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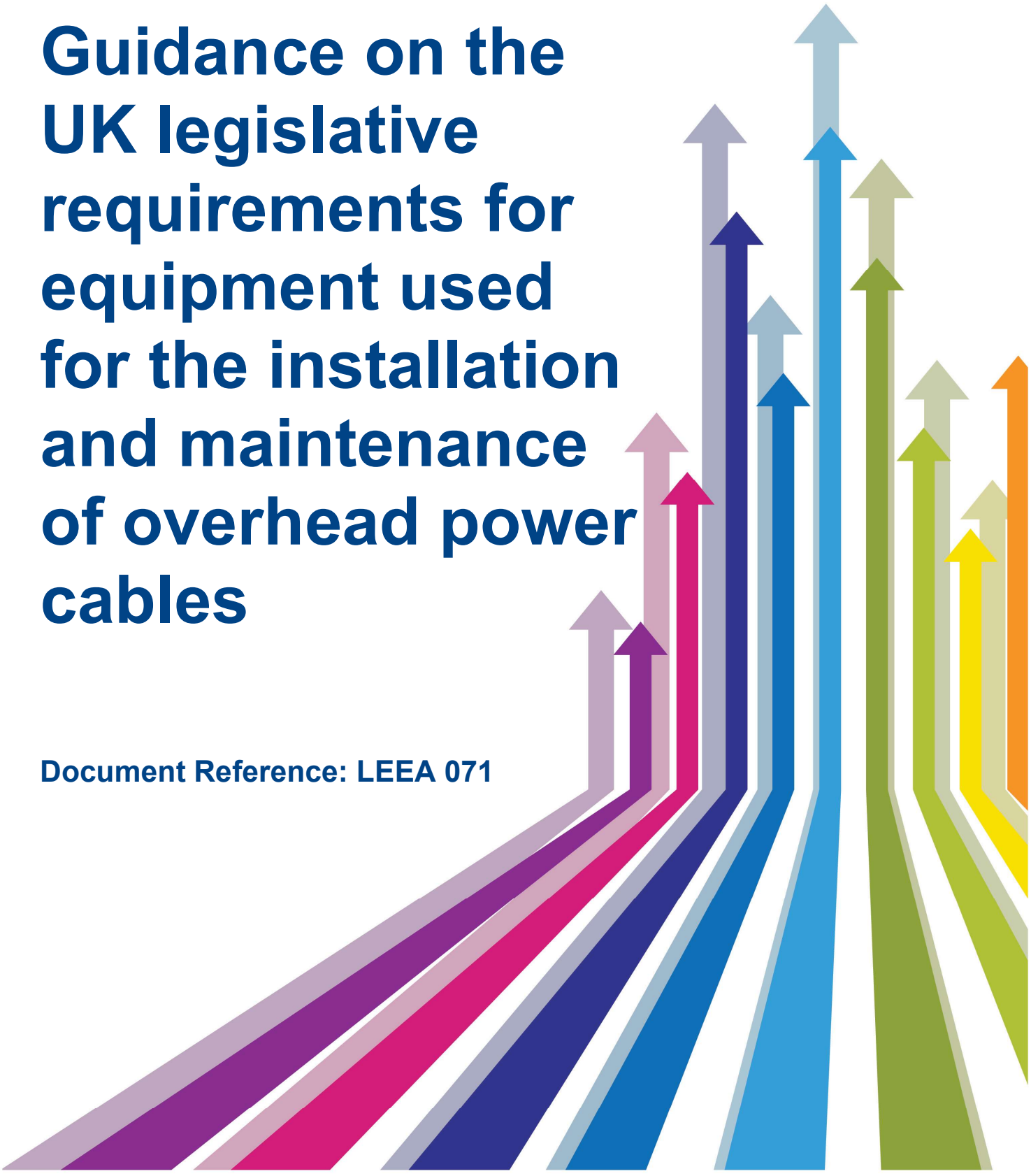
LEEA

Guidance on the UK legislative requirements for equipment used for the installation and maintenance of overhead power cables



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Disclaimer

Every effort has been made to achieve the highest degree of accuracy in the generation of the data and information supplied, but ultimate responsibility for safety must continue to rest with the persons and organisations charged with specific duties in current legislation.

