in line with ENA Engineering Recommendation G55/4 and therefore the type of work that can be undertaken (refer to Appendix 1a). Photographs must be provided for all HV and EHV sites where vegetation is in the live zone or has the potential to breach the live zone. The photographs will be attached to the risk assessment to form part of the approval pack. Photographs are also required for all vegetation inside the vicinity zone on 132kV sites.

Both documents must be signed off by a nominated Northern Powergrid representative before any works can be carried out.

3.4.4. Additional Requirements

The following are specific Northern Powergrid requirements in addition to the procedures listed in ENA Engineering Recommendation G55/4 and those outlined above:

- No part of any person's body shall ever breach the vicinity zone with the exception of LV
- No work to be carried out directly over and above the conductors with the exception of LV
- No tools and equipment must enter the live zone with the exception of LV W13.3 procedures
- Only approved insulated tools or equipment can breach the vicinity zone
- A minimum of 3.6m of insulated rods must be used. Maximum of five rods or 6m in length
- MEWP's can only be used on the LV network, as per the current W13.3 procedures and training course.
- Suitable precautions, including the provision of suitable protective equipment, are taken to prevent injury.

3.4.5. Compliance

To ensure the code of practice is adhered to there are a number of processes that will measure compliance to the procedures and enable continual review of these working practices.

These include:

- Northern Powergrid's 159 Reporting Hotline for any accidents or incidents
- Exception reports initiated to investigate accidents and incidents
- Safety audits carried out by internal Northern Powergrid staff
- Safety performance KPI's monitored on a monthly basis with individual service providers
- Northern Powergrid authorisation codes issued to individual contractor staff, and regular refreshers required to ensure codes remain current
- National industry channels reporting and reviewing safety incidents within the industry
- Regular review of documentation to ensure fit for purpose.

4. References

All documents referenced will be the latest versions of the relevant Northern Powergrid documents, Industry Regulations, International Standards, British Standard Specifications and all relevant Energy Network Association Technical Documents current at the time.

4.1. External Documentation

Reference	Title
	Electricity at Work Regulations 1989
AFAG805	Arboriculture and Forestry Advisory Group (AFAG) Guide 805
ENATR 132	ENA Engineering Technical Report 132
ENATR 136	ENA ETR 136 – Vegetation Management Near Electricity Equipment
ENATR G55/4	ENA Engineering Recommendation G55/4
ENATS 43-08	ENA Technical Specification 43-08 – Overhead Line Clearances
ESQCR	The Electricity, Safety, Quality and Continuity Regulations (ESQCR)

4.2. Internal Documentation

Reference	Title
DSR	Distribution Safety Rules
MNT/013	Policy for the management and control of vegetation near overhead lines
OPM	Operational Practice Manual

4.3. Amendments from Previous Version

Reference	Description
3.3 Competence of Persons	Correction or typo – the word EHV has been removed from the table detailing “HV & EHV work required W13.6”

5. Definitions

Term	Definition
EHV	Extra High Voltage
HV	High Voltage
Live Zone	The zone around an exposed live circuit conductor or supporting insulators where there is a danger of burn or electric shock if any part of a person’s body or non-insulated tool enters the zone. The distances are shown in Table 1 – Section 3.4.1
LV	Low Voltage
NPTC	Arborist Safety certificates and qualifications
UA	Utility Arborist courses for competence
Vicinity Zone	The zone around an exposed live circuit conductor where the danger of burn or electric shock is prevented because the Live Zone is not breached. The distances are shown in Table 1 – Section 3.4.1. The live zone is included within the vicinity zone distances.
W13.3	Authorisation code for vegetation management work within the vicinity zone of live LV lines using live line techniques
W13.6	Authorisation code for vegetation management work within the vicinity zone of live HV lines

6. Authority for Issue

6.1. CDS Assurance

I sign to confirm that I have completed and checked this document and I am satisfied with its content and submit it for approval and authorisation.

		Date
Liz Beat	Governance Administrator	16/05/2022

6.2. Author

I sign to confirm that I have completed and checked this document and I am satisfied with its content and submit it for approval and authorisation.

Review Period - This document should be reviewed within the following time period;

Standard CDS review of 3 years?	Non Standard Review Period & Reason	
Yes	Period: n/a	Reason: n/a
Should this document be displayed on the Northern Powergrid external website?		Yes
		Date
G Hammel	Senior Policy & Standards Engineer	24/05/2022

6.3. Technical Assurance

I sign to confirm that I am satisfied with all aspects of the content and preparation of this document and submit it for approval and authorisation.

