NORTHERN POWERGRID

Working together with agriculture to save lives

Information guide for the agricultural industry

Contents

POWER CUT?
CALL 105

In the event of an emergency call us immediately on 105.

Welcome

This guide has been prepared to help you when you're working with agricultural machinery.

The content includes public sector information published by the Health and Safety Executive (HSE) about working safely near to, and underneath, overhead power lines.

About Northern Powergrid

Northern Powergrid is responsible for delivering electricity to over 8 million customers across 3.9 million businesses and homes.

Who we are

Northern Powergrid is owned by Berkshire Hathaway Energy (BHE) and we are a Distribution Network Operator (DNO), operating through our subsidiary companies, Northern Powergrid (Northeast) Ltd and Northern Powergrid (Yorkshire) Ltd, which are electricity distribution network operators, and hold two of the 14 regional distribution licences in the UK.

Integrated Utility Services (IUS) is a subsidiary of Northern Powergrid and operates independently of the distribution business. IUS provides engineering resources, including strategic and technical design of electrical distribution systems, through to construction, installation and commissioning of assets for all system voltages up to 132kV.

What we do

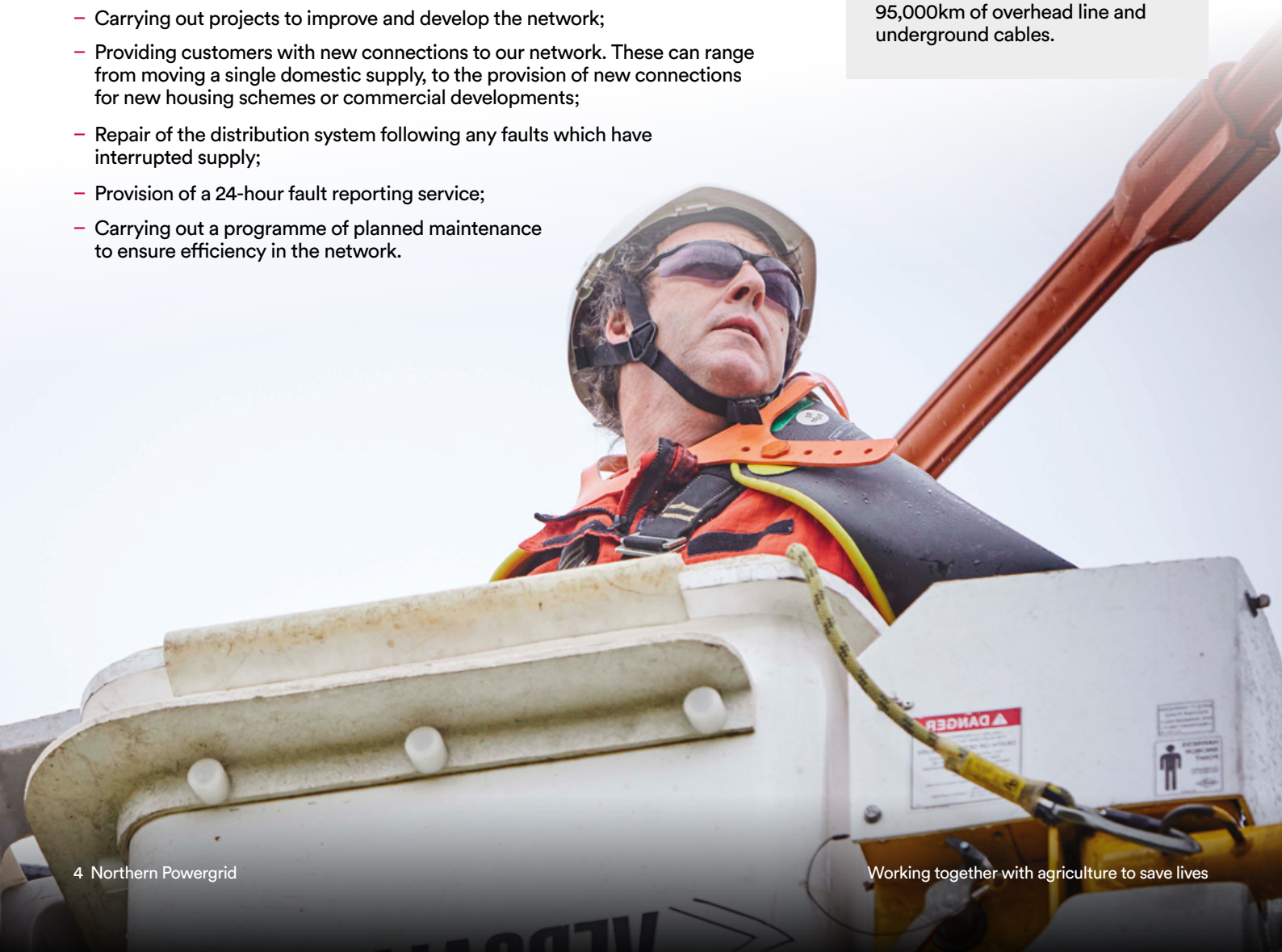
Northern Powergrid is also responsible for:

- Setting policies for improving and replacing the region's electricity network as necessary;
- Carrying out projects to improve and develop the network;
- Providing customers with new connections to our network. These can range from moving a single domestic supply, to the provision of new connections for new housing schemes or commercial developments;
- Repair of the distribution system following any faults which have interrupted supply;
- Provision of a 24-hour fault reporting service;
- Carrying out a programme of planned maintenance to ensure efficiency in the network.

Our business

Covering an area of 25,000 square kilometres, Northern Powergrid's network extends from north Northumberland, south to the Humber and northern Lincolnshire, and from the east coast to the Pennines.

The network consists of more than 60,000 substations and 95,000km of overhead line and underground cables.



Working together with agriculture to save lives

Who supplies and distributes the region's electricity?

It is important to differentiate between the distribution and supply businesses within the UK electricity industry.

A distribution business such as Northern Powergrid is responsible for the distribution of electricity within a licensed area.

Distribution businesses deliver the electricity to homes and business premises along underground cables and overhead lines.

