



AzSPU Manual Handling Management Programme

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<http://docs.bpweb.bp.com/dkazspu/component/hssesms>

1.0 Purpose/Scope

BP is committed to the HSE policy of “no harm to people” and so recognizes that manual handling is an area where ill health can arise.

This controlled document describes programme that should be established to ensure that potential risks to health and safety from manual handling activities are assessed and that appropriate corrective actions are taken to control the risks. This programme reflects the minimum requirements of [EC Directive 90/269/EEC](#).

This document applies to the Azerbaijan Business Unit including exploration, drilling, production and transportation of oil.

2.0 General Requirements

[Manual Handling Guidance, BP Group](#)

[EC Directive 90/269/EEC](#) on the minimum health and safety requirements for the manual handling of loads. This Directive states that all manual handling activities, which involve a risk particularly of back injury should be avoided, and that where this is not feasible an assessment must be undertaken and control measures implemented to reduce the risks to an acceptable level.

3.0 Introduction

All manual handling activities which involve a risk particularly of back injury should be avoided and that where this is not feasible an assessment must be undertaken and control measures implemented to reduce the risks to an acceptable level.

The Manual Handling Program seeks to prevent injury to any part of the body – including:

Muscular strains and sprains

Cuts

Fractures

Amputations

Thermal injury

Such injuries can be eliminated or significantly reduced by adopting good ergonomic principles. This involves looking at manual handling activities in their entirety and for each activity taking into account all relevant factors such as:

- The nature of the task(s)
- The load(s)

- The working environment
- Individual capability

A seven-stage approach to managing risks to health and safety associated with manual handling use is advocated, as illustrated in Figure 1.

- 1) Understand the issues
- 2) Get organized
- 3) Assess the Risks
- 4) Reduce the Risks identified
- 5) Train and Inform
- 6) Manage any episodes of ill-health
- 7) Monitor program effectiveness

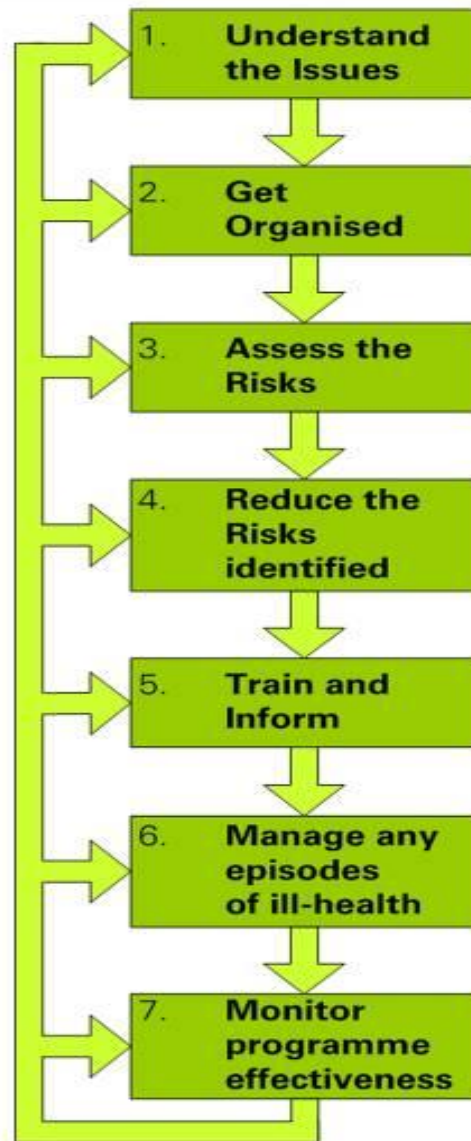


Figure 1.
The Seven-stage approach in managing risks to health and safety associated with Manual Handling use is advocated.

4.0 Key Definitions

4.1 Manual Handling of Loads

Means the transporting or supporting of a load by hand or bodily force including;

- The lifting
- The putting down
- The pushing
- The pulling
- The carrying
- The moving

Manual handling of loads does not include via mechanical handling equipment such as by conveyor or forklift truck.

The human effort may be applied directly to the load or indirectly by hauling on a chain or pulling on a lever. Mechanical assistance may reduce but not eliminate manual handling as human effort is invariably required to move, steady or position the load(s).

It should be noted that the application of human effort for a purpose other than transporting or supporting a load does not constitute a manual handling activity – including;

- Lifting a control lever on a machine
- Pulling on a rope while lashing down a cargo on the back of a vehicle
- Using hand tools

4.2 Injury and Load

Guidance on interpretation of the terms ‘injury’ and ‘load’ are as follows;

4.3 Injury

Injury resulting from the weight, shape, size, external state, rigidity or lack of rigidity of a load or from the movements of its contents.

It does not include injury resulting from the condition or properties of a load. External properties of a load which may affect grip or cause direct injury must be considered e.g. roughness, sharp edges and temperature extremes.

4.4 Load

A discrete movable object including any item, person or animal

5.0 Key Responsibilities

5.1 Employees Duties

Employees are required to;

- Cooperate with their employer in making decisions
- Observe safe systems of work
- Use safety equipment correctly
- Report defects in equipment or systems of work
- Participate in training
- Notify the employer of any physical condition which might affect their ability to handle loads safely
- Ensure that manual handling activity has been evaluated by MH assessor prior to start the work

5.2 Line Managers/Supervisors shall:

- Be responsible for the implementation of Manual Handling programme
- Identify manual handling activities under their supervision
- Ensure that an effective manual handling assessment is carried out and potential risks to health arising from manual handling operations are assessed
- Ensure that appropriate corrective actions are taken to control the risks identified
- Ensure that the assessments are recorded (in writing or electronically) and kept readily accessible
- Conduct quarterly Manual Handling risk assessment review (see Section 11.1)
- Ensure that Manual Handling assessment tools introduced are duly implemented and used

Line managers may appoint a MHO assessor to undertake this work on their behalf. When appointing MHO Assessor Line managers should ensure that individuals have necessary competencies and adequate time to be able to perform this task, i.e. consider individual's capabilities and their level of training, knowledge and experience. Once a MHO assessor has been appointed it remains the line manager's responsibility to support and promote the manual handling program.