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1.0 Introduction

Discussions with LEEA member organisations involved with the utilities companies and rail network companies that install overhead power lines have indicated there is much confusion in terms of the legislative requirements that apply. This guidance document is designed to provide clarification, based on LEEA's interpretation of the applicable UK regulations and consultation with the HSE (Health and Safety Executive) in the UK.

2.0 Installation techniques

The installation of overhead power cables is known as stringing. There are several different techniques that can be used. Typically, the wire stringing operation requires equipment at each end of the section to be strung. Wire is pulled between these pulling sites through stringing blocks (pulleys) at each structure. These pulling sites are set up at various intervals along the line of the supports. Once the wire is strung and tensioned, the stringing blocks are removed and the wire secured into position.

To fit the wire into position requires some tensioning. This is often done using a tensioning device and wire rope grip/sock arrangement, see figure 1:

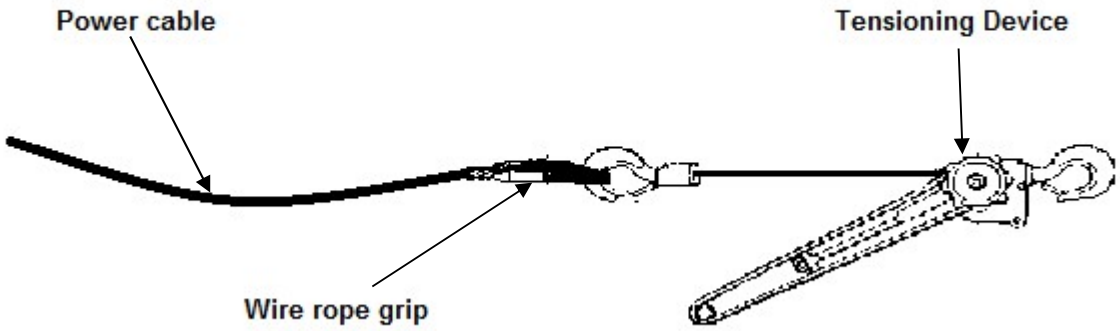

Figure 1: Tensioning assembly

Although the wires are pulled at height, and there is sometimes a change in elevation and deviation during the pulling of the wire, having consulted with HSE, LEEA has concluded that it is a 'pulling' operation and not a 'lifting' operation. However, when equipment is used in this type of operation the consequence of failure of one or more of the tensioning components must be considered.

For example, if the wires are being pulled over populated areas, where it cannot be guaranteed that no-one is in the danger zone, then consideration shall be made to LOLER (.Lifting Operations and Lifting Equipment Regulations 1998)

Note: Tensioning components would also include the power cable and the supporting structure, the integrity of which must also be considered in the planning of the operation.

3.0 Legislation

The following sections provide an overview of the various applicable legislative requirements for the equipment involved in the tensioning and fitting operation for the overhead conductors.

3.1 Supply legislation

The applicable legislation will largely depend on three main factors:

1. If the equipment is powered by means other than human effort.
2. If the equipment is placed on the market for multiple applications, with one of those applications intended for lifting.
3. Manual machinery that is not intended for lifting.

3.1.1 Powered equipment

Whether or not the operation is lifting or pulling, if the equipment is powered by means other than direct human effort then the equipment is classified as machinery (within the scope of the Supply of Machinery (Safety) Regulations 2008 (SOM(S)R).

Powered equipment must therefore be appropriately conformity marked with safety information (refer to LEEA 058 for guidance) and issued with a UK Declaration of Conformity declaring that the equipment meets the Essential Health and Safety Requirements of SOM(S)R. It must also be supplied with instructions for use (refer to LEEA 062 for minimum content of the instructions).

3.1.2 Multiple application equipment, with one application intended for lifting
All lifting equipment, whether powered or manually operated, is within the scope of SOM(S)R and therefore the same requirements apply as referred to in 3.1.1.

