MASTCLIMBING WORK PLATFORMS (MCWPs)

HSE Safety alert

Mast climbing work platforms: Failure to detect mechanical failure in drive units leading to uncontrolled fall of platforms - HSE

Arrangements

There will be two short presentations from HSE.
Brent Bolton, HSE Inspector and Regulator, will outline the legal position
Jamie Davies, HSE Specialist Inspector mechanical engineering, will outline the technical position

Attendees should ask questions using the “chat” function

Following the presentations;
some questions may be answered during the meeting
answers to residual questions will be collated by IPAF and communicated at a later date

HSE issued a Safety Alert in May 2022 advising all those with responsibility for, or control of, MCWP operations to check that suitable and sufficient arrangements are in place to prevent platforms falling from height where mechanical faults in drive units can go undetected.

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This issue can be found on some platforms which rely on two independent motor drive units per mast as the means to prevent the platform falling with overspeed.

Definition of drive unit:

Within the safety alert, a drive unit is defined as a single motor assembly consisting of one motor and the associated drive equipment including reduction gearbox, electromagnetic brake, centrifugal brake, and pinion.

The Health and Safety at Work etc. Act 1974 requires every employer

“to ensure, so far as is reasonably practicable, the health, safety and welfare at work of all his employees”

and

“to conduct his undertaking in such a way as to ensure, so far as is reasonably practicable, that persons not in his employment who may be affected thereby are not thereby exposed to risks to their health or safety”

Additionally

The Provision and Use of Work Equipment Regulations 1998 (PUWER) require every employer to

“ensure that work equipment is so constructed or adapted as to be suitable for the purpose for which it is used or provided”

“suitable” means suitable in any respect which it is reasonably foreseeable will affect the health or safety of any person

Furthermore, there is a duty on

“any person who designs, manufactures, imports or supplies any article for use at work…”

to

“ensure, so far as is reasonably practicable, that the article is so designed and constructed that it will be safe and without risks to health at all times when it is being set, used, cleaned or maintained by a person at work”

Most MCWPs are manufactured to BS EN1495, which requires platforms that rely on two or more independent and identical electric motor direct drive units to ensure safety, to have a brake on each drive unit and a device to detect malfunctions in each drive unit

The device to detect malfunction should, at least indicate a loss of mechanical integrity which results in a differential in the current demand between each drive unit,

exceeding 25 % of the full load current

The primary objective is to reduce the risks associated with the use of these MCWPs to the lowest level reasonably practicable (ALARP)

This should be achieved by adopting the general principles of prevention contained in schedule 1 to Regulation 4 of the Management of Health and Safety at Work Regulations 1999

To that end, alternative methods of ensuring safety may be acceptable provided they offer at least the same degree of protection provided by the requirements of BS EN1495

Adopting the ALARP approach means that a management systems approach, which might stipulate increased frequency of inspections, more robust maintenance regimes, or pre-use checks on the mechanical integrity of the motor drives before each upward stroke of the platform, is not acceptable.

The reason for this being that, mechanical and electrical solutions are available which can be fitted in preference to giving instructions to employees, which is identified as the lowest level of protection in the principles of prevention.

- MCWPs are required to comply with the machinery directive.
- This is enacted in UK law by the supply of machinery safety regulations.
- Usually, MCWPs are CE marked in accordance with the harmonised standard BS EN 1495, but they can be to the machinery directive and not follow the standard.
- If in accordance with the machinery directive, the essential health and safety requirements (EHSRs) should be satisfied if compliance is not achieved by following a harmonised standard.
- In any event the machinery requires notified body oversight to confirm compliance with either.
- If the equipment fails to meet the standard of the directive, then it isn't compliant and as such should not be placed on the market.

A thermal overload relay, on its own, does not provide the differential current detection required by the standard for the option using 2 identical drive units. i*) Detect malfunctions in each drive unit which endanger proper function. These shall at least indicate a loss of mechanical integrity which results in a* ***differential in the current demand*** *between each drive unit, exceeding 25 % of the full load current*

The thermal overload relay isn't sensitive enough to detect a failure in one drive unit, and do not have any way to compare the currents drawn by each motor to measure a percentage value. This is particularly relevant if being relied on in the cold or if operating for short periods where they do not heat up and trip.

If a mechanical failure cannot be detected between the drive and the pinion, then a single motor can be doing all the work and the failed unit may not be detected. In this scenario without detection the remaining unit is the sole connection with the mast and if this fails mechanically and the means of engaging the emergency brake is at the end of the motor, then there is no emergency brake.

If independent safety gear is used, then the discussion on thermal overload relays is mute as that is the 1st option available in the standard and requires no further measures, it is the second option where additional measures are needed and make the failure detection of the drive unit essential as there may not be any independent means of preventing falling due to overspeed.

It has been found that some manufacturers have claimed compliance with BS EN 1495, without fulfilling the requirement of detecting malfunctions, relying solely on a thermal overload relays, which as stated doesn't provide the intended safety function.

There are also allegations of fraudulent notified body documentation claiming compliance with BS EN 1495 or irrelevant directives associated with low voltage, rather than the machinery directive.

We are not requiring machinery to be modified or altered if it complies with the standard or the machinery directive, but where they do not then rectification is required.