Plant Risk Assessment

Details of Plant Assessed			
Plant Type:	Wheeled Telescopic Handler	**Model Number:**	
Serial Number:		**Chassis Number:**	
Assessor(s)	Danny Lynch, Dale Eastman		
Location:	17-23, Ventura Pl, Dandenong South, VIC 3175	**Date:**	26th July 2017

Plant Risk Assessment Report Prepared By:

Danny Lynch
Operations Manager - Senior Consultant
Eastman Lynch

Note:

The conducting of the plant inspection and subsequent preparation of the Plant Risk Assessment Report has been carried out to the requirements of the NATIONAL STANDARD FOR PLANT [NOHSC:1010(1994)]

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Background Information

This risk assessment should be read with reference to the operator manual for the machine being operated. This assessment is does not provide operating information or instructions. The purpose of this risk assessment is to identify the risks associated with this item of plant and identify risk controls that are in place on the machine. No qualitative judgements are made on the effectiveness or adequacy of these controls or any information supplied by the manufacturer.

Plant Design and Construction

Merlo machines and systems have been designed to comply with international standards in relation to:

Structural Analysis

- **DIN 15018-1:** Cranes; steel structures; verification and analyses
- **DIN 15018-2:** Cranes; steel structures; principles of design and construction
- **DIN 15018-3:** Cranes; principles relating to steel structures; design of cranes on vehicles

Hydraulic Sytems

- **DIN 20066:** Hose assemblies - Dimensions, requirements

Cabin Structure

- **ISO 3471:2008** - Earth-moving machinery - Roll-over protective structures - Laboratory tests and performance requirements
- **ISO 3449:2005** - Earth-moving machinery - Falling-object protective structures - Laboratory tests and performance requirements
- **CODE 4 - 2007 -** OECD standard code for the official testing of protective structures on agricultural and forestry tractors

Stability

- **EN 1459**: Safety of industrial trucks - Self-propelled variable reach trucks

Noise Levels

- **2000/14/CE:** Noise Directive

Plant configuration

The Panoramic range of wheeled telescopic handlers are designed with the boom located to the right of centre of the chassis. The cabin is offset to the left hand side of the chassis while the engine and transmission are located on the right side of the boom.

Engine

The machine is powered by a 4 cylinder, turbocharged, water cooled diesel engine.

Transmission

The transmission is a two speed hydrostatic gearbox with electronically controlled variable displacement pump. An inching-control pedal controls travel speed whilst allowing high engine speed for hydraulic operation. The plant has permanent four-wheel drive.

Boom

The boom pivots from the rear of the machine. The telescopic sections of the boom slide on low friction pads. The hydraulic extension mechanism, hydraulic hoses and electrics are contained within the boom assembly. Attachments are attached to the carriage with quick attachment fitting system controlled from the cabin by hydraulics. The Load Management System locks out the

operation of the boom when the machine's longitudinal stability limits are approached. A key override system is provided to enable the load to be moved back into a safe position.

Cabin

The cabin conforms to ISO 3449 (FOPS Falling Object Protection System) and ISO 3471 (ROPS - Roll Over Protection System) with the protection system fully enclosed in the cabin structure to ensure the integrity of the protection at all times. The cabin is mounted on rubber blocks for vibration reduction. Entry is through a single door. Emergency exit can be made through the front or rear windows.

Braking

The hydrostatic transmission provides immediate braking with the release of the accelerator. A hydraulically operated disc brake is located on each of the exit shafts of the differential, inside the axle casings. The hydraulic braking system has two independent hydraulic circuits.

An independent disc parking brake is located on the main transmission shaft. The operator is able to engage the brake manually or it will automatically engage when the engine is stopped or hydraulic pressure is lost.

Steering

All wheel steering occurs through a hydraulic servo-assisted system with auto synchronisation. Three steering modes are able to be selected - Front wheel steer, all wheel steer and crab steer.

Chassis

The chassis incorporates a frame levelling and side shift mechanism which uses hydraulic rams controlled by the operator from the cabin. The frame levelling levels the frame relative to the front axles (± 10%) when operating on uneven surfaces. The side shift moves the upper part of the chassis sideways (± 340mm) to move the boom across the longitudinal axis of the machine.

Stabilisers are fitted to the front axle to provide greater stability when lifting loads.

Plant Function

The operator sits in a forward facing position with the load carriage to the front of him.