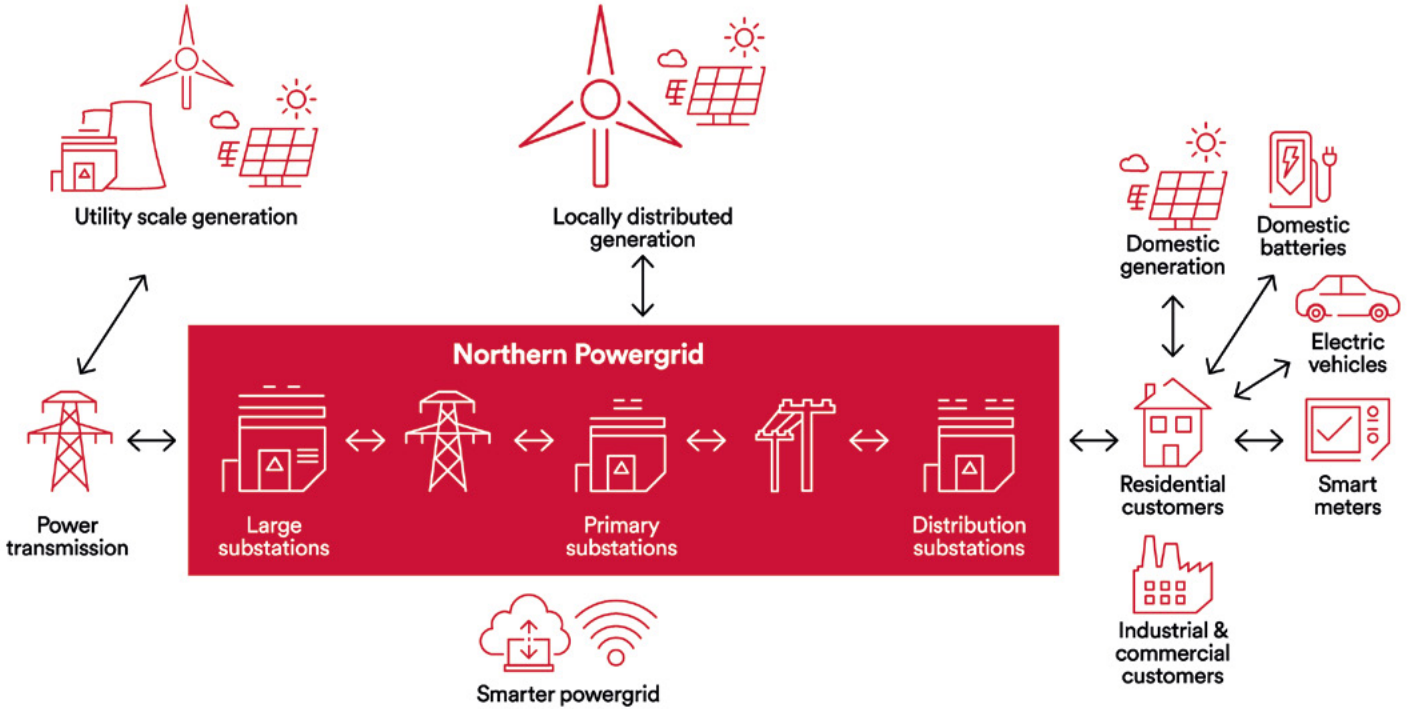
Even though consumers are able to change their chosen electricity supply company, the electricity will always be delivered by the distribution business licensed to serve the area where the consumer lives, or has business premises.

Northern Powergrid is one of these businesses.

Electricity supply companies are those to which householders and businesses pay their electricity bills. As well as electricity, many of them also offer other services including gas and insurance.

Where we fit into the industry

Our power network transports electricity between the national grid and the connection to your home or business, operating at voltages from 132,000 volts down to 230 volts at our connection to domestic premises.



GS6 - HSE Publication

Avoiding danger from overhead power lines

Every year people at work are killed or seriously injured when they come into contact with live overhead electricity power lines.

These incidents often involve:

- machinery, e.g. cranes, lorry-loader cranes, combine harvesters, and tipping trailers;
- equipment, e.g. scaffold tubes and ladders;
- work activities, e.g. loading, unloading, lifting, spraying, and stacking.

If a machine, scaffold tube, ladder, or even a jet of water touches or gets too close to an overhead wire, then electricity will be conducted to earth.

This can cause a fire or explosion and electric shock and burn injuries to anyone touching the machine or equipment. An overhead wire does not need to be touched to cause serious injury or death as electricity can jump, or arc, across small gaps.

One of the biggest problems is that people simply do not notice overhead lines when they are tired, rushing or cutting corners. They can be difficult to spot, e.g. in foggy or dull conditions, when they blend into the surroundings at the edge of woodland, or when they are running parallel to, or under, other lines. Always assume that a power line is live unless and until the owner of the line has confirmed that it is dead.

HSE Guidance Note GS6
This general series guidance note is for people who may be planning to work near overhead lines where there is a risk of contact with the wires, and describes the steps you should take to prevent contact with them.

It is primarily aimed at employers and employees who are supervising or in control of work near live overhead lines, but it will also be useful for those who are carrying out the work.

This guidance is available on the HSE website: **www.hse.gov.uk**

Figure 1: 275kV transmission line

Figure 2: 11kV distribution line

Figure 3: 400V distribution line

Types of overhead power lines and their heights

Most overhead lines have wires supported on metal towers/pylons or wooden poles – they are often called 'transmission lines' or 'distribution lines'. Some examples are shown in Figures 1–3 on page 6.

Most high-voltage overhead lines, ie greater than 1000V (1000V = 1kV) have wires that are bare and uninsulated but some have wires with a light plastic covering or coating. All high-voltage lines should be treated as though they are uninsulated.

While many low-voltage overhead lines (ie less than 1kV) have bare uninsulated wires, some have wires covered with insulating material.

However, this insulation can sometimes be in poor condition or, with some older lines, it may not act as effective insulation; in these cases you should treat the line in the same way as an uninsulated line. If in any doubt, you should take a precautionary approach and consult the owner of the line.

There is a legal minimum height for overhead lines which varies according to the voltage carried. Generally, the higher the voltage, the higher the wires will need to be above ground (see Figure 4).

Equipment such as transformers and fuses attached to wooden poles and other types of supports will often be below these heights.

What does the law require?

