OSHAssociation UK

Occupational Safety and Health Training

International Professional Certificate in Occupational Safety and Health

COURSE 106 GUIDE

HOW TO CONTROL SPECIFIC RISKS AT WORKPLACES

How to Control Specific Risks at Workplace

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Slips and Trips Hazards

Slips normally occur when there is poor contact between footwear and the floor surface. Trips occur when a person's feet are obstructed so that the person loses balance.

Every workspace needs to draw up a plan to prevent slips and trips. This chapter provides guidance on what to do.

Key Words and Phrases

Ergonomic design – the application of scientific data about human mental and physical capacities and performance to the design of work systems.

Reportable accidents (or diseases) – an accident (or disease) as specified in RIDDOR that must be reported to the enforcing authorities, such as accidents resulting in death, major injury, 'over three-day injury' or dangerous occurrences, or certain diseases.

RIDDOR – The Reporting of Injuries, Diseases and Dangerous Occurrences Regulation 1995.

Slips and trips are the main causes of injuries and major injuries at work. They account for more than one third of reportable accidents every year. Most of the major injuries occur in the manufacturing and service industries. More than half of the accidents involving members of the public in workplaces are due to slips and trips.

The main slip hazards are liquid spills and wet floors, dropped solid materials, refuse on the floor, dusty floors (for example, in woodworking factories or workshops), loose rugs or mats, unsuitable floor surfaces, slopingfloor surfaces and wearing unsuitable footwear.

The main trip hazards are floors with holes or uneven surfaces, trailing cables, loose floor tiles and floorboards, holed and worn carpets or rugs, changes in floor level including steps and stairs, obstruction to the walkways and floor fixing such as doorstops and electrical sockets near floor level. Overcrowded workplaces can also create several tripping hazards; because the space for movement is restricted and overcrowded workplaces tend to be untidy.

Risks

The risk of slipping or tripping increases in a number of situations. Examples are given below:

- Areas with work equipment (such as a dishwasher, deep fat fryer or grill) that can leak or splash water, fat or another material so that the floor becomes slippery.
- Any floor where spilt liquids are not cleaned up immediately.
- Where there is no regular scheme of cleaning so that rubbish or accumulated dust and dirt can cause someone to trip or slip.
- A haphazardly organised workplace with obstructions in work areas and along pedestrian routes, or routes with blind corners, twists and turns or narrow passageways.
- A badly supervised workforce, with some people rushing around and others unable to concentrate.
- Any workplace where staff are badly stressed.
- Poor lighting; so that people may not see a hazard.

Arm Plunged into Hot Oil
A 16-year old chip cook badly burnt her arm in boiling oil in a deep fat fryer when she tried to stop her fall after slipping on water from a leaking icing machine.

- Workers under the influence of drugs or alcohol. (There is a considerably increased risk that workers under the influence of drugs or alcohol will have an accident).
- Where the nature of the work influences risk – for example, hotel kitchens and fast food outlets with a lot of grease; anywhere that portable electrical equipment is used especially if there are trailing electrical cables; supermarkets where the throw-put of goods makes it possible that some goods will fall to the floor.

Controls

A hierarchy of control comes into play. In the first instance, try to eliminate slipping hazards from spills by putting lids on vessels, using tables with a lipped edge, and by preventing leaks

If floors do become wet or greasy, clean up frequently and consider installing floor drainage channels.

Risks Assessment

It is essential to carry out a risk assessment of slips and trips in the workplace. The assessment could be carried out by managers or supervisors together with employees and safety representatives.

The assessment should enable you to identify the slip and trip hazards and the people who might be harmed – workers, visitors or members of the public. There may already be some controls in place, but a risk assessment will identify whether they are adequate.

This will help you to identify and put in place any additional controls that would reduce the risk of injury. Findings should be recorded and the assessment reviewed occasionally – and certainly after any significant change in the workplace or its procedures.

Trips Hazard Example
Raised Plinths in a Retailer Shop

A member of the public fractured his arm in an electrical store when he tripped over an unmarked plinth.

It was difficult to see because it was covered in a similar carpet to the rest of the floor. The retailer was prosecuted and fined when another member of the public tripped because the plinths were still not marked clearly.

Good Housekeeping

Managers and supervisors should ensure that all work areas are kept tidy and that all pedestrian and traffic routes and stairs are unobstructed.

It is very important to stop floor contamination in the first place. Maintenance programmes should be introduced for floors, steps and stairs.

Managers should set up a system of periodic inspections to identify hazards and why they are there. Suitable equipment needs to be provided to ensure that the cleaning schedules are achievable and that the cleaning methods leave floors as dry as possible. The cables to electrical equipment should be secured and should not create tripping hazards.

Floors

Floor coverings need to be chosen carefully. The risk assessment will help to determine the type and quality of floor covering that is suitable. Special care needs to be taken if the floor gets wet and dusty as a result of work activities – for example, behind the bar of a pub, in a restaurant kitchen or in a joinery workshop. It is important to provide floorings with sufficient surface grip.

When deciding on the types of floors to get in a workplace, managers should consider a number of issues:

- Where it is to be used – indoors or outdoors
- How it is to be cleaned
- How often it is to be cleaned
- How many people will walk over the floor?
- Whether it is to be used for pedestrians only, or for vehicles too
- Whether there are any other legal requirements for the standard of cleanliness – for example, if the workplace is for food business, then, one of the requirements is that the floor must be capable of being cleaned.
- How it can be maintained and repaired

It is also important to ensure that employee's footwears, where it is provided, is compatible with floor surfaces.

Do not choose a floor covering that is very smooth, just because it is easy to clean. Instead, opt for one with sufficient slip-resistance for your workers' safety, even if it needs a little more effort to clean. You can measure the slip resistance of a floor covering with a device that registers the friction between the floor covering and a test pod. It is advisable to obtain specialist help to make the measurement and interpret the results.

Existing floor can be treated to improve the slip-resistance of the floor covering. For example, terrazzo floors can be roughened and coated with a non-slip material, concrete floors can be coated with resin containing abrasive particles, or flooring strips or squares can be stuck to the floor. Some treatments have to be repeated regularly due to excessive wear to the flooring, and in particular, if the floor accumulates dirt which inhibits the slip-resistance of the treatment.

Practical Example
Give correct information
A new non-slip floor was laid in a catering kitchen, but after a few months, it become very slippery and stained.

After consulting the floor manufacturer, the employer discovered that the cleaners were not cleaning the floor in the recommended manner – simply because the kitchen manager had not passed on the correct information.

The simple remedy was to give the cleaners the information they needed. They changed the cleaning method to the recommended one and the floor ceased to be slippery.

Stairs

Staircases must be constructed in accordance with current building regulations. This ensures that treads and risers are of the correct and consistent size and height, and that handrails are provided. The slip-resistance of stairs can be improved by applying non-slip nosings (strips on the edge of the tread) or by providing roughened–tread surfaces.

Cleaning and Repairs

Cleaning procedures should be designed so that floors are cleaned regularly and properly and are left as dry as possible afterwards. While cleaning is in progress, barriers and warnings should be put in place to keep people from walking over the wet area. If possible, cleaning should be done out of normal working hours or at quiet times.

Repairs to damaged, worn or defective floors and floor covering should be done as soon as possible after they have been reported as defective. Similar precautions to those used for cleaning should be used when repair work is being carried out.

Lighting

The quality of lighting is very important in preventing slips and trips. Make sure that all parts of the workplace are properly lit. There should be no area where dazzling lights or glare can obstruct someone's vision.

Lighting should be included in the cleaning and maintenance schedules and programmes. Arrange stacked goods so they do not obstruct light and create shadows.

Footwear

Employers have a responsibility to provide proper personal protective equipment for the health and safety of workers. Protecting against slips and trips can come under this responsibility. When choosing the design or range of footwear, managers and supervisors should consider the floor surface and the hazards involved in the work activities. The area of the sole in contact with the surface should be as big as possible and the tread should be well defined to give a firm grip in wet conditions.

You should look at the range of footwear and test the shoes or boots for a sensible period in your own workplace. Choose the make and model that is most suitable overall for the circumstances. Avoid PVC and leather for anti-slip footwears, as micro-cellular urethane and rubber gives a better slip-resistance.
Footwear must fit properly and be replaced whenever necessary.

Planning and workplace procedures

The planning and organisation of work activities can prevent slips and trips. Tasks should be designed so that workers are not exposed to unnecessary risk – for example, the moving of goods could be mechanised to avoid the need for workers to push, pull or carry goods on slippery floors. Ergonomic design of work area can prevent workers from creating obstructions, having to work around obstructions or having to work across slippery floors.

Information and training

Managers and supervisors must ensure that employees are given adequate information and training. This should include the risk of injury, and the nature and extent of slips and trips in a particular workplace. It should also include the control measures necessary, particularly those that enable employees to prevent slips and trips, particularly information on methods for cleaning up spillages immediately.

Practical Example
Training, Information and Motivation Improve Safety

A major oil company halved its incidence of injury from slips, trips, manual handling and falls from a height by:

- Training supervisors and managers in safety leadership
- Creating awards and recognition programmes that reward excellent safety performance and reinforced good health and safety practices
- Training supervisors in intervention techniques, including the observation of safe and unsafe behaviours, and to help them introduce changes in undesirable practices
- Introducing and enforcing discipline procedures for breaches of safety.

Checklist for Safety Representatives

Check whether there is a significant risk from:

- Work in progress – for example, goods receipts and dispatches, maintenance and cleaning
- Leaking plants or machinery with fluids pooling on floors
- A build-up of floor contamination brought in on foot wear in wet weather
- The use of temporary measures to control leaks, such as corrugated cardboards being Put down or warning signs
- The age and construction of buildings, for example, leaking roofs, walkways exposed to elements and the possibility of water or mud being brought into the workplace on wet clothing, shoes or vehicles.
- Clustered walkways, build-up of waste materials, general untidiness, restricted pedestrian access and trailing cables.

It is worth talking to staff to identify difficult jobs or to hear about incidences of falls not leading to injury (near misses) and to examine records for evidence of slip and trip problems – sickness absence records, accident records, RIDDOR reports.

Legal Requirements

The Health and Safety at Work etc. Act 1974 (HSWA) requires employers to ensure the health and safety of all employees and anyone who may be affected by their work.

This includes taking steps to control slip and trip risks. Employees must not endanger themselves or others and must use any safety equipment provided.

Manufacturers and suppliers have a duty to ensure that their products are safe. They must also provide adequate information about their appropriate use.

The management of health and safety at work regulation 1999 builds on HSWA and include duties for employers to assess risk (including slip and trip risks) and where necessary to take action to safeguard health and safety.

The workplace (health, safety and welfare) Regulations 1992 requires floors to be suitable, in good condition and free from obstructions. People must be able to move around safely.

Under the reporting of injuries, diseases and dangerous occurrences regulation 1995 many accidents at work have to be reported to the health and safety executives.

Work at Height

About 35 people are killed each year as a consequence of work at height – the single biggest cause of death at work. About 4,700 people suffer major injuries.

Key Words and Phrases

Access equipment – ladders, steps, trestles, cradles, mobile elevated work platforms and any other type of work equipment that enables an employee to reach to, or stand at, a height above their own height.

Competent people – someone with appropriate qualifications, knowledge and experience to identify the risks arising from a situation and the measures needed to control them.

Fall-arrest system – a personal fall-protection system to arrest and restrict a fall by preventing the user from hitting the ground. An energy – absorbing device limits the forces on the body.

Inspection of equipment – visual checks by a competent person on items or equipment to verify that they can be operated, adjusted and maintained safely.

Platform – a horizontal surface raised above the level of the adjacent area, for a worker to stand on and work from.

Safety harness – personal protective equipment that is attached to a reliable anchor point.

Safety lines – ropes that stop the user hitting the ground in the event of a fall.

Safety nets – nets used to catch people or object that fall from a height.

Safe system of work – a set of procedures for carrying out a task safely

Work equipment – equipment used at work including machines, appliances, apparatus, tools, installations, ladders, hoists, and lift equipment.