Steering is via a conventional steering wheel. Forward and reverse and gear selection is via switches and levers on the steering assembly. Speed and brake controls are through foot pedals. The boom control is via a right mounted joystick. The main instrument panel is forward and to the right of the operator.

Assessment Summary

The purpose of this Report is to document the results of a plant inspection aimed at assessing the safety features of the design and operation of this wheeled telescopic handler.

The wheeled telescopic handler has been design to relevant standards to ensure its design, structure and operation meets the high quality required by these standards. A number of safety devices and systems are incorporated into the machine to ensure the risks to the operator and other workers are minimised during the normal operation of the machine in an appropriate work environment.

Despite the number of safety devices and systems incorporated in the machine, the safe operation of this machine is dependent on the qualification, competency and skill of the operator. Inappropriate or unskilled operation of the machine can lead to increasing the risk associated with the operation of the machine.

In addition, the work environment of the machine can present hazards to both the operator of the machine and other workers, plant and surrounding structures. The work environment must be managed in such a way as to minimise these risk.

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Plant Risk Assessment

Hazard Identification Requirements - Clause 65	Hazards	Risk Assessment Requirements Applied - Clause 66	Risk Control	Control of Risk Requirements Applied - Clause 67
(a) suitability of the type of *plant* for the particular task;	General operational hazards	2 - a, d, f	• All machines are design and built to comply with the Standards listed previously in the Plant Design and Construction section of this report.	2 - a, c, d
(b) actual and intended use in the workplace;	General operational hazards	2 - a, d, f	• An Operators Manual is supplied with each machine to provide details on operational use and limitations	3
(c) environmental conditions and terrain in which *plant* is used;	Uneven/sloping ground	2 - a, c, d, f	• Operator education • Operate vehicle in accordance with owner/operator manual • Wide machine track • Low centre of gravity design • Three steering modes - 4 wheel, front wheel, crab steer allow greater manoeuvrability • Floating rear axle • Frame levelling • Front stabilisers	2 - b 3
	Falling load	2 - a, d, f, g	• Cabin complies with **ISO 3449:2005** - Earth-moving machinery - Falling-object protective structures • Load is never suspended directly over cab. • Carriage load guard • Carriage is self levelling • Lock valves fitted to all hydraulic cylinders in case of hydraulic failure • Side shift to place load	2 - b, d 7
	Tip over	2 - a, d, f, g	• Operator training • Operate vehicle in accordance with owner/operator manual • Wide machine track	2 - b, d 3 7

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			• Low centre of gravity design • Frame levelling • Front stabilisers • Three steering modes - 4 wheel, front wheel, crab steer allow greater manoeuvrability • Load Management System (LMS) provides lock out of boom hydraulics if machine reaches 100% of its lifting capability • Cabin complies with **ISO 3471:2008** - Earth-moving machinery - Roll-over protective structures	
	Poor Lighting	2 - a, d, f, g	• Driving and reversing lights on vehicle • Provide adequate area lighting • Work lights on chassis • Install optional lighting on cabin	2 -b
	Overhead obstacles/power	2 - a, d, f, g	• Operator training • Operate in open area with overhead obstructions beyond reach of boom • Inching pedal allows fine control of movement • Side shift to place load • Three steering modes - 4 wheel, front wheel, crab steer allow greater manoeuvrability	2 - b 3
	Adverse weather	2 - a	• Windscreen wipers - front and rear	2 - b
	Enclosed areas - poor ventilation		• Operate in open area • Open building doors for ventilation when operating inside • Provide mechanical ventilation in unventilated areas	2 - b 3
	Dusty conditions	2 - a, f	• Air conditioned cabins • Ventilated work area when working inside	2 - b 3
(d) foreseeable abnormal situations, misuse and fluctuation of operating conditions;	Speeding	2 - f	• Operator training	3
	Brake failure	2 - a, c, f, g	• Maintain machine as per Manufacturer's specifications. • Brake machine by closing throttle to use hydrostatic transmission • Use Parking brake	2 - b 3

