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## SUMMARY

- The *Occupational Safety and Health Act 1984* requires employers, as far as is practicable, to provide and maintain workplaces, plant and systems of work which do not expose their employees to hazards.
- The *Occupational Safety and Health Regulations 1996* include general requirements relating to all plant as well as detailed requirements for certain types of plant. The Regulations refer to each phase in the life of plant from design to demolition or disposal.
- Designers, manufacturers, importers and suppliers of plant for use at a work place must, as far as practicable, ensure the hazards associated with the plant have been identified, the risk of injury or harm assessed and controls to reduce the risk of injury or harm are implemented.
- Suppliers must provide comprehensive safety information about the hazards associated with the plant and its safe operation when it is supplied to an end user. Designers, manufacturers and importers have a duty to provide this information.
- Operators must be trained to operate plant safely and without risk to themselves or others.
- Appropriate safeguards, such as operator protective devices and guarding, must be used to reduce the risk of injury or harm. Operator protective devices include roll-over protective structures (ROPS), falling object protective structures (FOPS), operator restraining devices and seat belts.
- This guidance note deals principally with operator protective devices.
- Certain tractors must be fitted with ROPS. Other powered mobile plant, where indicated by a risk assessment, must also be fitted with appropriate operator protective devices. It is recommended all new tractors over 560 kgs be fitted with ROPS to AS 1636 or equivalent.
- A seat belt (complying with AS/NZS 2596 or equivalent) should be fitted to all tractors that are fitted with a ROPS.

The Occupational Safety and Health Legislative framework relating to plant in Western Australia is outlined in Appendix 1, p.13.

## DEFINITIONS

### EXPLANATORY NOTE:

A multi-purpose item of powered mobile plant is determined by its use. For example, an hydraulic excavator used to ‘crane’ loads, such as pipes, is considered to be a crane while in this mode. It is considered to be earthmoving machinery when used to excavate or load earth, rubble or similar.

Similarly, a tractor fitted with a front-end loader bucket is an earth moving machine. Powered mobile plant with a telescoping boom will be a forklift when fitted with forks, a crane when fitted with a hook to lift a freely suspended load and an elevating work platform when fitted with a work platform.

Most terms in this guidance note have their normal dictionary meaning unless they are defined in Western Australian occupational safety and health legislation. In some cases these definitions differ from the dictionary meaning.

The following definitions are provided in the Western Australian Occupational Safety and Health Legislation.

### ***Occupational Safety and Health Act 1984:***

**Plant:** includes any machinery, equipment, appliance, implement, or tool and any component or fitting thereof or accessory thereto.

**Practicable:** means reasonably practicable having regard, where the context permits, to -

- (a) the severity of any potential injury or harm to health that may be involved, and the degree of risk of it occurring;
- (b) the state of knowledge about –
  - (i) the injury or harm to health referred to in paragraph (a);
  - (ii) the risk of that injury or harm to health occurring; and
  - (iii) means of removing or mitigating the risk or mitigating the potential injury or harm to health.
- (c) the availability, suitability, and cost of the means referred to in paragraph (b) (iii).

**Risk:** in relation to any injury or harm, means the probability of that injury or harm occurring.

**Supply:** in relation to any plant or substance, includes supply and re-supply by way of sale, exchange, lease, hire, or hire-purchase, whether as principal or agent.

**Workplace:** means a place, whether or not in an aircraft, ship, vehicle, building, or other structure, where employees or self-employed persons work or are likely to be in the course of their work.

## ***Occupational Safety and Health Regulations 1996:***

**Competent person:** in relation to the doing of anything, means a person who has acquired through training, qualification or experience, or a combination of those things, the knowledge and skills required to do that thing competently.

**Earthmoving machinery:** means an operator controlled item of plant used to excavate, load, transport, compact or spread earth, overburden, rubble, spoil, aggregate or similar material.

**Elevating work platform:** means a telescoping device, scissor device or articulating device or any combination of those devices used to position personnel, equipment and materials to and from workplaces located above or below the support surface.

**Industrial lift truck:** means powered mobile plant designed to move goods, materials or equipment and which is equipped with an elevating load carriage and which usually has a load-holding attachment but does not include a mobile crane or earthmoving machinery.

**Mobile crane:** means a crane capable of travelling over a supporting surface without the need for fixed runways or railway tracks and which relies on gravity only for stability and accordingly, has neither a vertical restraining connection between itself and the supporting surface nor a horizontal restraining connection (other than frictional forces at the supporting surface level) to aid stability.

**Operator protective devices:** includes roll over protective structures, falling object protective structures, operator restraining devices and seat belts.

Note: In addition to the operator protective devices in the definition in the legislation, the use of metal mesh around a cab or structure such as Rollover Protective Structures (ROPS) or Falling Object Protection Structures (FOPS) used to prevent objects contacting the operator (such as in the case of meshing the operator's position in a skid-steer loader to prevent the loader arms from striking the operator) can be considered to be an operator protective device.

**Tractor:** means a motor vehicle, whether wheeled or track mounted, designed principally to be used in agriculture, horticulture or turf management to provide power and movement of any attached trailer, machine or implement.

In this document the use of the word "must" indicates a mandatory requirement ie supported by legislation.

## 1. INTRODUCTION

This guidance note has been issued by the WorkSafe Western Australia Commission pursuant to section 14 of the *Occupational Safety and Health Act 1984 (the Act)* to assist persons achieve compliance with the general duty provisions of the Act and the requirements in the *Occupational Safety and Health Regulations 1996 (the Regulations)* relating to plant generally and powered mobile plant specifically.

### **What is Powered Mobile Plant (PMP)?**

While there is no definition of powered mobile plant in the legislation it can be described as any machine that is self propelled and controlled by an operator.

It includes:

- industrial lift truck (forklifts);
- mobile cranes;
- earthmoving machinery;
- all terrain vehicles;
- motor cycles;
- agricultural machinery; and
- log recovery vehicles (skidders).

PMP is associated with a number of accidents and injuries that occur at workplaces, the most common being:

- falls from;
- crushing by;
- run-overs by;
- roll-overs of tractors and forklifts; and
- entanglement in and being trapped between moving parts (including implements attached to tractors).

## Chain of responsibility relating to plant

The Regulations place obligations on every person involved in any phase of the life cycle of plant from design to destruction.

Figures 1 and 2 show the chain of responsibilities in respect to plant.

