

Overhead work set to change

Utility companies and their contractors were some of the very first users of powered access, helping develop light tower wagons to service and maintain overhead lighting and cables on early street lights and tram/ bus cables. Since those early days the sector has blossomed to include high tension transmission lines, telephone cables, street lighting, mobile phone and other transmission antennae, water towers and a surprising array of other tasks.

Until relatively recently the aerial lifts of choice for most utility companies has been the truck or van mounted boom lift. Oddly the tower wagon has virtually vanished from the scene and its potential replacement, the truck mounted scissor lift has so far failed to take off.

Van and light truck mounted boom lifts are ideal for street work and ongoing development by the manufacturers working with utility contractors is making the latest products even more useful.

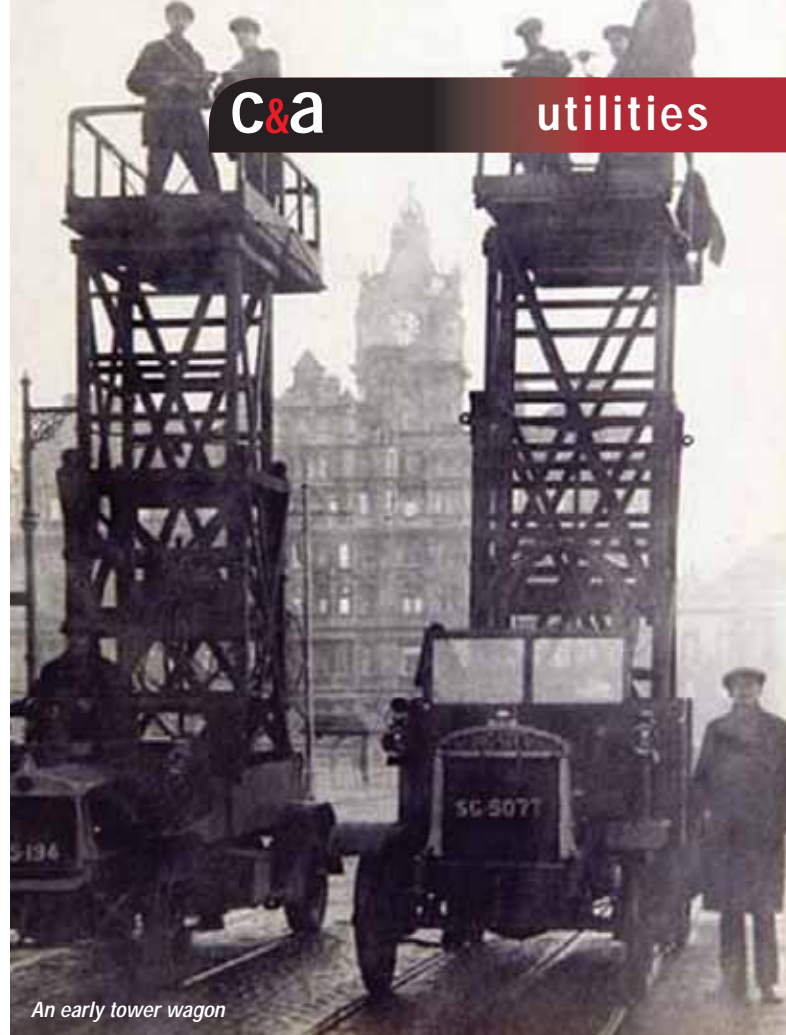
The preferred method of working on overhead power lines



Zero tail-swing and narrow or no-outrigger configurations allow work to be carried out on overhead lines without taking up more than a single lane of the street, thus keeping it open even if restricted.

With this in mind the UK Health & Safety Executive has been steadily increasing the pressure on utility companies to stop the long-held practice of climbing poles to carry out maintenance or repairs. It has been doing this in several ways including the use of the hierarchy of access methods which almost invariably point to the use of powered access over and above climbing or ladders. It has also been imposing strict rules or recommendations for the lower level methods such as climbing and ladder use which serves to make the employment of powered access simpler and more straightforward.

The problem has been, as in all such initiatives by the HSE, a wide regional variation on the application and interpretation of such rules. In some regions utility contractors have reported being stopped and warned for using a ladder or pole climbing even when they have been using recommended work practices and have carried out all of the relevant equipment testing and paperwork, including risk assessments and method statements. In order to clear up such variations Balfour Beatty, one of the UK's largest Utility contractors called a meeting of all



An early tower wagon

power distribution contractors to discuss the issue and to provide a forum for the HSE to discuss its approach and help develop an understanding with contractors.

