Code of Practice

BULK STORAGE

(Pressure Systems)

Contents

1 Purpose and Scope

This Code of Practice (CoP) applies to all bulk storage pressure equipment used by staff, students, and visitors at the University of Warwick. Specifically, it details the University-wide arrangements and responsibilities for the procurement, management, design, installation, maintenance, examination and use of bulk storage pressure equipment.

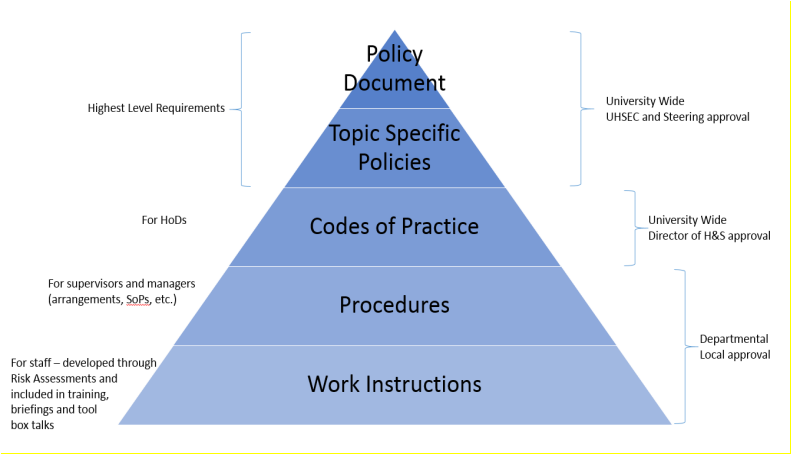
The objective of the management arrangements described within this code of practice is to ensure compliance with regulation, to follow industry best practice and to protect employees, students, third party occupiers, contractors and inspectors or any others that might use, operate, hire, maintain or inspect bulk storage pressure equipment used at the University.

Specifically excluded from this CoP are transportable cryogenic liquid storage tanks (such as cryogenic receptacles and dewars), or any other gases or liquids, such as LPG, oil or water, that may be stored in bulk tanks at the University.

This CoP forms part of the University of Warwick's Occupational Health and Safety Management System and supports the University of Warwick Pressure Systems Policy. It should be read in conjunction with the Policy and the associated guidance on the management of pressure systems, which are available on the University's Health and Safety web pages (Ref. 1).

Departmental/Estates arrangements for all other aspects of the management of bulk storage pressure equipment are detailed in local procedures, including Standard Operating Procedures (SOPs) and Work Instructions, as indicated in the document hierarchy below:

Figure 1: Health and Safety Document Hierarchy



This CoP is based on a new 'corporate approach' to overall accountability for statutory inspections and compliance at the University[1], with an initial focus on departments with a high volume of high-risk assets[2]

[1] The 'corporate approach' is a new initiative to align the way statutory inspection and compliance of equipment is managed across the University. Some of the accountabilities and responsibilities described within this document have therefore changed or are new. As such, there will be a transition period for this new approach to be fully implemented.
[2] Departments with the highest volume of high-risk assets: Faculty of Science, Engineering and Medicine.

2 Introduction

'Bulk Storage' is a term used at the University to identify a specific type of pressure equipment that is located within the Chemistry, Physics, Engineering, Life Sciences, Warwick Medical School. It is used for the bulk storage of gases (e.g., nitrogen, argon, carbon dioxide, helium, and hydrogen) used for teaching and research proposes.

The storage of gases in the liquid state under pressure on the University premises not only provides a practical way of storing gas, but when used in conjunction with a distribution system, it improves efficiency and safety by eliminating the need for cylinder handling. However, the properties of cryogenic liquids necessitate additional precautions to be taken in addition to the usual precautions for pressure equipment.

The principal legislation covering pressure equipment and pressure systems and therefore also the bulk storage equipment are the Pressure Equipment Regulations 1999 (Ref. 2) and the Pressure Systems Safety Regulations (PSSR) 2000 (Ref. 3), supported by the Approved Code of Practice, L122 (Ref. 4). Pressure equipment is also 'work equipment', and so the Provision and Use of Work Equipment Regulations (PUWER) 1998 (Ref. 5) also apply.

Further guidance is provided by the British Compressed Gases Association (BCGA) in their Codes of Practice CP36 'Cryogenic liquid storage at users' premises' (Ref. 6) and CP48 'The safe filling of third-party owned and/or maintained tanks' (Ref. 7).

This Code of Practice for Bulk Storage builds on the Code of Practice for Pressure systems. Both documents can be found on the University's Health and Safety web pages (Ref. 1).