5.3 Manual Handling Operations Assessors (MHOA) shall:

Be responsible for ensuring that the requirements of the Manual handling programme are successfully implemented on their respective sites.

Assessor's duties are summarized in [Figure 2](#) below;

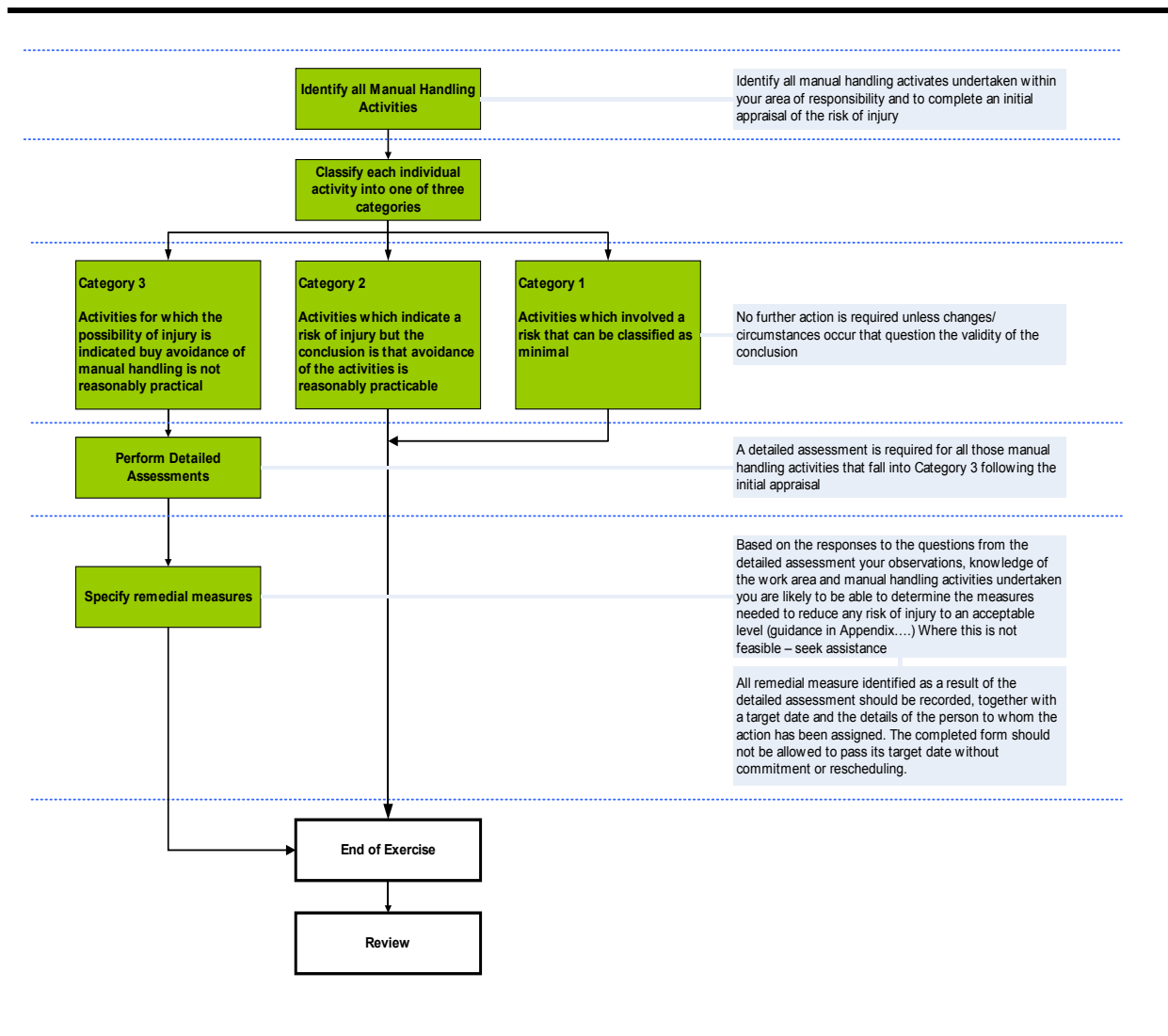


Figure 2.
Manual Handling Assessor's Duties

5.4 Health Manager or designee shall

- Periodically review and update this document
- Ensure that the Manual Handling program is implemented effectively, monitored and reviewed at regular intervals
- Appoint Manual Handling Coordinator

5.5 Manual Handling Coordinator/ Industrial Hygiene Advisor shall

- Be responsible for ensuring that the requirements of the Manual Handling program are successfully implemented in Az BU
- Be responsible for the provision of both initial and refresher training for Manual Handling Operations Assessors
- Provide up-to-date technical and professional advice
- Assist in carrying out manual handling assessments if required
- Assist in management of concerns and problems arising
- Advise on and assist with purchase of mechanical aids required

6.0 Procedure

6.1 Assess the risks

6.2 Avoidance of Manual Handling

Any manual handling activity which involved a risk of injury should be avoided so far as is reasonably practical. Consequently – the first question to ask is whether the activity can be eliminated. If not, consider whether the activity can be automated or mechanized.

6.3 Appraisal of Manual Handling Activities

There is a requirement for an initial appraisal for all manual handling activities. Any job, activity or team effort which involves one of more of the activities listed below should be appraised.

- Lifting
- Lowering
- Carrying
- Pushing
- Pulling
- Dropping
- Throwing

The initial appraisal should highlight the activities and necessary remedial actions in response to:

- What is the risk of injury?
- What can be eliminated from the activity?
- What can be automated?
- What can be mechanized?