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	Travelling with raised load	2 - a, c, f, g	• Load Management System (LMS) provides lock out of boom hydraulics if machine reaches 100% of its lifting capability while travelling • Operator training	2 - b, d 3
	Lowering boom when travelling	2 - a, c, f, g	• Travel mode prevents boom, frame levelling and side shift hydraulic capabilities operating while travelling • Operator training	2 - b, d 3
	Sudden stops/acceleration	2 - a, c, f	• Operator training and supervision • Worksite traffic management plan	3
	Overloading	2 - a, c, f	• Load Management System (LMS) provides lock out of boom hydraulics if machine reaches 100% of its lifting capability • Operator training	2 - b 3
	Lifting people	2 - a, f	• People can only be lifted in a compliant cage • Operator training	3
	Carrying passengers	2 - a, f	• Carrying passengers is prohibited • Operator training	3
	Operator thrown around/out in collision/tip over	2 - a, e, f	• Seat belt fitted • Padding on roof of cabin	2 - b
(e) potential for injury due to entanglement, crushing, trapping, cutting, stabbing, puncturing, shearing, abrasion, tearing and stretching;	People under load	2 - a, e, f	• Operator training • Worksite pedestrian management plan	3
	People hit by moving load	2 - a, e, f	• Operator training • Worksite pedestrian management plan	3
	People hit by moving plant	2 - a, e, f	• Operator training • Worksite pedestrian management plan • Warning decal fitted	3
	Moving engine parts	2 - a, e, f	• Engine is enclosed by secured cover • Warning decal fitted	2 - b, d
	Operator cut by broken glass	2 - a, e, f	• All windows fitted with safety glass	2 - b

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	People crushed by moving parts	2 - a, e, f	• Operator training • Worksite pedestrian management plan • Warning decal fitted	3
(f) generation of hazardous conditions, due to pressurised content, electricity, noise, radiation, friction, vibration, fire, explosion, temperature, moisture, vapour, gases, dust, ice, hot or cold parts;	Hydraulic fluid leaks - pressure	2 - a, f	• Major hydraulic hoses are contained within covers, under the chassis or inside the boom	2 - d, d 6 7
	Noise	2 - a, d, f, g	• Cabin has sound proofing installed • Cabin is attached to chassis via rubber mounts to reduce vibration and sound transference	2 - b, d
	Exhaust gas	2 - a, f	• Exhaust is to the rear of the cabin • Cabin is fully enclosed and fitted with air conditioning • Enclosed worksites should be ventilated	2 - b, d 3
	Hot parts	2 - a, f	• Engine is enclosed by secured cover • Warning decal fitted	2 - b, d 6 7
	Dusty conditions	2 - a, f	• Cabin is fully enclosed and fitted with air conditioning	2 - b
	Hot fluids - oil, coolant,	2 - a, d, f	• Engine is enclosed by secured cover • Follow maintenance instruction in Operators Manual • Warning decal fitted	2 - b, d 3 6 7
	Fumes from fuel	2 - a, d	• Fuel tank to the rear of the cabin • with firm fitting cap • Fuel tank constructed from damage resistant plastic	2 - b, d
	Battery acid	2 - a	• Battery is in compartment which is enclosed by secured cover	2 - b, d 7
	Electrocution	2 - a, f	• Cover on positive terminal of battery • 12 volt electrical system	2 - b, d 7
(g) failure of the *plant* resulting in the loss of contents, loss of load, unintended ejection of	Hydraulic failure - boom	2 - a, f	• Lock valve blocks fitted to boom hydraulics to prevent boom collapse	2 - b, d
	Hydraulic failure - steering	2 - a, f	• Steering continues to operate with extra effort required due to loss of hydraulic assistance	2 - b

work pieces, explosion, fragmentation or collapse of parts;	Attachment release from carriage	2 - a, f	• Attachment locking pin hydraulic hose is disconnected from locking pin during operation to prevent accidental release of locking pin • Operator training	2 - b 3
	Structural failure - boom, chassis	2 - d, f	• Maintenance of machine according to Manufacturer's instructions	3 4
(h) capability of the *plant* to lift and move people, equipment and materials and suitability of secondary back-up system to support the load;	Attachment detaching	2 - a, f	• Hydraulically operated locking pin is manually controlled to detach attachment • Locking pin hydraulic hose is detached and connected to blind connector to prevent inadvertent detachment • Operator training	3
	Hydraulic failure	2 - a, f	• Lock valves fitted to all hydraulic cylinders	2 - b
	Overloaded	2 - a, c, f	• Load Management System (LMS) provides lock out of boom hydraulics if machine reaches 100% of its lifting capability	2 - b
(i) control systems, including guarding and communication systems;	Collision	2 - a, c, d, f, g	• Warning devices - horn and flashing light, indicators. • Safety glass windows in cabin • Reversing beeper installed • Worksite traffic management plan • Operator training • Load Management System includes reversing camera as an option • Mirrors - left and right side • Three steering modes - 4 wheel, front wheel, crab steer allow greater manoeuvrability	2 - b, d
	Engine parts	2 - a, f	• Engine compartment is enclosed by secured cover • Warning decal fitted	2 - b, d 6 7
	Moving parts		• Worksite pedestrian management plan • Warning decal fitted	3 6
	Overloaded		• Load Management System includes a light tower to provide communication with spotter/dogman/ other workers on when machine is reaching its lifting capability limits (green - ok, Amber- 80% of capability exceeded, Red- 100% of capability exceeded	2 - b 15

