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ACCESS FEDERATION

Preventing Operator Entrapment

Chris Wraith – IPAF Technical Officer

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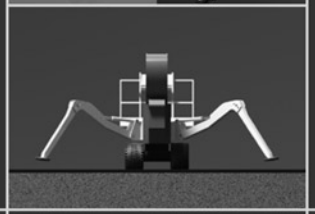

Preventing Operator Entrapment

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An overview of the latest thinking from manufacturers, safety authorities and rental companies.

- Facts
- Problem
- Causation
- Solutions

Facts

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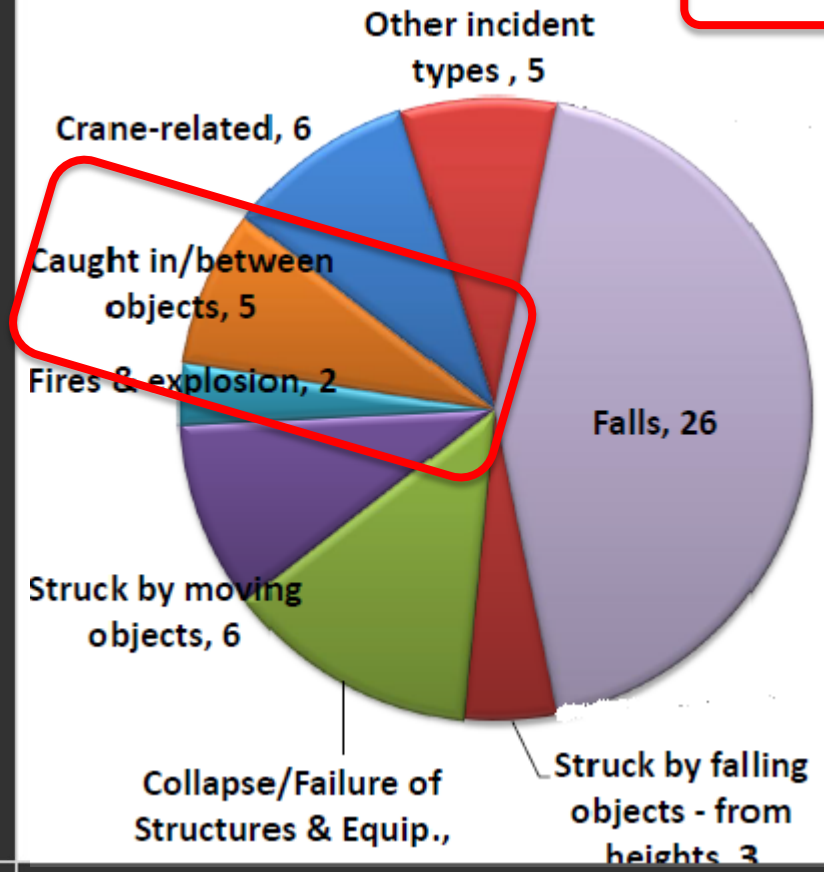
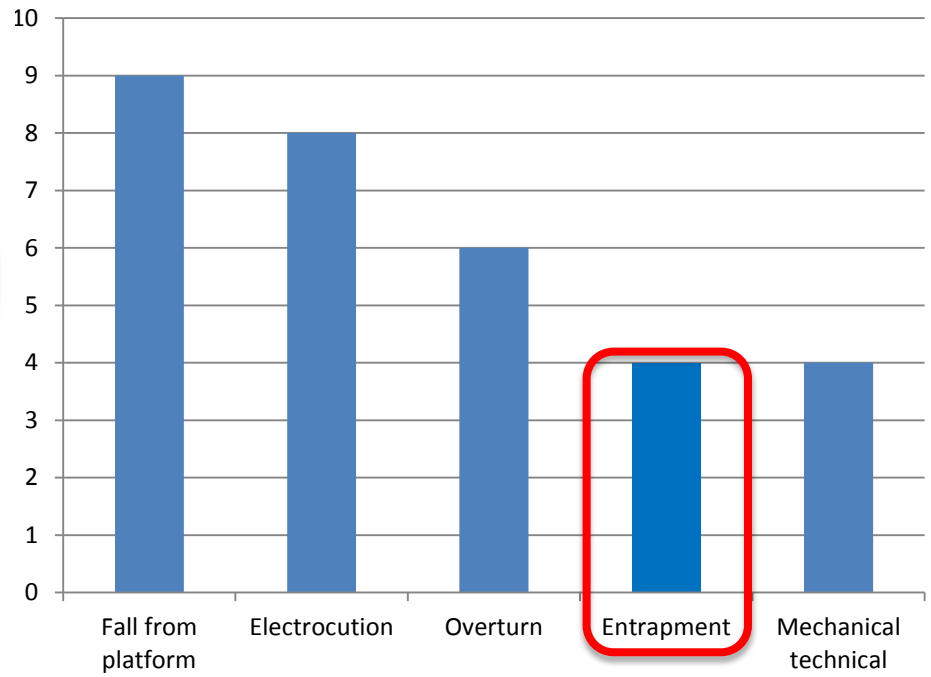
Falls – 251 (35%) **Struck by Object** – 73 (10%)