		Date
M Emsley	Programme Manager	17/05/2022
P Sanderson	Operational Training Engineer, Safety, Health & Environment	16/05/2022
T Oates	Vegetation Management Manager	22/06/2022
Joe Helm	Senior Policy & Standards Manager	19/05/2022
Gordon Burrows	Regional Manager	31/05/2022

6.4. Authorisation

Authorisation is granted for publication of this document.

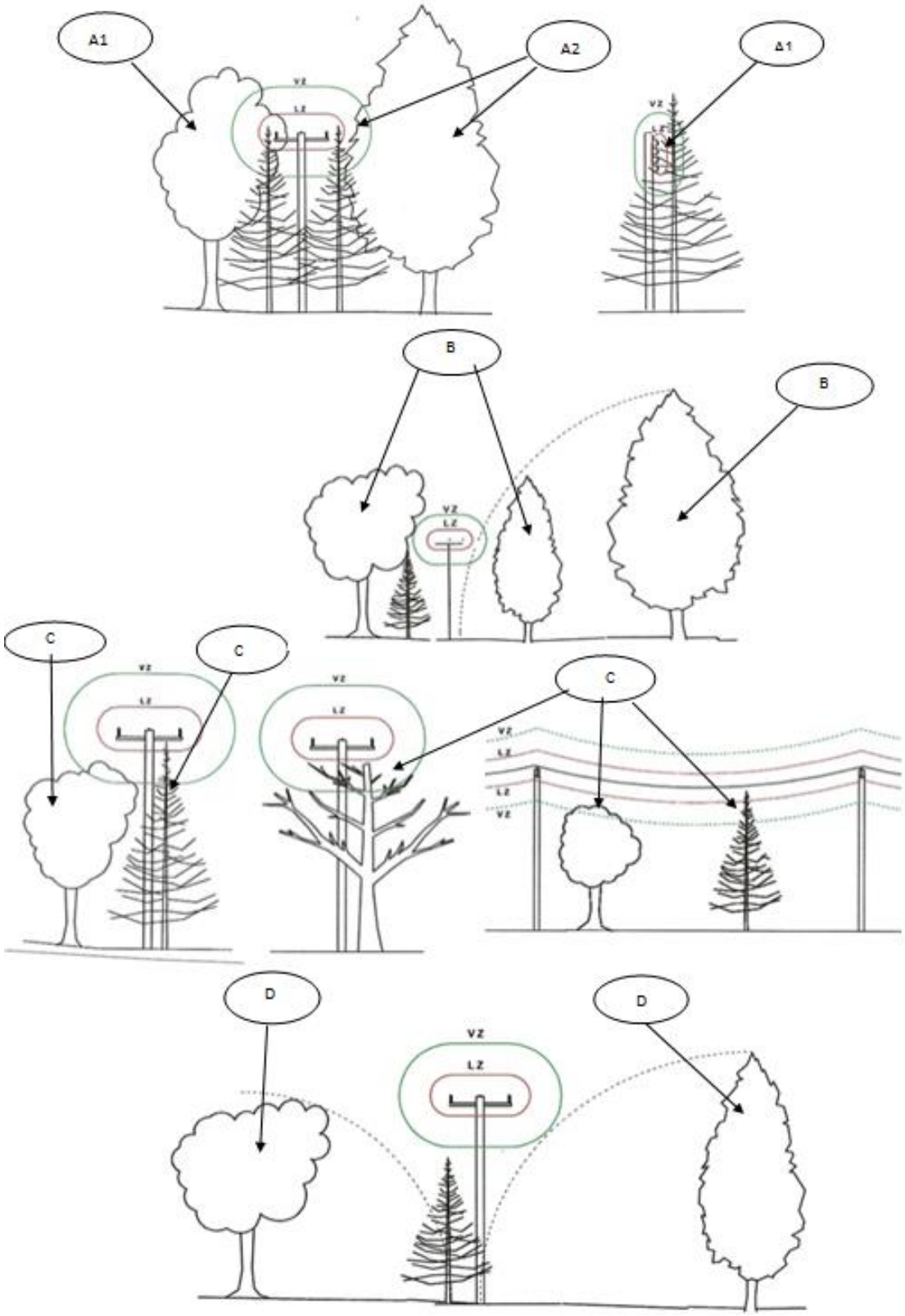
		Date
Paul Black	System Engineering Manager	27/06/2022