The meeting turned into a highly focused event with a number of specialist access equipment manufacturers attending and lending their support.

A key presentation - The legal context of working at height on wood poles - was made by HM Inspector of Health and Safety, Neil Hope-Collins. He made it very clear to delegates that the HSE regarded the climbing of poles within an urban environment as a last resort or for special circumstances. He pointed out that the use of Mobile Elevating Work Platforms comes above that of fall protection. When pole climbing is deemed the best method for a job, the HSE insists on prescriptive requirements for rope access and work positioning. This includes the use of two separately anchored lines, harnesses connected to both, a self locking ascender/ descender and that the safety line has a mobile fall protection system. In summary all of this makes the use of aerial work platforms seem simple and straightforward, not to mention safer and more efficient.



The UK HSE is looking to make pole climbing a thing of the past



The HSE has prescriptive guidelines for climbing, including dual lines and climbing irons

This line from the HSE was hardly a surprise and follows a trend that it has been increasingly stepping up over the past two years or so. What was perhaps more surprising was a clear statement from Hope-Collins that the HSE will begin to call time on the climbing of poles in more remote and difficult to reach locations. Until now climbing poles 'off-piste' has been accepted on the basis that equipment was not available to reach such locations and therefore climbing the only practical method.

However the range of equipment available is now so wide that the 'excuses for not using MEWPs in such locations' no longer applies. He suggested that the HSE will be encouraging utility contractors to use more aerial lifts and will be less tolerant of accidents in such locations. He pointed out some key examples of equipment which is now available, ranging from Land Rover and Unimog mounted platforms to tracked spider lifts with up to 50 metres working heights, not to mention even more highly specialised access equipment mounted on tractors and crawlers.

Access Hierarchy 1

- Mobile Elevated Work Platform (MEWP) and approved body harness attached inside bucket by lanyard.

Or

- Approved scaffolding or fixed platform and approved harness

Access Hierarchy 2

Ladders with approved harness and fall arrest. They should be footed and top-tied where reasonable.

Access Hierarchy 3

Climbing irons, approved harness and pole choker

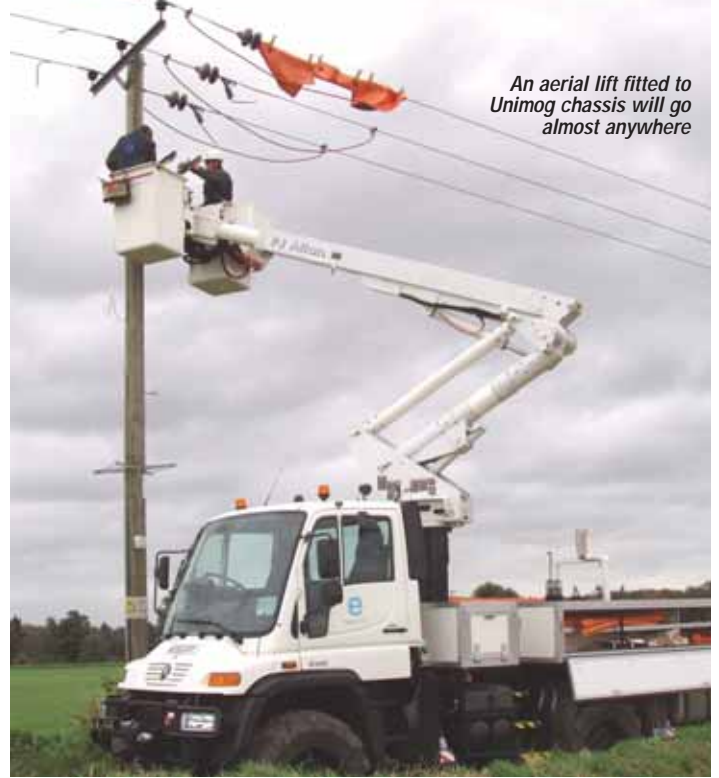
An aging network

Wood poles are typically used for voltages ranging from low voltage up to and including 132kV. A considerable part of the UK's distribution network was

