

## UON Key Risk Area: KRA 1.4

### Plant and Equipment

#### 1. Purpose

This procedure describes how the University meets its obligation to ensure the health and safety of people, through the processes of selection, use, maintenance and disposal of plant and equipment.

#### 2. Scope

This document applies to all faculties, divisions, and organisational units of the University of Newcastle and its controlled entities where plant and equipment are used.

#### 3. Definitions

In the context of this document, the following definitions apply:

- **Plant or equipment** : Any piece of machinery, equipment or appliance that is powered such as a forklift or bulldozer; hand held such as chainsaws or drills; static such as metal folding equipment, boilers, or scaffolding; or plant that moves people such as elevators or motor vehicles. This includes components and fittings that are part of the items listed.
- **Leaders/Supervisors**: Any member of the University who is responsible for supervising staff and/or for undergraduate or postgraduate students and/or for leading research projects.
- **Workers**: As defined in the NSW Work Health & Safety Act 2011, workers include employees, conjoints, students on work experience, contractors, sub-contractors and their employees. Staff, conjoints, students on work experience, and contractors may be referred to collectively as workers, or separately as staff, conjoints, students, or contractors.

#### 4. Responsibilities

##### 4.1 The Vice-Chancellor and University Executive Committee

- Ensure that resources are allocated for the appropriate selection, use, maintenance and disposal of plant and equipment;
- Monitor that processes are in place and being used, to ensure that these procedures are being followed and that health and safety of people is not put at risk from plant and equipment.

## **4.2 Leaders/Supervisors**

- Implement and monitor systems and processes in line with these procedures and ensure that these are being followed to control the risk to the health and safety of people who may be using or impacted by plant and equipment;
- Ensure that all documentation including manuals and instructions are received and kept in a place for future reference;
- Ensure that any registration (See table 2), installation and commissioning requirements are implemented prior to plant or equipment being used;
- Ensure that all operating procedures are developed and that instruction is provided to the users and others who may be affected by the plant or equipment;
- Ensure that any operator of plant or equipment has the required certificates or competencies prior to use, and that those certificates are kept up to date;
- Ensure that any plant or equipment that requires registration is advised to the Infrastructure and Facilities Services team or Health and Safety Team as required (see table 1);
- Monitor that all inspections, testing, certifications or registrations have been undertaken in line with the requirements of the particular plant and equipment;
- Ensure that the records of all commissioning, testing, inspections and registrations are kept and available to anyone who uses or has reason to verify that these things have been done;
- Ensure that any plant or equipment that is no longer required, is decommissioned and disposed of in line with the designer and manufacturer's recommendations.

## **4.3 Health & Safety (H&S) Team**

- Provide advice to the University community in regard to the particular requirements of safe use of plant and equipment;
- Support the University community in the selection, use, maintenance and disposal of plant and equipment.

## **4.4 Workers**

- Follow the Standard Operating Procedures (SOPs) and instructions provided for using and maintaining plant and equipment;
- Attend instruction and training sessions relating to use and maintenance of plant and equipment.

## **5. Procedure**

### **5.1 Registration of Plant**

Items of plant typically listed for registration are:

- Boilers;
- Pressure vessels;
- Tower cranes;
- Lifts;
- Building maintenance units;
- Amusement structures;
- Truck mounted concrete placing units with booms;
- Mobile cranes.

### **5.2 Risk Management**

The risk management procedures described can be applied to proposed plant, existing plant or where modifications are planned. For further information on risk management see HSP 4.1 – Risk Management.

### **5.3 Hazard Identification**

All reasonably foreseeable hazards to health and safety arising from plant and systems of work associated with the plant must be identified. Major considerations should include:

- Suitability of the type of plant for the particular task;
- Actual and intended use in the workplace;
- Environmental conditions and terrain in which plant is used;
- Foreseeable abnormal situations, misuse and fluctuation of operating conditions;
- Potential for injury due to entanglement, crushing, trapping, cutting, stabbing, puncturing, shearing, abrasion, tearing and stretching;
- 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;
- Failure of the plant resulting in the loss of contents, loss of load, unintended ejection of pieces, explosion, fragmentation and collapse of parts;

- Capability of plant to lift and move people, equipment and materials and suitability of secondary back-up system to support the load;
- Control of systems, including guarding and communication systems;
- Potential for falling objects and the plant to roll over;
- Suitability of materials used for the plant;
- Suitability and condition of all accessories;
- Ergonomic needs relating to the installation and use;
- Location in the workplace and impact on workplace design and layout;
- Suitability and stability of the plant and supports;
- Presence of persons and other plant in the vicinity;
- Maintainability, including isolation, access, frequency, cleaning;
- Potential for inadvertent movement or operation of the plant;
- Systems of work associated with the plant;
- Access and egress;
- Competency of operators.