Appendix 1a - Vegetation Management Work Prescription Table

Tree Position	G55/2 Category	Voltage	Work Condition	Work Type	Documentation to be in place	EG:
Any vegetation directly over the conductors. Branches within the **Live and Vicinity Zone**, with the potential to contact electrical equipment / conductors.	**G55 Cat A**	All	**Shutdown**	Work carried out with line dead, under permit-to-work via control	Risk Assessment, Live Working Justification. Control notified by normal working procedures	**A1**
Vegetation above conductor height that is in the **Live or Vicinity Zone** with no potential to contact electrical equipment / conductors.		LV.	**Live work to W13.3**	Trees pruned from ground level or MEWP using Approved Insulated Tools	Live Working Justification	**A2**
		HV & 33/66KV	**Live Work**	Vegetation in the vicinity zone can be cut from ground level providing the vegetation cannot enter the live zone	Risk Assessment signed by Northern Powergrid, Live Working Justification.	
		HV	**Live Work**	Small lengths of vegetation within the live zone can be cut from within the vicinity zone (from ground level), providing no vegetation has the potential to contact electrical equipment.	Risk Assessment signed by Northern Powergrid, Live Working Justification. Live line pocket book to be completed, control to be notified by outage request (1 point) and a phone call on the day of the work (HV)	
Any vegetation that is adjacent or above conductor height, Outside the **Vicinity Zone** and has the potential to enter the **Vicinity Zone**.	**G55 Cat B**	LV	**Live work to W13.3**	Trees pruned from ground level or MEWP using Approved Insulated Tools	Live Working Justification	**B**
		HV & 33/66KV	**Live Work**	Vegetation outside the vicinity zone can be cut from ground level using approved insulated tools, providing the vegetation cannot enter the live zone	Risk Assessment signed by Northern Powergrid, Live Working Justification.	
		132KV	**Shutdown**	No work to be carried out if any vegetation can enter the Vicinity zone on 132KV		
Any Vegetation below conductor height in the **Live or Vicinity Zone.** (No vegetation should be touching the conductors) .	**G55 Cat C**	LV	**Live work to W13.3**	Trees pruned from ground level or MEWP using Approved Insulated Tools	Live Working Justification	**C**
		HV	**Live work**	Trees pruned from ground level using approved insulated tools	Risk Assessment signed by Northern Powergrid, Live Working Justification	
		33/66KV	**Live work**	Vegetation within the live zone can be cut from within the vicinity zone (from ground level), No tools should enter the live zone		
		132KV	**Live work**	132KV No vegetation to be cut within the live zone on 132KV below the conductors		
Vegetation outside the **Vicinity Zone** with no potential to breach the **Vicinity Zone**	**G55 Cat D**	All	**Proximity Work**	Trees can be pruned, sectioned or felled with non-insulated tools, such as chainsaws.	Risk Assessment.	**D**

LV live work can be completed in association with W13.3 procedures* ** No Tools & Equipment to enter the Live Zone

