Freezer and Cold Storage

POLICY NO: RES - 23

DATE: 19 October 2018

REFERENCE AUTHORITY: Deputy Vice Chancellor: Research and Innovation

CROSS REFERENCES: Safe Management of Chemicals Procedure.
Available at: (http://w3.unisa.edu.au/safetyandwellbeing/SMS/procedures/safe_management_of_chemicals.pdf)

TO BE READ IN CONJUNCTION WITH:
- Res 17 Ownership and retention of data (http://i.unisa.edu.au/policies-and-procedures/university-policies/research/res-17/)
- C-24 Risk Management policy (http://i.unisa.edu.au/policies-and-procedures/university-policies/corporate/c-24/)
- Purchasing and Safety WHS procedure (http://w3.unisa.edu.au/safetyandwellbeing/SMS/procedures/purchasing&safety.pdf)
- Australian Code for the Responsible Conduct of Research (https://www.nhmrc.gov.au/guidelines-publications/r41)
- Safe Management of Chemicals Procedure (http://w3.unisa.edu.au/safetyandwellbeing/SMS/procedures/safe_management_of_chemicals.pdf)

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Preamble

Various materials are stored in freezers and other cold storage facilities across the University. Failure of freezer and cold storage facilities can result in loss and/or damage which has negative impacts both financially and in relation to progress of various projects against milestones.

The University has established a Freezer and Cold Storage Working Group which has representation from all Divisions, Schools, Research Institutes/Centres and other units that utilise, or have responsibility for, freezer and cold storage facilities. The purpose of this Group is to:

- Develop and implement consistent standards to be applied to all laboratory based freezers and other cold storage devices.
- Assess the progress of current initiatives in mitigating risks.
- Assess future needs of the University and potential solutions.
- Consider the optimisation of freezer and cold storage solutions across the University.

This policy was developed by the Freezer and Cold Storage Working Group to assist in meeting these objectives in order to mitigate risks relating to loss and/or damage through failure of freezer and cold storage infrastructure.

Where chemicals are held in cold storage, this policy should be read in conjunction with the Safe Management of Chemicals Procedure.

Policy statement

The University will ensure that:

• suitable freezer and cold storage infrastructure is selected based on the required application;

• freezer and cold storage infrastructure is maintained and tested in accordance with relevant safety standards;

• risk management assessments for freezers and cold storage devices are undertaken that are consistent with the International Risk Management Standard ISO 31000.

Definitions

Freezer and cold storage infrastructure: Any equipment, device, or facility that is used for the purpose of lowering temperature in order to store materials that are required to be kept at low temperature

Risk: The effect of uncertainty on objectives

Risk management: Coordinated activities to direct and control an organisation with regard to risk

Principles

The University at all levels should comply with the following principles:

Freezer and cold storage devices should be fit for purpose. Materials must be stored in accordance with the Importance Category outlined in Table 1 (see Risk Assessment Section). The importance category should be determined from a suitable risk assessment.

Each facility housing freezers or other cold storage devices must nominate a responsible officer as Coordinator for that facility. Those Coordinators will sit on the Freezer and Cold Storage Working Group. In addition to these Coordinators, each Division with research materials stored in freezers or cold storage facilities will nominate at least one additional person to sit on the Freezer and Cold Storage Working Group.

The University purchases insurance to protect against the loss of materials, including research materials, stored within freezers and cold storage devices. This insurance will cover the reasonable cost to replace the contents, including the costs to repeat experiments if applicable provided the cause of the spoilage is covered by insurance and subject to policy terms and conditions. For accidental damage and machinery breakdown claims higher policy excesses apply to devices not fitted with a functional back-to-base monitored alarm (e.g. Gallagher alarm system).

While the University carries this insurance all reasonable steps should be taken to mitigate against the loss of such materials in order to protect against reputational damage, loss of time, and other non-financial losses that can occur as a result of loss of stored materials.

Procedures

Risk Assessment

A risk assessment and Pre-Purchase Checklist (WHS 79) should be completed prior to purchase of cold storage devices. Where devices will be used for storage of materials of ≤ MEDIUM importance non-laboratory grade (e.g. commercial grade) devices may be used if they are considered fit for purpose. However, where devices will be used for storage of materials of > MEDIUM importance laboratory grade devices must be used.

The risk assessment prior to purchase must be based upon an assessment of the replacement value of the contents contained within the device, which determines the importance of the contents. The resulting Importance Category then determines the conditions that must be met for compliance with University standards.