3.1.3 Manual machinery that is not intended for lifting
Manual machines and accessories not intended for lifting applications, i.e. manual pulling or tensioning machines and their accessories, are not within the scope of SOM(S)R. As such it is an offence to Conformity mark these products, unless some other UK Regulation applies. However, this does not mean that the equipment is now unsafe - it simply means that the manufacturer will need to ensure compliance with other requirements, such as relevant standards (LEEA recommends the philosophy of BS EN ISO 12100 as a benchmark) and national legislation, e.g. Section 6 of the Health and Safety At Work Etc. Act. 1974 in the UK.

In the UK, section 6 of the Health and Safety At Work Etc. Act 1974 applies to the supply of all work equipment. It is similar to the directive, but is a little more flexible and leaves much to the manufacturer's risk assessment and risk reduction measures to ensure the safety of the equipment.

In terms of documentation, the requirement is to provide 'adequate instruction'. LEEA advises this should be in the form of an instruction leaflet for simple devices and an operating manual for more complex machines. Adequate instruction concerning limitations should also be permanently marked on the equipment. For example**, 'for pulling only'** or **'not for lifting'**, and pulling capacity in kN or kgf, particularly when the device has a similar appearance to a lifting machine.

3.2 Use legislation
The applicable use legislation will depend on the following:

1. The device is used in a lifting operation.
2. The device is not used in a lifting operation, i.e. tensioning or pulling, but the consequence of failure associated with operation is high.
3. The device is not used in a lifting operation.

3.2.1 The device is used in a lifting operation
In this instance it is the Lifting Operations and Lifting equipment Regulations (LOLER) that apply. This covers various aspects of lifting including planning and thorough examination. This legislation applies to lifting equipment in addition to the requirements of the Provision and Use of Work Equipment Regulations (PUWER).

The thorough examination of lifting equipment is set at statutory intervals of 6 months for lifting accessories and people carrying machines and 12 months for lifting machines. These statutory requirements are designed as a final stop check and to check the inspection/maintenance regime is effective. If the inspection and maintenance regime is effective then the thorough examination should not find any defects, if it does then it suggests that there is an issue with the inspection/maintenance regime, the competency of the inspectors or maintainers, the product's fitness for purpose, etc. It would therefore be the responsibility of the duty holder to investigate the root cause of any defect found and put measures in place to prevent reoccurrence. In terms of a written scheme, this would require the scheme to be reassessed and improved.

3.2.2 The device is not used in a lifting operation, i.e. tensioning and pulling, but the consequence of failure associated with the operation is high.
When the consequence of failure associated with a non-lifting operation is high, although it is not a legal requirement, the authorities (i.e. HSE) and LEEA recommend that LOLER and PUWER are applied. The reason for this is that it provides an extra level of safety, as described in 3.2.1.

It is the duty holders responsibility to ensure that consequence of failure is properly risk assessed and appropriate measures and legislation is adopted. For guidance the HSE have provided examples of equipment and applications which they consider to have high consequence of failure, refer to LOLER Guidance paragraph 28(j) and ACOLAR LOLER 2007 – June – 13 v2.

3.2.3 The device is not used in a lifting operation

If the device is not used in a lifting operation, it is PUWER that applies. PUWER requires all work equipment to be maintained and inspected at regular intervals. The intervals between inspections and maintenance are determined by a risk assessment, taking into account the manufacturer's instructions and factors that are likely to result in deterioration, such as use and environmental conditions for example.

As well as the planned maintenance and inspection, there is also an obligation placed on the trained operator to do a basic pre-use check for obvious signs of damage.

It is important to note that in many tensioning or pulling operations a device as described in 3.1.2, has also been designed for lifting. In this instance, if the mode of use is restricted to non-lifting operations and PUWER requirements, it is vital that the use is controlled, i.e. through clear permanent marking, that the equipment is used for pulling or tensioning only and not covered by a LOLER inspection regime.

Note: a chain lever hoist can be used for the pulling and tensioning operation, but because it is a hoist the operator may also decide to use it to lift tools or assemblies into position. In this case LOLER will apply.

4.0 Conclusion

This document demonstrates that the design intent of the lifting, pulling or tensioning equipment can determine the applicable supply legislation. Likewise, the manner in which the equipment is used can also influence the applicable use legislation. It is therefore important that anyone procuring work equipment or planning operations for the installation of overhead cables understands these requirements, particularly as there will be differences in the manner in which compliance is achieved: for example, the applicable documentation or marking requirements.