At the University of Warwick, we have currently two types of bulks storage systems:

- leased bulk storage system where the owner is the third party;
- bulk storage systems owned by the University.

The University of Warwick is still legally responsible for the third party completing the inspections and any other relevant work correctly and within due dates. For a current list of leased and not leased bulk storage systems at the University of Warwick see Appendix A.

Any new bulk storage of cryogenic liquids identified as needed by department should be under a leased arrangement.

2.1 Terminology and Definitions

The list of terms and definitions most frequently used in legislation relevant for pressure systems and/or bulk storage is compiled below.

'Access Apron' is the area between the tank or fill point and a tanker where the process operating controls on both tank and tanker are accessible to the operator during filling/discharging.

'Bulk Storage' is a term used for a specific type of pressure system used at the University. These are large, installed static liquid storage tanks, with associated pipework and protective devices. Specific features of 'Bulk Storage' include:

- A permanently fixed and installed pressure system, external to the building, comprising one or more pressure vessels of rigid construction, any associated pipework, and protective devices;
- A temporary fixed and installed pressure system, external to the building, comprising one or more pressure vessels of rigid construction, any associated pipework, and protective devices;
- The tank is vacuum insulated and designed to store cryogenic liquids and generally has a water capacity over 200 litres;
- Contains or is liable to contain a cryogenic liquid but does not include gas cylinders or similar transportable pressure receptacles;

- The contents are delivered and filled by means of a road going tanker;
- Can be owned by the University, i. e. individual departments or increasingly and more commonly leased from a third party. If leased the owner of the bulk storage system is the third party.

'Cryogenic liquid' is type of relevant fluid as defined in PSSR. For the purpose of this CoP the examples are liquid oxygen, nitrogen, helium and argon.

'Gas supplier' is the organisation that supplies gas for the bulk storage system under the contract arrangement.

'Owner' of bulk storage system at the University is the third party (for leased bulk storage systems) or individual department (for not leased systems);

'Tank' is an assembly, complete with a piping system, of an inner vessel and an outer jacket containing insulation. The insulation space will normally be subject to a vacuum.

'User' of the bulk storage system is the department that has control of the operation of the bulk storage system = the department occupying the buildings that are supplied with the gas from the respective bulk storage tank.

'Vessel' is a pressure vessel, which may or may not be insulated.

'Written Scheme of Examination' (herein referred to as WSE) is required for bulk storage systems. This is a document listing all protective parts of the pressure system and all parts in which a defect may give rise to danger. A periodic examination must then be performed for those parts of the system covered by the written scheme of examination.

2.2 Training and Competence

It is the responsibility of individual departments to ensure that all University staff or students that may be directly involved in the operation and maintenance of bulk storage systems shall be fully informed regarding the hazards associated with cryogenic liquids and properly trained to operate or maintain the equipment as applicable. Training should cover those potential hazards that they are likely to encounter.

The training programme should make provision for refresher courses on a periodic basis. Records of all staff and student training on using the bulk storage equipment shall be retained in accordance with the University Records Retention Schedule (Ref. 8).

When procuring new bulk storage systems, the supplier shall be required to provide operating instructions for all the equipment and for the control of the whole system including emergencies. Departments must ensure that the appropriate staff and students have access to these instructions and are properly trained in the operation and use of this equipment or system.

Standard Operating Procedures for typical task involving the use of bulk storage equipment have to be created prior to using the equipment and communicated to personnel responsible for the task.

Where bulk storage systems are under direct control of the department it is the responsibility of that department to appoint a competent person to draw up written scheme of examination (WSE) or certify the existing WSE and carry out the examinations under that scheme. Details of WSE and responsibilities of that competent person are listed in Chapter 3.4 of this document.

Department in control of bulk storage equipment must take all reasonable steps to ensure that selected competent person can demonstrate the knowledge, experience and independence required for inspections of bulk storage equipment under certified WSE. e Bodies that have United Kingdom Accreditation Service (www.ukas.com/) accreditation to the British, European and international standard BS EN ISO/IEC 17020: 2004, for the scope of in-service inspection of pressure equipment, can provide competent persons meeting the appropriate criteria.

3 Requirements for Bulk Storage Equipment

There are significant requirements surrounding bulk storage and associated pressure equipment to ensure safety and compliance. This section details the specific requirements that shall be met when bulk storage is designed, procured, maintained and operated.