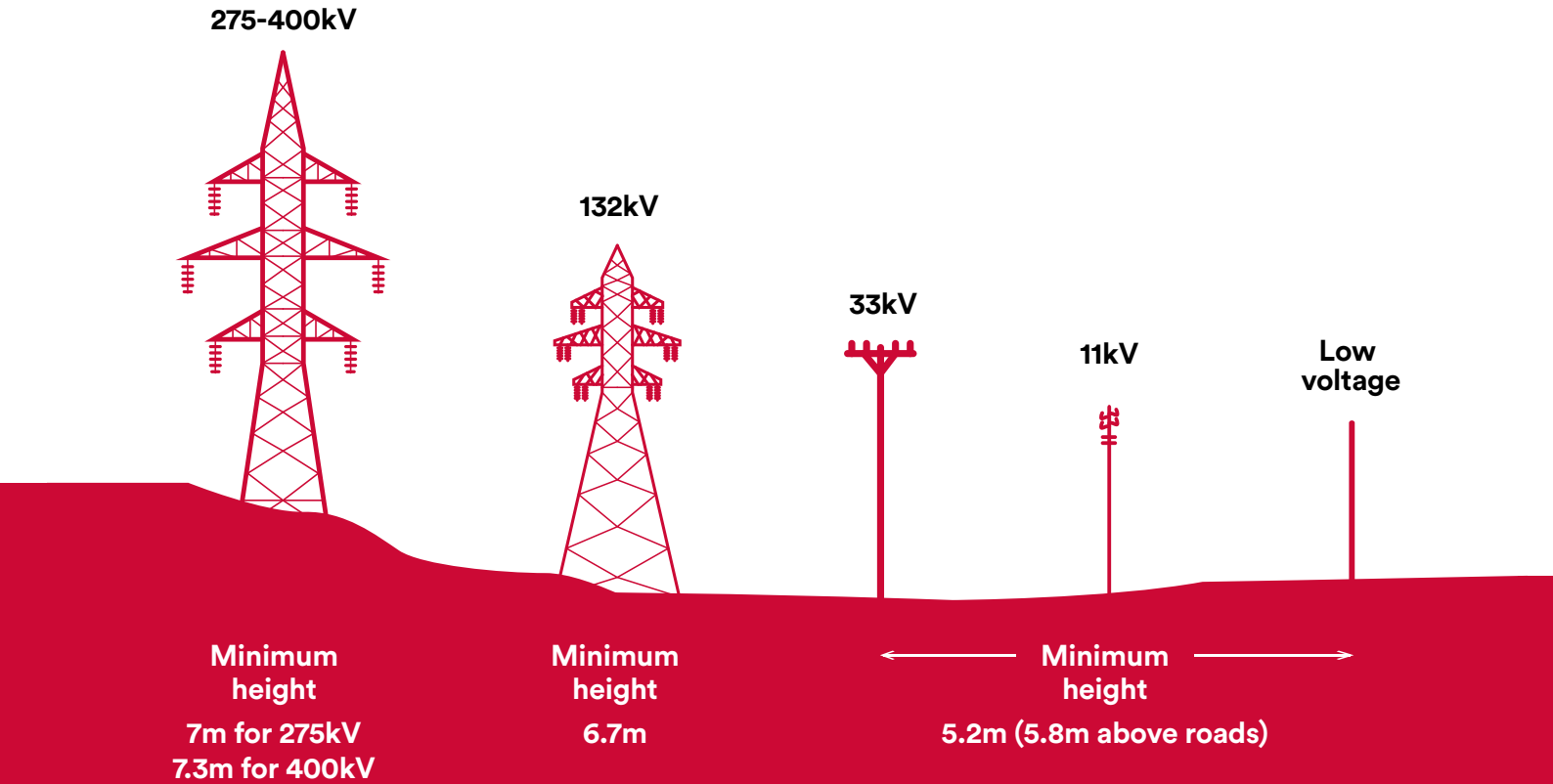
The law requires that work may be carried out in close proximity to live overhead lines only when there is no alternative and only when the risks are acceptable and can be properly controlled.

You should use this guidance to prepare a risk assessment that is specific to the site. Guidance on how to carry out a risk assessment is available at www.hse.gov.uk.

Businesses and employees who work near to an overhead line must manage the risks. Overhead line owners have a duty to minimise the risks from their lines and, when consulted, advise others on how to control the risks.

The line owner will usually be an electricity company, known as a transmission or distribution network operator, but could also be another type of organisation, e.g. Network Rail, or a local owner, e.g. the operator of a caravan park.

Figure 4: Minimum heights above ground level for overhead power lines.



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Avoiding danger from overhead power lines

Preventing overhead line contact accidents

Good management, planning and consultation with interested parties before and during any work close to overhead lines will reduce the risk of accidents.

This applies whatever type of work is being planned or undertaken, even if the work is temporary or of short duration. You should manage the risks if you intend to work within a distance of 10m, measured at ground level horizontally from below the nearest wire.

Remove the risk

The most effective way to prevent contact with overhead lines is by not carrying out work where there is a risk of contact with, or close approach to, the wires.

If you cannot avoid working near an overhead line and there is a risk of contact or close approach to the wires, you should consult its owner to find out if the line can be permanently diverted away from the work area or replaced with underground cables.

This will often be inappropriate for infrequent, short-duration or transitory work.

If this cannot be done and there remains a risk of contact or close approach to the wires, find out if the overhead line can be temporarily switched off while the work is being done.

The owner of the line will need time to consider and act upon these types of requests and may levy a charge for any work done.

Risk control

If the overhead line cannot be diverted or switched off, and there is no alternative to carrying out the work near it, you will need to think about how the work can be done safely. If it cannot be done safely, it should not be done at all.

Your site-specific risk assessment will inform the decision. Things to consider as part of your risk assessment include:

- the voltage and height above ground of the wires. Their height should be measured by a suitably trained person using non-contact measuring devices;
- the nature of the work and whether it will be carried out close to or underneath the overhead line, including whether access is needed underneath the wires;
- the size and reach of any machinery or equipment to be used near the overhead line;
- the safe clearance distance needed between the wires and the machinery or equipment and any structures being erected. If in any doubt, the overhead line's owner will be able to advise you on safe clearance distances;
- the site conditions, e.g. undulating terrain may affect stability of plant etc;
- the competence, supervision and training of people working at the site.

If the line can only be switched off for short periods, schedule the passage of tall plant and, as far as is possible, other work around the line for those times.

Do not store or stack items so close to overhead lines that the safety clearances can be infringed by people standing on them.

Check ground levels have not been raised where minimum height levels would be compromised.

Working near but not underneath overhead lines – the use of barriers

Where there will be no work or passage of machinery or equipment under the line, you can reduce the risk of accidental contact by erecting ground-level barriers to establish a safety zone to keep people and machinery away from the wires.

This area should not be used to store materials or machinery. Suitable barriers can be constructed out of large steel drums filled with rubble, concrete blocks, wire fence earthed at both ends, or earth banks marked with posts.

- If steel drums are used, highlight them by painting them with, for example, red and white horizontal stripes.
- If a wire fence is used, put red and white flags on the fence wire.
- Make sure the barriers can be seen at night, perhaps by using white or fluorescent paint or attaching reflective strips.

The safety zone should extend 6m horizontally from the nearest wire on either side of the overhead line. You may need to increase this width on the advice of the line owner or to allow for the possibility of a jib or other moving part encroaching into the safety zone. It may be possible to reduce the width of the safety zone but you will need to make sure that there is no possibility of encroachment into the safe clearance distances in your risk assessment.

Where plant such as a crane is operating in the area, additional highlevel indication should be erected to warn the operators. A line of coloured plastic flags or 'bunting' mounted 3-6m above ground level over the barriers is suitable. Take care when erecting.