Work positioning system – a personal fall protection system to support the user in tension or suspension so that a fall is prevented or restricted.

What Does Work at Height Mean?

According to legislation a place is at height if the person could be injured falling from it, even if it is at, or below, ground level. Work includes moving around at a place of work (except by staircase in a permanent workplace).

Work at height usually involves the use of **ACCESS equipment** such as ladders, steps, trestles, cradles, tower scaffolds, scaffolding and certain types of lifting equipment. Access equipment is classed as **work equipment**. So, the principles and standards applicable to work equipment are equally relevant to access equipment.

A shop worker standing on a stepladder is involved in work at height, but a police officer riding a horse on patrol is not working at height as defined by the legislation.

Hazards

The hazards include:

- Falling from a high place – for example, construction worker falling from scaffolding, warehouse worker falling from mobile platforms and cleaners falling from stepladders.
- Objects falling from a height and striking people – for example, bricks falling from a scaffold, tools falling from a platform or cartons falling from a storage rack.
- Being dislodged from, or crushed by, a structure that collapses – such as scaffolding that has not been erected properly.

Contact with high-level lighting and other electrical equipment and installations when working at a height.

RISKS when working at height

A number of factors need to be taken into account when assessing the risk of a work activity at a height, including the:

- Time needed for the job to be completed
- Complexity of the task
- Weather conditions
- The place where the work is to be done, including the surface on which the access equipment is supported
- Amount of working space
- Provision of protective barriers, safety harnesses or safety nets
- Provision of protection against falling objects
- Manner in which access equipment is erected or installed
- Competence of the worker including physical capabilities, training and experience

The time involved to complete a task may increase the risk, because the longer a task takes, the greater the likelihood that an accident will happen. Complex work can be particularly risky, such as working on a scaffold with several ladders to climb to gain access to the area of work.

Bad weather can seriously affect work outdoors, particularly if it is cold, wet and very windy at some time. The weather can also affect ground conditions – making it boggy, for example – increasing the chance that access equipment will become unstable.

Risk increases in any conditions where the access equipment is unsuitable, unstable, erected incorrectly or maintained in poor condition.

If working space is limited, or if a roof or other high-level structure is fragile or covered with moss or lichen, then there is a greater risk of knocking something to the ground, slipping over or falling through a weak supporting surface.
Risk increases if employees are unprotected by barriers, guard rails or a fall-protection system, such as a safety harness or a safety net.

The physical capabilities of the employee are also important: an employee's strength, suppleness, balance and confidence at heights, for example, all have a bearing on the risk that an accident will occur.

If there is no protection or inadequate protection against falling object, there is a strong possibility that someone will be injured. Roof tiles from building work, display boards in shops, light fittings in a workroom and electrician's tools from high-level repairs are typical examples of objects that could fall and injure someone.

Controls

A risk assessment of the whole workplace must be carried out to identify the activities that involve a risk of falling from a height. This must be done before the work starts at any temporary workplace, such as construction and arboriculture sites. Where more than one employer is operating at a site, the person carrying out the assessment should prepare a short report about it for the site supervisor.

Once the risks and activities are known, you need to decide whether there is need for permanent or temporary access to specific areas of the workplace.

Planning

Whatever work is to be done at a height, it must be properly planned, supervised and organised before the job starts. A simple hierarchy of control should be used:

1. Avoid work at height where possible
2. Use work equipment or other measures to prevent falls where work at height cannot be avoided
3. Provide personal protection to minimise the distance and consequence of a fall, if other methods are not suitable.

Avoiding work at height

The first question to be asked is: does anyone really need to work at a height? Consider ways to eliminate the hazard. For example, could goods be stacked and retrieved from storage racking from the ground by using fork-lift trucks, rather than by staff using ladders? There are, however, many instances where work at height must be carried out. The risks must be assessed and appropriate work equipment selected and used.

Choice of equipment

When selecting work equipment for use in work at height, you should consider giving collective protection measures priority over personal protection measures and should take account of:

- The working conditions
- The risks to the safety of the people at the place where the work equipment is to be used
- The vertical distance for moving equipment into place and the space around the base of the equipment
- The distance and consequence of a potential fall
- The duration and frequency of use
- The need for easy and timely evacuation and rescue in an emergency

When planning a job involving work at height, consider the use of the following protective measures:

- Platforms
- Guards and barriers
- Safety lines and ropes
- Safety harnesses

A platform in this context is a secure piece of equipment from which people can work safely, such as a scaffold, tower scaffold, mobile elevating platform (MEWP), mobile platform steps or ladders with a platform. In selecting what is suitable, consider:

- The space available for the task
- The type of work to be carried out
- The time the job will take
- The risks when setting up the platform
- How difficult the platform will be to maintain
- How many people will use it.

A work platform must be capable of supporting the weight of the worker and any materials and tools being used. The platform must be stable and designed not to overturn or fall and there should be adequate working space on and around it.

If the platform has a work area – for example, on a tower scaffold – it must have guard rails or barriers that are high enough and positioned in a way that prevents someone from falling over or through the rail or barrier.

Protection Against Falls

When guard rails or barriers cannot be provided, a safe system of work needs to be designed and operated. This could be a fall-arrest system or work-positioning system and could involve safety nets or safety lines with safety harnesses and using secure anchor points. Although these measures will not prevent a fall, they minimise the risk of injury. Like the issuing of personal protective equipment, these measures should be the choice of first resort after every effort has been made to adopt other control methods.

Checks on Equipment

Equipment used for work at height must be inspected and maintained thoroughly. In addition to daily checks before use, a more rigorous or detailed inspection must legally be carried out by a competent person at appropriate intervals.

Workers must be given training on how to:

- Assemble the system correctly according to the manufacturer's instructions
- Wear the harness
- Check equipment and recognise significant defects
- Fall or land to minimise injury
- Rescue themselves from a position at height or to assist others after a fall (Similar requirements apply to mechanical lifting operations).

Scaffolding

Scaffolding should be erected on firm, level ground that is capable of supporting the weight of the scaffold, the people working on it and any materials or work equipment being used.
It should:

- Be secured to a permanent structure if possible
- Be wide enough for easy access
- Have sufficient work space and be provided with safe access.

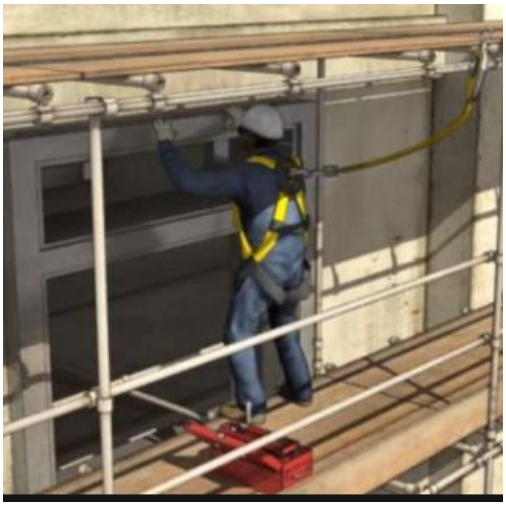
Only competent people should design, erect, alter, dismantle and inspect scaffolding.
The structure should be inspected and the inspection recorded:

- Before first use
- At frequent intervals (not exceeding seven days)
- After severe weather
- After any significant alteration to the structure
- After any accident involving something substantial, such as a vehicle hitting the structure.

Towers scaffolding

This type of work equipment can be erected easily and quickly, and can provide safe access. The rules for general access folding outlined in the two previous paragraphs also apply to tower types, but there are other specific precautions to be taken.

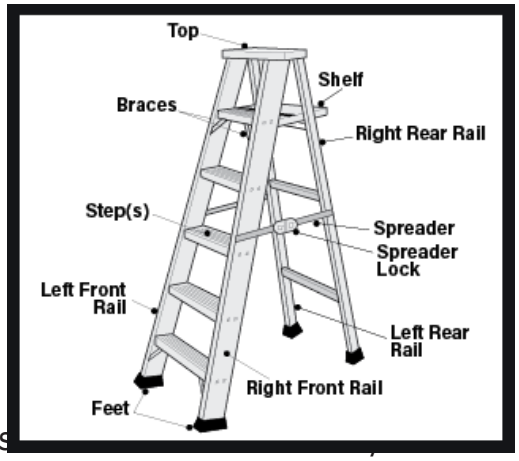
You need to follow the manufacturer's instructions for setting up the equipment. It needs to be vertical, with the wheels locked.



Safe access to the work platform needs to be provided, for example via ladders on the inside of the tower. You may need to tight the tower to a rigid structure if the tower is shifted or if any other significant loads are expected to be used. The workers have to move the tower, making sure there are no overhead cables or holes in the ground and there are no people or materials on the platform.

Mobile Elevating Work Platforms (MEWPs)

Only fully trained competent people must operate this equipment. It should be used only on firm, level ground, without triggers extended and secured before the platform is raised. Safety harnesses provide extra protection against falls



Ladders and Step Ladders

Ladders are one of the most common means of gaining access to high levels and are one of the most misused and abused pieces of work equipment.

If you want to keep full control of ladders, it is good practice to keep the ladder registered. Each ladder should be marked with a unique identification mark.
The mark should be recorded in a register which also has space for the details of inspections, defects and repairs a person takes a ladder for use and returns it. If the ladder is destroyed, this would also be recorded.

You should inspect ladders every three months. Every year you should thoroughly examine them by testing their strengths, looking carefully at their physical conditions and noting any defect.

Ladder use

A system should be put in place so that the condition of ladders is checked before use. Ensure that before using ladders, employees check for:

- Split of wears
- Rot (wood)
- Corrosion and rusting (metal)
- Any other damage

Ladders should be laced face-on to work on a firm, level surface. The top and bottom of the ladder should be secured. Stepladders should be spread to their fullest extent.

Blocks or boards must not be beneath the ladders or stepladders to extend the height; instead, longer set of ladders or stepladders should be used. The top platform of stepladders should be used only if there is a handrail or a hold at least 1m above the platform.

The ladder should be placed in such a position to prevent workers from over reaching. There should be a hand hold available to maintain three points of contact where possible. When climbing the stepladder, both hands should be used and the user should face the step. Nobody should be allowed below the ladder or stepladder when work is going on. Tools should not cluster or be left on the ladder's platform.

Fragile Surfaces

Where the surface on which the access equipment is supported is fragile, there must be sufficient means of support or protection. Where there is still a risk that someone would fall, despite the measures taken, you must minimise the distances and consequences of the fall. This requirement also applies to the police, fire, ambulance or other emergency services when they are acting in an emergency.

The person doing the work must be made aware of the danger either through notices affixed on or near the fragile surface or by informing them personally.

Temporary Access Equipment

A competent person should inspect and maintain all temporary access equipment regularly. Any defective equipment should be clearly identified and not used. The people using temporary access equipment needs to be trained adequately and be capable of using the equipment safely.

Falling Objects and Materials

No material or object should be stored at, thrown or tipped from height in circumstances where it could injure anyone. You can minimise the likelihood that materials will fall from height by keeping platforms free from anything loose.

Scaffold can be provided with debris netting that would stop and hold any material, such as bricks that could fall. Double sheeting or plywood sheet on the platform prevents materials from falling through the boards.

Waste materials must not be thrown from the scaffold: instead waste should be lowered in skips or buckets, or sent down enclosed debris chutes. Toe boards can stop materials from being kicked from, or rolling off platforms. Hoarding and protected walkways can protect workers, visitors and members of the public.

Where, despite all your reasonable preventive measures, there is a high risk that objects will fall for example, during the demolition of a dangerous building in high winds – the vulnerable ground area must be clearly designated and marked. You could also create exclusion where entry is strictly prohibited to site staff whenever work is taking place above. When you cannot prevent people from working below an area where there is high risk from falling objects, you must ensure that they all wear safety helmets.

Collapsing Structure

Scaffolds must be erected, altered and dismantled following the guidance of the health and safety executives given in health and safety in construction HSG 150, or of any reputable industry body, such as the national access and scaffolding confederation.