Electrocutions – 67 (9%) **Caught-in/between** - 19 (3%)



IPAF Data fatal AWP incidents 2012



The problem

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Bigger machines , more machines, more complicated structures

The risk of being crushed against fixtures or other obstacles while accessing the work area, or while working at height.

The risk is everywhere

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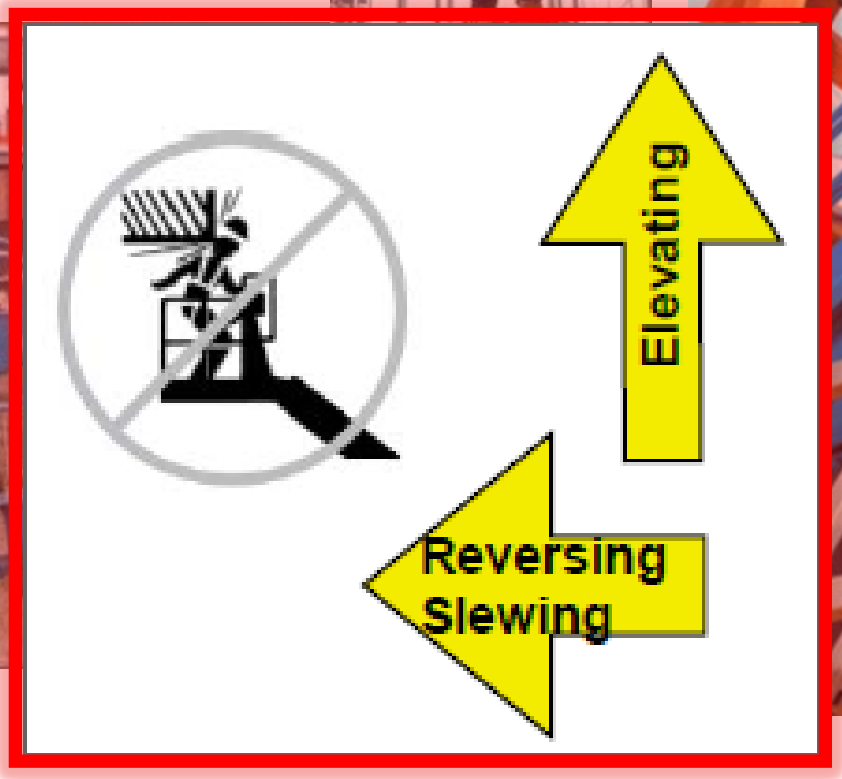

Causation

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Best Practice Guidance for AWPs

Avoiding Trapping / Crushing Injuries to People in the Platform

Strategic Forum for Construction
Plant Safety Group
US Edition – Prepared by the
International Powered Access Fede

Ref. IPAF UST1

First Published: April 2011, Copyright

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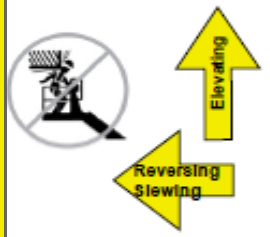
The document was first published for the UK-based Strategic Forum for Construction – Plant Sa
following UK organisations contributed to the document: the British Constructional Steelwork As
Engineering Contractors Association, Construction Skills, the Construction Plant-hire Associatio
Equipment Training (FASET), the Health & Safety Executive (HSE), the International Powered A
National Construction College (NCC), UCATT and the UK Contractors Group (UKCG).

The Trapping/Crushing Risk

AWPs are acknowledged to be the safest and most efficient means of providing temporary access at height for many work activities.

In some work situations, however, AWP operators, particularly of boom-type AWPs, have been trapped/crushed between the AWP platform/basket and an overhead obstruction. This has resulted in a significant number of serious accidents, including several deaths, in the recent years. In some of these accidents, the operator's body was trapped/crushed over the control panel, trapping the controls in the "on position" and making the crushing worse.