Table 1 – Risk Assessment: Importance ratings for materials stored within cold storage devices

1	2	3	4	5	6	7
Row 1 - Required Elements		Temp. detection alarm required	Loss of power detection alarm required	Back-up power required	Room access control	Emergency contact list
Value of contents to replace and/or cost of damage caused by overheating of stored materials*	Importance Category					
$500,000 +	CRITICAL	REMOTE Alarm**	REMOTE Alarm**	YES	YES	YES
$100k -$500k	VERY HIGH	REMOTE Alarm**	REMOTE Alarm**	YES	YES	YES
$10k - $100k	HIGH	REMOTE Alarm**	REMOTE Alarm**	YES	YES	YES
$2k < $10k	MEDIUM	LOCAL Alert	LOCAL Alert	NO	Optional	Optional
$500 < $2k	LOW	NO	NO	NO	Optional	NO
<$500	NEGLIGIBLE	NO	NO	NO	NO	NO

* The cost of replacing the cold storage device, if defective, should also be considered. ** Remote alarm systems such as the Gallagher alarm system are appropriate.

Instructions for use of risk assessment matrix:

Step 1 – In Column 1 assess the replacement $ value of the contents within the cold storage device, or the potential cost of damage that would be caused by overheating of stored materials (such as stored chemicals that might cause damage if overheated), and the replacement cost of the device if it were to be defective– this will determine the 'Importance Category' (i.e. Column 2).

Step 2 – Read across Columns 3-6 to determine what conditions are required to comply with the assessed 'Importance Category'

Spare storage capacity should be maintained at all times to allow for transfer of materials in the event of a device failure.

Due to the high heat output of ultra-cold freezers, back-up power should be available for air-conditioning for rooms which house freezers of high, very high and critical importance (see Table 1).

Where liquid nitrogen facilities are being used the levels of liquid nitrogen should be checked at least weekly and sufficient stores should be kept on hand for topping up storage containers. In addition, the area should be fitted with an oxygen depletion alarm to mitigate the risk of nitrogen asphyxiation of staff.

Where cold storage devices are being used for storage of potentially hazardous biologics, or genetically modified samples, the device must display appropriate signage to alert users of this and access to the samples must be restricted.

Inventory

When a large number of samples will be stored for long periods of time, or genetically modified samples are stored for any length of time, an appropriate cataloguing system (e.g. FreezerPro®) must be put in place to allow researchers to accurately track stored materials.

Where a small number of materials will be stored for short-medium periods of time a cataloguing system (e.g. FreezerPro®) may be necessary. This will be at the discretion of the researcher.

Stored materials should be audited at least every 5 years and materials that are no longer required should be disposed of to prevent proliferation of cold storage devices.

Where chemicals are stored, the chemicals must be recorded in the UniSA Chemical Manifest (e.g. Chemwatch®) and the appropriate hazardous symbols must be displayed on the outside of the cold storage device in accordance with the Safe Management of Chemicals Procedure.

Identification of cold storage devices
Each cold storage device must be clearly labeled with a unique number. This Item reference will be concatenated with the campus and room number to form a unique identifier for inclusion in cataloguing, monitoring and/or alarm systems. This identifier is limited to 32 characters and may have some descriptor added post the item number to assist in identification of the type of device (e.g. CWE HB5-64 #79 -80deg).

Emergency Contact Staff List

The availability of emergency contact information for each cold storage device must be available in a consistent format that will allow security staff to respond effectively to alarms resulting from incidents. Emergency contact information must be accurate and kept current. Security Services must be advised when amendments are made to contact details and also when emergency contact staff are on leave so the records at the Security Monitoring Centre can be updated accordingly. There is a 48hour notification requirement for changes with the Security Monitoring Centre.

A copy of this information must also be updated in the SharePoint Temperature Controlled Environment contact list held by Security Services.

The names and phone contact details for a minimum of three people, one primary and two secondary emergency contacts, must be provided to security and a copy of this information must also be placed on each cold storage device. At least one of the contacts must be contactable outside of normal business hours, including University shutdowns, public holidays and weekends. The cold storage device Manager's contact details also need to be included to provide advice out-of-hours or to respond to an alarm.

Contacts on the emergency contact list must be available to respond to an alarm promptly and be familiar with the contents of a cold storage device. Emergency contacts must also be familiar with the procedures to be followed when responding to temperature fluctuation alarms.

Upon activation of a cold storage device alarm an alert will be sent to an external Security Monitoring Centre via a direct monitored line. At all hours the Security Monitoring Centre will follow protocol and attempt to contact each person on the equipment contact list to advise of the alarm in the priority order as provided by the University.

The Security Monitoring Centre will cease attempting to contact other parties on the list when they have been successful in speaking to one of the members on the notification list.

The last number on the list is Campus Security who will repeat the contact process until someone is contacted.