Site workers and supervisors should inspect the scaffolds every week and after it has been altered and damaged or when there is a strong wind.
If, after all reasonable precautions have been taken and the risk of a fall cannot be eliminated, you must do all that you reasonably can to minimise the distance and the effect of the fall.

Safe Working Practices Indoors

Many accidents occur inside buildings where employees and members of the public are injured because of work taking place above ground level.

Many of the controls that apply to ladders and stepladders apply equally to work activities inside buildings – for example:

- Retrieving items from storage and display racking in retail shops or warehouses
- Cleaning, changing or repairing ceiling lights and their fitting in offices
- Cleaning walls above head heights in a food factory or catering business
- Hanging up shop display signs or decorations
- Cleaning windows.

Free-standing mobile platform ladders are the safest options in most of these situations. The ladders should be provided with guard rails around the platforms that are sufficiently high to prevent someone from falling over or between the top rail and the platform. Single-section ladders should, ideally, be provided with hooks to secure the top of the ladder to racking.

Storage Racking

Racking is a skeletal framework of fixed or adjustable beams designed to support loads without shelves. Safe racking should have the following characteristics – it should:

- Be installed in accordance with the manufacturer's instructions
- Be erected on sound, level floors
- Be fixed securely to the floor
- Have aisles wide enough for mechanical handling equipment to be maneuvered easily
- Have beam-connector locks in position at both ends of the beam (this prevents horizontal beams being knocked out of position by mechanical handling equipment such as fork-lift trucks)

- Use column guards, boots or end protectors to protect the base of exposed beams from damage by mechanical handling equipment such as fork-lif trucks
- Display maximum load notices on the racking: the weight indicated should never be exceeded
- Incorporate coloured horizontal beams for high visibility
- Have no physical damage
- Use the correct type of pallet – this can be verified using calculations recommended by SEMA (Storage Equipment Manufacturers Association)
- Have pallet in good conditions

Racking should be inspected regularly by a competent person to determine any damage that might affect its stability.
Free standing mobile platform should be used in preference to ladders to retrieve goods by hand. Where ladders are used, they should be provided with hooks or some other method of fitting the top end to the racket. No one should be allowed to climb on the racking itself to retrieve goods

Key messages

- Carry out risk assessment before work starts
- Make sure that all work at height is planned, organised and carried out by competent people
- Follow the hierarchy of control for managing risks from work at height – take steps to avoid, prevent or reduce risks.
- Choose the right work equipment and select collective methods to prevent falls (such as guardrails and working platforms) before other measures which may only reduce the distance and consequences of a fall (such as nets or airbags) or which may only provide personal protection from a fall.

Legal requirements

The Work at Height Regulations 2005 (as amended) over work at any height at which someone could be injured, unless appropriate preventive and protective controls are in place. Those covered by the health and safety requirements include instructors or leaders in recreational climbing and caving.

The regulation relates to the organising and planning of work at height; competent persons at work, or supervision by competent persons; the steps to be taken to avoid risks from work at heights; the selection of work equipment; particular work equipment; the avoidance of risk from fragile surfaces, falling objects and danger areas; the inspection of certain work equipment and work places and the duties of people working at height.

In many occupations the requirement of the lifting operations and lifting equipment regulations 1998 are closely linked.

Musculoskeletal Disorders

Musculoskeletal disorders affect about a million employees a year. They include what are popularly known as repetitive strain injuries or work-related upper limb disorders (WRULDs) and particularly affects the lower back and the joints in lower and upper limbs.

Key Words and Phrases

Display screen equipment – any alphanumeric (letters and numbers) or graphic display screen, usually a part of a computer system

Ergonomic design – the application of scientific data about human mental and physical capacities and performance to the design of work systems

Ergonomics – the study of the interaction between people and their work.

Musculoskeletal disorders – conditions affecting the muscles, nerves, tendons, ligaments, joints, cartilage or spinal disc.

Repetitive strain injury – a popular term for work related disorder mainly affecting the upper limbs

Work-related upper limb disorder (WRULDs) – conditions that result from prolonged and frequent activities that damage the muscles, tendons or joints involved so that it becomes painful and has a reduced function.

Workstation – an assembly comprising a work surface, such as a desk, all the necessary equipment needed to carry out the assigned task, and the immediate surrounding area affected by the work activity at the work station.

What Causes Musculoskeletal Disorders?

Many ordinary work activities can lead to musculoskeletal disorders – for example:

- Entering in formation into a computer using a computer keyboard
- Writing by hand
- Working as a check-out assistant in a supermarket and handling good through the automatic pricing machine
- Laboratory work involving the repeated use of pipettes or the repeated staining of agar plates
- Packaging goods in a warehouse, including frequently folding cardboard boxes
- Pot washing, dishwashing, preparing foods, storage and cleaning in a kitchen
- Constructing products on an assembly line
- Pruning fruits trees or shrubs using secateurs
- Plastering a wall
- Butchering meat
- Any job where a movement is repeated for a long time

The Health Impact of Musculoskeletal Disorders

The symptoms can include:

- General aches and discomfort
- Cramp-like pain
- Pin and needles
- Stiffness and restriction of joint movement
- Loss of grip
- A burning sensation
- Swelling of the joints or soft tissues

The areas of the body most affected include:

- The tendons that connects muscles to bones
- The muscles themselves
- The nerves supplying the affected area, joints and ligaments.

If certain work activities are repeated for a long time, the repeated strain may result in a chronic or recurring injury. In turn, this may lead to permanent disability.

Examples of musculoskeletal disorders include:

- Carpal tunnel syndrome – a condition that causes pressure on the nerves passing through the wrist
- Epicondylitis – inflammation of the area where the bone and tendon join, which is often known as tennis elbow or golfer's elbow, depending on where the problem occurs
- Lower back pain
- Tendonitis – inflammation of the area where muscles and tendons join
- Tenosynovitis – inflammation of the tendon or the tendon sheath.

Hazards

Hazards arise because of repeated actions such as:

- Gripping
- Squeezing
- Twisting
- Pushing
- Pulling
- Reaching

It is important to remember that the actions themselves are usually not hazardous. It is the prolonged repetition of a movement, without sufficient rest, that is the hazard.

Risk

The severity of the risk from the prolonged repetition of a movement is increased by factors such as the:

- Force applied
- Regularity and length of time the action takes place, including the time allocated for rest and recovery
- Posture of the worker while doing the job
- Type of movement
- Tool used in the work activity
- Workplace design
- Skill of the worker

Force

Where an employee has to exert pressure on something while standing or sitting still – for example, fixing a component into an electrical appliance using a screwdriver – the manual force required may put an excessive demand on the fingers, hands or shoulders, so increasing the risk of injury.

Regularity and length of time

There is a high risk of injury in tasks where short bursts of repetitive movements are necessary – for example, a supermarket checkout operator or a data processing clerk may carry out thousands of movements in any working day

The risk is reduced if employees are given sufficient time between the repeated actions for their muscles to recover their normal state of tension. This may mean that the rate of work needs to be appropriate to a particular employee, so that each person can carry out his or her assigned tasks in comfort and without the likelihood of injury.

It follows that, if you have a number of people on a production line, you will have to take care to select people with similar capabilities or to train them to work at a similar pace. So, it is important that the ergonomic arrangement of the job reduces the risk of injuries to the lowest possible level.

Posture

Some jobs cause staff to work in some very awkward postures – for example, working with their arms above their heads, with arms outstretched, or bending down. Awkward posture might also occur in less obvious ways. For example, computer users might experience discomfort and injury because of an inappropriate chair, the inability to move the computer screen to an appropriate height or the use of a laptop across their knees.

Types of Movement

The repeated twisting movement of the fingers, hands and wrists, when repeatedly turning or rotating dials, for instance, can lead to injuries, similarly employees may develop problems if they must repeatedly grip equipment or materials firmly – for example, a packer may need to manipulate cardboards or stiff papers around products to wrap them securely.

Tools Used

Some tools can create severe strain on the upper limbs – for example, on the fingers and wrists when using scissors or cutters for a prolonged period. If the equipment also creates vibration, the employee may need to use greater force to keep control of it. Both the vibration and the intense gripping may lead to an injury.

Workplace Design

The design of workstations, workplaces, work procedures and work equipment is often for the 'average person', with no account taken of the individual user's size, shape or strength. Injury is less likely where the height and position of chairs, work benches, tables and computer screens can be modified for the comfort of the individual staff member.

Skill of the worker

Untrained or poorly trained staff may not understand how to carry out their jobs in a safe and responsible manner, hence increasing their risk of getting injuries. Poor supervision may also increase the risk of injury – for example, where a worker develops his or her own method of doing the job and carries on unchecked, or where someone has been shown to do a task by a colleague who is not competent to demonstrate the task correctly.

Controls

The control principles for musculoskeletal disorders are:

- Carry out a risk assessment
- Apply ergonomic principles to the job
- Reduce the force used
- Improve posture
- Provide effective training
- Introduce job rotation
- Organise regular breaks

Risk Assessment

You must carry out a risk assessment of all work activities to:

- Identify the hazards present
- Assess the level of risk for each hazard identified
- Ascertain who may be affected
- Apply the controls that are described below.

Organisations that fail to carry out risk assessment may be liable to pay compensation to injured employees. For instance, a motor tester was required to test 130 heavy motors an hour, a task involving much twisting, turning, gripping and drifting at speed. She was diagnosed as having carpal tunnel syndrome, tenosynovitis and osteo-arthritis. The employer was held liable because it was known that the work carried a foreseeable risk of injury: it failed to give advice on the risks and consequences of repetitive strain injury and had no system of job rotation.

Ergonomic Approach

Ergonomics is the study of the interaction between people and their work. Ergonomic design is normally defined as the application of scientific data about human mental and physical capacities and performance to the design of work systems. In the main, it involves designing tools, equipment, workstations and workplaces, so that the job fits the person, rather than trying to make the person fit the job.

An ergonomic approach takes in to account the size and shape of the human body. It is used to identify and control hazards.

Applying Ergonomic Approach

You should take account of operating positions, working heights and reaching distances. Operators should not exert undue force, or stretch or reach beyond their normal range of movement in order to carry out tasks.

A small alteration is all that may be needed to make a task easier and safer – for example, providing an adjustable chair for a computer workstation or adjusting the height of a workshop machine so that the operator does not have to lean down to use it.

Generally speaking the risk of musculoskeletal disorders can be reduced by using engineering controls, redesigning the task, training the workers or changing the job design so that a shorter time is spent on the task – for instance, by using job rotation.
If it is possible, organise tasks so they can be done sitting down. Workbenches and desks should have plenty of legroom. If employees have to work standing up, the workbench should be at a height that prevents them from having to stoop or stand on tiptoe. All equipment should be within easy reach.

Seating should be adjustable. Swivel chairs should be provided where the job involves twisting of the upper body – for instance, at a supermarket checkout. Seats should provide support for the lower back and the footrests should be provided to staff who need them. Seating and workbench heights should allow employees to work with their hands at about elbow level or lower so that there is no undue strain on the wrist, elbow and shoulders.

A number of different solutions to reducing risk to an acceptable level can be used. The following ergonomic principles need to be considered.

Reducing the force used

You should try to reduce the force needed to do the job by, for example, making sure that tools are maintained in good condition. If necessary and where it is feasible consider having the tool redesigned so that it can be operated easily. Also consider redesigning the activity so that the stronger muscle groups are used or so that the task can be done with the tool held in either hand.

Reduction in Regularity and Duration (Repetitive Movements)

Someone – it could be you – needs to analyse the job carefully to identify whether it could be done without the need for frequent movements. Consider the body movements of the individual's characteristics, the environmental conditions and the workstation design. Organise tasks so that individuals are not doing the same activity for long periods. Consider automating appropriate tasks to reduce the number of repeated movements.

Managers and supervisors should also consider whether it is appropriate to reduce the expected pace of the work activity, or even, where appropriate to allow the employee to vary the pace. Small changes can lead to a significant reduction of risk.