All other manual handling activities need to be assessed subsequently in more detail to identify remedial measures. Where the risk can be avoided by elimination, automation or mechanization the remedial measures should be

specified (RAT Tool, Appendix 1) and progress on their implementation recorded.

6.4 Manual Handling Risk Assessment

Manual Handling shall be assessed to ensure that the precautions which need to be taken are related to the risks created by the work. Manual Handling risk assessment should follow an ergonomic approach to ensure tasks are designed to suite individuals' capabilities and limitations.

A meaningful assessment can only be based on a thorough practical understanding of:

- The type of manual handling activity undertaken
- The loads to be handled
- The working environment in which the activities are carries out
- The capability of the individuals performing the activities

Line managers are best placed to know about the manual handling activities conducted within their areas of responsibility. They should be assisted as necessary by Manual Handling Assessors and IH specialists if required.

6.5 Numerical Guidelines

Numerical guidelines to assist in making the initial judgment are given below.

The following figures set out an approximate weight and force limit within which manual handling activities are unlikely to create a risk of injury sufficient to warrant a more detailed assessment.

The guideline figures give protection to nearly all men and 50-70% of women. Where differential guidelines are not given between the sexes to provide the same degree of protection for women the figures should be reduced by one third.

6.6 Lifting and Lowering

Guideline information is given in Figure 3. Indicated values shall be applied with absolute caution in addition to the following assumptions;

- The load is readily grasped with both hands
- The activity takes place in reasonable working conditions
- The operator is in a stable position

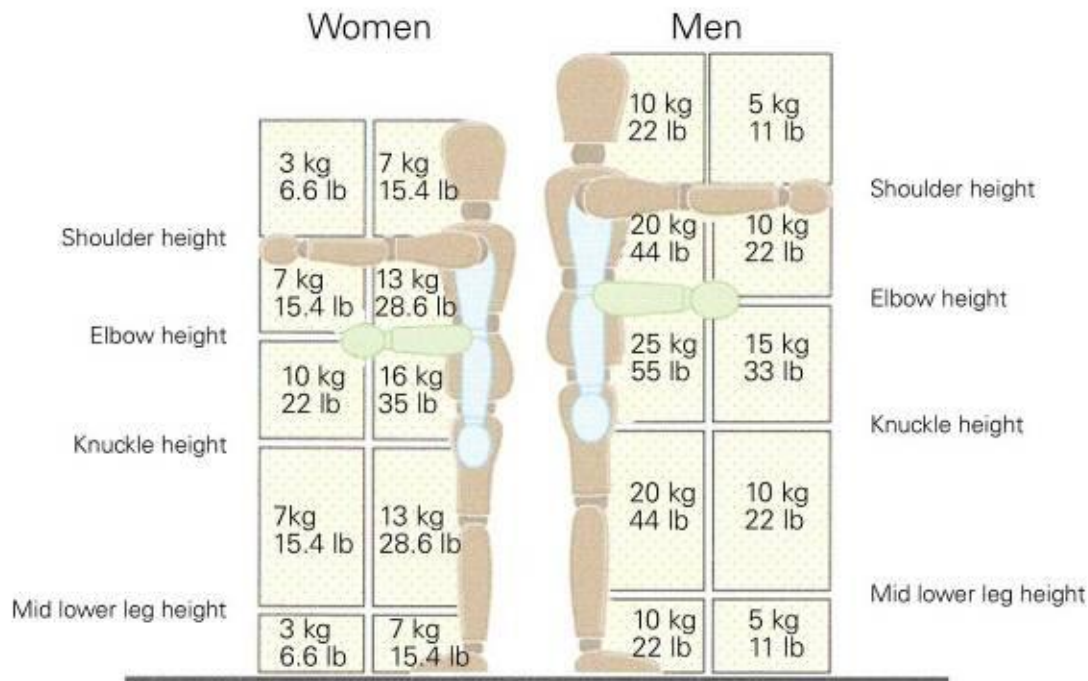


Figure 3.
Guideline Figures for Lifting and Lowering

Account is taken of both the weight of the load and its horizontal and vertical position during the operation. If the hands pass through more than one box zone during the activity the lower weight figure would be used.

6.7 Twisting or Frequent Lifting / Lowering

The guideline figures illustrated in [figure 3](#) should be reduced if the task involves any twisting or frequent lifting / lowering. Where the activity involves these tasks the following guidance should be followed;

6.7.1 Twisting

The guideline figures for lifting and lowering should be reduced by 10% where the operator twists through 45° and about 20% when the operator twists through 90° as illustrated in [Figure 4](#).

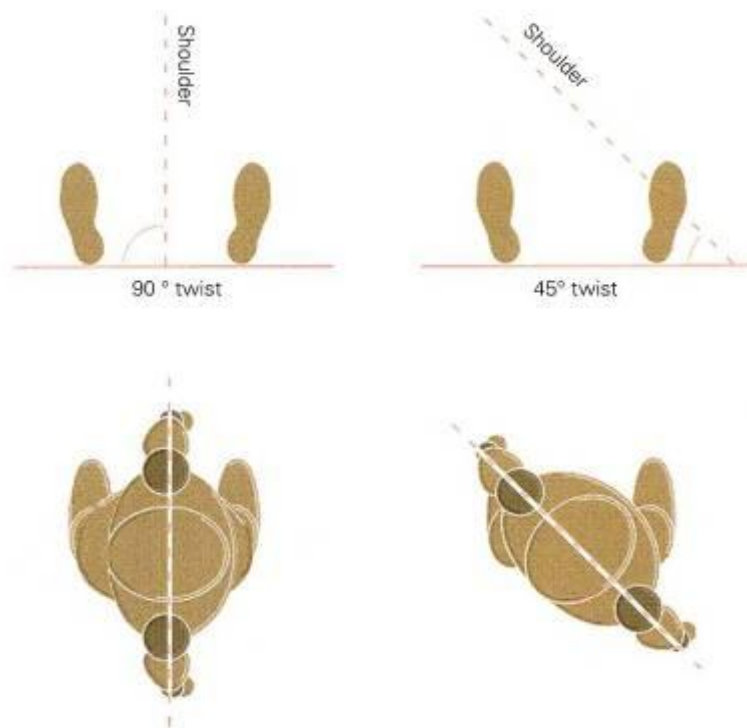


Figure 4.
Assessing Twists

6.7.2 Frequent Lifting / Lowering

Effects of frequency on the maximum acceptable weight of lift can be more significant than box size effects. The guideline figures are for relatively infrequent activities – up to approximately 30 per hour. For activities which do not fall under this bracket follow the guidance in [Table 1](#).