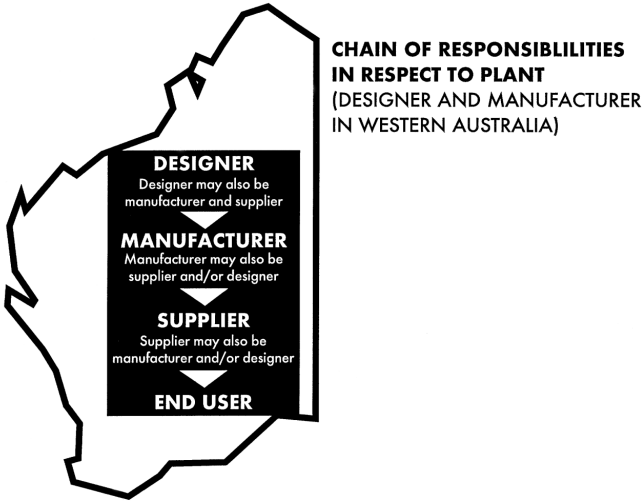


Figure 1

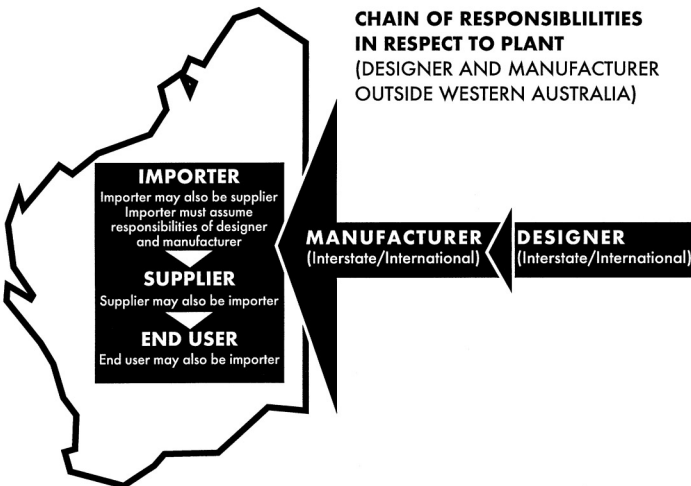


Figure 2

## **2. RISK MANAGEMENT**

The Regulations set out a risk management approach to each phase of the life cycle of plant. The approach focuses on the prevention of workplace injuries through identifying hazards and assessing and controlling the risks they present.

### **2.1 Hazard identification**

Hazard identification involves identifying situations or events where plant or associated systems of work could cause harm or injury.

The design of an item of plant is critical to effective elimination or reduction of risk and therefore plant related fatalities and injuries. An appropriate design process can avoid hazards and eliminate many of the risks from plant before it is introduced into the workplace.

All phases in the life of the plant, from design through to demolition or disposal, have to be considered when designing plant. Designers are also required to produce adequate information about the plant and its proper use in the workplace and this information must pass with the plant through each phase of its life.

It is important to try to anticipate how human behaviour, plant and system failures could combine to create a harmful situation. This might include looking at the need for ROPS, FOPS, structures to prevent the operator from being injured by the intrusion of an object such as a tree branch, seat belts, side restraints on operator seats, power take-off (PTO) guards, safe access steps and noise attenuation.

### **2.2 Risk assessment**

Risk assessment is the process of determining whether there is a risk associated with an identified hazard, that is, whether there is any likelihood of injury or harm. The process should include consultation with plant operators and other people involved in the task, consideration of the terrain, soil and weather conditions (in the case of off-road mobile plant), experience and training of the operator, individual tasks to be performed and the length of time the operator is exposed to the identified hazards.

For the person in charge of the plant, such as a farmer or forest worker, this might mean assessing the likelihood of a roll-over because of ground conditions, eg. slope, embankments or obstacles on the ground or above the ground to be worked, holes, wet, boggy or sandy soil, the operator's level of experience and training, procedures for attaching towing or hauling equipment and the towing of heavy loads and the presence or otherwise of operator protective devices.

### **2.3 Control measures**

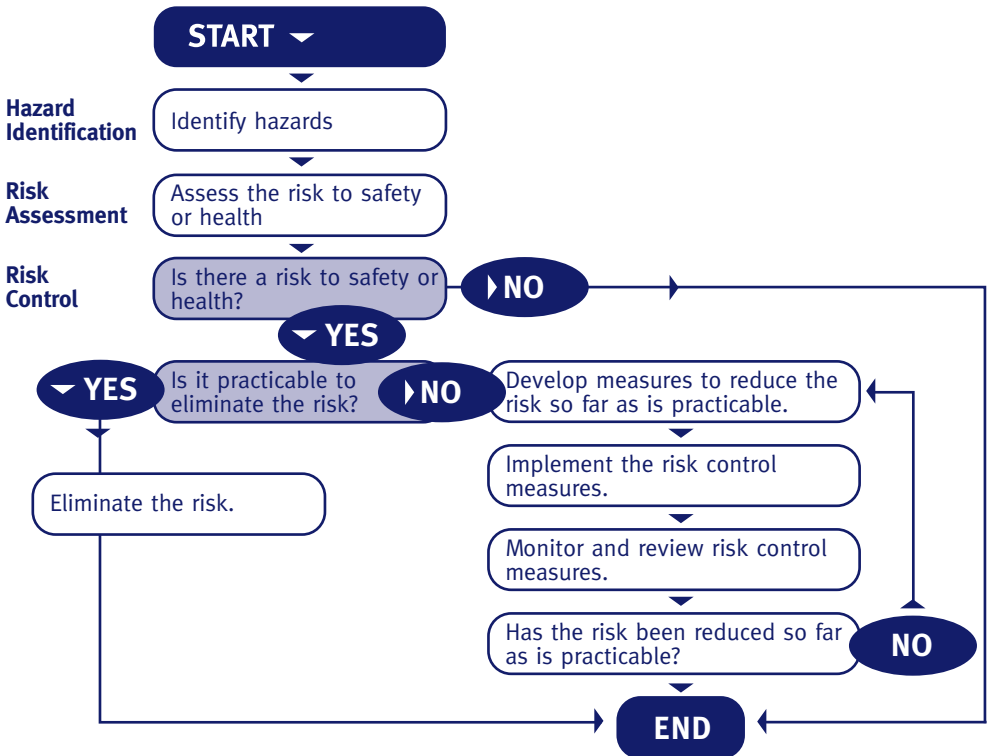
Risk control measures must be implemented to eliminate or reduce the risk of injury or harm as far as practicable. The preferred order of control is:

- elimination - removing the hazard or hazardous work practice;
- substitution - substituting or replacing the hazard or hazardous work practice with a less hazardous one;

- isolation - isolating or separating the hazard or hazardous work practice from people involved in the work or people in the general work area;
- engineering control - if the hazard cannot be eliminated, substituted or isolated an engineering solution is the next preferred measure. This may include modifications to tools or equipment, or guarding;
- administrative control - includes danger signs and limiting the amount of time a person is exposed to the hazard; and
- personal protective equipment - only when other control measures either individually or in combination are not practicable, or to increase the level of protection.

A combination of control measures may be necessary to minimise risk.

**Figure 3** sets out the hazard identification, risk assessment and risk control process.



See Appendix 4 for sources of further information on risk management.



### 3. MINIMISING RISK TO OPERATORS OF POWERED MOBILE PLANT

#### 3.1 Hazards associated with powered mobile plant

The most serious of the hazards associated with PMP are overturning and the operator being ejected or struck. In most cases injuries, including fatal injuries, can be prevented with operator protective devices such as ROPS, FOPS, secure seating, footrests and seatbelts.

*Regulations 4.44 and 4.45* (see Appendix 2, pp 18-21) are designed to minimise the risk of the operator being injured in a roll over or being ejected or struck.