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	Controls	2 - a, d, f	• All controls clearly labelled and detailed in Operator's Manual • Controls within easy reach of operator from sitting position	11
(j) potential for falling objects and the *plant* to roll-over;	Tip over	2 - a, c, d, f, g	• Operator training • Operate vehicle in accordance with owner/operator manual • Wide machine track • Low centre of gravity design • Frame levelling • Front stabilisers • Three steering modes - 4 wheel, front wheel, crab steer allow greater manoeuvrability • Load Management System (LMS) provides lock out of boom hydraulics if machine reaches 100% of its lifting capability • Cabin complies with **ISO 3471:2008** - Earth-moving machinery - Roll-over protective structures	2 - b 3
	Load falling on operator	2 - a, d, f, g	• Cabin complies with **ISO 3449:2005** - Earth-moving machinery - Falling-object protective structures • Load is never suspended directly over cab. • Carriage load guard • Carriage is self levelling • Side shift to place load • Lock valves fitted to all hydraulic cylinders in case of hydraulic failure	2 - b, d 7
(k) suitability of materials used for the *plant*;	Tyre puncture	2 - a, d, f	• Machines fitted with agricultural standard tractor tyres	2 - b
	Glass breaking	2 - a, d, f	• Safety glass fitted to all windows	2 - b
	Chassis/Boom failure	2 - d, f	• Chassis and boom constructed to **DIN 15018** standard	2 - b
(l) suitability and conditions of all accessories;	Poor lighting	2 - a, d, f	• Machine lighting includes all lights required for road travel • Option available for four working lights on cabin - two forward and two rear	2 - b
	Dusty Conditions	2 - a, d, f	• Cabin is fully enclosed and fitted with air conditioning	2 - b
	Electrocution	2 - a, d, f	• Machine is fitted with 12 volt power system • Positive battery terminal has plastic cover	2 - b, d 7

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			• Manual battery isolator switch (automatic switch offered as an option)	
	Heat/Cold	2 - a, d, f	• Cabin is fully enclosed and fitted with air conditioning	2 - b
(m) *ergonomic* needs relating to installation and *use*;	Reversing	2 - a, c, d, f	• Rear window allows full vision for operator • Load Management System provides a reversing camera as an option • Mirrors - left and right side	2 - b
	Vibration	2 - a, d, f	• Cabin attached to chassis with rubber mounts • Vibration absorbing seating	2 - b
	Operator hitting head on roof of cabin	2 - a, d, f	• Seat belt fitted • Padding on roof of cabin	2 - b
	Poor posture - operator	2 - a, c, d, f	• Steering wheel and seat are fully adjustable • Operator sits immediately adjacent to the boom allowing excellent vision of boom and load • Front section of roof of cabin has a glass window for extra overhead visibility • narrow pillars allow greater all round vision • Hand throttle and inching pedal fitted to allow operator to not use accelerator during difficult manoeuvring	2 - b 11
	Awkward posture - servicing		• Visual gauge shows hydraulic oil level • Engine cover lifts up to provide easy access	2 - b 4 11
(n) carrying out the work without the *plant*;	Weight and height lifting capability is not otherwise available	2 - a, d, f	• This machine is able to complete the required tasks within its capability	2 - a
(o) location in the workplace and the impact on workplace design and layout;	Other people	2 - a, c, d, f, g	• Warning devices - horn and flashing light, indicators. • Safety glass windows in cabin • Reversing beeper installed • Worksite traffic management plan • Operator training • Load Management System includes reversing camera as an option • Mirrors - left and right side	2 - b 15