This Best Practice Guidance has been produced by the Strategic Forum
risk
detailed



WP close to an overhead
page 29.

lzed operators

- Poor MEWP route planning
- Poor MEWP selection
- Insufficient MEWP familiarisation
- Uneven ground
- Poor visibility at height
- Distractions when operating MEWP
- Objects placed on the control panel
- High drive speeds, or lack of care...
- Overriding MEWP controls
- Using faulty or poorly maintained MEWPs

Operators responsibility

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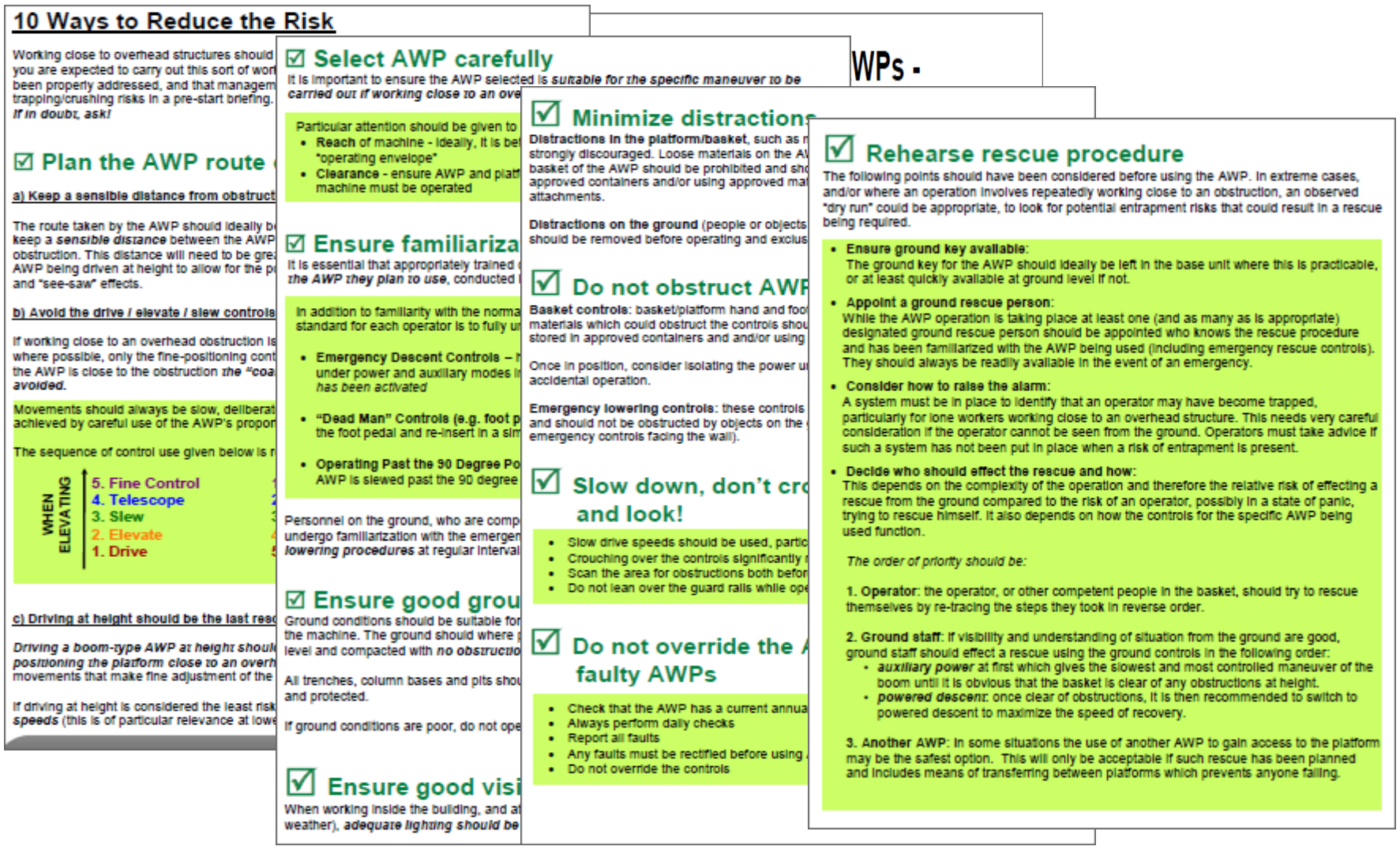

10 Ways to Reduce the Risk

Working close to overhead structures should
you are expected to carry out this sort of wor
been properly addressed, and that managem
trapping/crushing risks in a pre-start briefing.
If in doubt, ask!

☑ Plan the AWP route

a) Keep a sensible distance from obstruct

The route taken by the AWP should ideally b
keep a ***sensible distance*** between the AWP
obstruction. This distance will need to be gre
AWP being driven at height to allow for the p
and "see-saw" effects.

b) Avoid the drive / elevate / slew controls

If working close to an overhead obstruction is
where possible, only the fine-positioning cont
the AWP is close to the obstruction ***the "coa***
avoided.