Passing underneath overhead lines

If equipment or machinery capable of breaching the safety clearance distance has to pass underneath the overhead line, you will need to create a passageway through the barriers. In this situation:

- keep the number of passageways to a minimum;
- define the route of the passageway using fences and erect goalposts at each end using a rigid, non-conducting material, e.g. timber or plastic white pipe, for the goalposts, highlight with, for example, red and white stripes:
- if the passageway is too wide to be spanned by a rigid non-conducting goalpost, you may have to use tensioned steel wire, earthed at each end, or plastic ropes with bunting attached. These should be positioned further away from the overhead line to prevent them being stretched and the safety clearances being reduced by plant moving towards the line;
- ensure the surface of the passageway is levelled, formed-up and well maintained to prevent undue tilting or bouncing of the equipment;
- put warning notices at either side of the passageway, on or near the goalposts and on approaches to the crossing giving the crossbar clearance height and instructing drivers to lower jibs, booms, tipper bodies etc and to keep below this height while crossing;
- you may need to illuminate the notices and crossbar at night, or in poor weather conditions, to make sure they are visible;
- make sure that the barriers and goalposts are maintained.

On a construction site, the use of goalpost-controlled crossing points will generally apply to all plant movements under the overhead line.

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Avoiding danger from overhead power lines

Working underneath overhead lines

Where work has to be carried out close to or underneath overhead lines, e.g. road works, pipe laying, grass cutting, farming, and erection of structures, and there is no risk of accidental contact or safe clearance distances being breached, no further precautionary measures are required.

However, your risk assessment must take into account any situations that could lead to danger from the overhead wires. For example, consider whether someone may need to stand on top of a machine or scaffold platform and lift a long item above their head, or if the combined height of a load on a low lorry breaches the safe clearance distance. If this type of situation could exist, you will need to take precautionary measures.

If you cannot avoid transitory or short-duration, ground-level work where there is a risk of contact from, for example, the upward movement of cranes or tipper trailers or people carrying tools and equipment, you should carefully assess the risks and precautionary measures. Find out if the overhead line can be switched off for the duration of the work. If this cannot be done:

- refer to HSE document **'Avoiding danger from overhead power lines Guidance Note GS6'**. This advises establishing exclusion zones around the line and any other equipment that may be fitted to the pole or pylon. The minimum extent of these zones varies according to the voltage of the line, as follows:
  - low-voltage line – 1 m;
  - 11kV and 33kV lines – 3m;
  - 32kV line – 6m;
  - 275kV and 400kV lines – 7m;
- under no circumstances must any part of plant or equipment such as ladders, poles and hand tools be able to encroach within these zones. Allow for uncertainty in measuring the distances and for the possibility of unexpected movement of the equipment due, for example, to wind conditions;
- carry long objects horizontally and close to the ground and position vehicles so that no part can reach into the exclusion zone, even when fully extended. Machinery such as cranes and excavators should be modified by adding physical restraints to prevent them reaching into the exclusion zone.

  Note that insulating guards and/or proximity warning devices fitted to the plant without other safety precautions are not adequate protection on their own;
- make sure that workers, including any contractors, understand the risks and are provided with instructions about the risk prevention measures;
- arrange for the work to be directly supervised by someone who is familiar with the risks and can make sure that the required safety precautions are observed;
- if you are in any doubt about the use of exclusion zones or how to interpret the ENA document, you should consult the owner of the overhead line.

Where buildings or structures are to be erected close to or underneath an overhead line, the risk of contact is increased because of the higher likelihood of safety clearances being breached.

This applies to the erection of permanent structures and temporary ones such as poly tunnels, tents, marquees, flagpoles, rugby posts, telescopic aerials etc.

In many respects these temporary structures pose a higher risk because the work frequently involves manipulating long conducting objects by hand.

The overhead line owner will be able to advise on the separation between the line and structures. You can also read Northern Powergrid's Code of Practice NSP/004/011 Guidance on Overhead Line Clearances (**northernpowergrid.com/sites/default/files/assets/NSP004011.pdf**).

However, you will need to take precautions during the erection of the structure.

If the overhead line cannot be diverted or switched off then you should take account of the guidance on this page relating to working underneath such lines.

Consider erecting a horizontal barrier of timber or other insulating material beneath the overhead line to form a roof over the construction area – in some cases an earthed, steel net could be used.

This should be carried out only with the agreement of the overhead line owner, who may need to switch off the line temporarily for the barrier to be erected and dismantled safely.

Ideally, work should not take place close to or under an overhead line during darkness or poor visibility conditions. Dazzle from portable or vehicle lighting can obscure rather than show up power lines.

Emergency procedures

POWER CUT? CALL 105

LOOK UP IT'S LIVE!

Every year in the UK drivers of agricultural equipment are killed and many more are seriously injured when their vehicle or plant comes into contact or too close to overhead power lines.

Anyone driving agricultural vehicles or operating plant near overhead power lines should be extra vigilant of power lines which can carry voltages of up to 132,000 volts.

- Make sure anyone working near power lines is aware of the dangers and the action they should take in an emergency.
- You don't need to make contact with a power line to be in danger, electricity can jump or "ARC" to any object (including people).
- Never try to disentangle or return to equipment until staff from the distribution network operator have confirmed that it is safe to do so.
- Be aware that ground levels may have changed since your last visit and clearance may not be enough, risk assess each situation and on each occasion.
- Carry a mobile phone at all times and store 105, the number to call in an emergency.
- Remind others to stay clear. Power lines which have been damaged can stay live or automatically become live again at any time, without warning.
- Always report any contact or damage to equipment, however minor it seems.

If in doubt - call 105 for free safety advice or for non-urgent enquiries and to get our free in-cab safety stickers email safety.information@northernpowergrid.com

Working near overhead lines connected to buildings

Sometimes, work needs to be carried out near uninsulated low-voltage overhead wires, or near wires covered with a material that does not provide effective insulation, connected to a building.

Examples of such work are window cleaning, external painting or short-term construction work. If it is not possible to re-route or have the supply turned off, the line's owner, e.g. the distribution network operator, may be able to fit temporary insulating shrouds to the wires, for which a charge may be levied. People, plant and materials still need to be kept away from the lines.

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Avoiding danger from overhead power lines

Industry-specific guidance
HSE and other organisations publish industry and sector-specific guidance based on this guidance.

The main industries and sectors covered by this are construction, agriculture, horticulture, forestry and arboriculture. The Energy Networks Association (ENA), the body representing transmission and distribution network operating companies, also publishes guidance leaflets (see the References section).

Annex 1 The law
The Health and Safety at Work etc Act 1974 (HSW Act) places responsibilities on everyone concerned with work activities, including employers, the self employed and employees.

Regulations:
www.legislation.gov.uk/ukpga/1974/37/contents

The Management of Health and Safety at Work Regulations 1999 require that:

- risks are properly assessed and controlled;
- employees are provided with adequate health and safety training;
- employers who share a workplace consult and co-ordinate with each other.

Regulations:
www.legislation.gov.uk/uksi/1999/3242/contents/made

Approved Code of Practice:
Management of health and safety at work. Management of Health and Safety at Work Regulations 1999.
www.hse.gov.uk/pubns/priced/l21.htm

Regulation 9 of The Provision and Use of Work Equipment Regulations 1998 requires all people who use work equipment to have received adequate training in the use of that equipment.