			• Three steering modes - 4 wheel, front wheel, crab steer allow greater manoeuvrability • Warning decal fitted	
	Other plant	2 - a, c, d, f, g	• Warning devices - horn and flashing light, indicators. • Safety glass windows in cabin • Reversing beeper installed • Worksite traffic management plan • Operator training • Load Management System includes reversing camera as an option • Mirrors - left and right side • Three steering modes - 4 wheel, front wheel, crab steer allow greater manoeuvrability	2 - b 15
	Building structures	2 - a, c, d, f, g	• Warning devices - horn and flashing light, indicators. • Safety glass windows in cabin • Reversing beeper installed • Worksite traffic management plan • Operator training • Load Management System includes reversing camera as an option • Mirrors - left and right side • Three steering modes - 4 wheel, front wheel, crab steer allow greater manoeuvrability	2 - b 15
	Working surface	2 - a, c, d, f, g	• Operator training	3
(p) suitability and stability of the *plant* and supports;	Tip over	2 - a, c, d, f, g	• Operator training • Operate vehicle in accordance with owner/operator manual • Wide machine track • Low centre of gravity design • Frame levelling • Front stabilisers • Three steering modes - 4 wheel, front wheel, crab steer allow greater manoeuvrability • Load Management System (LMS) provides lock out of boom hydraulics if machine reaches 100% of its lifting capability	2 - b 3 7

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			• Cabin complies with **ISO 3471:2008** - Earth-moving machinery - Roll-over protective structures	
(q) presence of persons and other *plant* in the *vicinity*;	Collision	2 - a, c, d, f, g	• Warning devices - horn and flashing light, indicators. • Safety glass windows in cabin • Reversing beeper installed • Worksite traffic management plan • Operator training • Load Management System includes reversing camera as an option • Mirrors - left and right side • Three steering modes - 4 wheel, front wheel, crab steer allow greater manoeuvrability	2 - b 15
(r) potential for inadvertent movement or operation of the *plant*;	Load dropping	2 - a, c, d, f, g	• Operator training on safe load handling • Cabin complies with **ISO 3449:2005** - Earth-moving machinery - Falling-object protective structures • Load is never suspended directly over cab • Side shift to place load • Carriage load guard • Carriage is self levelling • Boom fitted with lock valve block to prevent boom falling	2 - b, d 3 7
	Rolling forward/back	2 - a, c, d, f, g	• Parking brake • Park brake applied when operator is not on seat	2 - b 15
	Starting in gear	2 - a, c, d, f, g	• Machine will not start unless neutral gear is selected	2 - b 14
(s) systems of work associated with the *plant*;	Collision	2 - a, c, d, f, g	• Warning devices - horn and flashing light, indicators. • Safety glass windows in cabin • Reversing beeper installed • Worksite traffic management plan • Operator training • Load Management System includes reversing camera as an option • Mirrors - left and right side • Three steering modes - 4 wheel, front wheel, crab steer allow greater manoeuvrability	2 - b 3 15

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	Tip over	2 - a, c, d, f, g	• Load Management System (LMS) provides lock out of boom hydraulics if machine reaches 100% of its lifting capability • Frame levelling • Front stabilisers • Cabin complies with **ISO 3471:2008** - Earth-moving machinery - Roll-over protective structures	2 -b 7
	Falling load	2 - a, c, d, f, g	• Operator training on safe load handling • Cabin complies with **ISO 3449:2005** - Earth-moving machinery - Falling-object protective structures • Load is never suspended directly over cab • Side shift to place load • Carriage load guard • Carriage is self levelling • Boom fitted with lock valve block to prevent boom falling	2 - b 7
(t) access and egress; and	Slips	2 - a, c, d, f	• Self cleaning foot plate grip on step	2 - b
	Falls		• 3 hand grips to assist operator access and egress cabin	2 - b
	Emergency situation	2 - a, c, d, f	• Front and rear windows push out for emergency escape • Optional emergency stop button	2 - b 4 14
(u) competency of operators.	Collision	2 - a, c, d, f, g	• Operator training	3
	Inappropriate operation	2 - a, c, d, f, g	• Operator training	3

Other Suggested Controls Required:		
	Hazard: Dangerous operation of machine	Control: Recommend that purchaser of plant have the optional Emergency Stop Button fitted to the machine
	Hazard: Poor lighting	Control: Recommend that purchaser of plant have the optional extra working lights fitted to the machine
	Hazard: Collision	Control: Recommend that purchaser of plant have the optional reversing camera fitted to the machine

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Appendix 1:

Extract from the National Standard for Plant [NOHSC:1010(1994):

RISK ASSESSMENT

Clause 66.

(1) Where a *hazard* is identified under Clause 65, an assessment of *risks* associated with that *hazard* must be made.