Appendix 1b – Vegetation Management Work Prescription Examples



Appendix 2 – Live Working Justification Flowchart

HV Live Working Justification Flow Chart

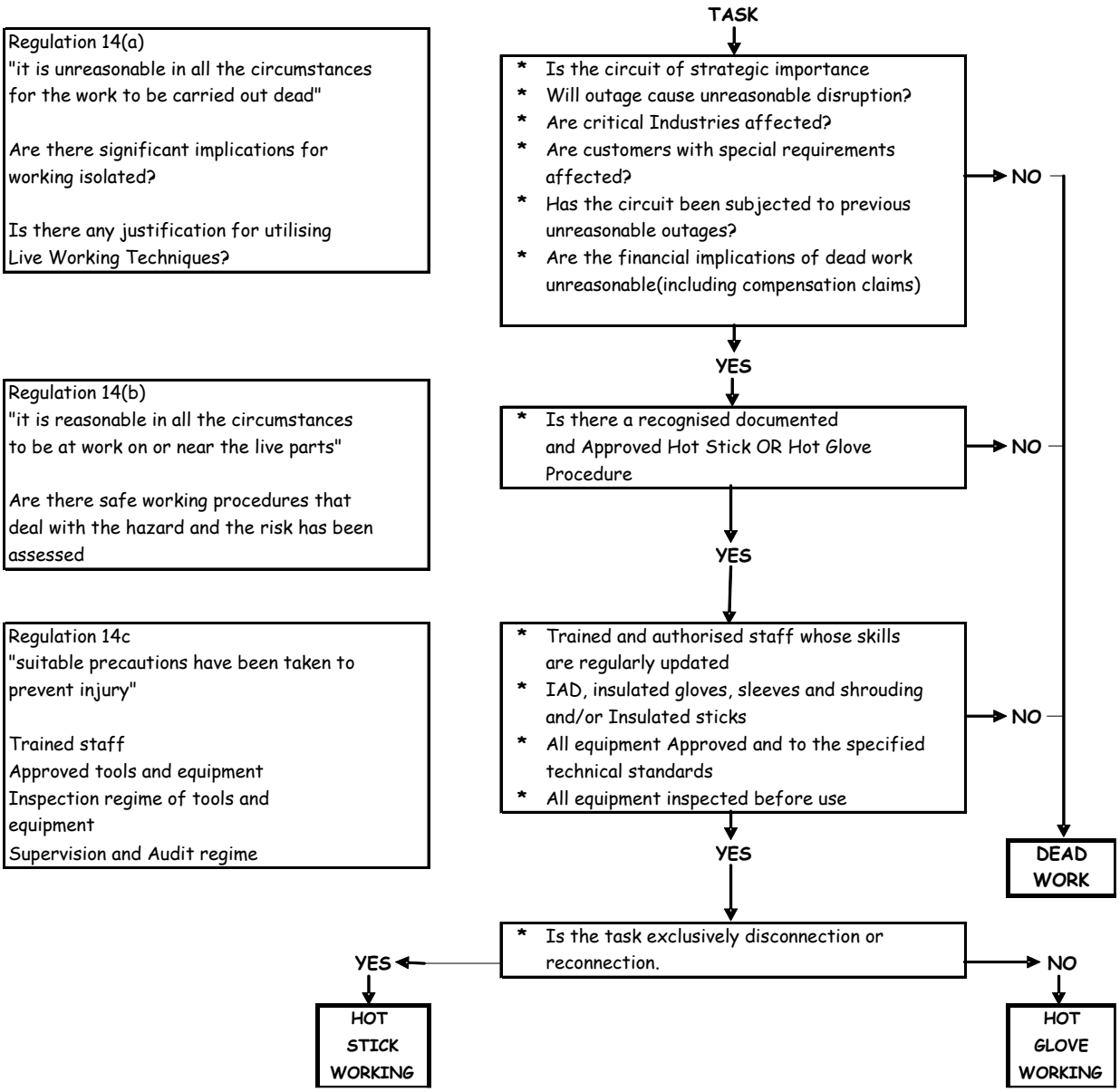
Work Location _____

Work Description _____ Date required _____

Work Initiator _____

Justification Reviewed by _____

Hot Stick ☐
Hot Glove ☐



Appendix 3 – Risk Assessment for Tree Working Adjacent to Overhead Networks

The below form is for example purposes and may be presented in a different format by the service provider

Risk Assessment for Tree Works Adjacent to Overhead Networks

Insert Tree Category G55/2 Cat A,B,C,D ☐

Northern Powergrid Authorisation Required Yes No

Has the live working justification been followed Yes No

Permission No:	Site Number:	Feeder Name	
Pole From: to	Line No:	Photo: Yes / No	
Date of Assessment	Name of Assessor	**Voltage – 132KV, 66KV, 33KV, HV, LV**	☐

Does the tree have branches to be cut, over ☐ above ☐ to the side ☐ under ☐ the conductor?

Insert distance over ☐ above ☐ to the side ☐ under ☐

Can the branch being cut enter the vicinity zone?
- Yes → **Can the branch be cut / controlled to prevent contact with the conductors or associated pole equipment?**
  - Yes → **Does the cutting head need to enter the live zone (all voltages).** (Vegetation can be cut on LV providing this can be done by approved techniques via access from a MEWP)
    - No → **W13.6 / W13.3 Live Tree works Adjacent to overhead lines** ☐
    - Yes → **Outage Required** ☐
  - No → **Outage Required** ☐
- No → **Proximity Working** ☐

Has any Vegetation the potential to enter the live zone

Yes ☐ No ☐

Has any Vegetation the potential to enter the vicinity zone

Yes ☐ No ☐

Northern Powergrid Work Prescription Category (for notification of control)

A1 ☐ A2 ☐ B1 ☐ B2 ☐ B3 ☐ C1 ☐ C2 ☐ D1 ☐ D2 ☐

Comments

Northern Powergrid Authorisation - Signature ..... **Print** .....

Has a site visit being carried out? No ☐ Yes ☐ **Date** .....

TO BE COMPLETED PRIOR TO COMMENCING ANY WORK, IN EITHER THE LIVE OR VICINITY ZONES as per competencies above and written authorisation from Northern Powergrid.

I am starting work on …./…./…. at ……am/pm* and confirm that I have read and understood this Risk Assessment. The Risk Assessment is/ is not* valid and work can/ cannot* proceed. I have read & discussed the Risk Assessment with the team on site and everyone agrees and understands it. (* delete as appropriate)

Team Leader: ..... Signature of Team Members: .....