Posture Changes

If you redesign the work activity by, for example, introducing a tool or altering the tool being used, you can eliminate the action causing the problem. The tool can replace the awkward or repeated movement or, if the tool is altered to change the grip, the change in posture may avoid the repeated use of the muscles which are being affected. However, care must be taken to avoid replacing one bad posture with another.

Effective Training

Employees need to be instructed on how to do their jobs correctly. The training should include the hazards and risks in a particular work activity and the controls that can be applied to eliminate the hazards or reduce the risks from them.

Job Rotation

It is helpful to allow employees to rotate their jobs. You may have to train employees in more than one job, but this can have other advantages. For example, the workforce may be more flexible and there may be better job satisfaction in doing a wider variety of jobs. This rotation has the advantage of reducing the repetitiveness of a work activity and the length of time on a particular task.

Regular Breaks

If you introduce regular short breaks, employees have an opportunity to recover from the exertion of work activity. Tele – workers – people who work from home or on the move using information technology to keep in touch with their employer – are an emerging group that could be affected by musculoskeletal disorders. There are now about 2million tele-workers in the UK and numbers are increasing. They may need to be reminded of their responsibility to ensure that they take enough breaks.

Practical Example

Height of beer barrel conveyor reduces back and shoulder pain

Workers at a beer factory had to use a chisel to remove the bung and the top from each empty beer barrel before it was washed for re-use. They experienced back and shoulder problems because of the forceful action required and because the work was at an awkward height, with the bungs on the sides of the barrels.

The brewery decided to take action to reduce the injury rate and lost time and to speed up production. Meetings brought together engineers, operators and ergonomists to decide on a solution.

The conveyor was adapted so that the caps and bungs arrived directly in front of the workers at a more suitable height for both tall and short staff. The manual force required for bung removal was also reduced by providing better tools.

The costs of the changes were paid back in under three months because sickness absence was reduced. In the year after the changes there was no time lost due to musculoskeletal disorders or injuries. What's more, there was less need for overtime work and reduction in conveyor belt breakdown, because fewer wooden fragments from the bungs fell into the conveyor.

Display Screen Equipment (DSE)

Most people use computers at some stage in their working lives and it is estimated that there are over 5 million habitual users of display screen equipment. They include word processing workers, secretaries and administrators, book keepers, data input operators, news subeditors, journalists, telesales / customer complaints /accounts enquiry operators, micro-electronics assembly or testing operators or television editing technicians. About 400,000 people a year suffer from an upper limb disorder caused or made worse by work.

There are specific legal requirements for the use of display screen equipment – any alphanumeric or graphic display screen, regardless of the display process involved. In everyday terms, this usually means a computer made up of a screen, central processing unit (CPU) with a hard drive (with networks there may be no CPU), keyboard, printer and associated additional equipment.

Computer workstations often include a desk (workbench or other work surface) and chair; display screen equipment; equipment; any optional accessories such as a disk drive, modem, printer and document holder; and a telephone.

Hazards

Hazards usually involve work over long periods – for example, repeated finger movements with wrists in an upward position. If users sit upright in a rigid posture for a long time, they can eventually experience pain and discomfort in their hands, wrists, arms, neck, shoulders or back, or may develop eyestrain, headaches, general fatigue and stress. Some rare conditions can also occur such as photo-epilepsy (sensitivity to flickering light that may trigger an epileptic fit) and facial dermatitis (skin complaints affecting the face).

Risks

The use of display screen equipment can lead to musculoskeletal disorders and stress if the appropriate controls are not used (see below).

The risk of injury increases if the work procedure, workplace and work environment do not take account of the employee's individual requirements. The risk varies depending on the duration, intensity and degree of difficulty of the work being done.

Controls

The principles to follow in controlling the hazards and the risks of using display screen equipment are:

- Carry out a risk assessment
- Assess the workstation design
- Schedule regular breaks
- After appointments for regular eye tests
- Provide effective training

Some examples of how these principles might be applied are outlined below:

Eyesight

Visual problems can be sorted out by placing the screen at a comfortable viewing distance, by keeping the screen clean and by making sure that the screen is not affected by reflected light. Anti- glare screens can be used as a last resort to reduce eyestrain. Changing the size at which text is viewed and the colour of text may also make reading the screen more comfortable.

Employees who use display screen equipment have a legal right to request the employer to provide an appropriate eye and eyesight test by a competent person. This must be done as soon as practicable after the request is made: if the person is not yet employed, the test should be done before the person starts work. Further tests should be carried out at regular intervals to find out if there is any change in the employee's eyesight over time. All of these tests are at the employer's expense. Any glasses required to correct vision defects at the normal viewing distance from the display screen equipment must be provided free of charge to the employee by the employer.

It is important to note that the rights provided by the regulations are precautionary measures; there is no evidence that display screen equipment causes permanent damage to eyes or eyesight.

Stress

Stress is not caused by display screen equipment, but usually arises from an increased pace of work or pressure to meet deadlines. Fatigue and stress can be dealt with by giving the employee some influence over the pace of the work to be done. Perhaps the pace of the work can be decided after discussion between the employee, supervisor and manager.

Training in the use of software is very important in avoiding problems of misunderstanding about how the software can be operated efficiently. If the operator is not trained correctly, mistakes can lead to more inputting than is necessary, in turn leading to stress and more mistakes.

Regular Breaks

People who use display equipment must be allowed regular breaks or changes of work activity throughout the day to allow them recover from the activity. The break or change may be in the form of a natural break, such as doing some photocopying, sorting out the post or assisting in the control of the office reception. Scheduled breaks are more likely to be needed if the work involves data entry or text entry because there is rarely an opportunity for natural breaks.

Risk Assessment

Employers must complete a suitable and sufficient analysis of workstations used in the business. This applies to the average person working at the workstation and also to staff working at home. The responsibility for carrying out the assessment may be delegated to a supervisor or other staff member.

Whoever carries out the assessment must:

- Be trained to do so
- Be familiar with the legislation covering display screen equipment
- Have the ability to assess the risks from workstations and draw valid conclusions
- Be prepared to record the findings of the assessment with care.

Assessments should be:

- Systematic
- Appropriate to the likely degree of risk (a manager is likely to be at less risk than a data processing operator for instance)
- Comprehensive
- Contain information provided by the employee and employer; such as ergonomic information.

If there are a number of identical workstations, one generic assessment could be carried out, provided the workstation design allows individual employees to adjust their chair height, backrest position and height, angle, brightness and contrast of the computer screen.
Any high-level risks identified need to be reduced to the lowest level that is reasonably practicable.

Assessments should be reviewed if there is a change in the work activity relating to the display screen equipment. Working with portable display screen equipment requires a specific risk assessment.

Recording a Risk Assessment

The assessments need not be recorded in writing or on a computer if the assessment is simple and no significant risks are identified, or if no user is identified as being at risk. However, it is good practice to make a record so that you have a comparison for any future assessments.

Some Solutions

Small adjustments to a workstation often result in greatly reduced risk. It is also usual for a combination of adjustments to be needed.

Posture

Postural problems can be solved by adjustments to the workstation and by training – for example, adjusting the height of the chair or by training the user about good posture, the correct hand position and how to adjust the equipment. If absolutely necessary, foot rests and wrist rests can help the employees adopt the correct posture.

Advice may need to be given on such issues as positioning the mouse within easy reach, so it can be used with a straight wrist; sitting upright and close to the desk; and moving the keyboard out of the way when it is not in immediate use. Display screen users need to be reminded not to sit in a position for long and to change their postures as often as practicable.

Information and training

All users of display screen equipment need health and safety training in the use of workstation. If a person is to become a user, the training should be given before he or she starts work.

The training should include:

- Recognition of hazards, such as poor posture and the degree of risk that could lead to fatigue and pain.
- The methods of control to reduce risk to an acceptable level – for example, comfortable posture and adjustment of the workstation components.
- Regular cleaning of the workstation
- The need to take regular breaks, whether natural or scheduled.

Employees need to be provided with information on the health and safety aspects of the workstation and the measures taken by the employer to comply with the legal standards. For their part, employees should report any symptoms of ill health which may be related to the work they are doing.

Display Screen Equipment

Staff need to be able to sit at the correct height with their eyes roughly leveled with the top of the computer screen and their forearms parallel to the desk top.
To achieve this, chairs need to be adjustable, and staff may need to alter the height of their screens.

Ideal Workstation Design for Seating and Posture for Typical Office Tasks

1. Seat back adjustability
2. Good lumbar support
3. Seat height adjustability
4. No excess pressure on underside of thighs and backs of knees
5. Foot support if needed
6. Space for postural change, no obstacles under desk
7. Forearms approximately horizontal
8. Minimal extension or bending of the wrists.
9. Screen height and angle should allow comfortable head position
10. Space in front of keyboard to support the hands and wrists during pauses while working.

Supermarket Checkouts

The employees who work at supermarket checkouts handle thousands of items every day, repeating similar movements throughout the day. This can lead to, or aggravate, musculoskeletal disorders, particularly in the shoulders, elbows and wrists.

The aim of any control is to reduce undesirable physical loading and operator dissatisfaction and to reduce the risk of injury from, or the development of, musculoskeletal disorders.

A basic supermarket checkout unit is made up of a place for the operator to sit or stand, the method of delivering the goods to the operator, a recording method for the price of the goods, a cash receptacle, ancillary equipment such as weighing scales and an area for the goods to be returned to the customer. There are, of course, variations including laser scanners and credit card swipes.

The best way to control risks involved with supermarket checkouts is to apply an ergonomic approach which emphasizes the need to ensure an acceptable fit between the operator, the equipment and the tasks performed.

Workstations

There should be sufficient room for operators to move and change posture without restriction. The seat backrest should be in good shape. Foot rest and bending should be available. Operators should be able to reach goods easily and the design of the checkouts should minimise the need for twisting and bending.

Workstations with a moving belt that delivers goods to the operator are generally preferable to systems that involve the operator in unloading and moving goods by hand. The scanner and the cash drawer should be directly in front of the operator, allowing for plenty of knee room. The scanner should be positioned so that the operator does not have to twist from the goods delivery point to the scanner.

Work Organisation

Operators should be allowed adequate rest breaks, and job rotation should be considered. A second person could help by packing bags. Opening a sufficient number of checkouts prevents long customer queues – benefiting the consumers and taking a little pressure off the checkout operators.

Work Environment

Poor environmental conditions may increase the likelihood that operators will complain about symptoms. Cleanliness, temperature, ventilation, noise and lighting are all important to employees' sense of wellbeing.

Training

Operators are unlikely to suffer injury if the work is performed properly at a well-designed checkout. Staff should be trained to vary sitting and standing postures, to use both hands for scanning and to request breaks before they become fatigued. Supervisors should observe

operators at work and advise them of any poor practices and how to improve what they are doing. Operators should be encouraged to report any symptoms such as shoulder or wrist pains.

Management controls

Supervisors and managers should respond quickly to complaints and reports of symptoms. Equipment should be maintained regularly and assistance should be given wherever possible to ease the workload.

Legal requirements

The management of health and safety at work regulations 1999 requires employers to assess risks (including risks from repeated movements) and where necessary to take action to prevent musculoskeletal disorders.

The manual handling operations 1992, amended 2002, require employers to avoid the need for employees to carry out manual handling operations including repeated and awkward lifting which involves a risk of their being injured. Employees must make full and proper use of systems of work provided for their use by the employer.

The workplace (health, safety and welfare) regulations 1992 require workspaces, workstations and seating to be suitable, in good condition and designed to prevent injuries and ill health.

The health and safety (display screen equipment) regulations 1992 require employers to make a suitable and sufficient analysis of display screen equipment workstations to assess and reduce the health and safety risks to operators.

Employers must plan their work to provide breaks or changes of activities. They must also provide employees with eye and eyesight tests on request and at regular intervals and must provide adequate health and safety information and training about the use of the workstation.

Employers must also meet the standards specified in the HSE Approved Code of Practice L26 Work with display screen equipment.

Display Screen Workstation Checklist

A. Display screen equipment

1-Monitor

-Can you tilt the monitor and swivel it easily?
-Is the monitor at the correct height for you?
-Is the screen flicker free?
-Are you able to adjust the brightness and contrast of the screen?