(2) A person carrying out a *risk assessment* under Clause 66 (1) must, as far as practicable, determine a method of assessment which adequately addresses the *hazards* identified, and includes one, or a combination of the following -

(a) a visual inspection of the *plant* and its associated environment;
(b) auditing;
(c) testing;
(d) a technical or scientific evaluation;
(e) an analysis of injury and near-miss data;
(f) discussions with *designers*, *manufacturers*, *suppliers*, *importers*, employers, employees or any other relevant parties; and
(g) a quantitative *hazard* analysis.

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Appendix 2:

Extract from the National Standard for Plant [NOHSC:1010(1994):

CONTROL OF RISK

Clause 67.

(1) Where an assessment under Clause 66, identifies a requirement to control a *risk* to health or safety, that *risk* must be eliminated or, where it cannot be eliminated, *minimised*.

(2) To *minimise* the *risk* to health and safety, one or a combination of the following approaches must be used:

(a) substitution of the *plant* by less hazardous *plant*;

(b) modification of the design of the *plant*;

(c) isolation of the *plant*; and/or

(d) engineering controls such as *guarding*.

(3) Where through the application of Clause 67 (2) the *risk* is not *minimised*, appropriate administrative controls and personal protective equipment must be *used*.

Access/Egress

(4) There must be sufficient access and egress to:

(a) parts of *plant* which require cleaning and maintenance; and

(b) the operators workstation for normal and emergency conditions.

(5) Where access to *plant* is required as part of normal operation, and persons may become entrapped exposing them to increased *risk* due to heat, cold or lack of oxygen, then the following must be provided:

(i) emergency lighting;

(ii) safety doors; and

(iii) alarm systems.

Dangerous Parts

(6) Where an assessment under Clause 66 identifies a *risk* of exposure to dangerous parts during operation, examination, lubrication, adjustment or maintenance, that *risk* must be eliminated or, where it cannot be eliminated, *minimised*.

Guarding

(7) Where *guarding* is used as a control measure, a person with the responsibility for the control of *risk* must ensure that any *guard* provided for the *plant* and its operation is -

(a) a permanently fixed physical barrier where no part of a person requires access to the dangerous area during normal operation, maintenance or cleaning; or

(b) an interlocked physical barrier where access to dangerous areas is required during the operating sequence; or

(c) where a *guard* in accordance with Clauses 67 (7)(a) or 67 (7)(b) is not practicable, that it is a physical barrier securely fixed in position by means of fasteners or other suitable devices, which ensures that the *guard* cannot be *altered* or detached without the aid of a tool or key; or

(d) where a *guard* in accordance with Clauses 67 (7)(a), 67 (7)(b) or 67 (7)(c) is not practicable, that *presence sensing safeguarding systems* are provided.

(8) Where *guards* are *used* in accordance with Clause 67 (7), they must be:

(a) designed and constructed to make by-passing or defeating them, whether deliberately or by accident, as difficult as is reasonably possible;

(b) of solid construction and securely mounted so as to resist impact and shock;

(c) regularly maintained; and

(d) designed so as not to cause a *risk* in themselves.

(9) Where parts are designed to move at high speed and may break or disintegrate, or *workpieces* may be ejected, the *guarding* provided must be adequate to effectively contain the fragments or *workpieces*.

(10) Where a *risk* of jamming or blockage of moving parts cannot be eliminated, specific work procedures, devices and tools must be specified to ensure the *plant* can be cleared in a way that *minimises* the *risk* to health and safety.

Operational Controls

(11) Operational controls must be:

(a) suitably identified on *plant* so as to indicate their nature and function;

(b) located so as to be readily and conveniently operated by each person using the *plant*;

(c) located or guarded to prevent unintentional activation;

(d) able to be locked into the "off" position to enable the disconnection of all motive power and forces; and

(12) Where it is not practicable to eliminate the need for *plant* to be operated during maintenance and cleaning then operational controls which permit controlled operation must be provided.

(13) Where *plant* is designed to be operated or attended by more than one person and more than one control is fitted, the multiple controls must be of the 'stop and lock-off' type so that the *plant* cannot be restarted after a stop control has been used unless each stop control is reset.

Emergency Stops and Warning Devices

(14) Emergency stop devices must:

(a) be prominent, clearly and durably marked and immediately accessible to each operator of the *plant*; and

(b) have handles, bars or push buttons which are coloured red.

(c) not be able to be affected by electrical or electronic circuit malfunction.

(15) Where a *risk assessment* identifies a need to have an emergency warning device this must be installed in such a position to fulfil its intended purpose.