Movements should always be slow, deliberat
achieved by careful use of the AWP's propor

The sequence of control use given below is r

WHEN ELEVATING

5. Fine Control
4. Telescope
3. Slew
2. Elevate
1. Drive

c) Driving at height should be the last reso

Driving a boom-type AWP at height shoul
positioning the platform close to an overh
movements that make fine adjustment of the

If driving at height is considered the least risk
speeds (this is of particular relevance at lowe

☑ Select AWP carefully

It is important to ensure the AWP selected is ***suitable for the specific maneuver to be carried out if working close to an ove***

Particular attention should be given to
- **Reach** of machine - ideally, it is be "operating envelope"
- **Clearance** - ensure AWP and platf machine must be operated

☑ Ensure familiariza

It is essential that appropriately trained ***the AWP they plan to use***, conducted

In addition to familiarity with the norma standard for each operator is to fully u

- **Emergency Descent Controls** – h under power and auxiliary modes i *has been activated*
- **"Dead Man" Controls (e.g. foot p** the foot pedal and re-insert in a sim
- **Operating Past the 90 Degree Po** AWP is slewed past the 90 degree

Personnel on the ground, who are comp undergo familiarization with the emergen ***lowering procedures*** at regular interval

☑ Ensure good grou

Ground conditions should be suitable for the machine. The ground should where level and compacted with ***no obstructio***

All trenches, column bases and pits shou and protected.

If ground conditions are poor, do not ope

☑ Ensure good visi

When working inside the building, and a weather), ***adequate lighting should be***

WPs -

☑ Minimize distractions

Distractions in the platform/basket, such as r strongly discouraged. Loose materials on the A basket of the AWP should be prohibited and sh approved containers and/or using approved ma attachments.

Distractions on the ground (people or objects should be removed before operating and exclus

☑ Do not obstruct AWP

Basket controls: basket/platform hand and foo materials which could obstruct the controls shou stored in approved containers and/or using

Once in position, consider isolating the power u accidental operation.

Emergency lowering controls: these controls and should not be obstructed by objects on the emergency controls facing the wall).

☑ Slow down, don't cr and look!

- Slow drive speeds should be used, partic
- Crouching over the controls significantly
- Scan the area for obstructions both befor
- Do not lean over the guard rails while ope

☑ Do not override the faulty AWPs

- Check that the AWP has a current annua
- Always perform daily checks
- Report all faults
- Any faults must be rectified before using
- Do not override the controls

☑ Rehearse rescue procedure

The following points should have been considered before using the AWP. In extreme cases, and/or where an operation involves repeatedly working close to an obstruction, an observed "dry run" could be appropriate, to look for potential entrapment risks that could result in a rescue being required.

- **Ensure ground key available**:
  The ground key for the AWP should ideally be left in the base unit where this is practicable, or at least quickly available at ground level if not.
- **Appoint a ground rescue person**:
  While the AWP operation is taking place at least one (and as many as is appropriate) designated ground rescue person should be appointed who knows the rescue procedure and has been familiarized with the AWP being used (including emergency rescue controls). They should always be readily available in the event of an emergency.
- **Consider how to raise the alarm**:
  A system must be in place to identify that an operator may have become trapped, particularly for lone workers working close to an overhead structure. This needs very careful consideration if the operator cannot be seen from the ground. Operators must take advice if such a system has not been put in place when a risk of entrapment is present.
- **Decide who should effect the rescue and how**:
  This depends on the complexity of the operation and therefore the relative risk of effecting a rescue from the ground compared to the risk of an operator, possibly in a state of panic, trying to rescue himself. It also depends on how the controls for the specific AWP being used function.

  The order of priority should be:

  1. **Operator**: the operator, or other competent people in the basket, should try to rescue themselves by re-tracing the steps they took in reverse order.

  2. **Ground staff**: if visibility and understanding of situation from the ground are good, ground staff should effect a rescue using the ground controls in the following order:
     - ***auxiliary power*** at first which gives the slowest and most controlled maneuver of the boom until it is obvious that the basket is clear of any obstructions at height.
     - ***powered descent***: once clear of obstructions, it is then recommended to switch to powered descent to maximize the speed of recovery.

  3. **Another AWP**: in some situations the use of another AWP to gain access to the platform may be the safest option. This will only be acceptable if such rescue has been planned and includes means of transferring between platforms which prevents anyone falling.