2-Keyboard

-Is the keyboard separate from the screen?
-Is there enough space in front of the keyboard for you to rest your hands?
-Can you easily see the character on the keys?
-Can you raise the keyboard?

B. Furniture

1-Desk

-Is the desk surface area large enough for the monitor and keyboard and are other equipment rightly kept?
-Is the desk at the right height for you?

2-Footrest

-Do you need a footrest?

3-Document holder

-Do you need a document holder?
-If you have one, is it adjustable?

C. Work environment

1-Lighting

-Is the lighting suitable for you?
-Do you have control over the lighting?
-Are there any reflections or glare from the screen?

2-Space

-Have you enough space around your workstation?

3-Noise

-Is there any work equipment near you that distracts you?

4-Temperature and humidity

-Is the temperature and humidity around your workstation conducive?

D. Training

1-Use of workstation

-Have you been trained on the use of workstation?
-Have you been trained on the use of softwares?
-Do you know what to do if the workstation is not suitable for you?
-Do you know about the arrangements for eye tests and eyesight tests?
-Do you have any other comments?

Manual handling occurs in almost every workplace in the world at any time someone is moving objects as part of their everyday work activities. It could be an administration assistant moving a small pile of papers from one side of the desk to another. It could be a shop assistant stacking packs of bottles, or a checkout assistant moving goods from the conveyor to the scanner. It could also be a builder lifting bags of sand and cement to tip them in a mixer, or it could be any number of actions that involve moving something from one place to another.

This common activity causes more than one-third of all injuries lasting over three days that are reported each year in the UK. Over one million people suffer from musculoskeletal disorders (often back pain) that are caused, or made worse, by their current or past work.

Key Words and Phrases

Competent person – someone with the appropriate qualifications, knowledge and experience to identify the risks arising from a situation and the measures needed to control them.

Hierarchy of Control – a well-tested system of graded health and safety controls. The sequence helps organisations to determine their most effective health and safety controls.

Load – any movable object, including a person or animal.

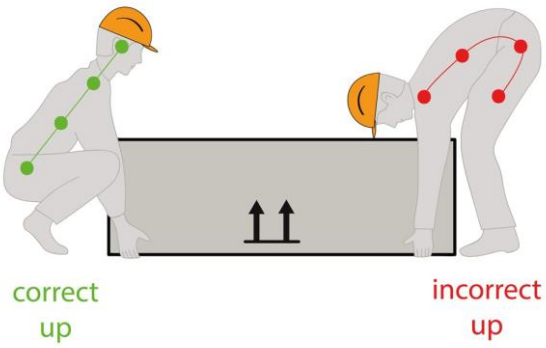
Manual handling or manual handling operation – any transporting or supporting of a load (including lifting, putting down, pushing, pulling, carrying or moving) by hand or bodily force.

Musculoskeletal Disorders (MSDs) – conditions affecting the muscles, nerves, tendons, ligaments, joints, cartilages or spinal discs.

Safe system of work – a set of procedures for carrying out a task safely.

What is manual handling?

British legislation defines manual handling as any transporting or supporting of a load by hand or by bodily force. This includes lifting, putting down, pushing, pulling, carrying or moving any object. A load is anything that can be moved, including a person or an animal. The load can be light or heavy, small or large.



The Occupational Significance

Workplace injuries arise from poor manual handling than from any activity. There are more than 3,500 major injuries a year, plus over 38,000 injuries that keep employees away from work for more than three days. Despite how enough these figures are, they do not present the full picture because many injuries go unreported while employees suffer in silence.

Manual handling contributes significantly to injuries known as musculoskeletal disorders. Most injuries involve a strain or sprain to the back: other injuries affect the muscles, nerves, ligaments, joints, cartilages, spinal discs and tendons. In addition, there may be cuts and bruises to the hands or feet or even bone fractures.

However, many injuries are difficult to link to any single activity or accident because they are cumulative – the problems develop gradually, perhaps over a considerable period and perhaps without being noticed at first. It is often difficult to make a full recovery from a manual handling injury and cumulative injuries may lead to temporary or permanent disability, leaving the sufferer with a limited range of movement that is very painful.

Even single strains can lead to other problems. For instance, suppose that an injured person continues to work but, as a consequence of the injury, lose grip of a box of bottles of chemicals. Vapours from the spilt chemicals could cause breathing problems affecting other staff, or the floor could become slippery so that other staff slip over and hurt their backs. The falling box could land on someone or become jammed in machinery.

Typical hazards

When considering manual handling, it is helpful to do so under three main headings:

a. The manual handling load
b. The manual handling task
c. The work environment

The manual handling load

The size, shape, weight, texture and contents of the load can all affect the ease with which an object can be handled and could give you initial problems in designing a safe procedure for moving it.

The manual handling Task

The task itself can also be a hazard. Some of the issues that need to be considered include the frequency of the operation and whether the task involves stretching, twisting the body or bending forward.

A task involving two or more people can also be a hazard because there could be a misunderstanding between them that leads to an accident. Good co-operation and communication between employees working on the same job is essential.

Even the use of personal protective equipment (PPE) has hazards. Some types of PPE, such as breathing apparatus, have a potential to restrict movement so that employees find it more difficult to lift a load.

The Working Environment

The workplace itself plays a major part in creating or eliminating hazards for staff involved in manual handling activities. The materials used in the construction of the building, the way equipment is laid out and installed, the standards of cleaning and maintenance and even the routes that are possible through the workplace can all affect the safety of staff and visitors.

Take flooring and the ground surface as examples. There may be different levels to negotiate. The flooring might be a special non-slip material, but it could become unsafe to walk on when wet or splashed with grease. If there are holes in the flooring, or rubbish is left lying around, the number of hazards increases. Work outdoors often poses particular problems where the ground is uneven or potholed and where there is debris or tools lying around.

The temperature of the workplace is also important, together with the ventilation and humidity. A high temperature and humidity can cause sweating that makes it difficult for workers to maintain a steady grip on a load. A low temperature or increased ventilation can lead to cold hands which can also make it difficult to handle materials. This is also the case when working outside- for example, scaffolders handle cold, steel poles which are heavy and sometimes awkward to lift.

If you are cold, you are more likely to strain a muscle, so droughts and stronger air movements can also cause problems. Droughts affecting a workstation for example can cause discomfort and can lead to muscular problems, especially for sedentary workers, such as data processing operators, when they are asked to carry out one of the manual handling tasks. Strong air movements can blow liters around and may even move light sheets of woods or plastic, making manual handling operations more hazardous.

Low lighting levels in the workplace or sunset can make it difficult for people to see where they are going and to negotiate obstructions and steps.

RISKS

The typical risk factors associated with manual handling operations are discussed below under the heading already identified:

- The manual handling load
- The manual handling task
- The work environment
- Personal capabilities.

The manual handling load

Factors to consider when assessing risk include:

- Size
- Shape
- Weight
- Texture
- Content

Size

A load that is large and difficult to get your arms around is likely to involve a high risk, while a smaller load which is easy to pick up and hold is likely to be a much lower risk.

Shape

There is likely to be a low risk from a load with a regular shape, such as a rectangular box. There is also likely to be a low risk of injury if a load has easy to grip handles or handholds, such as cut out handles on a cardboard box or a bag with rope handles. In contrast, a sack of gravel or stones intended for a dry stone wall can be difficult to grip and lift safely because of their awkward shapes.

Staff need to be trained to be aware of the centre of gravity of each load when assessing the lifting operation. If it is not taken in to account, the risk of injury increases because the load could unexpectedly tip away from the body, causing strain.

Weight

Lightweight loads are likely to involve a low risk for most people, provided they lift them safely. If a load is heavy, it is likely to create a higher risk of injury for most people.

Texture

How rough or smooth the texture of a load is will affect its level of risk for most people, depending on how they are lifted

Content

If the contents of a load are loose inside a container, there is an increased risk that the contents will shift position while the load is being moved. This may tip the load unexpectedly causing a loss of control that may cause a leak or spill. Where the contents of a load are toxic, corrosive, hot, cold or alive, the risk of injury is obviously much greater.

The manual handling Task

Factors to consider when assessing risks associated with a task include the:

a. Space available
b. Number of movements
c. Types of movement
d. Number of people involved
e. Use of personal protective equipment

Space available

If the space in which the load can be moved, or in which the worker can move, is restricted, there is an increased risk of injury.

Number of movements

Risk also increases the number of times a similar load has to be moved. Repeated lifting of small sized and medium sized loads can lead to strain on muscles, ligaments or tendons. A cumulative effect can lead to a long lasting injury.

Types of movement

If someone has to twist, bend down or stretch to move a load, the likelihood of getting an injury increases. For example, if you have to stretch to your fullest extent with your hands right above your head to get something from the high shelf, you are more likely to injure yourself than if you stretch just above your head height to retrieve something.

Number of people involved

The greater the number of people involved in handling a load, the greater the risk of poor communication. If one person misunderstands what the rest of the team members are doing. Someone could get seriously injured, particularly if the load was heavy.

To avoid misunderstanding between workers lifting a load, it is best to keep the number of people involved to a minimum. However there are many situations where a load has to be lifted by two or more people. In such cases, training and communication are crucial in reducing risk of injury.

Personal protective clothing

Clothing designed for personal protection can restrict movement and mobility. For example, if staff wear gloves to protect against splinters from wooden crates, they may have reduced sensitivity to the security of their grip on the load and may be more likely to let the crate slip.

The work environment

There are higher risks if the immediate environment is badly lit, the floor or grounds are holed, uneven or slippery, or there are sudden changes in floor or ground level. The temperature, humidity and ventilation can also influence the levels of risk.

PERSONAL CAPABILITIES

An individual's state of health, fitness and strength can affect his ability to perform a task safely, although there is no evidence to suggest that there is a close link between the incidence of injury and these factors. That said, the lifting of excessive weight in relation to a worker's capabilities can lead to the injury of the employee and colleagues.
People with the appropriate training are capable of lifting loads and are often attracted to jobs in which manual handling is involved: self-confidence and motivation are also significant factors in personal capability.

Controls
By law, employers must make a suitable and sufficient risk assessment of all manual handling operations.

Such a risk assessment may be a part of the responsibility of managers and supervisors and may also involve safety representatives. Whoever carries it out needs to be a competent person and may need specific training.

During the assessment, always consult the employees who carry out the manual handling operation. There are many other manual handling assessment charts available – for example, from the health and safety executive website. Some are specific to certain types of manual handling such as the pushing and pulling of wheelchairs or the lifting of people.

There is no legal requirement to record the assessment but it is good practise to do so. A generic assessment is acceptable, but specific assessments may be necessary for special manual handling operations, such as dealing with a toxic or corrosive substance.

Implement any new methods of handling and any other controls you identify. Update an assessment when significant changes are made to the operation or the workplace.

Hierarchy of control

When planning to implement measures to reduce the risks identified, consider the hierarchy of control:

- Elimination or avoidance
- Substitution
- Controlling risks at source
- Safe working procedures
- Training, instruction and / or supervision
- Personal protection equipment

First of all, try to eliminate the manual handling task altogether. Ask yourself whether

staff really needs to carry out a manual handling operation in the first place, or could the task be reorganised so that the load does not have to be moved at all? If moving the load is unavoidable, is there a feasible substitute process?

Can the goods be moved in another way-perhaps by automating the process or using mechanical help? For example, could retail goods be moved in a wheeled cage rather than carried to the shelves? Could goods in a warehouse be stacked on pallets which could be moved and lifted using a fork-lift truck? Might a powered conveyor belt be a more suitable system of handling loads?

Of course you'll also need to assess the hazards and risks presented by any mechanised or automated process. For example, might a folk-lift truck run over someone's foot, or might a conveyor belt trap someone's hand?

Once the assessment has been done, any actions required to reduce risk from the new procedure should be implemented.

Lowest Level Possible

The aim is to reduce the risk to the lowest level that is 'reasonably practicable'. All workers should be trained in handling techniques and practices. However, manual handling tasks that are unavoidable should be carried out by workers who are trained for the particular task and physically capable of undertaking it. In manual handling operations, the solution is to fit the job to the person and not the person to the job.