Regulations:
www.legislation.gov.uk/uksi/1998/2306/contents/made

Approved Code of Practice:
Safe use of work equipment. Provision and Use of Work Equipment Regulations 1998. Approved Code of Practice and guidance L22 (Third edition) HSE Books 2008 ISBN 978 0 7176 6295 1
www.hse.gov.uk/pubns/books/l22.htm

The Electricity at Work Regulations 1989 require precautions to be taken against the risk of death or personal injury from electricity in work activities. Regulation 14 addresses live work activities, which include working on, or so near, live overhead lines that there is a risk of injury.

Regulations:
www.legislation.gov.uk/uksi/1989/635/contents/made

Guidance:
Memorandum of guidance on the Electricity at Work Regulations 1989. Guidance on Regulations HSR25 (Second edition) HSE Books 2007 ISBN 978 0 7176 6228 9
www.hse.gov.uk/pubns/books/hsr25.htm

The Electricity Safety Quality and Continuity Regulations 2002 require, among other things, owners of overhead lines to ensure that they are at the appropriate height and meet certain standards.

Regulations:
www.legislation.gov.uk/uksi/2002/2665/contents/made

The Construction (Design and Management) Regulations 2007 place duties on construction clients, designers and contractors to plan and organise work so as to avoid danger from energy distribution networks.

Regulations:
www.legislation.gov.uk/uksi/2007/320/contents/made

HSE Publication

Working safely near overhead electricity power lines

Hazards

Overhead power lines typically carry electricity at voltages from 230V/400V at low voltage and 11kv to 400kV at high voltages. The lines are often uninsulated (bare) cables. Touching anything in contact with live electrical equipment (even at the lowest voltage) can be fatal. The height of the line varies according to the voltage carried (see below Figure 1) so for example any 11kV or 33kV overhead power lines on your land should be at least 5.2m above the ground.

Electrical equipment mounted on poles may be lower than the clearances specified in this guidance. Although the minimum heights of overhead power lines may be adequate for most work activities, there are many agricultural machines that are capable of reaching or touching overhead power lines or pole-mounted equipment, including:

- rough terrain fork lift trucks and telescopic materials handlers;
- combine harvesters;
- self-propelled harvesters, e.g. forage harvesters, beet harvesters etc;
- crop sprayers;
- tractors and tractor-mounted fore end loaders.

Remember that the overall height of a machine may be increased by fitting radio aerials, flashing beacons or in the case of combine harvesters, when the discharge auger or grain tank extensions are used. Other machines often used in agriculture are capable of reaching an overhead power lines, including:

- construction plant, such as excavators or diggers;
- goods vehicles with tipping bodies or trailers;
- lorry-mounted or self-propelled cranes or grabs.

HSE Agriculture Information Sheet No 8

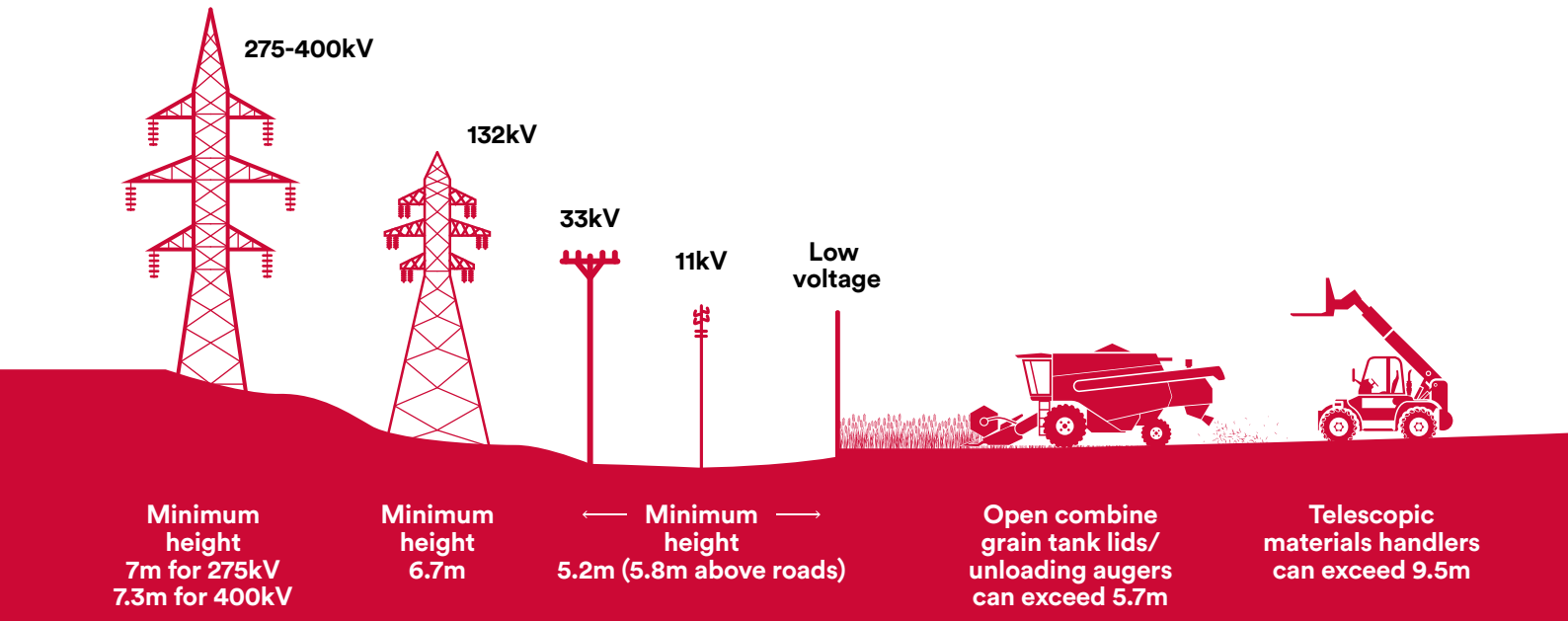
This information sheet is aimed at everyone in agriculture who may work near overhead electricity power lines and outlines what you can do to reduce the risks of electric shock when working near them.

If a machine or other conductive item of equipment comes into contact with live overhead power lines, electricity will be conducted through it to earth.

You do not need to touch the line, as in some circumstances electricity can flashover or arc (it can jump across gaps).

Anyone touching a machine or equipment in these circumstances risks a serious or fatal electric shock.

Figure 1: Minimum heights above ground level for overhead power lines.



HSE Publication

Working safely near overhead electricity power lines

Some agricultural activities may also create a risk of contacting overhead power lines, including:

- operating rain or slurry guns;
- tipping trailers;
- moving irrigation pipes or long boom irrigators;
- building temporary stacks or structures, e.g. bales, fertiliser, potato boxes;
- moving aluminium ladders or scaffold poles;
- construction work including erecting steel-framed buildings;
- erecting polytunnels and temporary structures;
- fishing (electricity can pass through fishing lines, rods and poles).