Examples of the plant required to comply with *Regulations 4.44 and 4.45* are shown in Appendix 3, pp 22-23.

#### 3.2 Regulation 4.44

*Regulation 4.44* covers PMP such as tractors, forklift trucks, earthmoving machinery and timber harvesting machinery. These items have a history of roll overs, operators being injured by falling objects or by the intrusion of foreign bodies such as tree branches. *Regulation 4.44* is not intended to cover vehicles meant principally for use on public roads, such as cars, buses and trucks.

*Regulation 4.44* requires a specific risk assessment be carried out in respect of PMP to determine whether there is any risk the plant could overturn, an object could come into contact with the operator of the plant, or whether the operator could be ejected from the seat. [*Regulation 4.44 (1)*]

However, in the case of certain tractors and certain earthmoving machinery, the fitting is mandatory. [*Regulation 4.45*]

If the risk assessment in relation to items of PMP (other than those specified in *Regulation 4.45*) concludes that such a risk exists, then, as far as practicable, the risk must be limited by an appropriate combination of “operator protective devices”. Thus:

- if the assessment determines that there is a risk that the tractor could overturn, it would be appropriate to ensure it is fitted with a ROPS and a restraint, such as a seat belt;
- if there is a risk an object may come into contact with the operator of the plant from the front, side or rear of the plant then, as far as practicable, the risk must be limited by the provision of an appropriate structure (such as an enclosed cabin) that protects the operator; and
- if the operator of the plant could be ejected from the seat, a restraint, such as a seat belt, should be incorporated. The person in charge of the workplace must ensure that operator protective devices fitted to PMP are used. The person responsible for the plant must ensure the operator protective devices are appropriately maintained. [*Regulation 4.44 (1)*]

The person who supplies (see definition of supply on piii) PMP (other than the tractors and earthmoving machinery covered by *Regulation 4.45*) must ensure the plant is fitted with adequate operator protective devices to reduce, as far as is practicable, the risk of injury or harm to the operator. [*Regulation 4.44 (2)*]

A supplier could be a dealer, or a person who simply sells an item of used PMP to another person for use at that person's workplace.

The supplier should always make enquiries of the purchaser as to the intended use of the PMP and carry out a risk assessment similar to that required by sub-*Regulation 4.44 (1)*. Suppliers should not rely solely on their own experience when considering the likelihood of something happening, or the consequences should it happen. Consultation with colleagues, employer bodies, industry groups, unions and the regulatory agency could provide relevant additional information. The risk assessment should be as objective as practicable.

ROPS may be lowered or removed to carry out work under a tree or in a place too low for the plant to work with the ROPS in the normal operating position. The ROPS must be raised or reinstalled as soon as the work for which it was lowered or removed is completed. [*Regulation 4.44 (3)*]

ROPS & FOPS must be designed and manufactured to Australian Standards [*AS 1636* or *AS 2294*] or designed by a suitably qualified engineer (mechanical or structural engineer) to a standard that provides at least the same level of protection to the operator as would be provided if the structure complied with the relevant Australian Standard. [*Regulation 4.44 (4)*]

If the PMP is fitted with a ROPS or FOPS and seat belt attachment points were incorporated in its original design, the plant must be fitted with a seat belt at each attachment point and the operator of the plant must use the seat belt. [*Regulation 4.44 (4)*]

If it is practicable to do so, seat belts should be fitted to any PMP not originally equipped with seat belt attachment points. Retrofit kits that include large diameter washers to distribute the loads that might be imposed by a seat belt anchorage in a collision or roll over are available from some manufacturers.

If there is a risk that an item of PMP could collide with a person or any other plant at the workplace, that risk must be reduced as far as practicable. This may involve measures such as separating vehicular traffic from pedestrian traffic, the installation of mirrors at intersections, road markings for stop, give way, keep left, don't pass, crosswalks and similar, and bollards at both sides of doorways in buildings used by plant such as forklifts.

A person other than the operator, i.e. a passenger, is prohibited from riding on PMP unless the passenger is seated in a seat, specifically designed for a passenger, that is equipped with a seat belt and is in the protective zone of the ROPS (if a ROPS is required). [*Regulation 4.44 (7)*]

However, an exception is made for a person who is training, instructing or assessing the operator, i.e. the instructor. In these cases, there must be a means of preventing the instructor from slipping, falling or being thrown from the plant. Such means could include a harness and lanyard attached to the plant, a temporary seat and a system of work change, such as a reduction in speed whilst the instructor is on board.

### **3.3 Regulation 4.45**

*Regulation 4.45* requires certain tractors to be fitted with a ROPS and certain earthmoving machines to be fitted with an appropriate combination of “operator protective devices,” regardless of the result of a risk assessment. The items nominated in *Regulation 4.45* (generally of recent design and manufacture) are expected to have mounting points for ROPS/FOPS and seat belts incorporated in the original design.

The tractors that must be fitted with ROPS are those with a mass greater than 800kgs and less than 15 000kgs manufactured or imported or originally purchased after 1 January 1981.

Hydraulic excavators, and earthmoving machinery of a kind to which AS 2294 applies, manufactured, imported or originally purchased after 1 January 1989 must be fitted with an appropriate combination of “operator protective devices”.

Australian Standard AS 2294 only applies to PMP having a power rating of 15KW or more.

Although not included in the tractors covered by *Regulation 4.45*, it is recommended that tractors having a mass greater than 560kgs be fitted with ROPS.

## **4. OPERATOR PROTECTION: ROLL OVER PROTECTIVE STRUCTURES (ROPS) AND FALLING OBJECT PROTECTIVE STRUCTURES (FOPS)**

### **4.1 Tractor roll over**

A major work hazard associated with tractors is the risk of a roll over. Measures to be considered in preventing a roll over include:

- improving tractor stability;
- restricting the places where the tractor is to be used;
- restricting the speed at which the tractor is to be operated;
- restricting the use of the tractor on the basis of the operator's competence;
- using a different tractor;
- hand-working the task; and
- protecting the driver in the event of a possible roll over.

### **4.2 ROPS on tractors**

ROPS are structures designed to meet an accepted performance standard or specification and to be attached to, or form part of, a machine for the purpose of reducing the possibility of an operator being injured should the machine roll over.

The terms safety frame, safety cab, protective structure, roll over protective structure, and ROPS are all used synonymously. ROPS include two-post frames, four-post frames and full cabs.

When developing preventative measures consideration should be given to:

- the hazards associated with any particular operation or task;
- the environment in which the tractor will be required to work;
- the nature and harm that could occur to an operator should a protective structure not be fitted;
- whether or not because of the age or design of the tractor, it is impracticable to fit a suitable protective structure; and
- other means of eliminating, isolating or minimising the hazard.

Roll overs of tractors can occur on any terrain. Therefore, irrespective of the topography where the tractor is used, all tractors should have a ROPS fitted.

### **4.3 Assessment of existing ROPS**

Where a tractor is already fitted with a ROPS and its suitability as an acceptable protective structure is in question, the services of a suitably qualified engineer or designer should be engaged to assess the protective structure.