In deciding whether someone is suitable to do a manual handling operation, a number of factors must be taken into account:

- The physical suitability of the employee who is to carry out the operation
- The clothing, footwear or other personal effects worn
- Knowledge and training
- The result of a relevant risk assessment
- Whether the employee is within a group of employees identified by the assessment as a group especially at risk
- The result of any health surveillance

Each staff member needs to be comfortable while lifting or carrying a particular load and should not have to struggle with it. Bear in mind that capabilities may vary at different times – for example, a woman who is usually confident and competent to lift a particular load may not be so while she is pregnant, and she may face a greater risk of having back injury.

The Manual Handling Load

If a load has an awkward shape, managers should consider redesigning the container or buying
different containers so that workers can handle them more easily. Provide cut-out handles in cardboard boxes. Add some form of handle
wherever possible or provide a means of gripping the container easily. Make sure that two or more people deal with heavy or awkward-shaped loads. If the load can be split into smaller loads, the risk may be reduced.

The staff selected should be trained on how to carry out the operation, there should be agreement on who should give instruction to lift, supervise and monitor the operation. There must be a safe system of work, based on the risk assessment. The system should ensure that staff work as a team and communicate well.

When assessing the risk from a manual handling operation you should consider:

- How quickly the job must be done
- How many loads are to be moved
- How big the loads are

Choose a balanced approach between these three factors so that you can minimise the risk. Where possible, eliminate any sharp object and ensure that packaged loads are secured and cannot move about inside their containers.

Special Loads

Special loads need special attention – for example, gloves or eye goggles may need to be worn if the load contains a toxic or corrosive substance. Everyone involved must be specially trained for the task, and it is particularly important to emphasise the procedures to follow if something goes wrong.

Marking the Weight

If possible, loads should be marked with the approximate weight of the load. For example, the health and safety executive campaigned to reduce the large number of manual handling injuries in the parcel delivery industry. Drivers collecting parcels often do not know how heavy they are before lifting them. It helps to know the weight of the parcel when employers assess the risk of injury from manual handling.

Businesses have a general responsibility towards the health and safety of everyone who handles their parcels. Encourage staff to mark parcels to the nearest kilo on the same side as the address, or to ensure that individual parcels are not too heavy by packing loads as two or more lighter parcels.

The Manual Handling Task

When planning manual handling there are a number of factors you need to consider:

- Whether there is sufficient space
- The frequency and length of rest breaks
- How the task is carried out
- The use of personal protective equipment

Space

The space where the manual handling task takes place must be large enough to allow the member of staff to man oeuvre the load easily without restriction of movement.

Rest Breaks

When staff have to handle a large number of loads, provide regular rest breaks to allow them recover from the physical exertion. Alternatively, vary the work pattern. This change of activity avoids harmful repetitive work.

Redesigning the Task

If you notice that staff have to bend down, reach or stretch frequently when moving loads, you need to consider redesigning the task so that they do not have to carry out these types of frequent movement.

Such a redesign might involve the use of mechanical aids such as levers, potable hoists, trolleys, sack trolleys, pallet truck, roller conveyors or chutes, for example. Using mechanical aids can improve productivity by making it easier, quicker and safer for workers.

If the loads are large and need to be moved frequently over considerable distances, manual handling should probably be excluded. Powered work equipment such as fork-lift or reach trucks, should be used.

The work environment

Use of personal protective equipment

Protective clothing can provide protection to staff when they have to work with unavoidable hazards. For example, gloves must be used if the load is hot, has sharp edges or would otherwise be very uncomfortable to handle.

The workplace must be well lit and the temperature and humidity of the workplace should be as comfortable for staff as it can be, depending on the loads being handled.

In a cold storage business, for instance, the temperature of the walk-in freezers should be at – 18^{0}C or colder to preserve the food, so staff must be provided with appropriate warm clothing.

As the temperature of the workplace cannot be altered in many industries, the protective clothing can have the dual purpose for protection against cold and allowing manual handling to take place without any increased risk due to the cold. However, the cold can present other risks such as icy surfaces and the fogging up of spectacles, for example. These hazards need to be dealt with in the manual handling assessment.

Training

Being able to lift a load correctly is a fundamental necessity for workers in order to prevent them from sustaining serious injuries. An employer has a duty to train in good manual handling techniques. Once trained, employees should be able to recognise poor handling techniques and carry out manual handling techniques without risk to their health and safety.

Storage Systems

The method of storage largely depends on the sharpness and fragility of the article being stored. For example, long thin articles are normally stored in a horizontal racking and boxes are stacked.

General Features

Storage areas should be specifically designated and clearly marked. The layout should be carefully designed to avoid tight corners, pillars, uneven surfaces, changes of gradient and awkwardly placed doors. The design of traffic and pedestrian routes should be considered with regards to handling methods.

Where many small items are to be lifted mechanically, they can be placed on pallets or battens which are then lifted by a pallet-truck or a fork-lift truck onto a storage rack. The driver must ensure that the load is uniformly distributed over the deck area of the rack.

A typical racking system consists of a steel framework, either fixed or adjustable, to support loads without the use of shelves. The design of the racking depends on the type of materials being stored – for example, pallet racking in a food warehouse, tyre racking in garages and drums racking in chemical storage areas. One of the most common types is the adjustable pallet racking, a system of upright frames connected by horizontal beams to provide pallet storage levels, which can be adjusted vertically.

Safety Standards

Racking should be installed by competent persons and the safe working loads, heights and widths should be set by the designers and manufacturers of the system. The standards of construction of the racking should meet those recommended by the health and safety executive guidance for storage racking.

Practical Example

Mattress Injury

A company ended up in court after several workers suffered back injuries and shoulder, knee and waist problems from lifting heavy mattresses on their own. One worker had even stacked double mattresses in a pile 2.4m high.

The company had failed to carry out a manual handling assessment.

Manual Handling Checklist

This checklist can be used during the first stage of assessing manual handling tasks.

1. Load

- Which loads are being moved in the workplace – e.g. Bags, boxes, drums and sacks?
- Who moves the load – one or more than one worker?
- What is the weight and shape of the load?
- Is it awkward to carry?
- Is it difficult to grip?
- Is the load wet, hot or cold?
- Does the load have sharp edges?
- Is the load potentially unstable?

2. TASK

- How are the loads moved?
- How often are loads moved?
- How far are loads moved?
- What height do the loads need to be lifted to?
- Is there handling while seated?

Does the procedure involve carrying, stooping, twisting, reaching, bending sideways, pulling or pushing?

3. Environment

- What are the environmental conditions where the manual handling operations takes place.
- Is it hot, cold or humid? Is it windy or dusty? Is it noisy or are there vibrations nearby? place?
- Is it well lit?
- Is there enough space to manoeuver the load? Are there obstructions in the way?
- Are the floors non-slip, in good condition and even?
- Are there steps or different ground levels that need to be negotiated?

4. Who IS at RISK?

- Is there a need for unusual strength?
- Is training required?
- Does personal protective equipment need to be worn?
- Are there any workers who may be at a greater risk than others – e.g. pregnant workers, young people or people with a medical condition or history?
- Does the accident book show what could be associated with manual handling?

Practical Example

Positive Action

People involved in medical and residential care often need to lift people or to help them to move. As a consequence, they often suffer back and other injuries. One NHS Trust estimated that about one-sixth of all time lost at work was due to manual handling injuries associated with patients.

Three priorities were chosen to reduce this lost time:

- Risk assessment – risk assessors were trained to focus on ergonomic assessment
- The purchase of lifting equipment, particularly patient-lifting aids
- General staff training on manual handling.

Following the implementation of these three priorities there was a dramatic fall in lost working hours from 6,720 hours to 200 hours. The cost of absenteeism fell from £800,000 in 1993 to £10,000 in 2001.

Another NHS Trust was concerned about the number of back problems among ambulance staff, often resulting in early retirement. The Trust adopted five actions aimed at reducing the personal, professional and financial cost of musculoskeletal injuries:

- Purchase of equipment that reduces the risk of injury
- Ergonomic design of vehicles and manual handling procedures
- Training on manual handling techniques
- Medical treatment and rehabilitation for staff
- Awareness and behaviour therapy as part of rehabilitation.

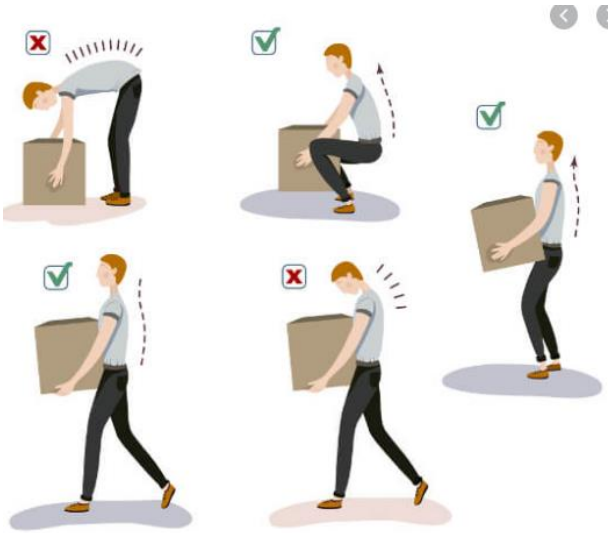
The Trust worked in partnership with the vehicle manufacturers to introduce automated tail lift on ambulances and manual pumps on stretchers to try to eliminate risks in those areas. The number of shifts lost to ill health fell from 4,000 to 2,000 in two years.

Legal Requirements

The manual handling operations regulations 1992, as amended, require employers to avoid the need for employees to carry out manual handling work involving a risk of injury. Employers must make a 'suitable and sufficient' assessment of all manual handling operations to reduce to the lowest reasonably practicable level the risk of injury. They must also provide employees with specified information about the loads to be carried and must review (and where necessary, change) arrangements regularly. Employees must make full and proper use of any system of work provided for their use by the employer.

Safe Handling Techniques

As a manager, supervisor or safety representative, you need to understand the basic techniques for manual handling because you may need to advice employees about safe lifting and handling methods and procedures



Keep a close eye on employees when they are lifting loads. Some indications of poor practice to watch out for include staff who:

- Attempt to lift awkwardly heavy loads without asking for assistance or without using mechanical aids, such as trolleys
- Are out of breathe or sweating after a manual handling task
- Lift a load from the floor, or from a low position, with straight legs and curved back
- Are very tired after manual handling tasks
- Have a poor posture after lifting loads.

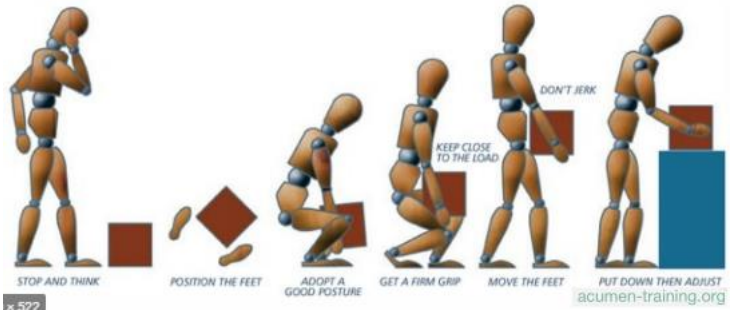
If they are following safe procedures, talk with them about the risk associated with poor manual handling and explain how they can improve the way they handle goods. Arrange for training or a refreshers training, or, if appropriate, give an immediate, simple, informal demonstration of ways to lift properly.

The BASICS

There are some common stages to all manual handling operations:

- Assess the load and plan the lift
- Position the feet with care and secure your grip (feet slightly apart and one in front of the other is a more stable stance than feet close together)
- Bend the knees, keeping the arms and back straight
- Lift smoothly, using the legs to take the main strain and keeping the load close to the body
- Use the feet to move the load from one position or place to another
- Put the load down with care, using the legs to take the strain and keeping the back straight.