During the development of this guidance industry experts also highlighted other overhead power cable installation operations that needed clarification in terms of the legislative requirements. These are listed in Appendix 1, along with LEEA's interpretation.

Appendix 1: Other operations associated with the installation of overhead power cables

The following sections highlight other operations associated with the installation of overhead power cables and LEEA's position in terms of the applicable legislation.

A1.1 Ladder basket

The ladder basket, figure 2, is attached to a suitably rated ladder and hung in a position on the tower to provide a temporary access platform.

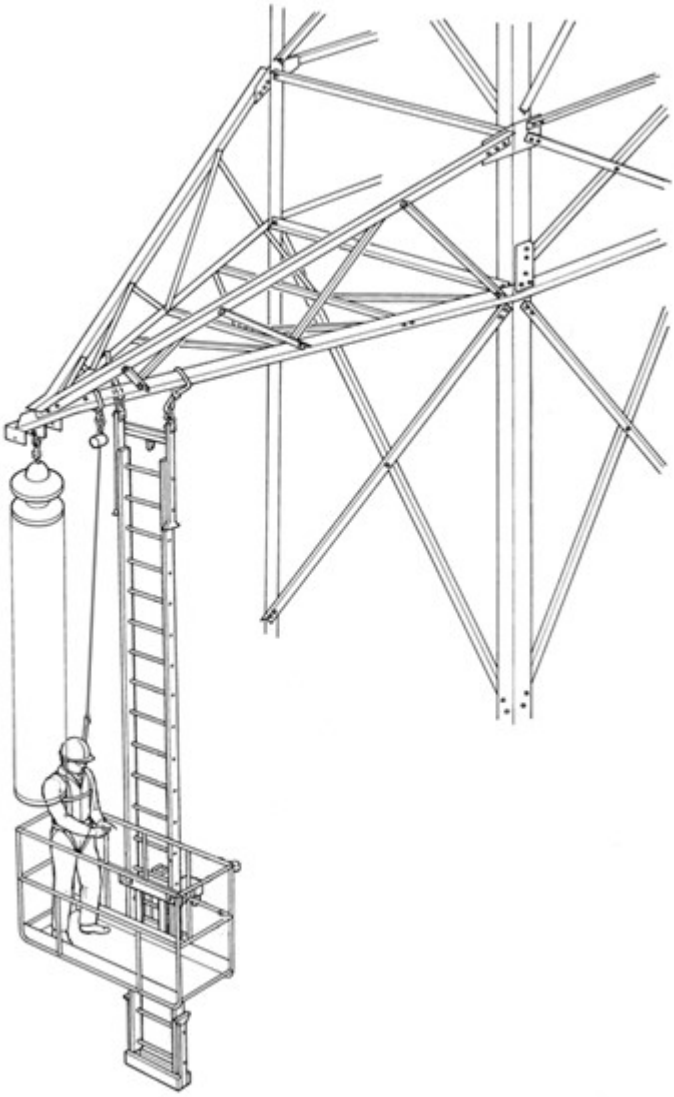

Figure 2: Ladder basket

The ladder basket is installed and maintained at a fixed height and is considered as a temporary access platform. Personnel accessing the platform will be wearing appropriate PPE (Personal Protection Equipment) including fall arrest equipment. This means that LOLER is not applicable to the basket, but the Working At Height Regulations and PUWER must be applied.

In terms of inspection, LEEA would expect the equipment to be inspected before each use and periodically. Intervals should be based on a risk assessment, taking into account the conditions of use that could cause deterioration, such as the amount of use and environmental conditions for example.

A1.2 Pladder

The “pladder”, figure 3, is a temporary lightweight platform suspended from an overhead line and tower.