Any structure with some identification that has been previously tested to the performance standard or specification in the relevant standard or more stringent criteria, and has been well maintained, is acceptable.

#### 4.4 Identification of ROPS

ROPS that have been designed and tested in accordance with AS 1636 should have a permanent – type label attached in a prominent position where it can be easily read and where damage by weather or abrasion is minimised.

The label should contain the following information:

- the name and address of the manufacturer of the structure;
- the type and serial number of the structure if any;
- the make and model of the plant that the structure is designed to fit;
- the number of the standard or code which the ROPS meets, its approval number under that code if applicable, and the name of the testing station; and
- any other information deemed appropriate (for example, installation date).

Following any repairs or modifications, an additional label should be put on the frame stating the repairs or modifications that have been made, when and by whom.

#### 4.5 Damage to ROPS

Where a ROPS has been damaged to the extent that the effectiveness of the structure or mounting system has been impaired, which could include rust and wear and tear, then the person with legal responsibility for the machine to which the structure is fitted shall not be deemed to be taking all practicable steps until the ROPS again complies with AS 1636.

ROPS are designed to absorb energy and deform permanently in the event of a roll over. Repair of a damaged ROPS is seldom possible. The effect of the damage on the strength of the steel or on the adequacy of the attachment system cannot be predicted.

- (i) **Where visible damage has been sustained** (e.g. there are cracks, tears, or bends in any member or weld, or if the doors or windows no longer fit correctly) the ROPS must be assessed by the original designer or a suitably qualified mechanical or structural engineer experienced in this class of work.
- (ii) **Where structural damage has been sustained** e.g. damage to structural members, mounting components, attachment points on the tractor, or associated welds or fasteners:
  - (a) If the damage is limited to slight bending of the structure which is considered by the inspecting engineer not to impair its ability to successfully meet the compliance conditions required of the original design, the structure can be returned to service. Non-structural components such as windows and doors may be modified to fit.

- (b) If the damage exceeds that described in (i) above, it may be repaired by replacing the damaged components with components having the design specifications of the original manufacture. If this cannot be done, the structure must be replaced.
- (c) If damage to any structural component is detected, it may be repaired by replacing the damaged components in a manner and with parts supplied and approved by the manufacturer. If this cannot be done, the structure should be replaced. Under no circumstances should a damaged structure be straightened.
- (iii) **Non-structural damage** e.g. damage to removable panels, doors, windows and attachments, may be repaired.
- (iv) **Any structural repairs** carried out should be certified by the manufacturer or a suitably qualified engineer.
- (v) **Identification of repairs.** When any repairs have been carried out, a label should be put on the frame stating the repairs which were carried out, when and by whom. The label should be permanently attached in a prominent location where it can be easily read, and where damage by weather or abrasion is minimised.

#### 4.6 **Modification of ROPS**

Modifications to any **structural component** of a ROPS for a tractor are not permitted. Modifications to any **non-structural component** of ROPS may be carried out if the original designer or a suitably qualified engineer experienced in this class of work confirms the modifications will not adversely affect the integrity of the ROPS.

**Identification of modifications:** When any modifications are carried out, there should be a label put on the frame stating the modifications which have been carried out, when and by whom. The label should be permanently attached in a prominent location where it can be easily read, and where damage by weather or abrasion is minimised.

#### 4.7 **Seatbelts**

Seatbelts are intended to hold the operator within the protective structure in the case of a roll over and substantially reduce the chance of injury in the event of a roll over.

Seat systems should be fitted in accordance with AS 2664 or an equivalent standard that encompasses the same or more stringent criteria. Seatbelts and anchorages must be maintained and kept in an effective condition at all times. A sign should be prominently displayed in every ROPS, warning the operator to wear the seatbelt provided.

#### **4.8 Operator training**

All operators must be provided with information and training on the working procedures of any machine they are expected to operate and any hazards they are likely to encounter. They should be closely supervised until they prove they are competent to work on their own.

#### **4.9 FOPS**

Similar provisions to those in sub-clauses 4.5(i) through 4.5(iv) apply to FOPS.

## 5. MINIMISING RISKS TO PERSONS OTHER THAN OPERATORS

The most common risk to persons other than operators from PMP is the risk of being run into/over by the PMP. Injuries to persons who work around forklifts as a result of being struck by the forklifts are particularly common.

Around earthmoving and road making machinery, being run over by PMP is the greatest risk to pedestrians. In respect of large earthmoving machinery it needs to be recognised that the operator's view of pedestrians may be restricted or even obscured by the PMP itself (see *Beware Dangerous Shadows* at Appendix 6). Safe systems of work need to be developed and implemented that provide, as a minimum, a method of communications between pedestrians and PMP operators that ensure each is aware of the other before the lack of distance between them creates a risk. Other recommendations are included in Significant Incident Summary 3/2003 at Appendix 5 of this Guidance Note and in the WorkSafe Western Australia Commission publication *Safe Movement of Vehicles at Workplaces*.

It is a reasonably common occurrence for operators to be run over by their own tractor. It is usually the result of either slipping while mounting or leaving a moving tractor, or from attempting to start (including jump starting) the tractor from a position on the ground in front of a rear wheel.

Platforms are available to minimise the risk of a person falling in front of a rear wheel of a moving tractor.

A system should be in place that requires the operator to be in the normal operating position before starting a PMP.

Attention to regular maintenance of the battery and generator (or alternator) should minimise the need for jump starting.

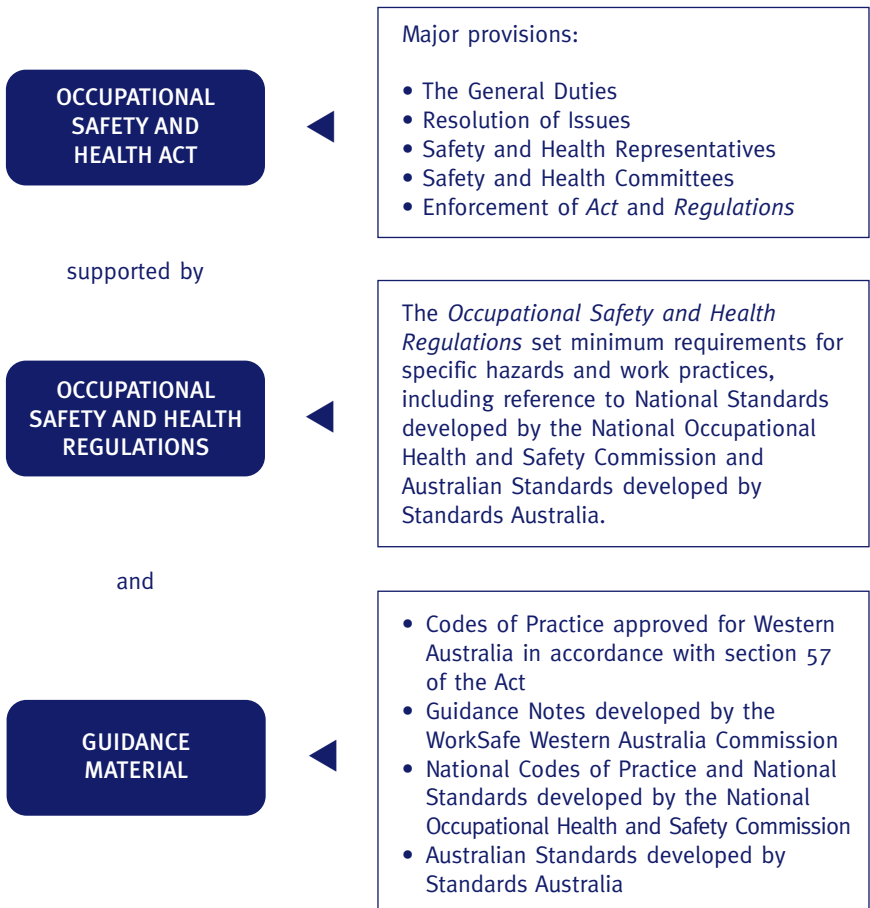
Attention to the efficiency of braking systems on PMP should also be given priority if run overs are to be avoided. However, it needs to be recognised that emergency application of the brakes of a forklift may result in the load sliding off the forks and hitting a pedestrian. This highlights the need to reduce the speed of PMP operating around pedestrians.