#### **5.4 Risk Assessment**

Where a hazard has been identified, an assessment of the risks associated with that hazard must be made. Methods of risk assessment that may be used are:

- A visual inspection of the plant and its associated environment;
- Consultation with employees;
- Inspection and testing;
- A technical or scientific evaluation;
- An analysis of injury and incident data;
- Discussions with designers, manufacturers, suppliers, importers or any other relevant parties;
- A quantitative hazard analysis.

## 5.5 Risk Control

Where a risk assessment identifies a requirement to control a risk to health safety and, the environment that risk must be eliminated or where this is not possible, minimised. To minimise the risk to the environment or health and safety, the hierarchy of controls must be used to select the appropriate risk control measures, i.e.

- Substitution of the plant by less hazardous plant;
- Isolating the plant from people;
- Engineering control of the plant through modifications of the design or guarding;
- Introducing administrative controls;
- Using personal protective equipment.

## 5.6 New Plant & Equipment

Leaders/Supervisors should consult with operators, engineers, maintenance staff, and H&S personnel, prior to the purchase of new plant or equipment. Taking advantage of employees' practical knowledge and understanding of machine operation and production requirements will greatly reduce the risk of new plant and equipment having hazards or being inappropriate.

Consultation should take place as early as possible when planning for the introduction of new plant, equipment, or systems of work, to allow time for changes to be incorporated.

The UON procurement or purchasing procedures will be followed to ensure that the correct risk management procedures are followed during the acquirement phase.

Before new plant or equipment is used, obtain the manufacturer or supplier's information on the hazards of the plant or equipment and what controls are in place and/or recommended to eliminate or reduce these hazards e.g. guards, safe operating procedures. Consider the following factors:

- Environmental risks, e.g. noise, dust, spillage, heat/cold, ventilation;
- Access for installation, operation and maintenance of the plant;
- Systems of work, including:
  - Systems to ensure quality of instruction, competency, assessment and supervision;
  - Systems of communication while performing a task.
- The organisation of work including:
  - The speed of the process;
  - Traffic around the plant (people and vehicles);
  - Time spent on monotonous or repetitive tasks;

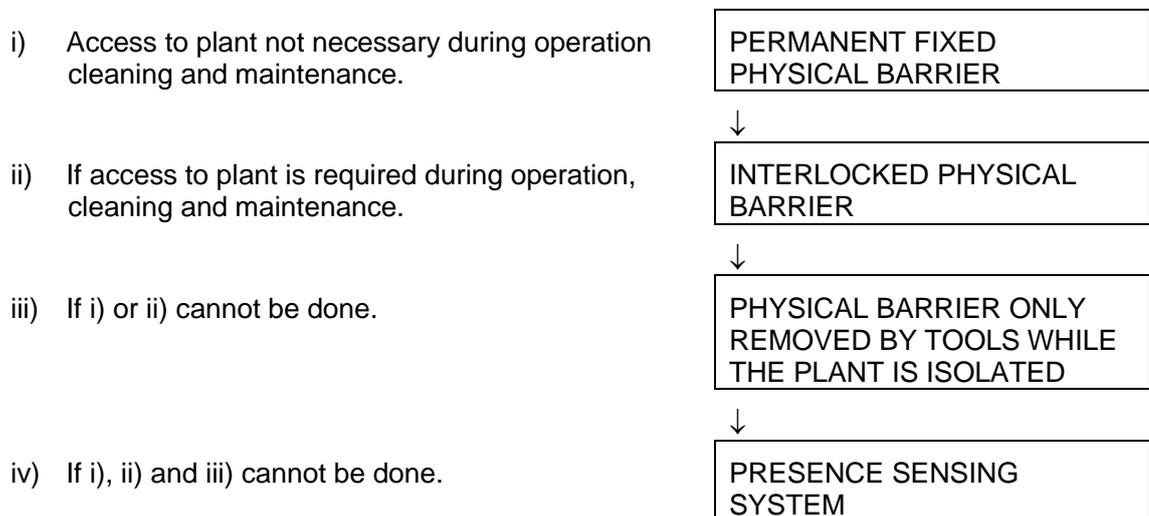
- Manual handling;
- Working extended hours.
- Maintenance and repair schedules;
- Emergency procedures, e.g. first aid and evacuation.

Inspections must be carried out to ensure risks are monitored during installation, erection, and commissioning and steps must be taken to control any risks identified.

### 5.7 General Safety Requirements for Plant

There must be sufficient access to:

- Parts of plant which require cleaning and maintenance;
- Operators' work station for normal and emergency situations;
- Access to any danger points of plant or hazardous areas, must be prevented by appropriate guarding;
- The choice of guarding should be based on the levels of control required to prevent access so far as it's practicable to the danger point or area of the plant:



See AS4024.1-2006 Safeguarding of Machinery for details on guarding requirements.

### 5.8 Operator Controls, Emergency Stops & Warning Devices

- Identified with labels or instructions to indicate nature and function;
- Readily accessible to personnel using the plant;
- Cannot be unintentionally activated;
- Must be able to be locked into the 'off' position;

- Emergency stop buttons must be red and preferably of mushroom head design and cannot be adversely affected by electrical or electronic circuit malfunction;
- Emergency stops for conveyors should be of the lanyard or stop cord variety with all the above points applicable;
- Work on plant such as maintenance and/or inspection must be controlled by lock out and tag out procedures and be fitted with appropriate lock out devices. Refer Key Risk Area KRA 3.10, Electrical Safety and Isolation.

### **5.9 Training & Instruction**

University Schools and business units have a responsibility to ensure that operators of all major plant, power tools and other items of small plant are experienced or are trained in the operation of the plant and equipment they will be using. Records are to be maintained locally of operators training and experience, including any applicable certificates of competency.

Competency checklists should be developed for operators of plant that do not require certificates of competency, e.g. drill presses, rotating machinery.

Operator information and instruction should include:

- The nature of the hazards and systems of work associated with the plant;
- Processes for hazard identification, risk assessment and control of risk;
- Standard Operating Procedures (SOPs) associated with operation of plant and equipment;
- Personal protective equipment (PPE) requirements;
- The level of competency and relevant skills necessary to operate the plant;
- People involved in maintenance and inspection, commissioning and installing, testing and decommissioning, dismantling and disposal of plant must be given information to ensure that the risks are eliminated or reduced while carrying out these activities.

Attachment 1 is an example of a Plant Inspection Checklist.

### **5.10 Maintenance of Plant and Equipment**

Regular maintenance of plant and equipment is essential to protect the environment and safety of workers, as well as to maintain the value of the asset.

NSW Work Health and Safety Plant Regulations place a general obligation on organisations to maintain plant in a safe operating condition. All Schools and business units with power-operated machinery should review these requirements on a continuing basis so they are aware of their legal obligations.

## 6. Divestment of Plant and Equipment

When any plant or equipment is removed from a site, either sold or scrapped, a risk assessment will be conducted. The assessment should include:

- Whether the plant and equipment is fit for operation by a prospective purchaser or the purchaser has been made aware of any conditions which may inhibit its safe use;
- How the plant and equipment is to be removed from site and what special considerations need to be taken into account e.g. size or height of equipment;
- The documentation required to prove the plant and equipment has been appropriately removed/sold.

## 7. Attachments

Attachment 1 Plant Inspection Checklist.

Attachment 2 Register of Plant and Equipment by Administrator

Attachment 3 Items of Plant Requiring Registration

## 8. References

[NSW WHS Regulations 2011](#)

[UON H&S Framework](#)

[UON HSP 2.1 Legal Compliance](#)

[UON HSP 2.2 H&S Responsibilities](#)

[UON HSP 10.1 H&S Inspections and Testing](#)

## Document Summary Table

<b>Plant and Equipment – KRA 1.4</b>					
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## Attachment 1 - PLANT INSPECTION CHECKLIST

<b>Business Unit:</b>	<b>Maintenance Manager/Supervisor:</b>
<b>Location:</b>	<b>Person Inspecting:</b>
<b>Item of Plant:</b>	<b>Date:</b>

Inspection Item	Action Required
<b>Guard Design</b>	
<ul style="list-style-type: none"> <li>• Accessible drive parts (shafts, belts, pulleys)</li> </ul>	
<ul style="list-style-type: none"> <li>• Accessible operational parts</li> </ul>	
<ul style="list-style-type: none"> <li>• If fixed, are they appropriate and do they comply with design requirements?</li> </ul>	
<ul style="list-style-type: none"> <li>• If interlocked, are they appropriate and do they comply with design requirements?</li> </ul>	
<b>Machine Controls</b>	
<ul style="list-style-type: none"> <li>• On controls - green, shrouded and lockable if needed</li> </ul>	
<ul style="list-style-type: none"> <li>• Off controls - red and unshrouded</li> </ul>	
<ul style="list-style-type: none"> <li>• Emergency stop - mushroom head, red and accessible</li> </ul>	
<ul style="list-style-type: none"> <li>• Foot controls – covered</li> </ul>	
<ul style="list-style-type: none"> <li>• Clear identification</li> </ul>	

Inspection Item	Action Required
<b>Isolation Facilities and Procedures</b>	
<ul style="list-style-type: none"> <li>• Power source isolating devices</li> </ul>	
<ul style="list-style-type: none"> <li>• Identification of remote isolating devices</li> </ul>	
<ul style="list-style-type: none"> <li>• Locks and/or tags available and used</li> </ul>	
<ul style="list-style-type: none"> <li>• Responsible person only to operate</li> </ul>	
<b>Access Authority and Control</b>	
<ul style="list-style-type: none"> <li>• Acceptable procedures exist and are implemented</li> </ul>	
<ul style="list-style-type: none"> <li>• Means of restricting access exist</li> </ul>	
<b>Operational Procedures/Methods</b>	
<i>(Refer to information/manuals provided by the designer / manufacturer / supplier)</i>	
<ul style="list-style-type: none"> <li>• Health &amp; Safety Work Procedures written</li> </ul>	
<b>Training</b>	
<ul style="list-style-type: none"> <li>• Identified and satisfied</li> </ul>	
<b>Personal Protective Equipment</b>	
<ul style="list-style-type: none"> <li>• Requirements are appropriate</li> </ul>	
<ul style="list-style-type: none"> <li>• Equipment is available</li> </ul>	
<ul style="list-style-type: none"> <li>• Rules are enforced</li> </ul>	

*Adapted from CCH Plant Safety Manual*

## Attachment 2. Registers of Plant and Equipment by Administrator

Administrator	Plant and Equipment
<b>Infrastructure and Facilities Services</b>	Boilers and Pressure vessels other than BBQ and rented gas cylinders, and automotive gas cylinders
	Lifts
	Installed Cranes
	Autoclaves
<b>Health and Safety Team</b>	Lasers
	Ionising radiation apparatus
	Equipment containing sealed source radioactive isotope devices
<b>Local school or business unit</b>	Gas fuel vessels for vehicles

## **Attachment 3. Items of Plant Requiring Registration (*Schedule 5 WHS Regulations*)**

- Boilers categorised as hazard level A, B or C according to criteria in Section 2.1 of *AS 4343:2005 (Pressure equipment-Hazard levels)*.
- Pressure vessels categorised as hazard level A, B or C according to the criteria in Section 2.1 of *AS 4343:2005 (Pressure equipment-Hazard levels)*, except:
  - gas cylinders, and
  - LP Gas fuel vessels for automotive use, and
  - serially produced vessels.
- Tower cranes including self-erecting tower cranes.
- Lifts, including escalators and moving walkways.
- Building maintenance units.
- Amusement devices covered by Section 2.1 of *AS 3533.1:2009 (Amusement rides and devices-Design and construction)*, except devices specified in clause 4 (2) of the Standard.
- Concrete placing machinery.
- Mobile cranes with a rated capacity of greater than 10 tonnes.

### **Exceptions**

- The items of plant listed in clause 3 of the Standard do not include:
  - any pressure equipment (other than a gas cylinder) excluded from the scope of *AS/NZS 1200:2000 (Pressure equipment)* , or

**Note :** See section A1 of Appendix A to *AS/NZS 1200:2000 (Pressure equipment)*

- a crane or hoist that is manually powered, or
- a reach stacker.
- The following devices are excluded from clause 3.6 of the Standard:
  - class 1 devices;
  - playground devices;
  - water slides where water facilitates patrons to slide easily, predominantly under gravity, along a static structure;
  - wave generators where patrons do not come into contact with the parts of machinery used for generating water waves;
  - inflatable devices, other than inflatable devices (continuously blown) with a platform height of 3 metres or more.