Working safely: Assessing the risks

Before you start work near overhead power lines, you should assess the risks. To help do this you should:

- find out the maximum height and maximum vertical reach of your own and your contractors' machines;
- find out the routes of all overhead power lines on your land or near your boundaries and mark them on the farm map;
- make sure you have information about all the lines on your land – if not, contact the owner or operator;
- make sure you have details of the maximum working heights permitted under each span of overhead power lines on your farm and next to each structure. Record these on the farm map. The map can then be used as a reference when assessing risks, planning cropping or other work, instructing machine operators and contractors, planning access routes or buying new or used equipment;
- get advice from the electricity distribution network operator (DNO) and/or the National Grid on line heights, minimum vertical clearance distances and precautions to take. DNOs can also arrange to have the height of the lines checked. Operating voltages are displayed on signs attached to steel towers.

Control measures

When considering what you need to do to work safely, you should follow the preferred hierarchy of measures described below:

- The safest option is always to avoid working near overhead power lines if you can. Creating alternative access routes or work areas to avoid overhead power lines is often the easiest and cheapest option.
- Consider re-routing or burying overhead power lines in certain locations, such as farmyards or silage clamps where machines often pass below the lines. Consult the DNO for advice and do not attempt to do this work yourself.
- Where you cannot relocate overhead power lines, select machines that can safely pass below the lines without being able to reach the vertical clearance distance.
- For some short duration work activities you may be able to get the power supply switched off. Speak to the DNO for advice.
- Where you cannot avoid working near overhead power lines, you will need to carry out a risk assessment and implement a safe system of work.

Key factors to consider for safe work near overhead power lines

Selecting suitable machinery

Larger farm machinery has increased the risks of contacting overhead power lines. You can reduce the risks of contact or flashover greatly by selecting machinery that will not reach more than 4m from the ground.

Check the working heights of machines and the maximum heights that any folding or extending elements can reach. Check with the manufacturer or supplier if necessary to obtain these details and check these heights against the clearances marked on the farm map to identify areas of risk. Consider line heights when you buy new or replacement machinery.

Safe use of machinery and equipment

Moving equipment or machinery when extensions are raised could bring it into contact with overhead power lines. Reduce risks by making sure machines can operate safely near overhead power lines. For example:

- retract the booms of telescopic handlers and keep them close to the ground when the vehicle is moving;
- lower grain tank lids and ensure that unloading augers on combines are stowed and not in the extended/unloading position;
- use sprayers with horizontally folding booms and never fold vertical sprayer booms on the move;
- fit shorter radio aerials and beacons, reposition or remove existing ones on high machines, so they cannot cause danger;
- take care not to damage poles and stays.
- remember that risks increase at dusk, in darkness or in poor visibility when it becomes harder for machine operators to see overhead power lines.

Safe work activities

Risks can be reduced if the following activities are not carried out within a horizontal distance of at least 10m from overhead power lines. These distances should be measured from the line of the nearest conductor to the work, projected vertically downwards onto the floor, and perpendicular to the route of the line (see Figure 2).

The activities are:

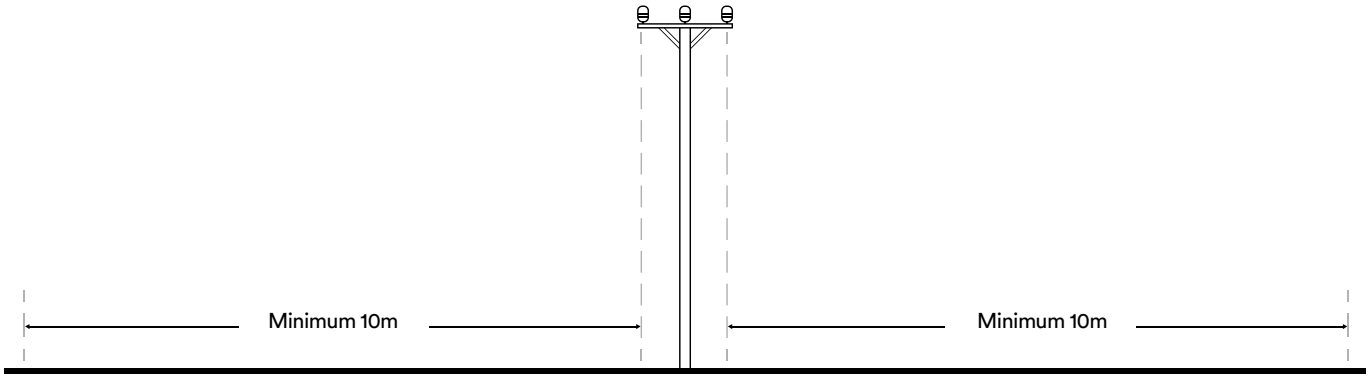
- stacking materials, e.g. bales, fertiliser bags or potato boxes etc;
- erecting temporary structures, e.g. polytunnels;
- folding sprayer booms;
- tipping trailers or lorries with tipping bodies;
- operating materials handlers or lift trucks;
- working on top of combines or other high machinery;
- moving ladders, irrigation pipes or scaffolding;
- tree work.

If you cannot avoid carrying out any of these work activities closer than 10m, consult your DNO for advice. If the line cannot be moved or made dead you will need to assess the risks and agree a safe system of work. This may involve the erection of barriers to keep machinery a safe distance away from overhead power lines, and other precautions as described in the HSE guidance note Avoidance of danger from overhead electric power lines (see 'Further reading').

Rain and slurry guns

- Position rain and slurry guns so that jets of water or slurry cannot contact overhead power lines when they are in use.
- Guns should travel parallel to overhead power lines, not below them.
- Check that jet breaker devices are working, as a continuous jet in contact with an overhead power line could cause the equipment to become live.
- Slurry guns should not come within 30m of an overhead power lines and this distance should be increased in high winds to take account of slurry being carried further by the wind.

Figure 2: Minimum horizontal distances to overhead power lines.



HSE Publication

Working safely near overhead electricity power lines

Long boom irrigators

- When a machine is being moved or used, keep it under close observation and control.
- Booms should have a nylon or polypropylene control rope at each end.
- If a boom is assembled or dismantled on site this should be done at least 10m away from overhead power lines.
- Check that the jets are not near overhead power lines and that jet breaker devices are fitted and working.

Sprinklers

- Do not store pipes under or close to overhead power lines.
- Always move irrigation pipes horizontally, using two people to carry them as low as possible.
- Plan the layout of the system carefully, so risks are minimised when putting pipes in position.

Fencing

- If fencing wire is being stretched, it could spring upwards and come into contact with overhead power lines, so always keep the wire under control.
- Long runs of wire on undulating ground or hillsides present an increased risk, so anchor the fence securely at several points.