## APPENDIX 1

### OCCUPATIONAL SAFETY AND HEALTH LEGISLATIVE FRAMEWORK IN WESTERN AUSTRALIA

The objective of the *Occupational Safety and Health Act 1984 (the Act)* is to promote and improve safety and health standards in Western Australian workplaces. The Act sets out broad duties for people at workplaces and those who design, manufacture, import or supply plant. The Act is supported by more detailed requirements in the *Occupational Safety and Health Regulations 1996 (the Regulations)*. The Act and Regulations are further supported by a range of guidance material such as approved codes of practice and guidance notes as shown below.



The objective of the legislation is to protect people at work against risks to their safety or health arising from plant and systems of work associated with plant.

“Safe systems of work” describes a wide range of activities which can contribute to safe work and may include:

- company policy and purchasing procedures;
- allocation of roles and responsibilities within the workplace;
- arrangements in place to ensure quality of instruction, competency assessment and supervision;
- systems of communication while performing a task, or within the workplace generally;
- work practices and procedures, including maintenance and repair schedules; and
- emergency procedures, for example, first aid and evacuation.

### **Duties of employers**

Under section 19 of the Act employers must, so far as practicable, provide and maintain a working environment in which their employees are not exposed to hazards. In fulfilling this obligation, employers must:

- provide and maintain workplaces, plant and systems of work which, so far as is practicable, do not expose workers to hazards;
- provide employees with the information, instruction, training and supervision needed to carry out their duties without being exposed to hazards;
- where appropriate, consult and co-operate with safety and health representatives, if any, and other employees in the workplace with regard to safety and health at the workplace;
- where it is not practicable to avoid the presence of hazards at the workplace, provide adequate personal protective clothing and equipment to protect employees without any cost to the employees; and
- ensure that the erection, commissioning, use, cleaning, maintenance, transportation and disposal of plant, is carried out so that employees are not exposed to hazards.

In addition, under section 21 of the Act, employers and self-employed persons must take reasonable care of their own safety and health at work and ensure that others are not adversely affected as a result of their work.

### **Duties of principals and contractors**

Section 19 of the Act also provides that, where, for trade or business, a person (“the principal”) engages another person (“the contractor”) to carry out work, the principal is regarded as the employer of the contractor and anyone whom the contractor employs to carry out or assist with the work. Therefore, the principal must fulfil the duties of the employer in relation to matters over which he or she has control (or would have had control but for an agreement with the contractor to the contrary).

## Duties of employees

Under section 20 of the Act employees must take reasonable care of their own safety and health at work and ensure that their work does not adversely affect the safety or health of any other person.

They must also:

- follow instructions given by their employer for their own or others' safety and health;
- use personal protective equipment provided by their employer; and
- report potential hazards plus actual injuries and harm to health arising out of their work.

## Duties of designers, manufacturers, importers and suppliers

Under section 23 of the Act, designers, manufacturers, importers and suppliers of plant for use at workplaces must, so far as is practicable:

- design and construct plant so that people who properly install, maintain, or use it are not exposed to hazards;
- test and examine the plant before it is used;
- provide information; and
- ensure plant is installed or erected so it can be used safely.

- (a) **Designers** have a duty to assess and control the risks associated with plant they design for use at a workplace and to provide safety information about the plant to manufacturers for use by the manufacturer and for passing on to the end user of the plant.
- (b) **Manufacturers** have a responsibility to follow the designer's specifications precisely in order to ensure the plant is as free from risk as the designer intended. If the plant is designed outside Western Australia's jurisdiction, and manufactured in Western Australia, the manufacturer takes on the designer's responsibility to make sure that risks are assessed and controlled.

Manufacturers are obliged to provide safety information about the products they manufacture to end-users either directly (if supply is direct) or through the distributor or retail dealer. The information to be provided to the user is covered at page 11.

- (c) **Importers and suppliers** of plant have a responsibility to ensure hazard identification and risk assessment processes have been undertaken and risk control measures incorporated before the plant leaves their control. The importer and supplier would normally ensure that this has been undertaken by receiving documentation from the designer and the manufacturer, or from the previous purchaser of the plant. The supplier would obtain this information from the importer where the plant being supplied is imported from another Australian State or Territory or from outside Australia. This information should confirm that appropriate hazard identification, risk assessment and risk control

measures were undertaken and, as a consequence, the designer has supplied documents associated with safe operation of the plant, such as service manuals and operations manuals. Where the importer or supplier of plant for use at a workplace is unable to establish that hazard identification and risk assessment have been undertaken, they have the responsibility of ensuring that any risks arising from the use of the plant are eliminated or reduced as far as practicable.

- (d) **Suppliers of used plant** are required to provide the purchaser with whatever information relating to the safe use of the plant that is in the possession of the supplier. This should include information relating to commissioning, safe operation, maintenance and safe systems of work. This may include data sheets, test certificates, operating and service manuals, reports and a safety manual.

A supplier who sells used plant should provide the safety and health information in his or her possession that would have been provided if the plant was new. If the supplier has additional information relating to safe use of the plant, for example, alerts, procedures, information from relevant industry associations or such sources, these should also be passed on to the purchaser. The supplier should also identify any components of the plant that are unserviceable.

The components of the plant that are unserviceable may constitute a hazard in the operation of the plant. Where plant is identified as not fully serviceable, the supplier should inform the purchaser in writing that the plant should not be used until the plant is fully serviceable.

- (e) **Persons who hire or lease plant** can expect to have information provided by the designer, manufacturer, previous supplier, or other persons who have hired the plant and statutory authorities.

This may take the form of data sheets, operations manuals and maintenance manuals and should include any information about safety and health obtained at the time of hire or lease.