Managers responsibility

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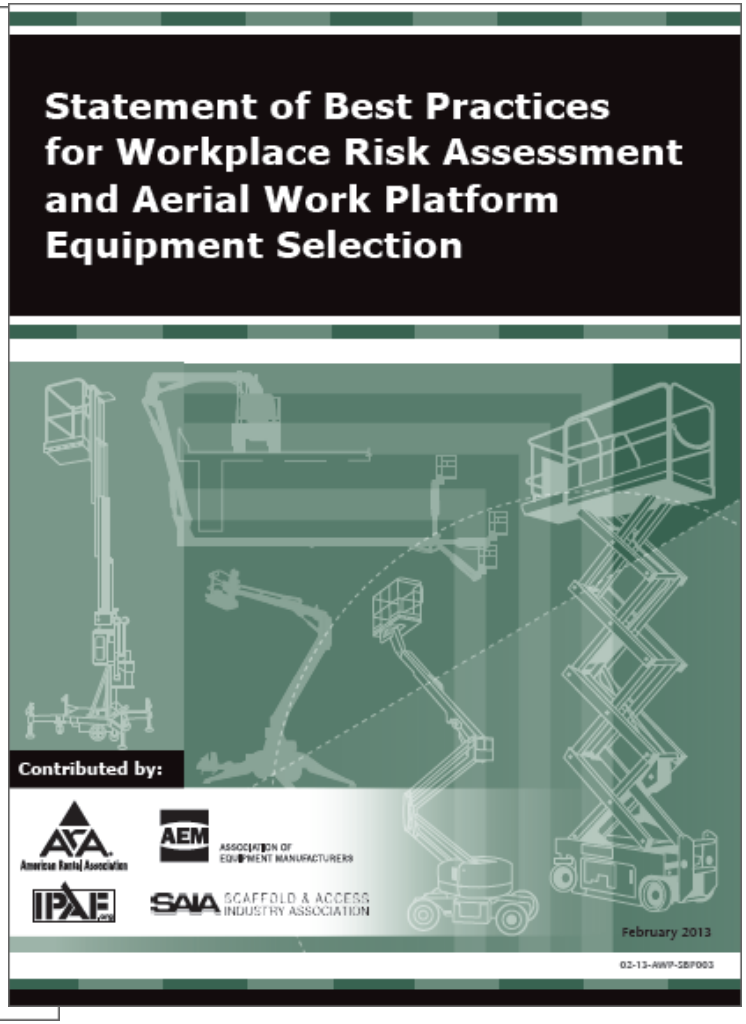
Part 1 :Guidance for Planners, Managers and Training Bodies

1. Purpose of Part 1

2. Typical hazards, causal factors and control measures

3. Planning
   - 3.1 Method of work
   - 3.2 Risk assessment
   - 3.3 AWP selection
   - 3.4 Safe system of work
   - 3.5 Emergency plan and drills
   - 3.6 Co-ordination with other activities and preparation of work areas



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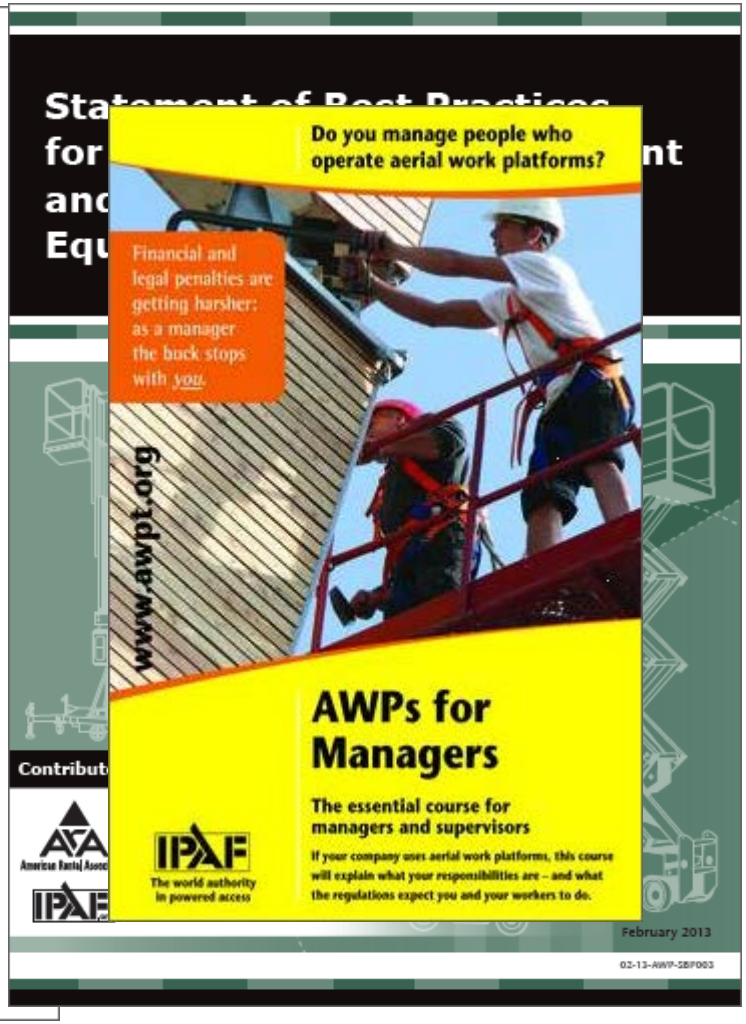
4. Supervision and monitoring