Stacks and temporary structures

- Before building a stack or other temporary structure, plan where to locate it to avoid overhead power lines. Do not site them in areas where machines such as telescopic handlers will need to travel underneath overhead power lines to get to them.
- Avoid creating clamps below overhead power lines, as vehicles rolling the clamp or trailers tipping grass etc will be at risk.
- Silos or bins should be sited so bulk feed delivery vehicles or trailers can tip safely.

Construction work

- There may be occasions when construction work has to be carried out, e.g. erecting farm buildings, excavation work for laying pipes etc which means machines or vehicles pass near overhead power lines. In such cases, you and your contractors should follow the precautions set out in the Avoidance of danger from overhead electric power lines guidance document See **www.hse.gov.uk/pubns/gs6.htm**.

Information, instruction and training

After assessing the risks and planning how to do the work safely, you will need to make sure anyone working near overhead power lines with a machine or work equipment is provided with information about the hazards, the risks and the precautions to follow, including what to do if they contact the line.

Contractors and temporary staff may be at an increased level of risk when they work on your farm, so make sure they know where the lines are and discuss and agree with them the precautions they need to take before they start work.

More detailed instructions may be needed for those workers whose first language is not English.

The location of overhead power lines can be highlighted by displaying suitable hazard warning signs in prominent positions and supplementing them with appropriate text, e.g. **'Danger – overhead power lines'**.

These signs need to kept visible and not obstructed by vegetation. If the signs are damaged, please call us on 105.

If you come into contact with an overhead power line

- Stay in the cab of the machine and lower any raised parts in contact with the line or try to drive the machine clear, if you can.
- Call us immediately on 105 (display this number in the cab or keep it on your mobile phone).
- Electrocution is possible if anyone touches both the machine and the ground at the same time. If you need to get out jump well clear so that no simultaneous contact is made between you, the vehicle and the ground. Do not touch any wires. Stay clear and warn others not to approach.
- Get the DNO to disconnect the supply. Even if the line appears dead, do not touch it, or any part of the machine. Contact with the line may cause the power supply to trip out temporarily and it may be reconnected and re-energise automatically, without warning.
- Never touch an overhead line that has been brought down by machinery, or has fallen, e.g. in a storm. Do not try to disentangle equipment, until you have received confirmation that the line has been de-energised and made safe.

Further reading

Avoidance of danger from overhead electric power lines General Guidance Note GS6 HSE Books 1997 ISBN 978 0 7176 1348 9
www.hse.gov.uk/pubns/gs6.htm

Information is also available from the Energy Networks Association (ENA): **www.energynetworks.org** and the Distribution Network Operators publish information on their own websites. Safety information is also available from the National Grid at **www.nationalgrid.com/uk/electricity**

Further information

For information about health and safety, or to report inconsistencies or inaccuracies in this guidance, visit **www.hse.gov.uk**. You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

This document contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

ENA Publication

Look Out Look Up!

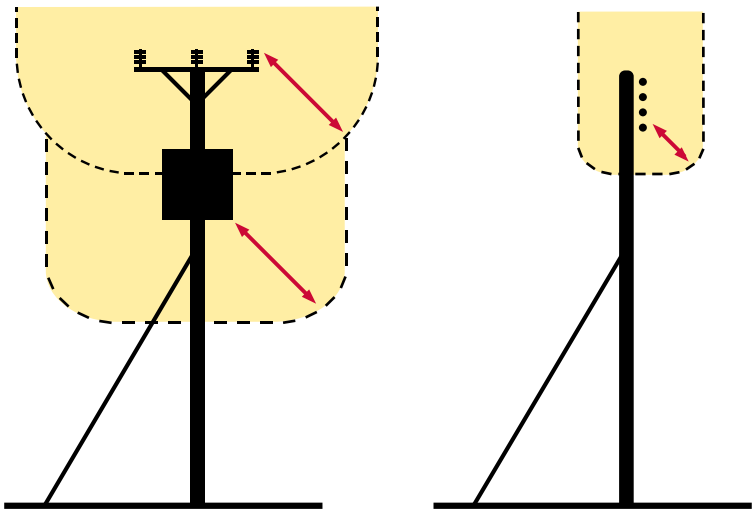
Before starting work

- Overhead lines have the advantage that they can easily be seen, so before you set up your vehicle or plant always: **STOP AND LOOK UP!**
- If you are working at night, or in conditions of poor visibility, you should use spotlights or a torch to carefully check that there are no overhead lines within your vehicle's reach.
- Always assume that overhead lines are live unless informed otherwise in writing by Northern Powergrid.
- If you are in any doubt about whether the lines in question are power or telephone (this is a very common mistake) - always assume that they are power lines and are live.
- It is not normally practical for electricity companies to shroud high voltage conductors and even when low voltage conductors are shrouded, the shrouding is not designed to protect against contact by mechanical plant - again, always assume the lines are live.

Exclusion zones

- Overhead power lines are not normally insulated and so any contact can result in serious or fatal injuries.
- Electricity at high voltages can also jump gaps with no warning whatsoever, so it is dangerous to let your plant approach too close to a line.
- The distance that electricity can jump depends on the voltage of the line. The higher the voltage, the further you must stay away from the line and any other equipment that may be fitted to the pole or pylon. This distance is called the **EXCLUSION ZONE**. Examples of this are shown highlighted in the diagram below.
- You must not allow any part of your plant to enter the **EXCLUSION ZONE**.

Exclusion zones are shown in yellow



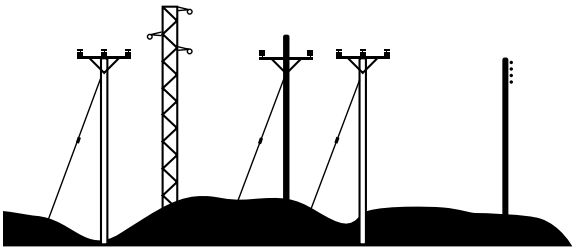
Exclusion zones for pole transformer

Exclusion zones low voltage (LV)

Every year in the UK on average, two people are killed and many more are injured when mechanical plant and machinery comes into contact or close proximity to overhead lines.

This information has been produced for anyone who uses mobile plant, (such as Hiabs, MEWPs, Tipper Lorries and Trailers, Grab Lorries, Concrete Conveyors and Excavators) for short duration work and provides general guidance on how to avoid becoming part of these statistics.

Pole profiles



11kV and 33kV Exclusion Zone 3m

LV 230/400V Exclusion Zone 1m

- The diagram above shows typical types of overhead lines and provides a guide to help assess the line voltage of lines on wooden poles or steel pylons. The minimum **EXCLUSION ZONE DISTANCE** is shown for each example.
- Please note that these are absolute minimum distances that should under no circumstances be infringed. **If you do - it could prove fatal.**
- As well as staying away from the lines or equipment, you should also stay at least 600mm away from any part of poles and stay wires.
- Please remember that this is for guidance only, and if you are in any doubt, please call Northern Powergrid on 105 for advice before setting up your plant or starting work.