Roles and Responsibilities

Freezer and Cold Storage Working Group

The Freezer and Cold Storage Working Group is responsible for:

1. Developing and implementing consistent standards to be applied to all laboratory based freezers and other cold storage devices;
2. Assessing the progress of initiatives to mitigate risks;
3. Assessing future needs of the University and potential solutions;
4. Considering the optimisation of cold storage solutions across the University

Freezer and Cold Storage Facility Coordinators

Freezer and Cold Storage Facility Coordinators are responsible for:

1. Liaison with Facilities Management Unit during the installation of a new device, or relocation of an existing device, to ensure access and connection to appropriate monitoring and alarm systems and back-up power if required;
2. Liaison with Device managers (i.e. researchers and/or others directly responsible for use of the device) to develop a maintenance schedule;
3. Liaison with Facilities Management Unit to check all critical equipment alarm points for correct operation as per the schedule (developed as per point #2 above) to minimise risk of alarm failure;
4. Liaison with the Insurance Office when responding to incidents involving the loss of research materials;
5. Liaison with the researchers using the device to facilitate the development and implementation of an induction and training program
6. Ensuring that the storage of materials within the Freezer and Cold Storage facility is consistent with the requirements of work, health and safety policies, procedures, guidelines and legislative requirements.

Device Managers

Device Managers are responsible for:

1. Developing and implementing an operational plan that clearly outlines the procedures to be followed when responding to temperature fluctuation alarms and the identification of a fault. This includes the co-ordination

of responses to out-of-hours alarms, safety and access issues, and liaison with Security Services, Insurance Office, Facilities Management Unit, and researchers.

2. Undertaking a risk assessment and a valuation of the contents held within a device in consultation with the users of the device. This will include all of the anticipated costs that would be incurred should research need to be repeated due to loss or spoilage, and risks associated with temperature-sensitive chemicals.
3. Establishing and maintaining a risk management framework to protect stored materials.
4. Liaising with the Facility Coordinator in the development and implementation of an induction and training program and ensuring that cold storage devices are included in laboratory inductions. Induction and training should include discussion of the potential impact of losing research materials, encourage the responsible use of cold storage devices and work, health and safety requirements.
5. Liaising with the Facility Coordinator to ensure that devices used for the cold storage of research and other materials are protected according to the Importance Category of the stored materials (See Table 1).
6. Liaising with the Facility Coordinator in the development of a maintenance schedule and monitoring its implementation.
7. Ensuring that maintenance schedules are kept adjacent to cold storage devices.
8. Ensuring that filters and condensers on freezers are cleaned routinely as per manufacturer's instructions.
9. Liaising with the Facilities Management Unit when an alarmed device is relocated or taken off-line.
10. Developing, maintaining and displaying an emergency contact staff list for cold storage devices in all locations.
11. Developing an emergency plan, and ensuring back-up storage facilities are available at all times.
12. Managing the contents, undertaking a regular inventory of contents, and monitoring the space available in cold storage devices and removing redundant materials. A full audit for removal of redundant materials should be performed every 5 years.
13. Ensuring that the storage of materials in cold storage devices is consistent with the requirements of work, health and safety policies, procedures, guidelines and legislative requirements.

Laboratory Staff and Students

While minimising duplication of effort, laboratory staff and students should:

1. monitor refrigerator/freezer cabinet temperatures when the door is open for extended periods to ensure that the cabinet temperature does not rise above the alarm set point;
2. ensure that refrigerator/freezer seals remain clean to ensure correct closure of doors or lids;
3. ensure that a cool temperature is maintained in air conditioned laboratories as freezers may fail if the laboratory ambient temperature rises above 30 degrees Celsius;
4. not overload refrigerator/freezers with room temperature product;
5. immediately report changes in refrigerator/freezer operating characteristics to the Device Manager or Facility Coordinator if the Device Manager is unavailable;
6. ensure that the Device Manager is advised of amendments to the emergency contact list; and
7. ensure that the storage of materials in cold storage devices is consistent with the requirements of work, health and safety policies, procedures, guidelines and legislative requirements.
8. on receipt of advice relating to an issue with a device from the Security Monitoring Centre the relevant laboratory staff or student must investigate and contact Campus Security to advise what action will be taken.

Campus Security

1. On receipt of a call from the Security Monitoring Centre relating to a cold storage device alarm Campus Security will attempt to contact the persons responsible for the device according to the appropriate contact list. They will continue attempting to contact persons on the list until someone is contacted.

2. Once alerted by the Gallagher Alarm System, Campus Security will attend the location of the device in alarm. They will look for any obvious external cause and await advice from the responsible person who will have been contacted according to the appropriate contact list.

3. Campus Security will facilitate access should material need to be moved from a device.

Review

The Freezer and Cold Storage Working Group will provide the University Research Leadership Committee with an annual report by the end of March in each calendar year on the performance of the framework as a basis for improvement. This may form part of a broader report on the system of internal control. On a five year cycle, the Deputy Vice Chancellor: Research and Innovation, through the University Research Leadership Committee, shall arrange for a review of the policy and its supporting framework.