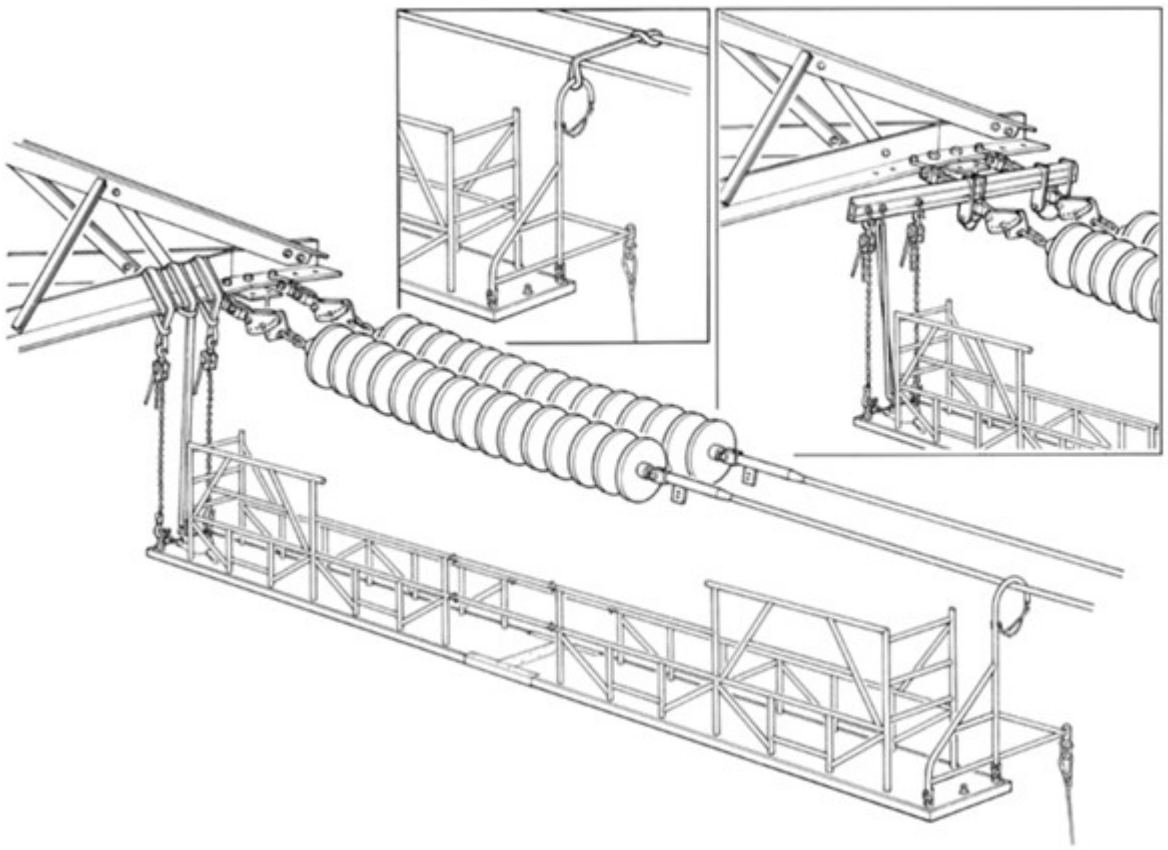

Figure 3: The ‘pladder’

The ‘pladder’ is not lifting equipment, but the chain lever hoist used to install and adjust the height is lifting equipment. It is generally not advised to leave a suspended load attached to lifting equipment, but if it is not reasonably practicable to do otherwise, and as depicted in figure 3, LEEA recommends that a secondary positive holding device is fitted to arrest the fall of the load should the primary device fail. This is particularly important given the fact that people form part of the load.

WARNING: Webbing straps without sufficient edge protection can easily be cut by sharp edges and small radii. It is therefore recommended that suitable edge protection is provided, or something more robust is used instead, such as soft steel or chain assembly.

A1.3 Spacer trolley

Spacer trolleys come in a variety of designs, but all have the same purpose: to allow a person to drive along the conductors, providing access to the conductors and spacers for replacement or repair. A spacer trolley is either manually propelled or mechanically driven along the conductors, see Figure 4.