5. Competency and training
   - 5.1 Competency
   - 5.2 Training
   - 5.3 Records



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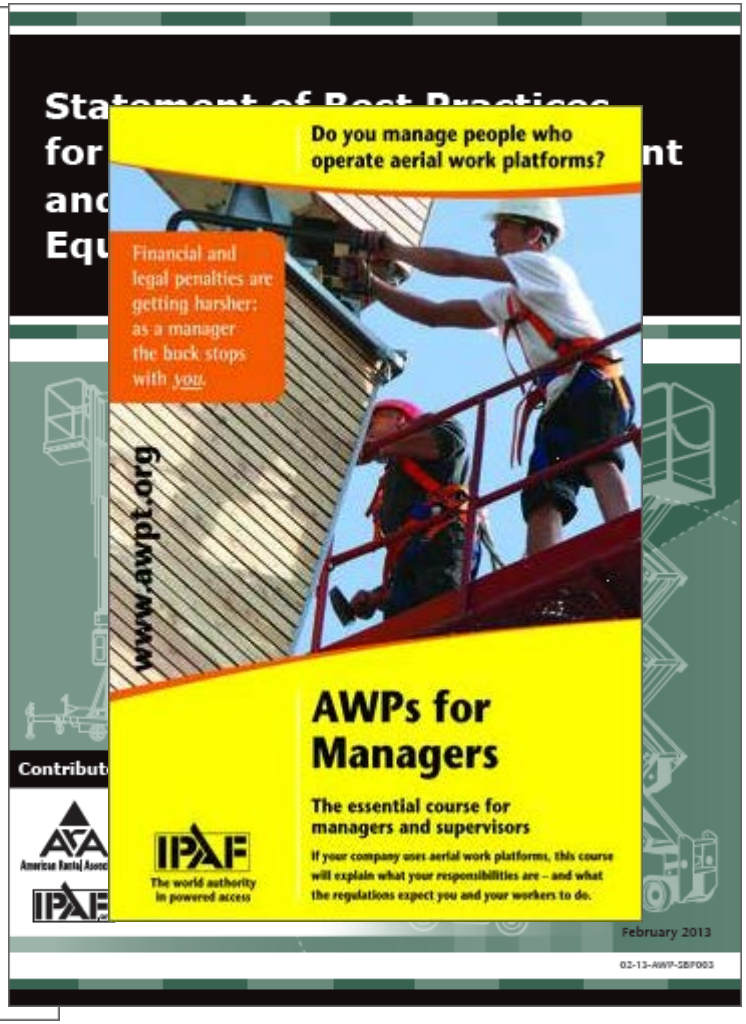
6. Fitting additional devices or equipment on AWPs

Annexes
1. Hazards, Causal Factors and Control Measures - Travelling to and from the work area
2. Hazards, Causal Factors and Control Measures – Accessing the work area and working at height
3. Important Factors in Planning
4. Important Factors when Selecting a AWP
5. Emergency Descent Decal
6. AWP Categories
7. Emergency procedures



