Health & Safety

Tony Rees looks at the Health & Safety requirements for tools, mowers, tractors and any other equipment that is used around the course and workshops.

On your guard

The legislation that covers these pieces of equipment that is the Provision and Use of Work Equipment Regulations 1992. The regulations came into force from 1 January 1993 for new equipment and from 1 January 1997 for existing equipment already in use.

General duties for all equipment

Work equipment is widely defined and includes everything from simple hand tools to vehicles and complex installations ie a screwdriver, a tractor and an oil refinery are all work equipment at any workplace - not just factories.

The general duties require employers to:

Select suitable equipment for use, and ensure it is only used where suitable.

Maintain all equipment in a safe condition and keep maintenance logs up to date where they are provided.

Restrict the use, modification and repair of equipment involving a specific risk to authorised persons.

Provide information, and where appropriate written instructions for use.

Ensure that users and their supervisors are adequately trained for the purpose of health and safety.

All work equipment provided for use for the first time after December 31, 1992 shall be manufactured in conformity with relevant EN standards, which replace existing British Standards.

Additional duties for machinery

Provision of Guards.

The Factories Act 1961 was for many years the basis of standards, summarised in the requirement that dangerous parts shall be securely fenced.

The equivalent requirement in the Work Equipment Regulations is that access to dangerous parts shall be prevented, or movement stopped before a person enters a danger zone. It applies to all work places and all machinery.

A hierarchy of prevention is listed including:

Fixed Guarding; Other Guards or devices; Jigs, work holders or protection devices; Information Instruct-ion, Supervision and Training.

Case law has determined that:

"Machinery is dangerous if it is a reasonably foreseeable cause of injury to anyone acting in a way in which a human being may be reasonably be expected to act in the circumstances which may reasonably be expected to occur."

It is anticipated that case law from decisions made under the Factories Acts will ensure the new regulations are interpreted to require a similar standard of safe guarding in the future.

A series of Special regulations were introduced in the past to mitigate the full effect of the factories Act requirements, to allow certain pieces of machinery to operate that would otherwise be illegal. These include:

The Abrasive Wheels Regulations 1970; The Horizontal Milling Machines Regulations 1928; The Woodworking Machines Regulat-ions 1974.

The guarding requirements of these Regulations have now been repealed, although sections related to training, noise etc remain in force at present.

Provision of other safeguards

The Work Equipment Regulations extend to all aspects of equipment safety. Other hazards, not previously covered by earlier legislation include:

Articles ejected or falling from the equipment (tools, Work-piece); Disintegration of the equipment (bursting grinding wheel); Hazards from fire, explosion or discharge of gases and dust (chemical reactions, operation of relief valves etc); Extreme temperatures (steam pipes, refrigeration plant); Controls for normal operation, emergency stops, readily accessible, all clearly visible and identified; Control Systems designed to minimise failure to danger; Provision of systems for isolation of power sources; Clamped or fixed to ensure stability of equipment when in use; Provision of adequate lighting for safe use (including maintenance); Maintenance to be arranged when equipment is shut down wherever reasonably practicable, or safe systems of work adopted; Provision of markings or warnings where appropriate.

Practical guarding of machinery

The current basis for design of machinery guarding systems is the British Standards BS 5304. This is being progressively replaced by a series of harmonised European standards which will cover different aspects of design.

There will eventually be three series of standards:

A Standards - basic principles of concepts common to all equipment

B Standards - relating to elements that may apply to certain equipment eg. for surface temperatures markings hydraulics etc.

C Standards - relating to a specific class of equipment or machine.

Classification of hazards

The British Standard BS 5304 classifies machinery hazards by the nature of the injury, or the way in which the harm is done.

Crushing injuries, between parts of machines or parts and fixed obstructions (such as walls); Contact injuries, with sharp cutting tools; Entanglement injuries on rotating equipment; Impact by ejected components or machining fragments; Burns by hot surfaces.

Types of guarding

Four main categories of guard can be identified:

Fixed guards, properly secured in place by means of a tool that is not readily available to the operator.

eg Any enclosure permanently fitted around machinery.

Interlocked guards, where the guard is secured by a means that is connected with the machine operation. A effective interlocked guard must meet two criteria:

The guard cannot open until the machine is at rest, and the machine cannot be started until the guard is secured.

The standard of interlock design must take into account the risk, that is, the nature of the hazard and the frequency of approach.

eg The normal guard for a power press; Many access panels into machine enclosures; Key exchange systems for interlocking different parts. Automatic guards are linked to the machine movement and operate to ensure there is no obstruction in the danger area often by a "sweeping" movement prior to closure of a press, eg. Guards for a large automotive panel presses.

Trip Devices serve to prevent danger by interrupting the dangerous motion before injury occurs eg. by shutting off power and applying a brake. eg. Instant stop for drilling machines, pressure mats. Photo-electric systems.