Guidance for private contractors working near overhead electricity conductors

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Introduction

Tree working in proximity to overhead electricity power lines (OHPL) is a specialist area of arboriculture and is almost always undertaken by specialist utility arboriculture contractors working for and on behalf of the distribution network operators (DNOs). Some DNOs employ arborists/tree cutters directly as staff, and survey and cutting work is done in-house. Utility arboriculture requires that tree workers have both a high degree of skill and hold the relevant utility arboriculture (UA) competencies in addition to the normal chainsaw competencies required for all arboricultural work, whether utility or non-utility. In some instances, specialist utility arborists can work in proximity to energised (live) conductors, provided they are trained and authorised to ENA. ER.G55/2.[1]

At Central Networks (CN) occasions arise where landowners want to have domestic or landscape tree work undertaken but a section of CN's overhead line network (OHPL) passes close to the trees. This happens because much of the overhead distribution network crosses private land. Some landowners want to do the pruning themselves or have their preferred arboricultural contractors do the work. In these instances the landowners or their contractors must contact CN so that an assessment can be undertaken of the proximity of the trees to the conductors and a decision made as to whether the conductors need to be de-energised (shutdown) before the work can be allowed to proceed safely.

In recent times, CN has received a number of complaints from landowners, but more often from arboricultural contractors acting for landowners, about the time it takes to arrange and carry out a shutdown. They complain of difficulties in scheduling work because a shutdown is taking too long to arrange, and in some instances because planned shutdowns are cancelled. This article provides an explanation as to why shutdowns can take time to plan and organise, which, it is hoped, will help contractors understand the constraints upon the electric utilities.

Arranging shutdowns

When a landowner in CN's service area requires work to trees that are adjacent to or through the OHPL, it is essential that the landowner or his/her contractor makes contact with CN to arrange for a competent person to attend the site and assess whether the lines need to be de-energised before work can proceed.

It is emphasised that shutdowns are arranged for the safety of the contractors. Central Networks takes safety very seriously. Indeed, Rule 1 at CN is 'We Don't Hurt People'. Work in proximity to live electricity lines is very dangerous. Within Central Networks this is reserved for the company's own linesmen and its specialist tree-cutting contractors who are trained to G55/2, and even then only under very specific conditions. Therefore, Central Networks will not countenance non-utility arboricultural contractors working anywhere near live electricity lines.

The process of arranging a shutdown is not straightforward and cannot be completed overnight. Therefore, contractors must realise that there will be a delay between when the site is assessed and when the shutdown can be scheduled.

Low voltage (LV) shutdowns

The LV network is that which distributes electricity to individual properties at 415 volts. Generally the LV network is overhead and is of four-bare-wire-conductor configuration (photograph 1).

1. LV showing the typical four-bare-wire-conductor construction.

1 Energy Networks Association (ENA): Engineering Recommendation (ER) G55 Issue 2 – September 2008 'Safe Tree Working in Proximity to Overhead Electric Lines'.

Some of the LV network is of aerial-bundled-cable (ABC) construction (photograph 2).

ABC conductors are treated the same way as bare conductors when it comes to deciding whether a shutdown is required. Assuming there are no other issues on an LV circuit, it should take between three and six weeks to arrange a shutdown. This is because of customer notification requirements: outage cards have to be sent to customers informing them of the date and likely duration of the shutdown. CN's internal standard requires that customers are given five working days' notice of the shutdown. Internal procedures and operational complexities mean that it can take some time to issue the notice cards to customers, hence the three- to six-week period.

2. Close-up of the ABC construction.

High voltage (11kV) shutdowns

The high voltage (HV) network operates at 11,000 volts (11kV). This network distributes electricity from the EHV or 'primary' network to the LV network, and is sometimes referred to as the secondary distribution network (photograph 3).

More customers are connected to the 11kV network so it may take a little longer to arrange a shutdown than for LV as more notification cards need to be issued. However, CN aims to arrange 11kV shutdowns in the same timescale as for LV, i.e. three to six weeks.

Contractors should build in a minimum period of three to six weeks where LV and 11kV are concerned and should not schedule any work with their clients until CN has notified them of the planned shutdown date. Even then, it is possible that a planned shutdown could be cancelled because more urgent issues arise, i.e. incidents elsewhere on the circuit or other operational reasons that must be dealt with as a priority.

3. A typical 11kV overhead line.

Primary network shutdowns

When shutdowns are required on the 132kV, 66kV or 33kV primary networks, this can take much longer to arrange than for LV and 11kV. Very little of the 132kV primary network crosses domestic/residential properties, but where it does CN reserves that work for its authorised utility arboriculture contractors as it has a statutory obligation to maintain all of its OHPL network clear of trees and a tree fault at 132kV would interrupt supplies to tens of thousands of customers. CN operates a proactive tree clearance programme on the 132kV OHPL network, and circuits are cut on a defined cycle. Photograph 4 shows a typical 132kV double circuit overhead line.

The same approach applies to the 66kV and 33kV networks. The occurrence of lines at these voltages on domestic/residential properties is comparatively rare, although it does happen. Typical examples of 33kV and 66kV OHPL are shown in photographs 5 and 6.

In some specific instances CN is prepared to allow landowners and/or their contractors to undertake domestic tree cutting in proximity to these lines, i.e. where the trees are adjacent to the lines but not growing through them but are too close for the work to be done safely with the lines energised. Therefore, the lines will have to be de-energised to facilitate this work, and as stated previously this can take considerably longer than for LV and 11kV. All circuits at 66kV and 33kV are on a planned cycle of clearance and the contractor may be advised that CN will only accommodate him/her doing the work for the landowner when the circuit is de-energised either for CN's ongoing tree clearance programme or for other planned maintenance. The timescale for the shutdown can therefore be anything from six months to three years.

Contractors' Business

4. A typical 132kV overhead line.

5. A typical 33kV overhead line.

6. A typical 66kV overhead line.

Central Network's position is that it would prefer all tree work on the 33kV, 66kV and 132kV lines to be done by its own tree-cutting contractors on the defined cycles. All of Central Network's primary circuits should be on a second cycle of cutting from January 2011.

Contractors should be aware that it is unlikely CN will allow them to cut trees in proximity to the EHV and 132kV lines where shutdowns are required.

Competence

As stated above, contractor personnel cutting trees on CN's lines are required to hold the relevant NPTC UA competencies. CN cannot insist that contractors other than those authorised to work on the network must hold relevant UA competencies. However, contractors should be aware that when CN arranges a shutdown to facilitate private work, the contractor will be held liable should any damage occur to the overhead lines, poles or other apparatus as a result of their work. Therefore, CN strongly recommends that at least one member of contractor staff should hold at least the UA1 competency 'Basic Electrical Knowledge' as this will ensure that the crew can be advised properly of the risks and that proper safeguards are in place to prevent accidental injury or damage. As an alternative, contractors could buy in a utility-competent person from the principal contractors who undertake tree cutting on behalf of Central Networks.

Working together

Central Networks is committed to working with all its external stakeholders including private tree work contractors. This article is one way in which CN is trying to assist third-party contractors by providing information on how the proximity shutdown process works. Hopefully this will ensure contractors work together with CN to get jobs done safely and efficiently. CN is always ready to accommodate tree work contractors; but contractors should realise that there are processes which CN has to follow, that these take time, that sometimes there are limitations, and that CN does not cancel planned shutdowns without good reason. By accepting these facts we can all work together safely and profitably.

For further information and general advice in relation to trees and vegetation contact Central Networks: 0800 096 3080, website: central-networks.co.uk, email: customerservices@central-networks.co.uk