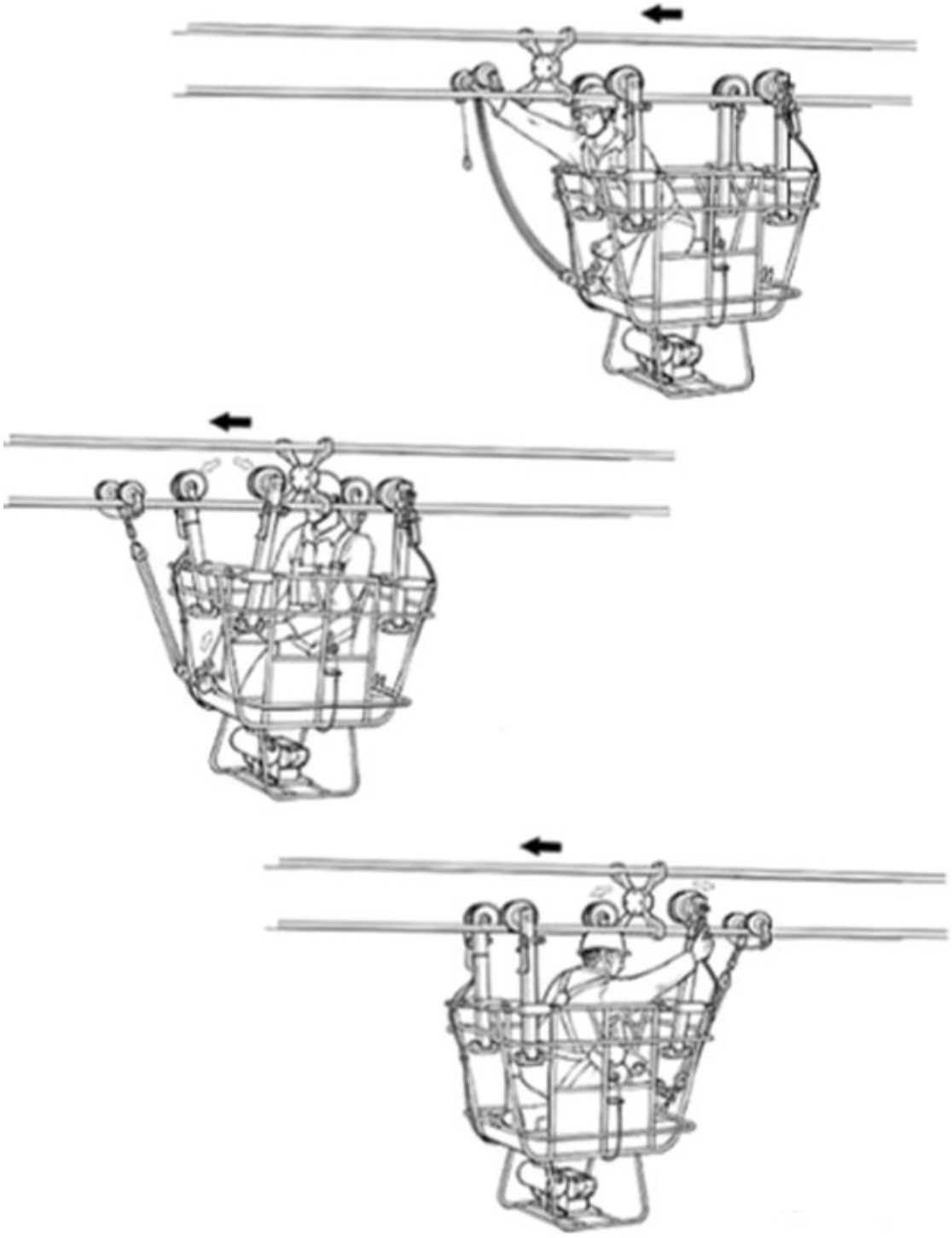

Figure 4: Spacer trolley

LEEA has categorised this type of equipment as a personnel carrier. As with all such carriers, it is not an item of lifting equipment within the scope of LOLER. However, for carriers such as this, LEEA recommends that the following safety precautions are adhered to:

1. Measures must be in place to prevent - so far as is reasonably practicable - a person using it while carrying out activities from the carrier being crushed, trapped or struck, or falling from the carrier.
2. The carrier must have suitable devices to prevent the risk of the carrier falling.
3. Measures must be in place such that a person trapped in the carrier is not thereby exposed to danger and can be freed.

In addition to the above requirements, the carrier should be inspected every day by someone competent to do so (e.g. trained operator, person in charge of the operation) and, if it is not regularly used, then before it is first used each time it is put into service and every day it is used.