Frequency of activity per minute	Reduction level
Activity repeated 1 – 2 times per minute	Reduce guideline figure by 30% e.g. 10 kg becomes 7 kg or 22 lb becomes 15.4 lb
Activity repeated 5 – 8 times per minute	Reduce guideline figure by 50% e.g. 10 kg becomes 5 kg

	or 22 lb becomes 11 lb
Activity repeated more than 12 times per minute	Reduce guideline figure by 80% e.g. 10 kg becomes 2 kg or 22 lb becomes 4.4 lb

Table 1.
Frequency reduction levels

6.7.3 Guidelines for Carrying

Use the guideline information illustrated in [Figure 3](#) though carrying should not normally be undertaken with the hands below knuckle height. The guidance assumes that;

- The load is held against the body
- The load is not carried further than 10 meters without resting

6.7.4 Guidance for Pushing and Pulling

It is widely accepted pushing a load is easier than pulling it. For pushing and pulling operations (including loads which are slid, roller or supported on wheels) the guideline figures assume the force is applied with the hands, between knuckle and shoulder height. It is assumed that the distance moved is no more than 20 meters over which the load is pushed as well as adequate opportunities for rest and recovery

Guidance figures for pushing or pulling a load is illustrated in [Table 2](#).

	Men	Women
Guideline figure for stopping or starting the load	20 kg / 44 lb (approx. 200 newtons)	15 kg / 33 lb (approx. 150 newtons)
Guideline for keeping the load in motion	10 kg / 22 lb (approx. 100 newtons)	7 kg / 15.4 lb (approx 70 newtons)

Table 2.
Guideline pushing and pulling figures

Moving an object over soft or uneven surface requires higher forces. On an uneven surface the force needed to start the load moving could increase by 10% of the load weight.

6.7.5 Guidance for Handling whilst Seated

The guidelines figures for handling operations whilst seated are illustrated in Figure 5.

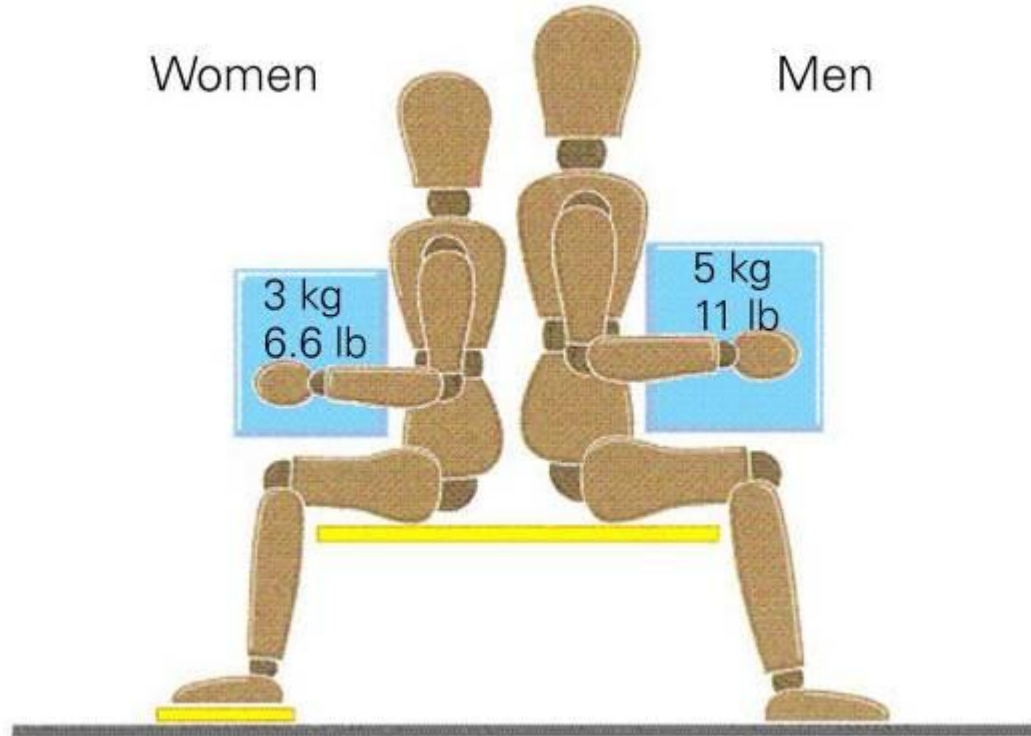


Figure 5.
Handling whilst Seated

The guidelines only apply when the hands are within the blue 'box zone' indicated in [Figure 5](#). If handling beyond the blue 'box zone' is unavoidable a more detailed assessment must be made.

6.7.6 None-routine work

Not all manual handling activities arise in the course of routine everyday work. For example, maintenance work involves a wide variety of tasks. In such cases it will often be quite unrealistic to attempt to assess every single instance of manual handling. Instead the assessment should identify the category type (Figure 2) of manual handling activity likely to be encountered and establish the range of risks that each creates. This will determine the appropriate remedial measures.

6.7.7 Work away from BP premises

Manual handling activities may occur away from BP premises in situations over which less direct control can be exercised. However – the task and the

load will remain under the control of the BP employees. Consequently risk can be reduced by ensuring that employees who work off-site are provided with effective training on manual handling techniques and on how to establish safe systems of work.