A previous hiree or lessee may identify a design feature or work practice associated with the plant that requires documentation not formerly supplied. In such cases the supplier should ensure that this documentation, if applicable, is supplied to all future persons hiring or leasing the plant.

Information subsequently obtained by the supplier and applicable to the plant, during the hire or lease of the plant should be passed through to the hiree or leasee as soon as practicable.

## **Information to be provided**

A manufacturer, importer and supplier must ensure that safety and health information required to be supplied by the designer is provided to the person to whom the plant is supplied. This could include, where relevant, information on:

- hazards and risks;
- purpose of the plant;
- testing;
- inspection;
- installation;
- commissioning;
- operation;
- maintenance;
- cleaning;
- transport;
- storage;
- dismantling (re plant with stored energy or hazardous substances such as asbestos);
- disposal (re plant with stored energy or hazardous substances such as asbestos);
- systems of work;
- operator competency; and
- any emergency procedures relating to the plant.

The information may be provided in user manuals and manufacturer's instructions.

If safety and health information is not provided to an importer by the designer or manufacturer, the importer assumes the responsibilities for supplying the information normally supplied by the manufacturer. The importer or supplier is then required to provide the purchaser with relevant information obtained from the hazard identification, risk assessment and risk control process carried out in respect of the plant.

## APPENDIX 2

### OCCUPATIONAL SAFETY AND HEALTH REGULATIONS

#### 4.44. Powered mobile plant

- (1) *Subject to regulation 4.45, a person who, at a workplace at which there is any powered mobile plant, is an employer, the main contractor, a self-employed person, a person having control of the workplace or a person having control of access to the workplace must ensure in relation to each item of powered mobile plant that –*
  - (a) *if there is any risk that –*
    - (i) *the plant could overturn;*
    - (ii) *an object could come into contact with the operator of the plant; or*
    - (iii) *the operator of the plant could be ejected from the seat, then,*

*as far as practicable, the risk is limited by the provision of an appropriate combination of operator protective devices, and that those devices are maintained and used appropriately; and*
  - (b) *if there is a risk that an object may come into contact with the operator of the plant from the front, side or rear of the plant then, as far as practicable, the risk is limited by the provision of an appropriate structure that protects the operator.*
- (2) *Subject to regulation 4.45, a person who supplies powered mobile plant for use at a workplace must ensure that the plant is fitted with suitable and adequate operator protective devices to reduce, as far as is practicable, the risk of injury or harm to the operator.*

*Penalty for a person who commits the offence as an employee: \$5 000.*

*Penalty in any other case: \$25 000.*

- (3) *Nothing in subregulation (1) or (2) or regulation 4.45 prevents a person from lowering or removing a roll-over protective structure for such time as the powered mobile plant is being used under a tree or in a place that would be too low for the plant to work had the roll-over protective structure been in operating position.*
- (4) *If powered mobile plant at a workplace is fitted with a roll-over protective structure or a falling object protective structure then a person who, at the workplace, is an employer, the main contractor, a self-employed person, a person having control of the workplace or a person having control of access to the workplace must ensure that -*

- (a) *the protective structure complies with AS 1636 or AS 2294; or*
  - (b) *the protective structure has been designed by a suitably qualified engineer to a standard that provides at least the same level of protection as would be provided if the protective structure complied with AS 1636 or AS 2294.*
- (5) *If powered mobile plant at a workplace -*
- (a) *is fitted with a roll-over protective structure or a falling object protective structure; and*
  - (b) *has seat belt attaching points incorporated into the original design of that plant,*

*then a person who, at the workplace is an employer, the main contractor, a self-employed person, a person having control of the workplace or a person having control of access to the workplace must ensure that the plant is fitted with a seat belt at each set of attaching points and that the operator of the plant uses the seat belt.*

- (6) *A person who, at a workplace at which there is any powered mobile plant, is an employer, the main contractor, a self-employed person, a person having control of the workplace or a person having control of access to the workplace must ensure in relation to each item of powered mobile plant that if there is any risk that the plant could collide with persons or any other plant or thing, then the risk is reduced as far as practicable.*
- (7) *A person who, at a workplace, is an employer, the main contractor, a self-employed person, a person having control of the workplace or a person having control of access to the workplace must ensure that a person other than the operator (“the passenger”) does not ride on powered mobile plant at the workplace unless -*
- (a) *the passenger is seated in a seat specifically designed for carrying a passenger;*
  - (b) *the passenger's seat is located within the zone of protection afforded by the framework of an operator protective device if such a device is required under these regulations; and*
  - (c) *the passenger's seat is fitted with an appropriate seat belt and that the passenger uses the seat belt.*

- (8) *Nothing in subregulation (7) prevents a person who is training, instructing or assessing the operator of a powered mobile plant in the operation of the plant (“the instructor”) from riding on the plant other than in a seat specifically designed for carrying a person if a person who, at a workplace, is an employer, the main contractor, a self-employed person, a person having control of the workplace or a person having control of access to the workplace ensures that means are used to prevent the instructor from slipping, falling or being thrown from the plant.*

*Penalty applicable to subregulations (1), (4), (5), (6) and (7): \$25 000.*

*[Regulation 4.44 amended in Gazette 8 Mar 2002 p. 983-5; 7 Jun 2002 p. 2737.]*

**4.45. Specific protection requirements for certain tractors and certain earthmoving machinery**

- (1) *A person who, at a workplace, is an employer, the main contractor, a self-employed person, a person having control of the workplace or a person having control of access to the workplace must ensure that -*
- (a) *a tractor of a mass greater than 800 kilograms and less than 15 000 kilograms manufactured, imported or originally purchased after 1 January 1981 is fitted with a roll-over protective structure; and*
- (b) *hydraulic excavators and earthmoving machinery of a kind to which AS 2294 applies manufactured, imported or originally purchased after 1 January 1989 is fitted with an appropriate combination of operator protective devices.*

*Penalty: \$25 000.*

- (2) *Nothing in this regulation or in regulation 4.44 applies to a tractor that is installed in a fixed position and in a manner that would not enable the tractor to be used as mobile plant.*

*[Regulation 4.45 amended in Gazette 8 Mar 2002 p. 985.]*

**4.54. Additional requirements as to cranes, hoists and building maintenance units (in part)**

- (2) *If, at a workplace, a person is to ride in a work box suspended from a crane, each responsible person at the workplace must ensure that both the rider and the driver of the crane have been given written instructions for the use of the crane in those circumstances, setting out the conditions of use, and signed by both the responsible person and a competent person.*
- (3) *If a crane or hoist is at a workplace, each responsible person at the workplace must ensure that the crane or hoist is not used as an amusement structure, whether or not for payment or reward.*