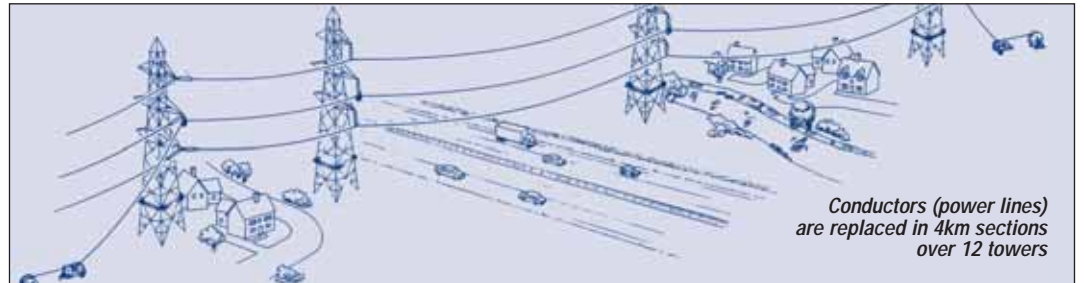
constructed during the 1950's as part of the rural electrification programme and considerable expansion has occurred since. With such a large part of the network now over 50 years old, the volume of refurbishment and replacement work is set to escalate, not to mention plans to improve the network capability to meet future demands.

Transmission tower maintenance

There are more than 80,000 high tension transmission towers in the UK alone, just 22,000 of which are owned and maintained by the National Grid. These tend to be double circuit types with a single, centrally mounted



An aerial lift fitted to Unimog chassis will go almost anywhere



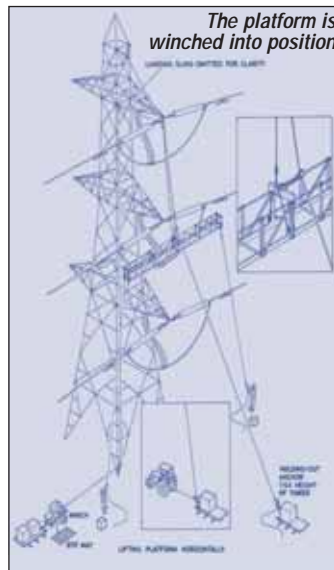
Conductors (power lines) are replaced in 4km sections over 12 towers

earth wire. The lines must be refurbished every 30 to 40 years with all of the conductors, insulators, fittings and earth wires being replaced on both circuits.

The conductors are typically changed out in lengths of around four kilometres which involves a span that includes an average of 12 towers. Platform access is required at both ends and on average at two intermediate towers in the four kilometre section.

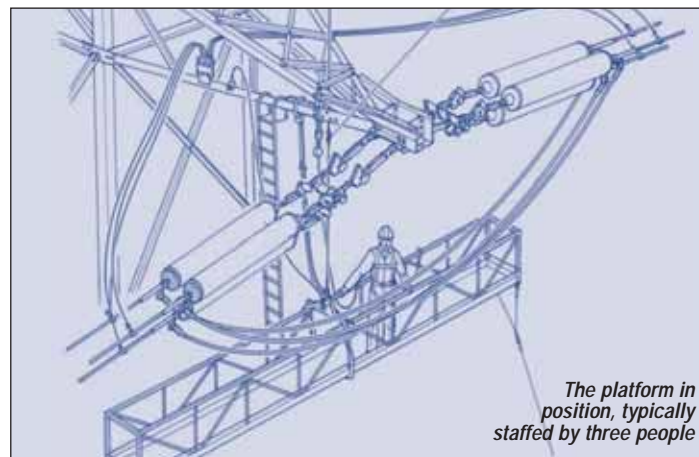
Strip outs

The replacement of conductors, insulators, fittings and earth wires is a major task in its own right, not so much the work itself, but the



installation and setting-up of a safe form of access equipment. Installers must climb the tower to fit the attachment points for the platform to be suspended from the cross arm. The platform is then winched into position either vertically or horizontally and then suspended centrally and kept level between two ground anchors or winch assemblies. The work can now commence and the whole process typically takes around three hours to set up and two hours to move between towers.

There are typically three linesmen working from the platform, each one climbing the tower an average of five times in a normal day in order to reach the platform. A linesman will remain at work in the platform working for an hour at a stretch. Some utility contractors have already started to use large truck mounts where possible or large spider lifts where the ground does not allow to carry out this work, both saving the most of the set up time as well as the time and dangers of climbing the towers. Many experienced linesmen still swear by the traditional method and are reluctant to change. However pressure from the HSE will eventually force this change, if efficiency savings don't get it done first.