For example, in the case of delivery operations a useful technique is to list the various types of task, load and working environment concerned and to review a selection of them. The aim should be to establish the range of manual handling risks to which employees are exposed to and decide the appropriate preventative measures where they are shown to be necessary.

6.7.8 Assessment Records

All assessment should be recorded in writing and kept readily accessible. The assessment need not be recorded when one or more of the list below applies;

- Where the assessment is simple and obvious
- The manual handling operation is quite straight forward and of low risk
- The assessment will last only a short time
- The time taken to record the assessment would be disproportionate

7.0 REDUCE THE RISKS IDENTIFIED

7.1 The Ergonomic Approach

Health, safety and productivity will be optimized when an ergonomic approach is used upon application to the manual handling activity. Application of the four points below should be used to ensure this approach;

Where ever possible full consideration should be given to the;

1. Task
2. Load(s)
3. Working environment
4. Individual capability and their interrelationship - with a view to 'fitting the operation to the individual', rather than visa versa.

Particular attention should be given to the provision of mechanical assistance where this is reasonably practicable. This should involve the use of handling aids and, whilst and element of manual handling is retained and bodily force are applied more efficiently thereby reducing the risk of injury.

More detailed guidance is provided in Appendices 2&3

8.0 TRAINING and INFORMATION

8.1 Employee Training

Knowledge and training alone will not ensure safe manual handling but are an important aspect of a safe system of work. A suitable and sufficient training program should address the following and be delivered to each employee involved into manual handling activities:

- How potentially hazardous loads may be recognized
- How to deal with unfamiliar loads
- Good handling techniques including the correct use of manual handling aids
- The correct use of personal protective equipment (PPE)
- Features of the working environment that contribute to safety
- The importance of good house keeping
- Factors affecting individual capacity

Employees should also be trained to recognize loads whose weight in combination with their shape and circumstances in which they are handling, might cause injury.

8.2 Provision of Information

Where reasonably practical, employees involved in the manual handling of loads should be provided with precise information about;

- The weight of each load
- The heaviest side of any load whose centre of gravity is not positioned centrally
- Where this is not reasonably practical, general advice should be given about;
- The range of loads to be handled
- How to handle the load whose weight is not evenly distributed.

Unfamiliar loads should always be treated with caution. The weight of an unknown load can be gauged by attempting to raise one end of the load. Force should always gradually until either undue strain is felt – in which case the task should be reconsidered. Alternatively the weight of the lad can be gauged by rocking it from side to side before attempting to lift it.

9.0 MANAGEMENT of ILL HEALTH EPISODES

9.1 Manual Handling Injuries

Many manual handling accidents result in musculoskeletal disorders (MSDs). MSDs can be defined as injuries or illnesses of the muscles, tendons, ligaments, joints, nerves, vessels and supporting structures of the human body. Symptoms of MSDs usually manifest as pain, numbness, tingling, swelling or loss of function, most commonly located in the upper limbs, the back and sometimes lower limbs.

Onset of MSDs can be either sudden or gradual. For example, low back problems can occur suddenly as a result of a fall, or gradually due to cumulative over exertion from repeated manual handling. Psychosocial and workplace issues are also important contributing factors.

Manual handling injuries tend to be cumulative rather than attributable to any single handling incident with each repetition of an activity producing some wear or tear on the tissues (muscles, nerves, tendons, blood vessels, etc.) and joints of the body. Injury then arises with time, from repeated mechanical stress. A full recovery is not always made and the outcome can be physical impairment or even permanent disability.

There are numerous manual handling activities and work-related risk factors, which have been associated with musculoskeletal disorders. These risk factors include:

- Physical workload - force, posture, movement, vibration etc. In particular, prolonged static or awkward posture (e.g. twisting, hyper-extension or flexion) of the back, neck, head or limbs is known to cause musculoskeletal disorders.
- Psychosocial stressors – autonomy, job satisfaction, organizational culture etc.
- Individual factors – anthropometry, biomechanics, age, gender etc.
- Level of exposure – intensity (i.e. magnitude), repetitiveness, duration. Repeated handling, even of lighter loads can cause cumulative injuries.

9.2 Accidents and Ill Health

All accidents and ill health must be;

- Reported by employees to supervisors/line managers
- Recorded in writing
- Investigated – including any regular occurrence of back disorders or other ailments possibly associated with unsatisfactory manual handling practices.

These records are a valuable indicator of risk. Careful analysis may yield evidence of links between manual handling and ill health including injuries apparently unrelated to any specific event or accident.

Other possible indicators of manual handling problems might also include;

- High levels of absenteeism
- High levels of staff turnover
- Poor productivity
- Poor morale
- Excessive product damage
- General dissatisfaction amongst the employees concerned

10.0 MONITORING PROGRAM EFFECTIVENESS

10.1 Monitor and Review

Systems should be in place to monitor and review the effectiveness of the Manual handling program.

10.2 Monitoring

Monitoring is the ongoing and regular appraisal of the systems and procedures put into place to control the Manual handling risk

There is a number of monitoring techniques which could be applied. This includes:

- Task analysis
- Manual Handling Risk Assessment
- Health examinations / interviews
- Manual handling task walkthroughs
- Monitoring of staff complaints
- Sickness and absence analysis
- Reported symptoms analysis

The results of monitoring will be reported to Health Manager and Industrial Hygienist and further communicated to Asset management.

11.0 Review

Reviews are less frequent but more strategic and should assess effectiveness of the manual handling program. It should be undertaken when monitoring indicates that the current manual handling program is not providing adequate control of manual handling risks. Appropriate ideas and suggestions for improvement should be captured and tracked through to completion.

