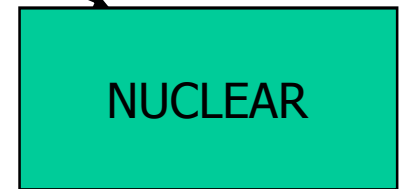
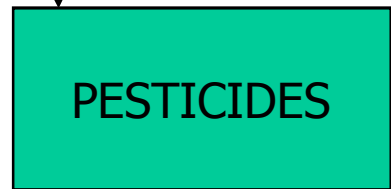
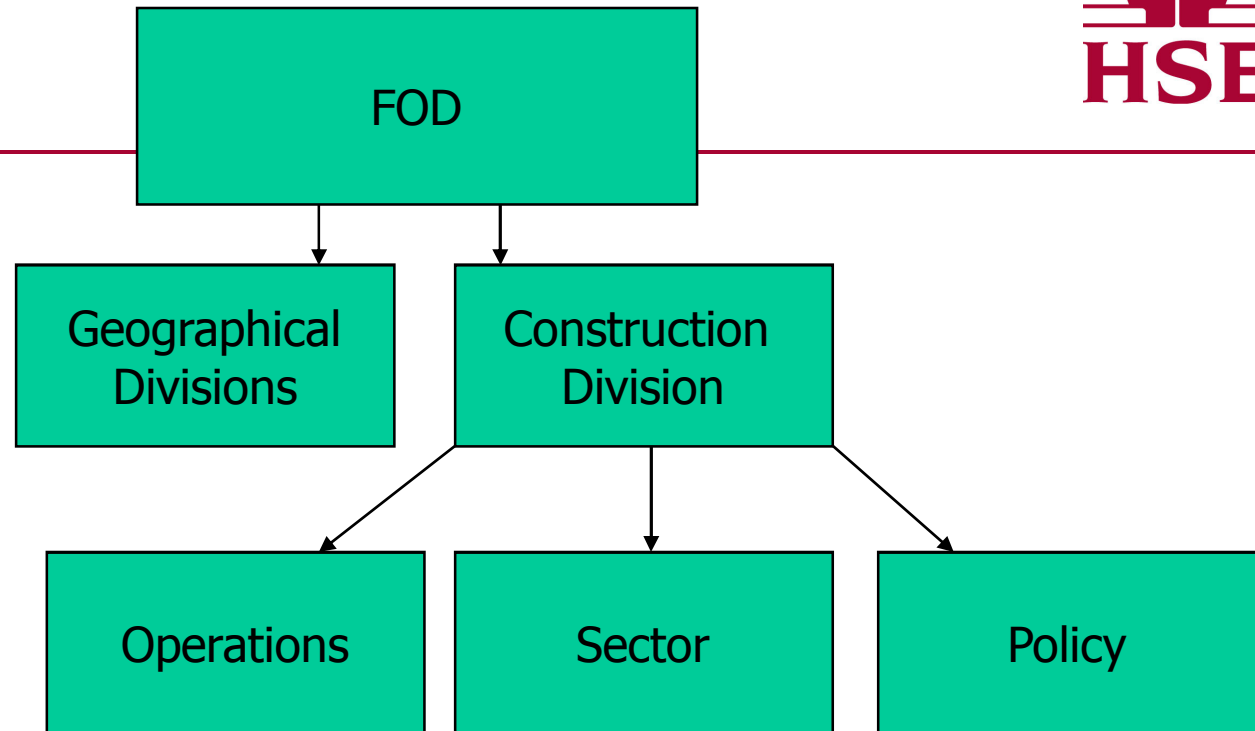

The Safe Use of Quick Hitches

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Construction Sector -
Safety Team

Health and Safety
Executive



Health and Safety
Executive



What are Quick Hitches?

- Attachment to excavator arm that allows for multiple tools to be used.
- Useful aid to changing over to larger/smaller buckets etc.
- Many different types of quick hitch to match many different makes of attachment (60+).

Why Quick Hitches? What do we know?



- 4 Fatalities associated with lifting operations December 2006-2007.
- Nature of the problem means that when bucket falls it will often result in no injury or death.
- Information from all spheres of the construction industry suggest a big problem- not often reported.

Two systems



Pin type systems pick up the bucket using the normal pins



Two systems



Dedicated systems pick up the bucket using special lugs



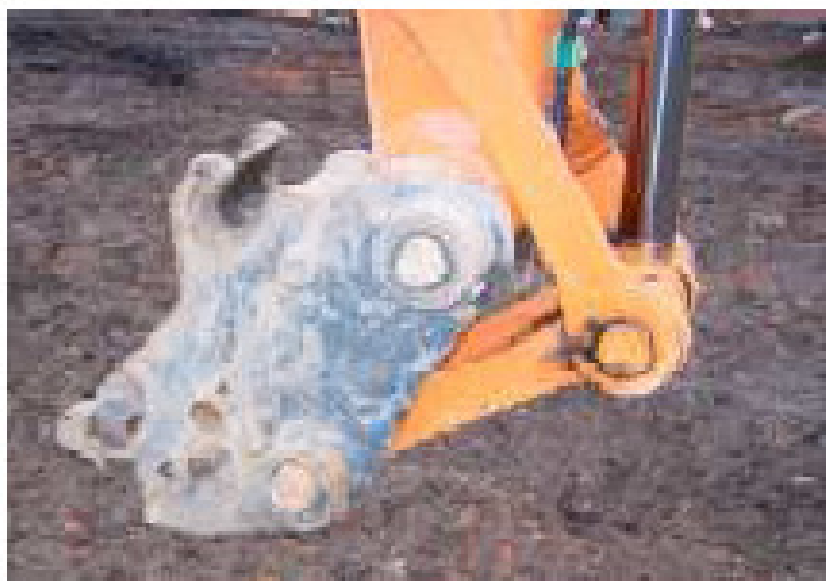
Different Types of Quick hitch

Many variations. Broken down into 3 levels of automation:

- Manual
- Semi automatic
- Automatic
- All fatalities involved semi-automatic types.