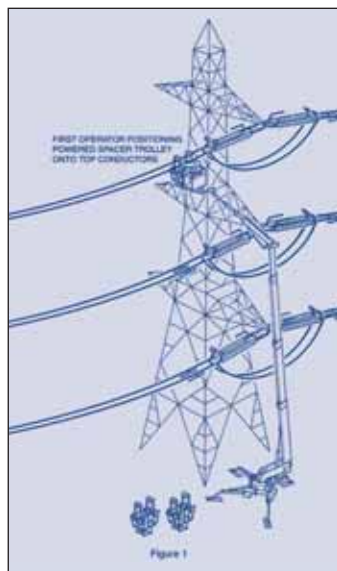




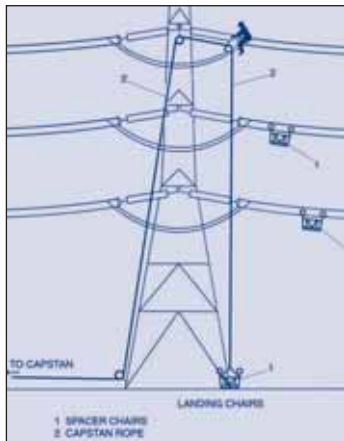
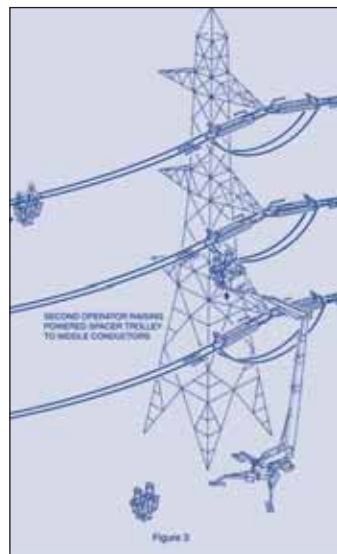
An increasing number of contractors are using powered access

De-spacing

Another task is de-spacing, in which the linesmen work from a trolley which travels on the power lines/ conductors. Traditionally the linesman climbs the tower to set up a winch arrangement and sits on the top lines - or conductors - while the winch raises the top trolley into position. Once the trolley is landed onto the top conductors the linesman assists in landing the trolleys onto the lower lines.



An alternative is to use a lift to place the trolleys which is proving to be faster and safer.



A linesman installing the working trolleys.

An alternative being tested is for a linesman to use a spider or rough terrain vehicle mounted lift to carry the trolley to the top conductors. He 'lands' the trolley onto the lines and transfers from the lift to the trolley. A second operator at the base of the machine then uses the lower controls to lower the lift and then repeats the exercise for the middle conductors and then the same for the lower.

Danish rules OK

The HSE is looking to follow the Danish rules where the climbing of towers is only permitted for one-off inspections. Solutions in Denmark have included the use of large All Terrain cranes equipped with large platforms and a specially modified loader crane attached to the crane's boom nose. The combination allows



Spider lifts can reach some of the most remote towers



Linesmen in Denmark using a crane with platform and loader crane for transmission tower maintenance

the work to be carried out without the need for any climbing, manual lifting or complex co-ordination of winches and anchors. Less earthing and equipment is required and of

course the platform can be positioned in exactly the right position to suit the linesman, allowing him to work more efficiently and with less chance of strain.

King off the road

The Mercedes Benz Unimog is almost unparalleled in its off road abilities. Combined with good road manners it makes it the vehicle of choice for utility companies for reaching remote locations with aerial work platforms and small cranes. Here are a few typical applications.

Pole placing and service truck

Regional electricity company, United Utilities, has purchased two new Unimog U5000s fitted with 16 tonne/metre Hiab cranes, possibly the largest crane fitted to such a vehicle.

The machines are used for carrying electricity supply poles, while the rear-mounted Hiab XS144 Hi Pro cranes provide the reach and lifting ability to place the poles exactly where they are needed. The crane has a reach of up to 13 metres while the poles range in weight from 200 to 750kg. Even after allowing for the crane's weight of 2.5 tonnes the Unimog's payload is more than enough to carry the poles and the wide range of additional equipment that the overhead line maintenance teams require.

The Hiab's conventional H shape outrigger footprint has been

replaced with an X configuration, which allows the crane to operate in a wider range of off-road locations.

United Utilities transport manager Graham Davies says: "There is simply no alternative to the Unimog. The central tyre inflation system, where tyres can be deflated and inflated from the cab, not only provides extra traction on difficult ground, but spreads the 'footprint' so that ground damage is considerably reduced. This saves us up to £2,000 a time in compensation to the landowner or farmer."

United Utilities operates throughout the North-West of England and the new Unimog U5000s are strategically based in Workington and Kendal, covering the remote networks of Cumbria and the Lake District. There are plans for a third, which will be based in the Macclesfield area.

United Utilities uses this unit with 16t/m crane to deliver and place poles in remote locations



United also has three Unimog U3000s on order which are being fitted with Versalift Eurotel ET36NF boom lifts with a two-man bucket, 13.2 metres working height and outreach of 7.3 metres for overhead line maintenance operations.