11.1 Review of the Manual Handling Assessment

All assessments must be kept up-to-date and therefore it is vital that they should be reviewed if there is any reason to suspect that they are no longer valid. This might include where there has been a change affecting the nature of the task or load to which an individual assessment relates or where other new information comes to light that could materially affect the conclusion reached previously including circumstances where a relevant reportable injury has occurred. Assessments should be reviewed biannually.

An assessment should be reviewed if:

- It is no longer valid
- Where there has been a significant change in the manual handling activity to which the assessment relates

12.0 MANUAL HANDLING ASSESSMENT TOOL

BP's Rapid Assessment Tool (RAT)

The RAT tool –main risk assessment tool to be used in AZSPU ([Appendix 1](#)) has been produced to rapidly create and review risk assessment data for manual handling tasks. The system provided delivers a risk 'score' and the necessary intervention strategies to reduce the score to an acceptable level.

13.0 Key Documents/Tools/References

[Manual Handling Guidance, BP Group](#)

[EC Directive 90/269/EEC](#) on the minimum health and safety requirements for the manual handling of loads.

UK HSE MAC Tool
<http://www.hse.gov.uk/msd/mac/index.htm>

[Rapid Assessment Tool](#)

Appendix 1

Rapid Assessment Tool (RAT)



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Appendix 2

Guidance on Detailed Assessments

1.0 The Task

1.1 Is the load held at a distance from the trunk?

Regardless of the handling technique used, failure to keep the load close to the body will increase the level of stress on the lower back. In addition, the further away the load, the less easy it is to counterbalance it with the weight of the body. Moreover, the benefit of friction between the load and the worker's garments in helping to support or steady the load is reduced or lost.

1.2 The importance of posture

Poor posture during manual handling introduces the additional risk of loss of control of the load and a sudden, unpredictable increase in physical stresses. The risk of injury is increased if the feet and hands are not well placed to transmit forces efficiently between the floor and the load.

1.3 Does the task involve twisting the trunk or stooping?

Stress on the lower back is increased significantly if twisted trunk or stooped postures are adopted. The angle of stoop is the extent to which a line drawn through the shoulders and the base of the spine departs from the vertical.

Safe capacity can be reduced very substantially if twisting is combined with stooping or stretching. Such combinations should be avoided. A requirement to position the load with precision can also add to the risk of injury.

1.4 Does the task involve excessive lifting or lowering distances?

Stresses are increased when loads are handled at extremes of vertical movement. For example, when lifting box-like loads, heights between mid-thigh and waist are most suitable, followed by lifting between waist and shoulder

height. Lifting or lowering outside these ranges is likely to increase the risk of injury.

1.5 Does the task involve moving the load through a large vertical distance?

The distance through which a load is lifted or lowered is important, with large distances considerably more demanding physically than small ones. Moreover, lifting or lowering through a large distance is likely to necessitate a change of grip part of the way, further increasing the risk of injury. Lifts commencing at floor level should be avoided where possible - and where unavoidable they should preferably terminate no higher than waist height.

1.6 Does the task involve excessive carrying distances?

In general if a load can be lifted and lowered safely it can also be carried without endangering the back. However if a load is carried for an excessive distance physical stresses are prolonged leading to fatigue and increased risk of injury. As a rough guide if a load is carried further than about 10 metres then the physical demands of carrying the load will tend to predominate over those of lifting and lowering and safe capacity will be reduced.

1.7 Does the task involve excessive pushing or pulling of the load?

The risk of injury is increased if pushing or pulling is carried out with the hands much below waist height or above shoulder height. The risk of injury is also significantly reduced if a good grip cannot be obtained between the foot and the floor.

1.8 Does the task involve a risk of sudden movement of the load?

If a load suddenly becomes free and the handler is unprepared or not able to retain complete control of the load, sudden unpredictable stresses can be imposed on the body creating a risk of injury. The risk is compounded if the handler's posture is unstable.

1.9 Does the task involve frequent or prolonged physical effort?

The frequency with which a load is handled can affect the risk of injury. A quite modest load, handled very frequently, can create as large a risk of injury as one-off handling of a more substantial load. The effect will be worsened by jerky, hurried movements which can multiply a load's effect on the body. Where physical stresses are prolonged, fatigue will occur, increasing the risk of injury. This effect will often be exacerbated by a relatively fixed posture, leading to a rapid increase in fatigue and a corresponding fall in muscular efficiency.

1.10 Does the task involve insufficient rest or recovery periods?

Failure to counter fatigue during physically demanding work increases ill health and reduces productivity. Care should therefore be taken to ensure that adequate opportunities for rest (i.e. breaks from work) or recovery (changing to another task which uses a different set of muscles) are provided.

1.11 Does the task involve a rate of work imposed by a process?

Mild fatigue can soon become pronounced where the rate of work cannot be varied by the handler, leading to an increased risk of injury and reduced output.

1.12 Handling while seated

Handling loads while seated imposes considerable constraints. Use of the relatively powerful leg muscles is precluded and the weight of the handler's body cannot be used as a counterbalance. Therefore most of the work has to be done by the weaker muscles of the upper limbs. Unless the loading is kept close to the body the handler will have to reach and/or lean forward. Not only will handling in this position put the body under additional stress but the seat, unless fixed in place, will then tend to move backwards as the handler attempts to maintain a stable posture. Lifting from below the level of a work surface will almost inevitably result in twisting and stooping, the dangers of which were discussed earlier.

1.13 Team handling

Handling by two or more people may make possible an operation that is beyond the capacity of one person, or reduce the risk of injury to a solo handler. However, team handling may introduce additional problems which the assessment should consider. During the handling operation the proportion of the load that is borne by each member of the team will inevitably vary to some extent. Such variation is likely to be more pronounced on rough ground. Therefore the load that a team can handle in safety is less than the sum of the loads that the individual team members could cope with when working alone.

As an approximate guide, the safe capacity of a two person team is two thirds of the sum of their individual capacities; and for a three person team the safe capacity is half the sum of their individual capacities. If steps or slopes must be negotiated most of the weight may be borne by the handler or handlers at the lower end, further reducing safe capacity.