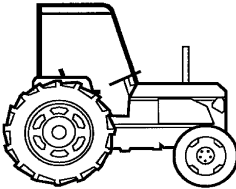


- (4) *If there is a crane, hoist or building maintenance unit at a workplace then each responsible person at the workplace must ensure that the crane, hoist or unit is maintained, inspected and operated –*
- (a) *in accordance with written instructions developed at the time of design or manufacture by the person who designed or manufactured the crane, hoist or unit;*
  - (b) *if it is not practicable for that person to obtain the instructions referred to in paragraph (a), in accordance with any written instructions approved by the Commissioner for the purposes of this paragraph; or*
  - (c) *if it is not practicable for that person to obtain instructions referred to in paragraph (a) or (b), in accordance with AS 2550.1 and any other part of AS/NZS 2550 that is relevant to that kind of plant and with AS 1418.1 and any other part of AS/NZS 1418 that is relevant to that kind of plant.*
- (5) *A person does not commit an offence under subregulation (4) in not complying with item 10.4.1(a), 10.4.2(e), or 10.4.3(d) of AS 2550.10 before 3 October 2005 where the relevant plant is a hoist that –*
- (a) *is a boom-type elevating work platform;*
  - (b) *is used only in connection with commercial fruit growing; and*
  - (c) *was owned immediately before 3 October 2003 by a person who has owned it continuously since then.*
- (6) *Nothing in subregulation (4) or (5) affects the requirement under regulation 4.34 to make and keep records of maintenance and inspection.*
- (7) *A responsible person at a workplace must ensure that no crane is used at the workplace for multi-crane hoisting unless –*
- (a) *the rated capacity of the crane exceeds the crane's share of the load by at least:*
    - (i) *20%, if 2 cranes are used;*
    - (ii) *33%, if 3 cranes are used; or*
    - (iii) *50%, if more than 3 cranes are used;*
  - (b) *the physical dimensions and mass of the load prevent the load from being handled by a single crane that is readily available; and*
  - (c) *the hoisting is supervised by a competent person who is not an operator of one of the cranes.*

# APPENDIX 3

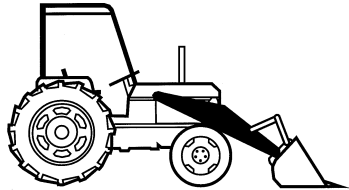
## PLANT ATTACHMENTS AND MODIFICATIONS

### Examples of plant required to comply with regulations 4.44 and 4.45



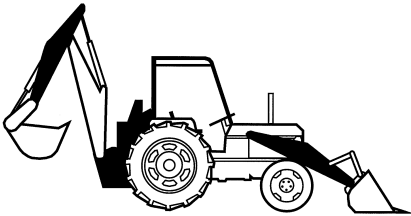
**Tractor**

The requirements of *Regulation 4.44* apply.



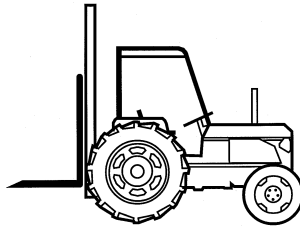
**Tractor with F.E.L. attachment**

This is an earthmoving machine. The requirements of *Regulation 4.44* or *4.45(1)(b)* apply.



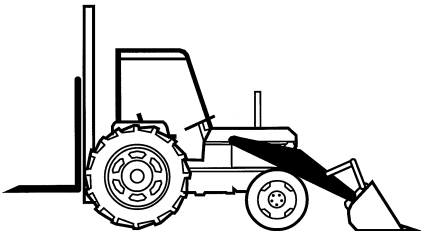
**Tractor with F.E.L. and excavator (“backhoe”) attachment**

This is an earthmoving machine. The requirements of *Regulation 4.44* or *4.45* apply.



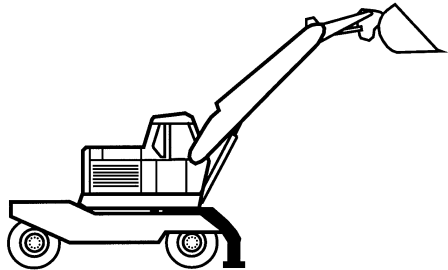
**Tractor with forklift attachment**

This is a forklift truck. The requirements of *Regulation 4.55* apply.



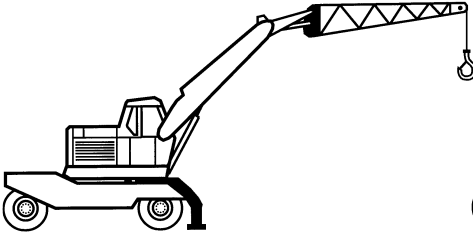
**Tractor with F.E.L. and forklift attachment**

This is a combination of forklift and front-end loader and the requirements of *Regulation 4.44*, or *4.55* apply. *Regulation 4.45(1)(b)* may also apply depending upon the age and power of the unit.



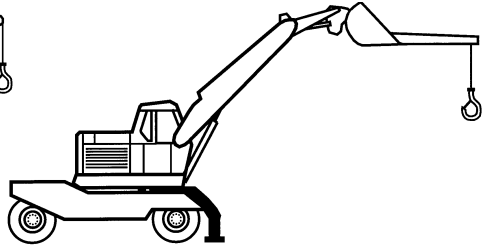
**Earthmoving machine**

This is an earthmoving machine. The requirements of *Regulation 4.44* or *4.45(1)(b)* apply.



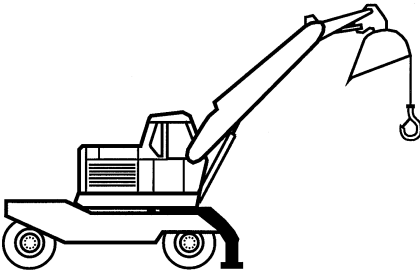
**Earthmoving machine with bucket replaced with lifting boom**

In the configuration shown this machine is a crane.  
*Regulation 4.53 applies.*



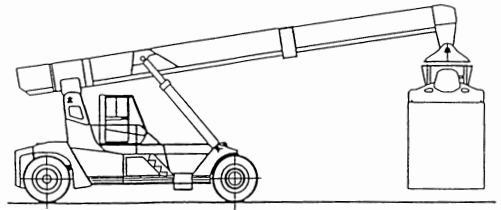
**Earthmoving machine with lifting boom mounted in bucket**

In the configuration shown, this machine is a crane.  
*Regulation 4.53 applies.*



**Earthmoving machine with lifting device attached to bucket**

In the configuration shown this machine is a crane.  
*Regulation 4.53 applies.*



**Container handling crane**

*Regulation 4.53 applies.*

## APPENDIX 4

### OTHER INFORMATION

**1. Occupational Safety and Health Act and Regulations**

The *Occupational Safety and Health Act 1984* and the *Occupational Safety and Health Regulations 1996* can be purchased from WorkSafe, Westcentre, 5th Floor 1260 Hay Street, West Perth [Tel. (08) 9327 8777] or State Law Publisher, 10 William Street, Perth [Tel. (08) 9321 7688]. Copies are also held in the WorkSafe library, 5th floor, 1260 Hay Street West Perth.

**2. Commission for Occupational Safety and Health Publications**

The following Commission for Occupational Safety and Health codes of practice, guidance notes and other publications can be purchased from WorkSafe, Westcentre, 5th Floor 1260 Hay Street, West Perth [Tel. (08) 9327 8777]. They can be downloaded from the Internet Service on [www.safetyline.wa.gov.au](http://www.safetyline.wa.gov.au). Copies are also held in the WorkSafe library.