The new vehicles join a fleet of older Unimogs, some of which have been working for 11 years. The Unimog U2150 with a fully insulated platform for Live Line work is the oldest unit in the fleet and is still operating efficiently and effectively.

"Unimogs play a key role in the transport fleet," says Davies. "We may have to go out at midnight in the worst possible weather conditions, and the driver and crew are confident that they can get to the site, complete the job and get back safely."

and occasionally continental Europe.

The Unimog U5000s haul the rigs on specially designed trailers on both the highway and then off-road. The alternative, says Brendan Henderson, Boart Longyear's operation manager for UK Drilling Services, is at least two vehicles - one to haul on road and another to get them to sites in remote locations.

Two of the Unimogs are fitted Palfinger cranes and two with PM cranes, each capable of lifting up to 4.5 tonne or 880kg to nine metres. These enable dual-skin fuel or water tanks and a wide range of other tools and equipment to be carried and off-loaded on site.

The 100C sonic drilling rigs have been designed and built by Boart Longyear for drilling to depths of up

The Unimog U500 is equipped with a crane and a trailer to provide fast on-road and all-terrain ability to deliver the drilling rig direct to the working site



Drilling and support vehicle

Boart Longyear is using a fleet of four Mercedes-Benz long wheelbase Unimog U550S equipped with loader cranes, to haul 100C sonic drilling rigs to drill sites in the UK, Ireland

to 50 metres producing high quality core samples without the need for a flushing medium. Sonic drilling is faster than conventional cable percussive, direct push or hollow stem auger methods and is effective



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The Unimog can also operate as an all-terrain support vehicle delivering fuel, water and other supplies to sites in urban or remote, difficult to reach locations

in loose materials through to solid rock. Investigative derived waste is reduced by as much as 80 percent, which combines with less time on-site to offer significant environmental benefits.

The Unimogs and rigs are based in Central Scotland, but their on-road ability and efficient fuel consumption allow them to operate throughout the UK and even as far afield as Poland. After the rig has been off-loaded from the trailer, the Unimog can operate as an all-terrain support vehicle delivering fuel, water and other supplies to sites in urban areas as well as the most remote locations.

Live line work on the increase

Live line work is still relatively rare in most of Europe, although in North America it is common place. With high energy costs now the norm,

electricity suppliers are coming under increasing pressure against power outages and disruption. This is having a number of knock on effects, including a greater investment in national distribution



Two Versalift VST235I insulated platforms on Unimogs for delivery to Scottish and Southern

systems and in fully insulated aerial lifts. The number of manufacturers regularly building such equipment is small. Altec, the US-based crane and aerial lift manufacturer is



Live line - Hot glove work is on the increase in Europe



Bronto has placed some of its larger boom lifts on crawler chassis

probably the largest and has its eyes on expanding in Europe, although progress is slow and sporadic.

Versalift on the other hand, is already well established and expanding its product offering. It says that it has seen a significant increase in demand for insulated booms, not only for electrical suppliers, but also for trades such as tree surgeons with contracts to keep trees near power lines trimmed. Some tree companies in the USA are already moving to an

cranes. A significant number of these are shipped to the USA and Canada where it has a large customer base. It has though shipped SI units all around the world to countries including Australia, Upper Volta, Ghana, Indonesia, Kazakstan, South Africa - where the company has recently supplied a 60 metre 765000 V to Eskom, Saudi Arabia and the UAE. The company has also been called on to produce large crawler mounted boom lifts for working on the more remote transmission towers. One such unit was recently supplied to Hydro-One in Canada.

Insulator washing

Bronto has also sold several units into the sector for washing transmission tower line insulators. In many environments line insulators frequently become contaminated with salt, dust, industrial pollution and bird droppings and need cleaning. Contamination can create a conductive path on the surface of the insulator, causing 'flash over' which can result in expensive power interruptions and damage.

To reduce this eventuality many utility companies have successfully implemented preventive insulator washing programmes fitting live-line insulator washing equipment to both insulated and non-insulated truck mounted booms. Bronto has fitted several units with an integrated insulator washing capability to provide real multi-purpose vehicles. The washing equipment can either be operated from the platform or from the ground using remote controls.



A Bronto SI truck mounted lift makes its way to a remote location

all insulated fleet following a number of fatalities where tree trimmers have come into contact with power lines that they had not realised were there.

Bronto, the Finnish-based truck mounted lift producer manufactures some of the largest insulated booms. Its SI range offers working heights of up to 60 metres, with 860kg lift capacity, shorter chassis, all wheel drive, differential locks and tight turning circles giving them similar capabilities to All Terrain



Power washing high tension insulators

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