Additional difficulties may arise if team members impede each vision or movement. This can occur particularly with compact loads which force the handlers to work close together. Such loads may also cause difficulty by offering an insufficient number of good handholds.

2.0 The Load

2.1 Is the load heavy?

The weight of the load is only one of the factors affecting the risk of injury. Other features of the load, such as its resistance to movement, its size, shape or rigidity, must also be considered. Proper account must also be taken of the circumstances in which the load is handled; for example postural requirements, frequency and duration of handling, workplace design, and aspects of work organization such as incentive schemes and piecework. The numerical guidelines, set out earlier, consider the weight of the load in relation to some of the other relevant factors.

2.2 Is the load bulky or unwieldy?

The shape of a load will affect the way in which it can be held. In general if any dimension of the load exceeds about 75 cm its handling is likely to pose an increased risk of injury. It will be especially so if this size is exceeded in more than one dimension. The risk will be further increased if the load does not provide convenient handholds.

The bulk of the load can also interfere with vision increasing the risk of slipping, tripping, falling or colliding with obstructions.

The risk of injury will also be increased if the load is unwieldy and difficult to control. Well-balanced lifting may be difficult to achieve, the load may hit obstructions, or it may be affected by gusts of wind or other sudden air movements.

If the centre of gravity of the load is not positioned centrally within the load, inappropriate handling may increase the risk of injury. For example, much of the weight of a typewriter is often at the rear of the machine; therefore an attempt to lift the typewriter from the front will place its centre of gravity further from the handler's body than if the typewriter is first turned around and then lifted from the rear.

2.3 Is the load difficult to grasp?

If the load is difficult to grasp, for example because it is large, rounded, smooth, wet, slippery or greasy, its handling will call for extra grip strength - which is fatiguing - and will probably entail inadvertent changes of posture. There will also be a greater risk of dropping the load. Handling will be less sure and the risk of injury will be increased.

2.4 Is the load unstable, or its contents likely to shift?

If the load is unstable, for example because it lacks rigidity or has contents that are liable to shift, the likelihood of injury is increased. The stresses arising during the manual handling of such a load are less predictable, and the instability may

impose sudden additional stresses for which the handler is not prepared. The risks are further increased if the handler is unfamiliar with a particular load and there is no cautionary marking on it.

2.5 Is the load sharp, hot or otherwise potentially damaging?

Risk of injury may also arise from the external state of the load, for example it may have sharp edges or rough surfaces, or be too hot or too cold to touch safely without protective clothing. Such characteristics may also impair grip and discourage good posture.

3.0 The Working Environment

3.1 Are there space constraints preventing good posture?

Space constraints hinder the adoption of good posture. Stooped and twisted postures may have to be adopted which increase the risk of injury from manual handling.

3.2 Are there uneven, slippery or unstable floors?

In addition to increasing the likelihood of slips, trips and falls, uneven or slippery floors hinder smooth movement and create additional unpredictability. Floors which are unstable or susceptible to movement, for example a mobile work platform, also increase the risk of injury through the imposition of sudden, unpredictable stresses.

3.3 Are there variations in level of floors or work surfaces?

The presence of steps, steep slopes, etc. can increase the risk of injury by adding to the complexity of movement when handling loads. Carrying a load up or down a ladder, if it cannot be avoided, is likely to aggravate handling problems because of the additional need to maintain a proper hold on the ladder.

Excessive variation between the heights or working surfaces, storage shelving, etc. will increase the range of movement and in consequence the scope for injury. This will be especially so if the variation is large and requires, for example, movement of the load from near floor level to head height or beyond.

3.4 Are there extremes of temperature, humidity or air movement?

High temperatures or humidity can cause rapid fatigue, and perspiration on the hands may reduce grip. Work at low temperatures may impair dexterity. Gloves and other protective clothing which may be necessary in such circumstances may also hinder movement, impair dexterity and reduce grip. Air movement in combination with air temperature can also significantly affect manual handling activities, for example the wind chill factor.

3.5 Are there poor lighting conditions?

Poor lighting conditions can encourage poor posture, aggravate tripping hazards and hinder the accurate judgment of height and distance.

4.0 Individual Capability

4.1 Does the task require unusual strength, height, etc.?

The ability to carry out manual handling in safety varies between individuals and with age. In general the lifting strength of women as a group is less than that of men but there is considerable overlap.

An individual's physical capability varies with age, typically climbing until the early 20s and declining gradually from the mid-40s. It should be recognized therefore that the risk of manual handling injury may be somewhat higher for employees in their teens or in their 50s and 60s, though again the range of individual capability is large and the benefits of experience and maturity should not be overlooked.

In deciding whether the strength, height and other requirements of a manual handling activity should be regarded as unusual it is not unreasonable to have some regard to the nature of the work. For example, strength requirements that would be considered unusual for a group of employees engaged in office work might not be regarded as out of the ordinary for a group of employees engaged predominantly in heavy physical labor. It would also be unrealistic to ignore the element of self-selection that often occurs for jobs that are relatively demanding physically.

As a general rule, however, the risk of injury should be regarded as unacceptable if the manual handling operation cannot be performed in safety by most reasonably fit, health employees.

4.2 Does the job put at risk those who are pregnant or have a health problem?

Pregnancy has significant implications for the risk of manual handling injury. Particular care should be taken for women who may handle loads during the last 3 months of a normal pregnancy and for 3 months following a normal delivery.

Allowance should be made for any known health problem which might have a bearing on the ability to carry out manual handling activities in safety. If there is good reason to suspect that an individual's state of health might significantly increase the risk of injury from manual handling activities, medical advice should be sought.

4.3 Does the task require special knowledge or training for its safe performance?

The risk of injury from a manual handling task will be increased where a worker does not have the knowledge or training necessary for its safe performance.