The following publications provide further and relevant information in respect to powered mobile plant:

- Codes of practice: First aid, workplace amenities and personal protective equipment
- Code of practice: Managing noise at workplaces
- Guidance note: General duty of care in Western Australian workplaces
- Guidance note: Working alone
- Guidance note: Prevention of carbon monoxide poisoning from petrol and gas powered equipment
- Guidance note: Safe movement of vehicles at workplaces
- Plant design – A guide for designers, manufacturers, importers, suppliers and installers of plant
- Plant design – A guide for employers, self-employed persons and employees

### **3. Contacts for further information**

#### **Chamber of Commerce and Industry of Western Australia**

180 Hay Street  
EAST PERTH WA 6004  
Tel: (08) 9365 7415  
Fax: (08) 9365 7550  
E-mail: osh@cciwa.com  
Website: www.cciwa.com

#### **UnionsWA**

Level 4  
79 Stirling Street  
PERTH WA 6000  
Tel: (08) 9328 7877  
Fax: (08) 9328 8132  
E-mail: unionswa@tlcwa.org.au  
Website: www.tlcwa.org.au

#### **WorkSafe**

##### **Department of Consumer and Employment Protection**

Level 5  
1260 Hay Street  
WEST PERTH WA 6005  
Tel: (08) 9327 8777  
Fax: (08) 9321 8973  
E-mail address: safety@worksafe.wa.gov.au  
Website: www.docep.wa.gov.au  
TTY: (08) 9327 8838

# Significant Incident Summary



## Two Workers Killed By Mobile Plant

### INCIDENT

Two separate incidents in recent months have resulted in the deaths of two people working on the ground near mobile plant.

### FACTORS TO CONSIDER

- Operators of mobile plant often have severely restricted visibility of ground workers, particularly those close to the plant.
- There is a need to establish an effective means of communication between mobile plant operators and ground personnel.
- Noise and other environmental conditions.
- Whether it is practicable to separate ground personnel from areas crossed by mobile plant.
- The need to limit movements of site visitors with barricades and appropriate signage.

### RECOMMENDATIONS

1. Employers must ensure there is a system of work in place that provides adequate protection for employees who have to work on the ground near mobile plant.
2. When mobile plant is being used, pedestrian movements in that area should be prohibited, if possible.
3. Pedestrian movement around mobile plant that is being manoeuvred (ie where reversing is involved) should be prohibited.
4. An effective system of communications between mobile plant operators and ground personnel should be established before work commences. Relevant staff should be trained in the procedures involved with the selected system.

The system should stop ground workers approaching mobile plant until the operator has agreed to their request to approach.

Similarly the system should stop operators from moving their plant closer than a given distance from ground personnel until the operator has received acknowledgement that the ground personnel are aware of the proposed movement.

5. Mobile plant operators and ground workers must be trained and familiar with the blind spots of plant working around them. They should be supervised adequately when working near mobile plant.
6. Mobile plant that works near persons on the ground should be equipped with a revolving light and reversing alarm.

### FURTHER INFORMATION

Guidance Note: Safe movement of vehicles at workplaces:

([www.safetyline.wa.gov.au/guidancenotes](http://www.safetyline.wa.gov.au/guidancenotes))

Contract Research Report 358/2001 Improving the safety of workers in the vicinity of mobile plant

([www.hse.gov.uk/research/crr\\_pdf/2001/crr01358.pdf](http://www.hse.gov.uk/research/crr_pdf/2001/crr01358.pdf))

Date: February 2003

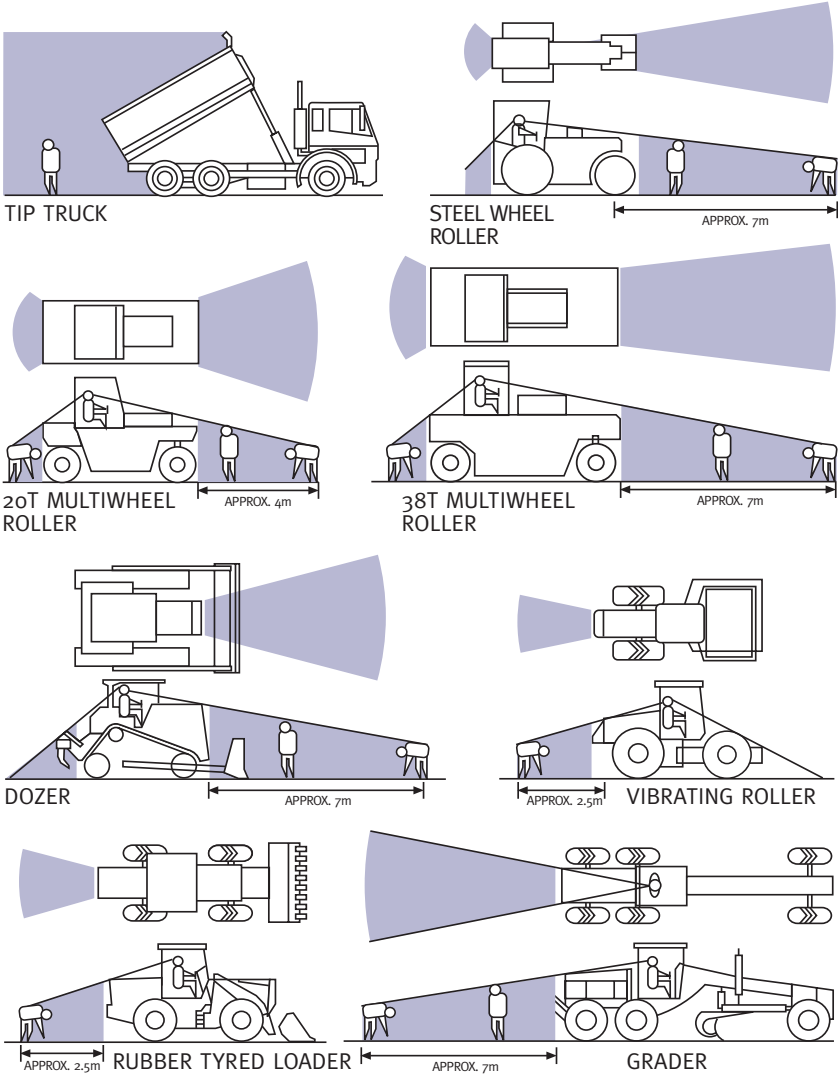
Bjorn Gillgren  
Director WorkSafe Operations

**Department of Consumer and  
Employment Protection**

**WorkSafe  
Level 5 WestCentre  
1260 Hay Street  
West Perth 6005**

APPENDIX 6

# BEWARE DANGEROUS SHADOWS



## MACHINES HAVE BLIND SPOTS WHERE OPERATORS MAY NOT SEE YOU

These are typical examples of blind spots for some common plant items

Clearly understand your workmates' tasks.

Other vehicles also share our roadworks areas.

Operators can't always see pedestrians.

**LOOK WORKER    LOOK TRAFFIC    LOOK MACHINE**