Manufacturers responsibility

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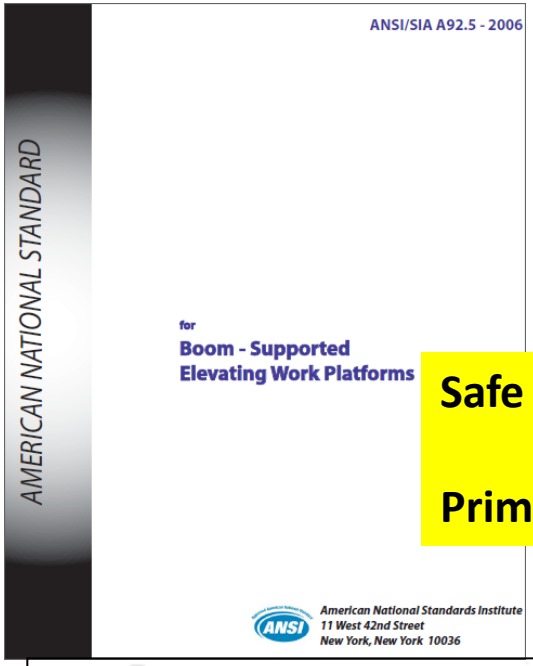
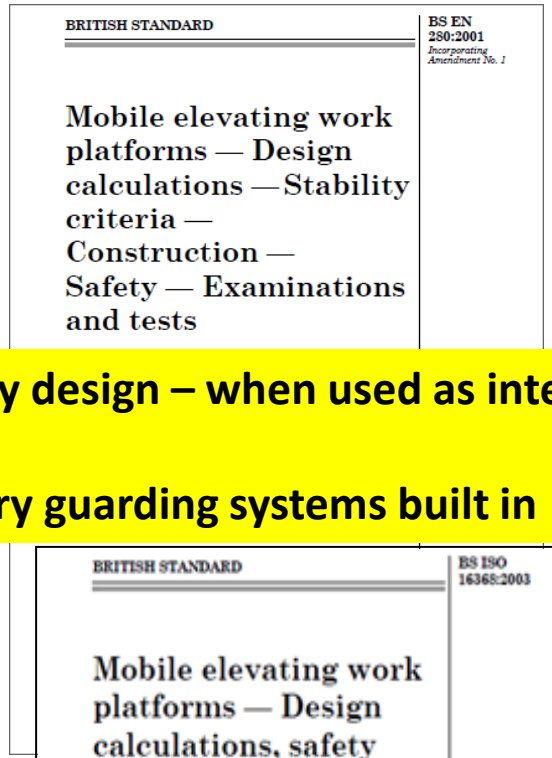
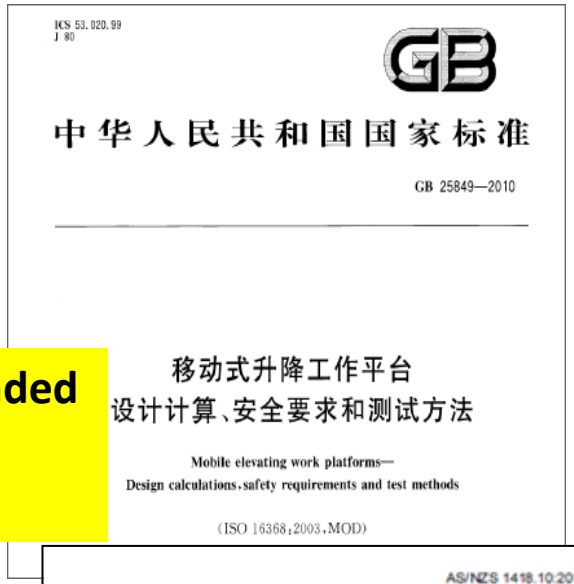
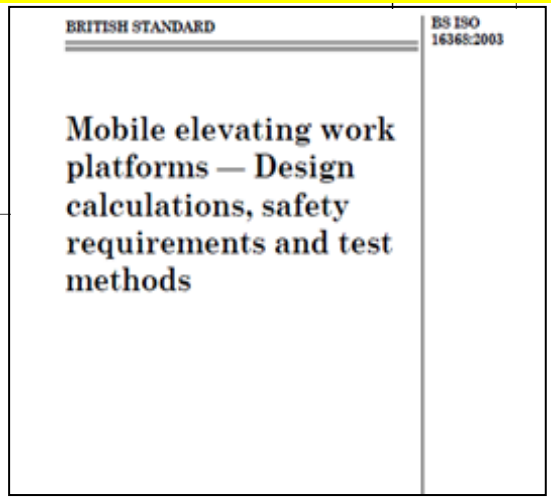






Safe by design – when used as intended

Primary guarding systems built in



Anti-[illegible]ment solutions???

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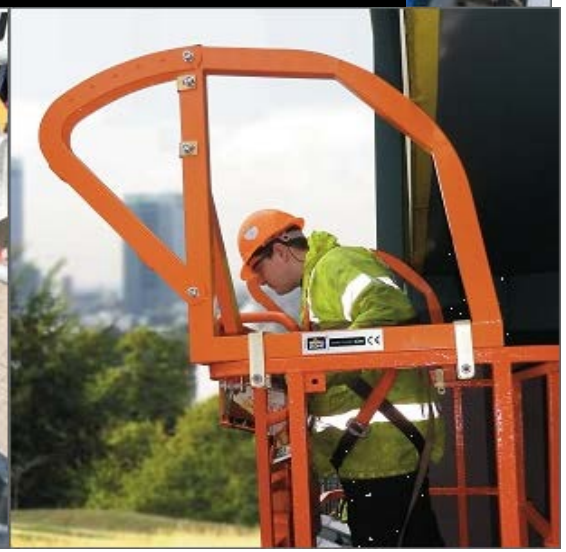
Protective structure