5.0 Other Factors

5.1 Personal protective equipment and other clothing

Personal protective equipment (PPE) should only be used as a last resort, when engineering or other controls do not provide adequate protection. Where the wearing of PPE cannot be avoided its implications for the risk of manual handling injury should be taken into account. For example gloves may impair dexterity; the weight of cylinders used with breathing apparatus will increase the stress on the body. Other clothing such as a uniform required to be worn may inhibit free movement during manual handling.

Appendix 3

Guidance on methods of reducing risk arising from manual handling activities

1.0 The Task

1.1 Improving task layout

Changes to task layout can reduce the risk of injury. For example, store heavy loads around waist height leaving the storage above or below this height for light loads or loads that are handled infrequently.

1.2 Use the body more efficiently

- Carry loads close to the body

The level of stress at the lower back will be reduced; the weight of the load will be more easily counterbalanced by the weight of the body; and the load will be more stable and the handler less likely to lose control of it. Friction between the load and clothing will help to steady and support it.

- Eliminate obstacles

The handler should be able to move in close to the load and adopt a good posture before commencing the manual handling operation.

- Replace lifting by controlled pushing or pulling

It may be possible to slide the load or push it along. However, for both pushing and pulling a secure footing is required. Another option, safety considerations permitting, is to push with the back against the load, using the leg muscles to exert the force.

1.3 Improving the work routine

The risk of manual handling injury can also be reduced by careful attention to the work routine. For example, the risk of injury can be reduced by minimizing the need for fixed work postures and by reducing the frequency at which heavy or awkward loads are handled.

Where possible, allow employees to adjust their rate of working to optimize safety and productivity. Voluntary breaks, rather than breaks undertaken at fixed intervals, are a more efficient method of reducing the risk of injury.

Introduce job rotation if feasible. This allows one group of muscles to rest whilst others are being used. Care must be taken to ensure that the change in task does not require the same set of muscles to be used as this will have little effect in reducing the risk of injury.

1.4 Handling while seated

This activity demands particular care. Lifting loads from the floor should be avoided where possible. The possibility of accidental movement of the seat should be considered. Castors may be inadvisable, especially on hard floors. A swivel-action chair will help the handler to face the load without having to twist the trunk. Ensure seat and work surface heights are matched.

1.5 Team handling

Safe team handling can be achieved if:

- there is enough space for the handlers to maneuver as a group;
- there is adequate access to the load;
- the load has sufficient hand holds or slings or a stretcher are available;
- one person co-ordinates and controls the task;
- Team members are of broadly similar height and physical capability.

1.6 Personal protective equipment (PPE)

Suitable PPE, such as gloves, aprons, safety shoes, coveralls and aprons should be provided where appropriate. For example PPE may be required to protect against cuts and thermal injury.

1.7 Maintenance and accessibility of equipment

Mechanical handling equipment should only be used by trained and competent personnel. All mechanical equipment provided for use during manual handling activities, including slings and chains, should be inspected and maintained in accordance with national requirements. Equipment should be readily accessible at all times.

2.0 The Load

2.1 Make it lighter

Consider reducing the weight of loads, for example liquids and powders may be packaged in smaller containers. Where loads are bought in it may be possible to specify lower package weights.

2.2 Make it smaller or easier to manage

Consider making loads less bulky so that they can be grasped more easily and the centre of gravity brought closer to the handler's body. Again where loads are bought in it may be possible to specify smaller or more manageable loads, or to redesign those produced in-house.

2.3 Make it easier to grasp

Use hand held hooks, slings or other devices when handling bulky awkward loads or loads that are difficult to grasp. The provision and location of handles, hand grips or indents will also need to be considered when designing packaging materials.

2.4 Make it more stable

Where possible, packaging should be such that objects will not shift unexpectedly while being handled. If the load lacks rigidity use slings or other aids to maintain effective control. Keep containers holding fluids and powders well filled, leaving only a small amount of free space.

2.5 Make it less damaging to hold

Keep loads clean and free from dust, oil, and other hazardous materials. Watch out for loads with jagged edges, sharp corners, rough or hot or cold surfaces use suitable handling aids or PPE.

3.0 The Working Environment

3.1 Removing space constraints

Gangways and other working areas should be large enough to allow adequate room to maneuver during manual handling activities. In many cases, this can be achieved simply by improving the standard of housekeeping.

3.2 The condition and the nature of floors

Floors should be flat, well maintained and adequately drained. All spillages should be cleaned up promptly. Where necessary, consideration should be given to the provision of slip resistant surfacing.

3.3 Work at different levels

Ideally all manual handling activities should be carried out on a single level. Where more than one level is involved the transition should preferably be made by a gentle slope or, failing that, by well-positioned and properly maintained steps. Benches should also be at a uniform height to avoid the need for the lifting and lowering of loads.

3.4 The thermal environment

Extremes of temperature, humidity and air movement should be avoided where possible, either by improving environmental control or by relocating the work. Where conditions cannot be changed appropriate PPE will have to be made available.

3.5 Lighting

There should be sufficient well-directed light to enable handlers to see clearly what they are doing and the layout of the workplace, and to make accurate judgments of distance and position.

3.6 Strong air movements

Care must be taken when handling bulky or unwieldy loads in circumstances where significant air movement (e.g. high winds or powerful ventilation systems) could catch the load and destabilize the handler. Possible improvements include relocating the manual handling operation or taking a different route, provision of handling aids to give greater control of the load, or team handling.

4.0 Individual Capability

4.1 Personal capacity

Consideration should be given to employees who are or recently have been pregnant, or who are known to have a history of back trouble, hernia or other manual handling injury.

An individual's state of health, fitness and strength affect the ability to perform a task safely. However, reliable studies have shown no close correlation between these characteristics and the incidence of injury. It is recognized, however, that there is an element of self-selection for work involving manual handling activities.

Motivation and self-confidence in the ability to perform manual handling activities are additional factors in reducing the risk of injury.

Revision/Review Log

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