STAGES OF LIFTING



Step by Step Approach of Lifting

1. Before you start any manual handling operation, plan what you are going to do. Assess whether you can lift the load easily without hurting yourself. Check that you can take the load to the desired place easily. If necessary, get help or use equipment.

2. Your body position is very important before, during and after the lift. The position of your feet, the position of your back, how you grip the load and the position of your legs and shoulders are all crucial to a good lift.

3. Make sure that you start the lift by positioning yourself in a stable and comfortable posture. Your feet should be apart, with one foot slightly in front of the other. Hold the load in a secure hook-shaped grip. Bend your knees with your back as straight as possible.

4. Lift in a smooth movement, avoiding any sudden or jerky movements. Your arms should be straight and you should keep the load close to your body. Keep your head up when handling a load, and look ahead.

5. Use your feet to move to the load's destination and to manoeuvre around obstacles, twisting your body or reaching.

6. When you put down the load, reverse the procedure if the load is to be put back on the floor. If you are using a table, put the load down first before sliding or pushing it into its final position.

Workplace Transport

The use of vehicles in workplaces accounts for the death of about 45 people every year. In addition, more than 1,800 people a year receive major injuries from being hit, run over, crushed or struck by a vehicle or thrown from one.

Key Words and Phrases

Competent person – someone with the appropriate qualification, knowledge and experience to identify the risks arising from a situation and the measures needed to control them.

Mobile equipment – any work equipment that operates while it is travelling or is moved between work locations.

Safe system of work – a set of procedures for carrying out a task safely.

Traffic – vehicles or pedestrian movement.

Traffic route – a defined or non-defined route used by vehicles or pedestrians in a workplace.

Vehicle – includes cars, vans, heavy goods vehicles, fork-lift trucks and reach trucks.

Work equipment – apparatus used at work including machines, appliances, tools, installations, ladders, hoists and lifting equipment.

Workplace transport – any vehicle or piece of mobile equipment used by employees or self-employed people or visitors to a workplace, excluding vehicles on a public road.

What is Workplace Transport?

Workplace transport is the term for any vehicle or piece of mobile equipment used by employees, self-employed people or visitors to a workplace. Examples include fork-lift trucks, compact dumpers, tractors or mobile cranes.

It does not cover vehicles travelling on a public road or by air, rail or water transport. However, a good vehicle loading or unloading on a public highway is regarded as a workplace transport.

Hazards

The hazards from workplace transport include being struck or crushed by a vehicle or the load it was carrying while the vehicle is moving or being unloaded. The reversing of vehicles often causes injury or death, as well as damage to vehicle, equipment and buildings, particularly loading bays. Manoeuvring through junctions and negotiating sharp bends, crossings, corners, steep gradients, roadworks and other work activities is also hazardous. Vehicles can also overturn and crush the driver or anyone nearby.

Sometimes people fall out of, or off, a vehicle, or fall from loading bays or while sheeting a load on a vehicle. Injuries also occur when people are trapped or become entangled in dock levellers
– machines used to breach the gap between the loading truck and a vehicle trailer to allow access for lift trucks and rolling containers – or vehicle tail-lifts.

Risks

The main risks involved in workplace transport occur because of inadequate training, information, instruction and supervision of the people who operate and work with or near the vehicles. Without specific training, instruction and information, the risk of injury and damage is high.

Recent research has showed that while training is essential to provide individuals with the necessary skills to use workplace transport safely, the way in which individuals subsequently choose to perform a task is more heavily influenced by the attitudes and behaviours of drivers. Poor management control often leads to unsafe **system of work** and lack of maintenance and repair. Low staffing levels may prompt to cut corners – literally and metaphorically – so that they can meet tight deadlines. This often leads to accidents.

Controls

The main control measures that can be taken to make workplace transport safer include:

- Risk assessment
- Good layout of traffic routes
- Pedestrian protection
- Safe parking
- Procedures at loading bays

- Construction of roads and routes
- Competent maintenance
- Driver selection and training
- Good practice

Risk Assessment

Identifying the hazards and assessing the risks involved with workplace transport are the first steps in dealing with the hazards that may exist in your workplace. This could involve managers, supervisors and safety representatives in consultation with employees.

If you are involved in the risk assessments, consider the potential dangers by looking at the vehicles, the route they follow and the behaviour of the employees, visiting drivers and pedestrians. Think about suitable precautions to take to reduce a risk of injury from these hazards: has a speed limit been imposed on traffic routes, for example? Once measures have been identified and put into practice, record all findings.

Traffic Layout

Safe routes need to be planned and made easily identifiable. Make sure that it is clear whether a route is for vehicle or for pedestrians, or both, and indicate traffic routes clearly by marking or signposting the direction of flow. Routes need to be wide enough to allow two vehicles to pass side by side. If the traffic flows are heavy, consider introducing a one way system.

Avoid traffic routes that pass vulnerable facilities, such as a fuel tank. If that is impossible, provide protection around it, such as fencing or barriers. Avoid sharp bends and junctions if possible: otherwise keep them to a minimum.

Clearly signpost any road junctions, areas where there is low headroom and any dangerous installation, such as tanks of flammable liquid. Forward visibility needs to be good enough to allow drivers to see and avoid hazards. Speed limits could be introduced: they are usually between 5 to 10 miles an hour. Traffic-calming features could also be used to reduce vehicles speeds.

Any doorway or entrance should be wide enough for two vehicles to pass one another. Allow for varying heights of vehicles. An unloaded vehicle may be greater in height than a loaded vehicle.

Pedestrians

Pedestrians are best protected by providing them with separate routes. In areas where vehicles and pedestrians do mix, provide barriers or guard rails – for example, at the entrance or exit to a building where the pedestrians' access leads straight on to a traffic route. It is also important to provide separate entrance and exit doors for both pedestrians and vehicles.

Inside building where vehicles and pedestrians mix, mark the routes on the floor to show pedestrians and drivers where the pedestrians and vehicles routes are. The points where traffic routes cross should be marked clearly and drivers should be able to see in all directions.

Where members of the public have access to the workplace, they should, wherever possible, be kept away from any work activities or separated from them as much as possible. Make sure that the separate pedestrian routes are clearly signposted, with plenty of warning signs about hazards from the work activity.

Parking

Provide parking area for all vehicles used in the workplace. If members of the public visit the premises, their parking area should be separate from those provided for workplace vehicles. Parking areas should be clearly marked, well-lit and in a position where those using the parking areas are not put in any danger from work activities nearby.

Practical Example

Take, for example, the car park for a large supermarket. The direction of traffic flows need to be clearly marked and the car parking spaces need to be clearly defined. The area should be well-lit to enable customers to find their way around safely. The routes to and from the supermarket should be well marked with pedestrian crossing points well signposted and protected, possibly by using pedestrian islands.

Loading Bays

There should be enough space outside loading bays for vehicles to be manoeuvred safely. The loading bays should be well marked and well-lit. Where there is a risk that people could fall off the raised area of the bay, guardrails should be fitted. There should also be a separate exit door from the loading bay for pedestrians.

It is important to design a safe system of work for the loading and unloading of goods.

Construction of Roads and Routes

Roads should be constructed so that they can support the type and amount of traffic that operates in and visits the workplace. In permanent premises, this probably involves the use of concrete or tarmacadam.

At temporary sites where routes are across field or other soft surfaces – such as at festivals or agricultural shows or where trees and other plants must be protected – a temporary load-
bearing road surface should be laid so that vehicles can move about the site easily and without causing compaction and other damage. Slopes and cambers should be avoided and the roads should be well drained, where possible.

Routes through buildings should have a floor or surface suitable for the purpose for which it is used. This is usually concrete of an appropriate thickness. All routes should be kept clear of anything that could obscure a driver's vision and cause any pedestrian to slip, trip or fall. All traffic routes should be adequately lit. Be careful where lights are positioned so that large vehicles do not block them.

Maintenance

All workplace vehicles are regarded as work equipment and must be designed, constructed and maintained to be suitable for their intended purpose. The construction of vehicles is subject to strict legal standards and controls.

The type and frequency of necessary vehicle maintenance varies. For instance, the driver of a vehicle needs to make basic visual checks on things like brake light, brakes and tyres before travelling, while a garage mechanic needs to make precise checks on the performance of the brakes, the integrity of the brake pipes and the efficiency of the brake system. In general, the type and use of the vehicle, together with the manufacturer's instructions, determine the frequency of preventive maintenance checks.

However, all vehicles must undergo specific checks by a competent person at appropriate intervals. These include the systems controlling braking, steering, signaling and windscreen washing, any special system used – for example, the lifting chains on a fork-lift trucks – as well as viewing mirrors and tyres.

Driver Selection and Training

Someone must be responsible for ensuring that new staff are competent. This may be the responsibility of a supervisor. Thorough checks should be made on the qualifications and experience of new drivers. Organisations should also ensure that existing employees have the skills and experience needed for safety and that they maintain their skills.

Practical Example

Training for fork-li† USE

A car manufacturer wanted to reduce the number of accidents involving fork-lift trucks so

- Modified the trucks to restrict their speed and give the driver better visibility
- Reduce the number of fork-lift trucks in the workplace
- Introduced system to control vehicles in designated areas
- Fitted rail guards outside doors to canteens and rest areas

The modifications were carried out only after consultation between the management, trade unions and employees. The resulting safer work environment reduced the risk of injury.

If work is contracted out, make sure that the contractor's drivers are competent to drive. The best way to do this is to ask for proof that they have been trained or instructed to a standard you are comfortable with. For example, ask to see certificates of training for a fork-lift truck driver and evidence of any refresher training courses taken.

(Employers need to provide health and safety information about the workplace and a site plan to contractors and drivers who visit the site.)

Training

When employing new drivers, access how much training, instruction and information the driver needs before taking up his or her duties. Drivers should be capable of operating a vehicle safely. He or she should have a mature attitude and be able to do their work responsibly. Assessing maturity and responsibility is a matter of personal judgement, taking into accounts the person's previous experience and record. The type and level of training should concentrate on the driver's areas of inexperience.

It is good practice to introduce a planned programme of initial and refresher training for all drivers to make sure they are, and continue to be, competent in their work. It is also good practice to record all training activities, particularly the formal training and instruction which needs to be done to prove competence for, for instance, fork-lift trucks.

General training should cover the workplace routes, instruction on how to use the vehicle safely, the hazards and risks associated with the vehicles and the controls needed to prevent accidents. It is also essential to reinforce the message that drivers must not attempt to control a vehicle under the influence of drugs or alcohol.

Specialist training must be given for particular vehicles that have been assessed as severe risk. For example, training on how to operate forklift trucks should be done by a qualified instructor who is trained and authorised to instruct others in the use of a particular type of lift truck.

Good Practice

Reversing vehicles

Avoid the need for vehicle reversing by, for instance, setting up a one-way system. If reversing cannot be avoided, set up well marked reversing areas and prohibit pedestrians from going into the reversing areas, or employ someone to direct reversing manoeuvres.

Consider fitting reversing alarms to vehicles, marking the floor with white lines to guide drivers into the correct position and fitting barriers to protect loading bays.

Access to vehicles

Aim to avoid anyone having to climb onto a large vehicle such as a petrol tanker. Where this is unavoidable, restrict access to the vehicle. The employee allowed onto the vehicle must be trained to follow safe procedures for access and the activities that take place on the vehicle, such as dipping – measuring the level of liquid present in the tanker.

The means of access to a vehicle must always be safe – for example, there may need to be a purpose-made walkway with a handrail or ladders specifically designed for access to particular types of vehicles, such as petrol delivery trucks.

Loading and Unloading

Any loading and unloading operation (deliveries) should ideally be done away from

passing vehicles and pedestrians. It must not be undertaken on a gradient that could make the operation unsafe.

When employees or subcontractors are loading a vehicle, they must ensure that the:

- Brakes are applied
- Vehicle is stable
- Weight is distributed evenly on the vehicle and the load is stable
- Weight of the load is within the legal maximum for the vehicle
- Load is secure before transporting

Before unloading a vehicle, employees or subcontractors must ensure that the:

- Brakes are applied
- Load is stable

A safe system of work should be agreed between the site manager and the driver well in advance of operation. For example, the keys to the vehicle could be kept by the person in charge of the loading and the unloading (not the driver) to avoid the vehicle been driven away before the operation is finished.