Pressure sensing and audible technology

Standard

Additional equipment

Secondary guarding solutions



No one simple solution

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Further guidance and word of caution

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Ref. UST3 07/12-001

Guidance on AWP selection where the risk of sustained involuntary operation of controls and/or overhead entrapment is identified

1.0 Introduction

The use of aerial work platf
and safer than using trad
significantly reduce the risk
Unfortunately, accidents in
incidents, some have involv
near obstructions. These i
selection of the appropriate

2.0 Means of prevention

Currently there is no single
the combined efforts of ope

- Improve oper
- Improve man
- Clarify supplie
- Continue AW

3.0 Existing Guidance

IPAF has worked closely
guidance on "Avoiding
comprehensive and easy t
Published in July 2010, co
recommended that the SF
converted for use in the N
section of www.ewpf.org.

4.0 Available equipment o

This document is intende
available, when considering
sustained involuntary opera
is not intended to replace th
selection of AWPs and po
Device selection should be

- Travelling to and fr
- Accessing the wor
- Working at height
- Emergency rescue

The pictorial examples in t
variety of boom type AWPs
application to scissor lifts (3

Please note: Inclusion or e
simply reflects those design
are in no particular order or

Guidance on AWP selecti

Item 1
Local control surround stand-ups

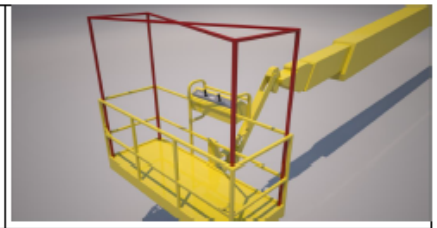
Item 2
Control well and front stand-off bar – with or without ergonomically designed pressure sensing feature

Item 3
Stand-off bar (above controls)

Item 4
Control panel with shroud

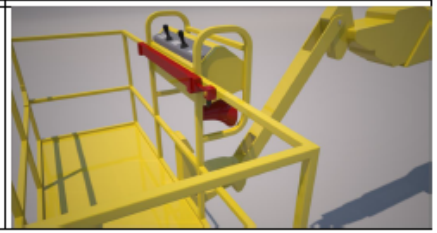
Guidance on AWP selection where the risk of sustained involuntary operation of controls and/or overhead entrapment is ide
Page 2 of 4

Item 5
Physical platform cage



Item 6
Side protection bars

Item 7
Pressure sensing bar with audible and visual alarm



5.0 Caution

It should be noted that: -

- No one particular device or item of equipment will prevent overhead entrapment in all known circumstances when operating a AWP (See Section 2 above)
- In selecting a device or equipment to address a single hazard, consideration should be given to the potential for significantly increasing other possible hazards
- Some of the devices and equipment shown above can be fitted to existing machines, used independently or in conjunction with each other

Guidance on AWP selection where the risk of sustained involuntary operation of controls and/or overhead entrapment is identified
Page 3 of 4

6.0 Fitting of additional devices or equipment

Some of the devices and equipment shown are fitted to AWPs by the manufacturer during the assembly process and as such are an integral part of the original machine design and certification.

pment to existing machines, it is recommended that those intending
ding trapping/crushing injuries to people in the platform" document,
ent on AWPs".

g operator training programs, IPAF supports manufacturers, rental
es and features to further improve the safe operation of AWPs.
and update this document as necessary in order to reflect current
sustained involuntary operation. Those with knowledge of relevant
should forward the information to IPAF at info@ipaf.org or contact

ensure that a safe system of work has been devised to ensure that
stem of work should be communicated to all persons involved in the
sks and potential rescue. Management, supervisors and operators
ify entrapment risks and carry out their duties safely.

chine selection where an increased risk of sustained involuntary
es been identified may be obtained from both the manufacturer and
Strategic Forum for Construction, Plant Safety Group guidance,
the platform" which is freely available to download from the
f.org or www.ewpf.org.

involuntary operation of controls and/or overhead entrapment is identified
Page 4 of 4

Conclusion

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- AWPs are safe by design - primary guarding systems
- AWPs do introduce specific hazards/risk
- Entrapment crushing is not the major cause of injury
- General and specific entrapment guidance
- No one single solution
- Involvement of everyone in the industry
- Secondary guarding alone is not the answer

Thank you for listening

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