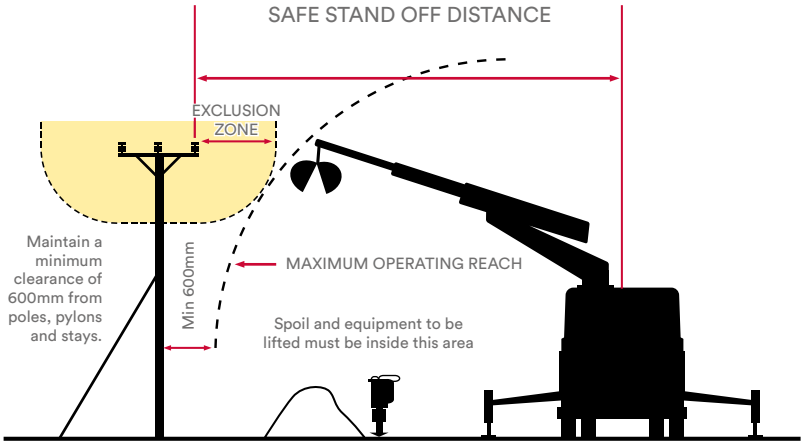

IVECO
NORTHERN POWERGRID
Power cut helpline
0800 375 675
159T

ENA Publication

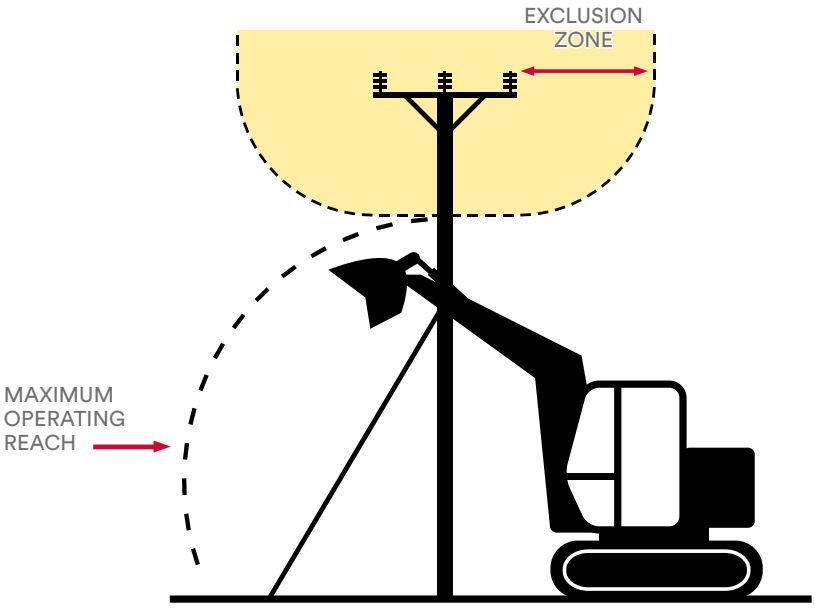
Look Out Look Up!

Stand off distances

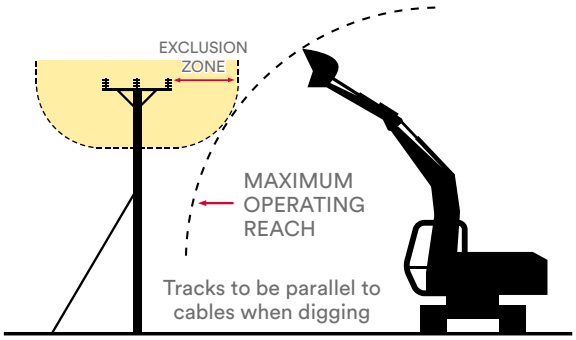
- If there are power lines in the vicinity of your work the best way to make sure you stay out of the **EXCLUSION ZONE** is to position your vehicle at a **SAFE STAND OFF DISTANCE** so that, even when fully extended, no part of it can accidentally reach inside the **EXCLUSION ZONE**.
- This **SAFE STAND OFF DISTANCE** can be calculated by adding the **EXCLUSION ZONE** distance for the appropriate voltage of the line to the Maximum Operating Reach of your vehicle. This is shown in the diagram below.



- If you position your vehicle outside of the **SAFE STAND OFF DISTANCE**, there is no risk of accidental contact with the lines and no danger of electricity jumping from the line to your vehicle.
- If you cannot achieve a **SAFE STAND OFF DISTANCE**, consider moving your vehicle to a safer location. It may make your job a bit more difficult, but if it means you stay away from the **EXCLUSION ZONE** - it will be safer.



- The next best option would be to consider using smaller plant with a Maximum Operating Reach that cannot enter the **EXCLUSION ZONE**.
- You may not be able to achieve either of these options, so, as a last resort, if you cannot avoid operating large items of plant in the vicinity of lines, you **MUST** make sure that the plant is fitted with restraints to ensure that the **EXCLUSION ZONE** cannot be entered. These restraints may be electrical or hydraulic systems fitted to the plant, or mechanical devices such as chains. Please seek advice from the plant manufacturer for more information on choices available for your particular item or plant.
- If you are using a mechanical excavator to dig parallel to the line, it is good practice to position the excavator with the tracks or wheels parallel to the line, so as you move along the excavation the **SAFE STAND OFF DISTANCE** is easily maintained.
- Care must also be taken to avoid non-mechanical equipment, (e.g. scaffold poles, ladders and long loads such as lengths of steel or timber) from entering the **EXCLUSION ZONE**.
- Always maintain at least 600mm clearance from your plant to any of our poles and stay wires. Any contact with these by your plant could cause theline to break and fall to the ground.



Further information

- Proximity Warning Systems (such as Wire Watcher) - see **www.wirewatcher.co.uk** for information) may be fitted to your vehicle. Never turn these devices off or disable them in any way.
- Take note of any warnings these proximity warning systems may provide but do not use the presence of such devices as a reason not to follow the advice provided here.

Further reading

More detailed general information on this subject is available in the following publications from the Health and Safety Executive (HSE):

- GS6 - Avoidance of Danger from Overhead Lines
- HS(G) 47 - Avoiding Danger from Underground Services
- AFAG 804 - Electricity at Work: Forestry and Arboriculture

This information can also be obtained at **books.hse.gov.uk**

This information is based on guidance provided by ENA (Energy Networks Association) on behalf of electricity companies. **www.energynetworks.org**

Finally... Please, always remember that electricity overhead lines can be very dangerous - the general rule is **STAY AWAY and STAY SAFE!**

Always follow these simple rules, they could save your life

- Treat all overhead lines as live and dangerous
- Any contact may be fatal or cause very serious injuries
- Electricity can jump gaps
- Before you set up or use plant near to lines - **STOP and LOOK UP**
- Take special care and use lights in the dark or poor light conditions
- If there are lines in the vicinity of your work - stay well away
- Set up your plant with care to reduce the chance of contact

Notes

Notes

NORTHERN POWERGRID

In the event of an emergency call us immediately on 105.

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