Train the staff on safe techniques for loading and unloading. Managers should consider giving a supervisor the authority to refuse permission for unloading or loading if there are any safety problems.

Tipping Loads

Drivers need to be given appropriate special instructions by the site manager before tipping a load and there should be good communication between them during the tipping operation.

The driver should check that the load is evenly distributed in the vehicle and that precautions are taken so that the whole of the load discharges smoothly and safely.

The driver must also be trained and experienced in the tipping operation.

Shifting of Loads

The sheeting of loads is done to prevent the load from falling or flying off and hitting people or other vehicles. Large loads can ship position during travel and could fall off the lorry. Systems must be in place to prevent this movement or falling.

Secure, strong curtains, for example, are used on brewery lorries to prevent kegs and barrels from falling off a lorry during transit.

Mechanical sheeting systems powered by electricity, pneumatics or hydraulics are the safest option because they can be operated from the ground. Where mechanical systems cannot be used, manual sheeting system should be designed so that drivers and other employees do not have to climb on top of the vehicle. For example, sheeting platforms with handrails can be constructed and placed on each side of the vehicle.

Bakery safety improvements

One bakery company halved the number of accidents associated with reversing within two years of introducing a closed-circuit television system.

Drivers used a video monitor in the cab that allowed them to see more easily where the lorry was going when reversing.

The new system also reduced the costs associated with reversing accidents to one-quarter of the original level.

Overturning

Vehicles overturn for a number of reasons – for example, when travelling on steep slopes, on slippery surfaces or on soft ground or when they are overloaded, unevenly loaded, travelling too fast around a corner or carrying loads at a dangerous height.

Drivers must wear seat belts, follow safety procedures and be trained to spot dangers in advance. There is a legal requirement for many types of vehicle to have rollover protection – for example, some grass cutters and tractors – but drivers must still wear seat belts if they are to be effective.

Legal Requirement

The road vehicle (construction and use) regulations 1986 (as amended) cover all aspects of vehicles including weights and dimensions, safety items and environmental standards. The specific guardian for the safety of transport at work is in the health and safety executive document HSD 136 workplace transport safety – guidance for employers.

The provision and use of work equipment regulations 1998 require lift trucks that need a seated ride-on operator to be fitted with a restraining system, such as a seat belt, if a risk assessment indicates a risk of the vehicle rolling over and the operator falling from the operating position and being crushed between the truck and the ground. The regulations also require operators to be trained to use the equipment safely.

Under the workplace (health, safety and welfare) regulations 1992 employers must organise workplaces to ensure that vehicles and pedestrians can move about safely.

Workplace Transport Checklist

1. Workplace

Are Vehicles and pedestrians kept apart?

2. Layout

-Are there crossing points on vehicle routes?
-Is there a parking space for employees?
-Is there a parking space for customers?
-Are there sharp bends or blind corners?
-Is there a one-way system needed?
-Are routes wide enough?
-Do routes have well-constructed, even surfaces and are they well maintained?
-Are the routes free from obstructions?
-Are the routes marked?
-Are signs necessary?
-Are any special facility needed, such as mirrors on blind bends?

3. Vehicle

-Does the vehicle have parking brakes?
-Has the vehicle got a horn, lights, reflectors and reversing lights?
-Are the seats provided with seat belts?
-Is the driver provided with adequate protection against adverse weather or hazards?
-Is it easy to get on and off the vehicle?
-Does the driver need protection in case the vehicle turns over or if the load, or parts of it, falls off?
-Is the vehicle included in a maintenance programme?
-Are reversing alarms and rear view mirrors fitted to the vehicle?

4. Driver

-Does the driver carry out basic safety checks before using the vehicle?
-Has the driver passed the required tests for the vehicle he or she is driving?
-Is there a planned programme of training and testing drivers, including refresher training?
-Does the driver follow the vehicle routes?
-Has the driver been trained in loading and unloading?
-Is everyone using the site, including contractors, aware of the site safety rules?

5. Loading and unloading

-Is loading and unloading done away from passing vehicles and pedestrians?
-Are vehicles stabilised during loading and unloading?
-Is the load stability checked before unloading and during loading?

6. Parking

-Do drivers use the parking areas provided for their vehicles?
-Are the parking brakes used?

7. Reversing

-Is there a designated reversing area?
-Is it practicable to prohibit pedestrians from entering the reversing area?
-Is there someone present to direct the reversing of vehicles?

Workplace Stress

Stress can be described as an adverse reaction that some people have to external pressure. Many employees find it difficult to admit that they are experiencing stress as a result of their work and may be reluctant to report the problem for fear of stigma. Other people openly doubt that stress really exists.

However, stress has overtaken musculoskeletal disorders as the biggest stated cause of working days lost through injury or ill-health. Statistics indicate that the health, education, local and central government and financial services sectors have the highest incidence and prevalence of work-related stress.

Key Words and Phrases

Stress – an adverse reaction to external pressure.

Duty and balance

Whatever your own views are on the issue, you need to be aware that stress is very real for some people and can make them ill.
What is more, employers have a legal duty to ensure that employees are not made ill by their work activities.

Some employers are moving towards introducing the concept of a work-home life balance: the employer encourages employees to adopt healthy life styles and tries to ensure that the workplace makes a beneficial contribution to the health of the workforce. This can contribute to the control of stress in the workplace.

Recognising Stress

If you are to deal effectively with the causes of stress, you need to know how to recognise the symptoms of stress, how it affects the individual, and what the effect might be on the business.

The symptoms of employee stress vary but may include:

- Lack of concentration
- Changes in person's normal behaviour or mood
- Raised blood pressure
- Frequent headache
- Poor relationship with other staff
- Being irritable
- Showing indecisiveness
- Drinking or smoking more than normal
- Loss of appetite or weight
- Backache
- Ulcers.

Some people can suffer sleeplessness, indigestion and fatigue. In several cases, stress can lead to mental problems – such as depression or even a nervous breakdown – or to heart disease. However, you also need to recognise that there is a difference between stress and pressure.

Some external pressures can have positive effects, helping us to be more productive. Some people actually strive under short-term added pressure, and our bodies are designed for these short-term demands.

RISKS

Employees are more likely to be affected by stress if the work activities are poorly organised, if there is an ineffective manager or if the views and interests of the staff are usually ignored by managers.

If even a few workers suffer from stress, other employees can be affected and this may ultimately affect the organisation's prospects. For example, there may be an increased absence because of sickness, poor work performance, poor timekeeping or an increase in customer complaints. Employees suffering from stress are more likely to be involved in accidents. There may also be financial impacts – for instance, if staff claims personal compensation for workplace stress.

Find out what the level of stress is, if any, in your workplace. First of all, speak with the staff about the pressures of work and how they are coping.

Find out if staff are regularly late for work and if the rate of absenteeism has increased. Low morale, a low rate of work and productivity and increased staff turnover may indicate stress in the workforce.

Involve the staff in identifying whether stress exists in the workplace. Their involvement could include surveys, questionnaires, discussions and suggestions about improvements in the practices.

The Triggers for Stress

The issues that can lead to employee stress are generally signs of poor management.

Features of a workplace that often generate low morale and subsequent poor performance include:

- Poor communication between the management and employees
- An employer's expectation that employees will work late without pay and will take work home
- Blame – if things go wrong, the employer blames the employee without first examining the circumstances
- Insufficient appropriate training in health and safety
- Managers who ignore health and safety rules
- Poor organisation of work activities
- Bullying and harassment in workplace
- Uncertainty about the company's prospects
- Job insecurity
- Inadequate support from managers and colleagues
- Conflict between different parts of the organisation
- Individuals' inability to cope with the pressures of work, or with pressures outside work
- Boring and repetitive tasks
- The feeling that staff have no power or influence in the workplace.

Controls

One of the first things to do is to carry out a risk assessment for stress in the workplace. This could include looking out for the work activities that could lead to stress and examining the current methods of dealing with stress, if such methods already exist. The assessment could be part of your job.

Organisational Controls

Managers and supervisors should listen to employees' ideas and to talk them through. It may be appropriate for managers to consider asking staff to contribute to designing the way they carry out their work, bearing in mind the safety and production targets. This can improve motivation, safety and work performance.

Communication within the business should also be reviewed. Introduce new ways of keeping employees informed about any alterations in their work activities – for example, set up weekly update meetings or a newsletter.
Make sure that the work environment is well controlled and does not contain any hazards which might increase the risk of stress – for instance, a noisy machine situated near staff who need sustained concentration.

Supervisors might be able to organise the work more effectively by making sure that individuals are suited to the job – for instance, by matching their skills, experience and temperament to a particular job. Train workers to become more competent, so that they increase their efficiency and confidence and take responsibility for, and ownership of, the job they do.

Introduce a system that identifies any bullying or harassment in the workplace, and ensure that managers and supervisors are not themselves inadvertently bullying staff or putting undue pressure on them. Clear and thorough procedures for grievances and complaints can help you to deal with these issues.

Supervisors could also create a team atmosphere by introducing regular meetings to discuss the work and how it is going. Encourage staff to make suggestions on how the work can be done better. Make sure that everyone knows what is expected of them and that there are clear objectives and targets in the work activities. Where possible, vary the work by moving people between jobs (but not against their will). Managers could consider varying working hours of employees and, where appropriate, supervisors should advice managers to do so.

Try to keep an open mind about what staff say about work pressure, and do not brush the issue aside. If an employee complains about stress, you should tackle the cause of the problem: involving him or her in the investigation and any decision-making will help.

Where the causes of stress cannot be controlled, consider moving the employee to other suitable work and suggest counselling. If the employee takes sick leave, keep in touch with him or her to find out how he or she is progressing.

Training and Assistance

Give as much support to individuals as possible – offer encouragement, treat staff with respect and ensure that they are well trained for the job they are doing.

Where employees do suffer from stress, offer them counselling to help them recover from the illness. Don't overlook your peers and superiors; they may suffer stress, too. For example, stress management sources should be available for supervisors and for members of the management team.

Call Centre Problem

Staff at call centres are prone to stress. The staff need a high level of concentration, but the work of dealing with the public can be exhausting. There are usually very tight time targets for handling each call, the work is often highly repetitive and there is rarely flexibility in what the worker can say and what they can do to follow up the call. Many workers also have to work long and anti-social hours. Some have been known to 'burn out' after only a few months.

A survey of workers at a call centre showed that stress was made worse for 66 per cent of workers whose telephone calls were constantly monitored. Only 15 per cent of those questioned felt that background noise levels were comfortable and high noise levels made listening and speaking difficult for 82 per cent. A total of 66 per cent had experienced pain in the hands, wrists and back.

The company has now introduced controls, including:

- Introducing regular rest breaks
- Implementing good communication and consultation procedures between staff and managers
- Bringing in flexible working arrangements
- Training staff specifically to deal with stressful situations such as calls from aggressive clients.

Time will tell whether levels of self-assessed stress have reduced.

Management Standards for Work-Related Stress

The health and safety executive has introduced management standards for work-related stress. These standards are demands, control, support, Relationships, Role and Change. The aim of the standards is to help employers to manage stress, reduce its impact and help the overall performance of the business. The standards present a set of conditions that help organisations to achieve high levels of health, well-being and organisational performance. Employers can use the standards to assess how well their organisation performs. If the standards fall short, the employer can then introduce measures to improve performance.

Revision Question

Do the following quiz to evaluate your performance of study and review with your course tutor.
Good starting for you:-)

1. How can you control slips and trips hazard at workplaces in the following sectors:

Office environment:

Construction site:

Manufacturing/Factories

2. Define the term "Ergonomic Design" and control measures for an employee that works in the banking sector

3. List three (3) main causes of musculoskeletal disorders you know

4. Define manual handling and possible controls

5. What is stress and list three (3) ways off recognising stress

6. What is the full meaning of the following?
-DSE:

-WRULDs:

-SEMA: