A policy to ensure the safety of staff or other persons in relation to confined spaces at Charles Sturt University.

This Procedure has been approved by Executive Director, Division Facilities Management under the Governance (Policy and Procedures) Rule 2005 of the Council and section 20 and 32 of the Act.

Facilities OHS Manager

Division of Facilities Management

20 August, 2001

See Table of Amendments

June, 2008

Occupational Health and Safety Policy

Occupational Health and Safety Act, 2000 (NSW)

Occupational Health and Safety Regulations, 2001 (NSW)

Policy, confined space, atmosphere
1. **PURPOSE**

   This policy describes the potential hazards of confined spaces, the precautions required in ensure the safety of personnel and procedures to follow for entry into a confined space.

2. **SCOPE**

   This policy applies to all confined spaces at Charles Sturt University.

3. **REFERENCE MATERIALS**

   a) ‘Safe Working in a Confined Space’ - Mines Rescue Service of NSW
   b) AS/NZS 2865: 2001 *Safe working in a confined space*
   c) HB 213: 2003 Guidelines for safe working in a confined space

4. **DEFINITIONS**

   4.1 **‘Confined Space’** in relation to a place of work means:

   A space of any volume which a person may at any time enter or be allowed to enter and in which:

   - is not intended as a regular workplace
   - has restricted means for entry and exit
   - may have inadequate ventilation and/or an atmosphere which is either contaminated or oxygen deficient and
   - is at atmospheric pressure during occupancy

   The atmosphere may contain dust, fumes, mist, vapour, gas or other harmful substance which could endanger the health and safety of persons entering or; in which the atmosphere is liable at any time to be oxygen deficient.

   Examples of confined spaces:
   1. Storage tanks, boilers, silos and other tank-like compartments usually having only a manhole for entry
   2. Open top spaces such as pits or degreasers, which are not subject to good natural ventilation
   3. Pipes, sewers, tunnels, shafts and ducts and similar structures

   4.2 **‘Contaminant’** means any dust, fume, mist, vapour, gas, or other substance, the presence of which can be harmful to the health of an individual.

   4.3 **‘Explosive (Flammable) Range’** means the range of flammable vapour or gas-air mixture between the Lower Explosive Limit (LEL) and the Upper Explosive Limit (UEL).
4.4 ‘Hot work’ means welding, thermal or oxygen cutting, heating and other fire producing or spark generating operations.

4.5 ‘Competent Person’ a person who has through a combination of training, education and experience, acquired knowledge and skills enabling that person to perform correctly a specified task.

4.6 ‘Threshold Limit Value (TLV) for Atmospheric Contaminants’ means the airborne concentrations of containments, which represent conditions under which it is believed that workers may be repeatedly exposed, day after day, without adverse affect.

4.7 ‘Safe Oxygen Level’ means a minimum oxygen content in air of 19.5% by volume under normal atmospheric pressure and a maximum oxygen content in air of 23.5% by volume under normal atmospheric pressure.

4.8 ‘Entry’ means a person whose upper body and/or head is, within a confined space is considered to have entered the confined space.

5. RESPONSIBILITIES

5.1 Managers & Supervisors

It is the responsibility of Managers and Supervisors, who have to any extent, control of the premises, to ensure, that any area in the workplace which meets the above criteria, is positively identified as a Confined Space. Upon identification of such spaces, procedures are to be established and implemented which meet the requirements of the relevant Act its Regulations and the Australian Standard.

Such procedures shall consist of a hazard analysis being conducted at any workplace identified as a Confined Space with particular emphasis being placed on personnel training, risk assessment, safety precautions and emergency response.

5.2 Employees

It is the employee’s responsibility to assist and cooperate with management in the identification of all Confined Spaces and to implement the agreed procedures stated in this Policy. Employees are to take reasonable care for the health, safety and welfare of all persons at the workplace and to report any hazardous situation immediately to their Supervisor who must undertake immediate remedial action.

6. CONFINED SPACES PROCEDURES

The Confined Spaces Procedures outline the minimum requirements that are required to be carried out whenever work is to be undertaken in confined space areas as defined under the OHS regulation 2001 and Australian Standard AS2865.

The objective of these procedures is to assist Managers and Supervisors to comply with the requirements of the Regulation and Australian Standard to
provide a safe working environment as outlined in Chapter 4, Part 4.3 of Division 9 – 2001 OHS regulation. The key steps in this process include:

1. Identification
2. Hazard Assessment
3. Risk Control
4. Isolation
5. Atmosphere
6. Ventilation
7. Personal Protective Equipment
8. Safety Harness and Lines
9. Rescue and First Aid
10. Authority to Enter
11. Entry Permits
12. Stand by Person
13. Training

6.1 Identification

Managers and Supervisors shall ensure identification of all confined spaces within the workplace under their control, which could endanger any person entering such space due to the following conditions:

- Atmospheric Contamination
- Oxygen Deficiencies or Excesses
- Temperature Excesses
- Accidental operation of machinery or services

Where areas are identified, they are to be assessed and signposted as appropriate under the relevant regulations.

6.2 Hazard Assessment

The Australian Confined Space Standard states that if entry to an identified confined space is deemed necessary, the employer or the responsible person shall review as a minimum requirement, the following guidelines:

- Consider the status of the work environment with particular attention to illumination, communication, climatic conditions, and time factors.
- Confirm the suitability of training and exposure of those persons intending to enter the confined space.
- Consider the atmosphere testing to be undertaken and assessed before an entry permit may be issued by a competent person.
- Consider the type of work to be done, ie hot work or chemical cleaning.
- Consider special needs of the individual workers who intend to enter the confined space.
- Ensure availability and adequacy of appropriate Personal Protective Equipment required to be worn by work persons.
- Ensure confined space is appropriately signposted.
• Assess the need for additional protective measures to preserve safety of personnel.
• Make positive detailed arrangements for the rescue of those entering the confined space.

The Competent Person is to complete the assessment checklist (Appendix 1) identified all confined spaces and to eliminate or reduce the risk factor wherever possible. Once this identification and assessment has been completed the document is to be recorded and retained in the University’s Workplace Hazard Register (Confined Spaces).

6.3 Risk Control

Risk control measures are of the utmost importance once identification and assessment have been completed. Prime consideration must always be given by the competent person to the basic question of whether the work proposed to be undertaken can be done other than in the confined space. The competent person should therefore look at one or more likely a combination of the following factors, which can be introduced as control measure.

6.3.1 Design and Installation

Hazards involved in working in a confined space should be minimised at the design stage and during initial installation of equipment. Where practicable, the design for a confined space should eliminate the need to enter the confined space for maintenance or other purposes.

The following features, aimed at enhancing the safety of persons working in a confined space, should, where practicable, be incorporated at the design and installation stages (consideration should be given to the type of work, the frequency and duration of the tasks):

• Provision of adequate and safe means of exit and entry of persons who may be required to wear personal protective equipment, including breathing apparatus, clothing and retrieval equipment
• Provision of outlets and facilities for cleaning to remove or minimise the need for entry
• Provision of ventilation facilities to avoid the build up of any contaminants or combustible atmospheres
• Provision for persons to work in other than stooped, awkward or cramped positions
• Use of cladding or lining materials that are durable, require minimal cleaning and do not react with materials contained in the confined space
• Design of structure and mechanical parts to provide for safe and easy maintenance without the need for persons to enter
• Provide levels of illumination complying with AS1680 which will be sufficient to permit safe entry, conduct of work and exit
• Provision of fixed ladders, platforms and walkways complying with AS1657
• Provision of signs in a manner appropriate to the workplace complying with AS1319 at each entry to the confined space
warning against entry by persons other than those who are listed on the entry permit and who are signatories thereto

- Provision of outlets and effective means of isolating energy sources
- Provision of drain valves and other means of positive isolation in pipework to reduce risk of possible pressurisation and incursion of contaminants to the confined space.

6.4 Isolation

6.4.1 Isolation Requirements

Isolation of services supplying a confined space is required where, owing to the nature of the confined space or the nature of the service or the material conveyed by the services, accidental or in advertent introduction of the material or movement of machinery would create a hazard.

Where proposed procedures are considered to represent a minimum hazard, positive steps shall be taken to ensure the following:

- Isolation procedures should be in accordance with CSU policies and procedures
- Prevention of accidental introduction into the confined space of materials through equipment such as piping, ducts, vents, drains, service pipes or fire protection equipment
- De-energisation and lockout, or tag out, or both, of machinery, mixers, agitators or other equipment containing moving parts in a confined space. Care must be taken to ensure machinery with stored energy, e.g. springs etc is safe guarded
- Isolation of all other energy sources which may be external but still capable of affecting the confined space, e.g. refrigeration or heating mediums.

6.4.2 Methods of Isolation from Hazardous Materials

A confined space shall be isolated before entry is permitted by any person.

Isolation shall be performed in accordance with one of the following methods described or by an alternative method ensuring equivalent security:

- Removal of a valve, expansion joint in piping leading to, or as close as possible to, a confined space, and blanking or capping the open end of the piping leading to the confined space.

- The blank or cap is to be identified to indicate this purpose. Blank caps shall be of a material that is compatible with the liquid, vapour or gas with which they are in contact.

- The material shall also have sufficient strength to withstand the maximum operating pressure, including surges, which can be built up in the piping.
• Insertion of a suitable full pressure spade (blank) in piping between the flanges nearest to the confined space.

• Where neither of the two methods described above are practicable, valve isolation will be as specified in the risk assessment.

6.4.3 Methods of Isolation for Moving Parts

Before entry is permitted to any confined space which in itself is capable of movement, or in which agitators, fans or other moving parts of potential hazard to personnel are present, the possibility of movement shall be prevented by the methods described below or by suitable alternative methods offering the equivalent security.

Where practicable, equipment or devices with stored energy, including hydraulic, pneumatic, electrical, chemical, mechanical, thermal or other types of energy should be reduced to a zero energy condition.

Methods

1. The person entering the confined space or the officer in charge shall place a lock or tag, or both, on the open circuit-breaker or isolating switch supplying electric power to equipment with hazardous moving parts, to indicate that a person is in a confined space and that such isolation shall not be removed until all persons have left the confined space.

   When the lock is used, the key shall be kept in the possession of the person entering the confined space or the officer in charge.

2. Where a power source cannot be controlled readily or effectively, a belt or other mechanical linkage shall be disconnected and tagged to indicate that a person is in a confined space and that such belt or linkage shall not be reconnected until all persons have left the confined space.

3. Where the above two methods of isolation are not practicable, movable components shall be blocked, and switches, clutches or other controls shall be tagged to indicate that a person is in a confined space and that such blocks and tags shall not be removed until all persons have left the space.

   When more than one person is working in a confined space the isolation devices shall be either:

   • Locked or tagged, or both, by each person entering the confined space, or
   • Locked or tagged, or both, by the officer in charge.

   Where the locking or tagging is undertaken by the officer in charge, each person entering the confined space shall verify, or have it verified to them, that isolation is effective prior to their entry.

6.4.4 Authority to Remove Isolation Mechanisms
The competent person identified on the Entry Permit shall only authorise the removal of protective devices such as tags, locks, blanks and other methods deployed to protect personnel working in a confined space when fully satisfied that the safety of personnel will not be compromised.

In determining that the confined space is deemed safe to return to service the competent person shall conduct a visual inspection of the confined space to ensure all persons have been removed from the area and that all persons nominated on the entry permit are signed off and accounted for.

### 6.5 Atmosphere

No person shall enter a confined space until it is free from any explosive hazard and either:

a) The person entering the confined space is equipped with an appropriate supplied air device and appropriate protective clothing or

b) Precautions have been taken to establish and maintain a safe atmosphere within the confined space, for the duration of the occupancy.

#### 6.5.1 Evaluation of the Atmosphere

The Competent Person shall ensure that no person enters a confined space without an entry permit. Such permit shall only be granted after an evaluation of the atmosphere and a survey of other hazards have been performed from outside the confined space and the results recorded on the entry permit.

Evaluation of a more remote region within a confined space may be performed once the adjacent area to the point of entry to the confined space has been determined and made safe.

Evaluation of the more remote regions may need to be undertaken by persons using appropriate protective clothing and/or equipment.

Where practicable the Competent Person(s) shall ensure that prior to persons entering the confined space that:

- The confined space contains a safe oxygen level
- The atmospheric contaminants in the confined space are reduced to below the relevant exposure standards
- The confined space is free from extremes of temperature, and shall ensure
- The concentration of flammable contaminant in the atmosphere of the confined space is below 5 percent of its LEL.

The Competent Person shall ensure that atmospheric testing and monitoring is carried out consistent with the hazards identified and the risk assessment.

#### 6.5.2 Re-test and/or Monitoring
Where considered necessary, arrangements shall be made to monitor to re-test at specified intervals, the atmosphere within a confined space.

6.5.3 Cleaning of Area

Where practicable, all solids and liquids, which are liable to present a hazard to persons inside the confined space, shall be removed from the area prior to the entry of persons. The cleaning process may need to be adopted to meet separate sets of circumstances and should consider the content of the confined space and the purpose for which entry is required. Cleaning methods utilised should be examined as to their individual hazards and after effects on the confined space.

6.6 Ventilation

Where it is preferred not to use supplied air respiratory protective devices, there shall be adequate precautions/actions taken to implement and maintain a safe breathing atmosphere in accordance with the standards of this policy and procedure.

Where persons entering a confined space are not wearing supplied air respiratory protective devices, the confined space shall be ventilated, by natural, forced or mechanical means, to establish and maintain a safe work environment. This ventilation shall be continued throughout the period of occupancy as a safeguard against the unexpected release of contaminants.

Where the maintenance of a safe breathing atmosphere in a confined space is depending on mechanical ventilation equipment, eg a fan, the equipment should:

a) be continuously monitored while the confined space is occupied, and
b) have the controls (including any remote power supply) clearly identified and tagged to guard against unauthorised interference.

Exhaust facilities should be arranged to ensure that any contaminated air removed from the confined space does not present a hazard to persons or equipment.

Inability to establish or maintain a safe breathing atmosphere shall make the wearing of supplied air respiratory protective devices mandatory.

6.7 Personal Protective Equipment

Suitable supplied air respiratory protective devices complying with AS1716 or otherwise approved by the regulatory authority should be worn:
• Where precautions and/or actions have not or cannot be implemented to ensure the health and safety of persons entering the confined space
• Where the results of the evaluation of air test samplings indicate that a safe breathing environment cannot be established or may not be maintained, or
• Where the nature of the work procedure within the confined space is likely to degrade or contaminate the atmosphere within the confined space, eg hot work, painting or removal of sludge.

It is important to note that mechanical ventilation equipment may not be adequate or sufficiently reliable to maintain a safe atmosphere in the operator’s breathing zone, particularly during operations likely to generate toxic contaminants.

The selection and use of respiratory protective devices take account of the hazards likely to be encountered (eg the need to guard against damage to the protective device by any contaminants).

The source of breathing air should be in accordance with AS1715.

Respiratory protective devices should be selected, fitted, used, stored, maintained and inspected in accordance with AS1715.

6.8 Safety Harness and Lines

Suitable safety harness and safety lines or rescue lines, complying with AS1891, should be worn where:

• There is a hazard of falling during ascent or descent, or if
• Rescue by a direct route, either vertical or horizontal, is practicable.

It is not always desirable to specify the use of a safety line or rescue line as this may be impracticable. When considering specifying the wearing of such equipment, care should be exercised to ensure that such equipment would not introduce a hazard or unnecessarily hinder free movement within a confined space.

The equipment should be stored, maintained and inspected in accordance with AS2626.

6.9 Rescue and First Aid

The Employer shall ensure that there are in placed planned rescue and first aid procedures. Such procedures are to be established and regularly rehearsed. Regular training in the proper use of personal protective equipment is to be an established part of these procedures. Before the issuing of an entry permit, after all atmospheric testing and area cleaning has been carried out, the Competent Person must first ascertain the name, address and emergency phone number of the nearest Emergency Service. This Service shall vary from location to location and it is the Officer’s duty to ensure that the information is correct, current and posted in a prominent position adjacent to the entrance of the confined space.
It is the Policy of Charles Sturt University that:

a) No person shall enter a confined space unless it be deemed to be free from contaminants and contain breathing air to the relevant standards;

b) Should such contamination or some other unforeseen occurrence require evacuation or retrieval of persons from the confined space, such procedure is to be adopted so as to render first aid as is necessary using available trained confined space personnel in the first instance. If no danger is present, ie in the case of an injury, then any personnel available may affect prompt first aid. No attempt is to be made at retrieval if the atmosphere becomes contaminated or the retrieval involves multi level movement of the injured person. In such cases, the Emergency Services are to be mobilised so that trained personnel may effect the rescue mission.

At all times the Competent Person must take control of the operation and organise the emergency procedures until such time as relieved by the Emergency Services. Any rescue equipment the Competent Person deems to be required to enter the confined space during a retrieval must be assembled and prepared ready for use prior to the personnel entering and/or working in a confined space. This equipment shall be placed in a convenient place adjacent to the entrance to the confined space and be clearly marked – FOR RESCUE USE ONLY.

6.10 Authority to Enter

Confined spaces represent a range of special hazards, therefore wherever possible work should be conducted from outside a designated confined space area. If such work can be undertaken, then precautions are to be taken to prohibit entry into the confined space.

When entry to a confined space is deemed necessary, the Competent Person, subject to review of the risk assessment, shall provide written approval in the form of an entry permit, prior to work being carried out within the confined space.

No person shall enter a confined space without an entry permit and that:

- the entry permit includes any precautions or instructions necessary for safe entry and execution or work
- the entry permit is provided to the person responsible for the direct control of the work in a confined space, and records which persons enter the confined space
- the persons involved in the work are advised of, understand and comply with the contents of the entry permit.

A Competent Person shall ensure that work in the confined space has been completed and that all persons involved in the work have left the space, before authorising cancellation of the confined space permit.

The entry permit should state the period of its validity and should be revalidated whenever it becomes evident that the duration or work will involve one of the following:
- a change in the person responsible for the direct control of the work in a confined space
- a significant break in work continuity, or
- a significant change in atmosphere or work to be performed.

The entry permit should be displayed in a prominent place to facilitate signing and clearance. The name and signature of persons and the time of entering and leaving the confined space must be recorded on the permit.

All original permits shall be retained on a central file as determined by the University Division/Faculty.

6.11 Entry Permits

The Competent Person is responsible for ensuring that the entry permit is completed. The following areas and actions should be considered as a basis for an entry permit:

- Location and description of the work to be done
- Hazards that may be encountered
- Isolation checklist
- Atmospheric test readings as appropriate
  - Oxygen levels
  - Flammability or explosive levels
  - Atmospheric contaminant level
  - Temperature and humidity
  - Radiation levels
- Need for continuing review of ventilation and atmospheric conditions
- Working conditions
  - Awareness that conditions (physical or chemical) may change and may need continuing review
  - The possibility of heat stress from task generated heat, ambient temperature or the effect of wearing protective clothing
  - The likely levels of noise or dust within the confined space
- Clothing and equipment
  - Types of equipment and clothing required for the task
  - Need for respiratory protective device
  - Need for safety harness and line
  - Need for emergency lighting, for example, torch, and
  - Means of communication
- Personnel
  - The number of persons to enter the confined space, stand by personnel for communication and operation of essential equipment
• Personnel for rescue and first aid, and
• Adequacy of personnel training and understanding of the hazards

• Other precautions
  • Need for signposting of barricading
  • Need for prohibition of smoking or naked flame within the confined space or surrounding area, and
  • Need for communication between stand by personnel and back up personnel

• Emergency precautions
  • Emergency procedures established
  • Provision and location of rescue equipment including emergency services
  • Location of first aid equipment, and provision of fire fighting equipment.

6.12 Stand By Person

Charles Sturt University shall not allow entry to a confined space unless that space has been subject to a risk assessment and atmospheric examination by a competent person and the results of such tests indicate that there is no risk to the health and safety of persons entering therein.

In complying with the above requirements, a stand by person will not be required for any general entry into a confined space receiving clearance as indicated above.

Entry into an area containing a known contaminant or whereby a contaminant may or shall be released by the nature of the work being carried out, ie asbestos removal, shall be subject to the terms and restrictions of that individual entry permit and/or the terms of the relevant Regulations covering operations within such workplaces.

IF IN DOUBT – DON’T ENTER

6.13 Training

Charles Sturt University shall ensure that all staff who may be required to work in a confined space are appropriately trained. Such training shall include the following:

• Confined Space Hazards
• Assessment Procedures
• Control Measures
• Emergency Procedures
• Selection, Use, Fitting and Maintenance of Safety Equipment

Initial training and retraining at appropriate intervals shall be provided. The training specified should be provided as close as practicable, in time to work in the confined space and to the specific task and procedure.
Training shall be conducted by persons knowledgeable in all relevant aspects of confined space entry, hazard recognition, safety equipment and procedures and shall continue until such time as the employer is satisfied that each worker has attained a satisfactory standard of competence.

Details of such training shall be recorded on the employee’s personnel file.

Training shall be reviewed in consultation with the employees and/or their representatives to ensure that content and context of the program has been achieved.

7. ACKNOWLEDGEMENT

Grateful appreciation is expressed to the NSW Mines Rescue Service of NSW, who allowed us to reprint in part form their ‘Safe Working in a Confined Space’ manual.
Appendix 1: Confined Spaces Checklist

Confined Spaces Checklist

Project / works description:

Certifying Officer: __________________________ Date: __________________________

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<thead>
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<th></th>
<th>Yes</th>
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<tbody>
<tr>
<td>1.</td>
<td>Has a risk assessment been undertaken? If yes, attach copy.</td>
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<td>2.</td>
<td>Has the entire work area surveyed for potential hazards?</td>
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<td>3.</td>
<td>Isolation:</td>
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<td>Have the required services been isolated (water, gas, steam, chemicals, electrical)?</td>
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<td>Have locks or tags been affixed to isolation points?</td>
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<td>4.</td>
<td>Atmosphere:</td>
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<td>Has the atmosphere of the confined space been tested?</td>
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<td>Oxygen</td>
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<td>Flammable gasses</td>
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<td>Other gasses</td>
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<td>Other atmospheric contaminants</td>
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<td>5.</td>
<td>Hotwork:</td>
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<td>Will any hot works be performed?</td>
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<td>If yes, has a permit been granted?</td>
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<td>Has the surrounding area been cleared of combustibles</td>
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<td>6.</td>
<td>Other precautions:</td>
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<td>Warning notices/ barricades</td>
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<td>Smoking forbidden</td>
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<td>All staff have been trained</td>
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<td>7.</td>
<td>Personal protective equipment:</td>
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<td>List the PPE that is required and will be worn</td>
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8. Emergency response
   - List all emergency response procedures and equipment, including standby personnel.

Signed by Certifying Officer: __________________________ Date: __________________________
Table of amendments

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<th>Version number</th>
<th>Date</th>
<th>Short description of amendment</th>
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<td>Original University Properties document</td>
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<tr>
<td>V1.1</td>
<td>2 Aug 2006</td>
<td>Amend in line with CSU format</td>
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