Type of Quick Hitch System	Typical Method of Engagement	Typical Locking / Security System
Manual	Manually retained e.g. by sprung latch operating with a lever	Manually inserted safety pin
Semi - automatic	Hydraulically operated retaining latch mechanism	Manually inserted safety pin
Fully - automatic	Hydraulically operated retaining latch mechanism	Hydraulically operated safety mechanism (may incorporate hydraulic and / or sprung safety system)

Manual



N.B Manual Hitches do not feature in the accident statistics

Automatic



Automatic – Movement is hydraulic, and locks automatically



Automatic



Some issues relating to way hitches work.

Buzzers.

Internal verification

Smaller number of accidents

Semi-Automatic



Semi- Automatic Cont'd

Pin acts as a safeguard to incorrect use.

- Ram pushes the mobile lock into place.
- Internal locking mechanism falls into place.
- Pin inserted to ensure internal locking mechanism does not become displaced.

Semi- Automatic Cont'd



Problems.

- Arm will still work if pin is not inserted.
- Pressure on hydraulics.
- Change of pressure, movement in ram

LOLER



- Came into force on 5th December 1998
- Applies to ALL work activities
- Duties on those in control
- Employers
- Self-employed
- Not all excavators are lifting appliances and subject to LOLER

Positioning and installation Reg 6 (1)



Reduce to as low as is practicable the risk:

- Of the lifting equipment or load striking a person
- From a load -
 - Falling freely (e.g. check valves, safety catches)
- And ensure that it is otherwise safe

Applicable Legislation/ Standards



Supply Machinery (Safety) Regulations 1992
(2008)

EN 474- Earth Moving Machinery
Part 1 appendix B.

No new legislation, no new Regulations....

Applicable Legislation/ Standards



Supply Machinery (Safety) Regulations 1992
(2008)

Machines should be designed to take into account foreseeable use and abuse.

Foreseeable that the pin would be left out so if possible to eliminate this characteristic by design then there is a legal obligation to do so.

Design



- 474-1. Amendments - currently ongoing.
- CDTU playing an instrumental role in changing EN standard to reflect level of dangers.
- Manufacturers consulted and a new form of words being discussed to alter design specifications in 474.
- Semi- automatics rely on insertion of safety pin to ensure against loss of engagement force.

Design



B.2.1 Locking

The attachment bracket shall have a locking system in addition to the primary engagement system that meets the following requirements:

The primary engagement system is that which connects the attachment to the coupler and allows it to be used as intended.

The locking system is that which prevents the release of the attachment from the engaged position, for example in the event of the failure of the primary engagement force.

Safety-related control circuits shall comply with ISO 15998: and ISO 13849-1:

the locking system shall prevent the attachment from being unintentionally released by means, for example, of a positive engagement system and shall retain it under all intended/normal operating conditions;

A positive engagement system is one which remains in place without the need of any external force.

the locking system shall be activated either automatically or from the location where the attachment bracket is operated to attach the attachment;

it shall be possible to verify from the operator's station, or from the location where the locking control is operated, that the system has activated successfully into the locked condition; Note to drafters: this indent needs to be edited to clarify the distinction between engagement and locking.

the locking system shall be able to take the full operating forces applied to the attachment in the event of failure of the engagement force(s), if any;

it shall not be possible to release the attachment by malfunction or loss of engagement force(s). For the purposes of testing, the attachment shall not be released with the machine switched off for a period of 12 hours.

Wedge-shaped locking systems shall provide a continuous force (e.g. continuous pressure with open return, hydraulic accumulator, compressed spring) to hold the attachment in the locked position.

Where the primary engagement system relies only on hydraulic pressure to hold the attachment the locking system shall not depend on the hydraulic pressure of the primary engagement system.

Note: systems which use sliding components (e.g. pins) to retain the attachment whereby those components are in shear in machine working operations are not considered to rely only on hydraulic pressure to hold the attachment.

Training



Difficult area...

Training providers- no previous training on QH's....

CITB course built specifically for qh's

Ongoing HSE work. Syllabus for driver training.

Maintenance



- Key to ensuring wear/dirt/ hydraulics do not contribute to incidents.
- Pin retention. Identify when pin not in use
- Replaced by? Srewdrivers, coat hangers

Enforcement Expectation

- See SIM 02/2007/01
- In principle EMM sees no pin available (or replaced by inappropriate material) as an extreme risk gap and IEE supports issuing a PN.
- Working below bucket? PN
- Operator not knowing how to use qh properly? PN operator using excavator with qh.
- No RA for qh use or management regime to check qh pin available? IN unless one of the above applicable.

Further Information



http://www.hse.gov.uk/foi/internalops/sectors/construction/2_07_01.pdf

<http://www.hse.gov.uk/construction/quickhitch.htm>

Future choices



Manual

Or

Automatic. Either locking on one pin or two. The standard **will not differentiate.**

Thank you



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- Any questions