3.1 System Specification, Design and Procurement

The specification of bulk storage systems shall follow the guidance set out in PSSR 2000 Approved Code of Practice (Ref. 4). This includes the need for departments to identify:

- What part of the system has 'relevant fluid'[3] that is under pressure and falls under the remit of PSSR 2000 (Ref. 3), or indeed needs to comply with any other regulations;
- Properties of the 'relevant fluid';
- Conditions that affect the pressure in the bulk storage system under normal and abnormal conditions;
- The design parameters required for the particular application to ensure its suitability, which should all form part of a risk assessment, taking into account:
    - User competency;
    - Construction (materials, including any connections);
    - Protection against failure (protective devices);
    - Its location;
    - The environment it will operate in.

Commercially available products will require less scrutiny, (providing they are CE or UKCA marked) for example, than larger/bespoke systems.

Where a bulk storage system requires any element of design, prior to installation, it shall be specified in relation to the risk assessment for the specific application for which it is intended to be used.

When developing the specification, departments should seek advice from the H&S Lead, Technical Lead, or other competent person to help in the selection of the right type of bulk storage system.

When procuring new bulk storage equipment, the supplier shall be required to provide operating instructions for the equipment including how to use, check and maintain it, and, where relevant, for the control of the whole system including emergencies.

Going forward, the University's preferred procurement option for installed bulk storage equipment is a leased solution. Here the supplier assumes responsibility in writing (known as a 'Schedule 2 letter') for compliance with those regulations which deal with WSE, operation, maintenance and record keeping. The supplier would be the legal 'owner' of the bulk storage equipment.

When leasing the bulk storage equipment, the leasing department must still ensure its suitability and that it is safe to use. Arrangements must be put in place to ensure that the bulk storage equipment is maintained and examined at the appropriate intervals and there is a mechanism in place for defects to be reported and remedied. Where leased bulk storage equipment is connected to the University pipework or systems, the demarcation of responsibilities must be clearly established.

Most new pressure equipment, including the bulk storage systems, is subject to conformity assessment and must be appropriately CE or UKCA (UK Conformity Assessed) marked and accompanied by the Declaration of Conformity (DoC). The procuring department must ensure that new bulk storage equipment conforms to the

[3] The relevant fluid for bulk storage systems is cryogenic liquid which has a pressure greater than 0.5 bar above atmospheric pressure when in equilibrium with its vapours at either the actual temperature of the liquid or at 17.5 °C.

appropriate standards and regulations. Most new bulk storage would be introduced to the University of Warwick via Capital Project Process (see Appendix B for the process overview).

For the requirements that have to be achieved before the first fill refer to BCGA Leaflet 12 (Ref. 9).

3.2 Pre-Use Checks

PUWER (Ref. 5) requires that work equipment must be regularly inspected to see if there is any significant risk of major injury to users and others from the equipment's installation or use. A pre-use check is a basic type of inspection carried out by the user before the equipment is operated. The aim of such checks is to pick up faults due to wear and tear or malfunction of safety-related equipment between more extensive inspections or examinations.

Whilst 'gas suppliers' carry out pre- and post-fill checks when making deliveries, the 'user' has a duty to carry out routine safety inspections as detailed in the operating instructions. Most propriety bulk storage equipment will come with a user manual highlighting the appropriate pre-use checks and ongoing maintenance requirements. BCGA Leaflet 11 (Ref. 10) gives good indication of what the pre-user checks should be about.

A trained operator or other person carrying out the checks should be able to identify damage or excessive wear, structural defects, leaks, and other obvious faults which could affect the safe operation of the pressure equipment. If any defects are found, the user should report the defect to the Departmental Point of Contact (or if competent to do so, take action to rectify it). The Departmental Point of Contact would ensure the remedial work is organised without delay with the suitable contractor (for owned bulk storage) or arranged with 'owner' (for leased bulks storage equipment.)

3.3 Maintenance

Where maintenance requirements exist (equipment inspection, testing of safety valves, replacement of seals, etc.), these shall be undertaken in line with the manufacturer's prescribed intervals. If no such documentation exists, a risk-based approach will be undertaken to define the periodicity of such work, informed by the Technical Lead for bulk storage or other competent person, as necessary.

Maintenance may require isolation of a part or the whole system. Where this is the case, adequate arrangements shall be made with the department to avoid any risk of uncontrolled release of pressure or the pressure system contents (e.g. locking off, venting).

Maintenance tasks shall only be undertaken by personnel or contractors who demonstrate the required level of competence to undertake those tasks in a safe manner and to the required standard of workmanship.

Risk assessments for maintenance tasks shall be reviewed in cooperation with departmental staff, to ensure that information relating to the bulk storage equipment contents is adequately incorporated, in addition to the hazards and controls arising from the task itself and the work environment.

Departments must allow appropriate access when required to carry out maintenance activities; this should be facilitated through the Departmental Point of Contact for bulk storage equipment, having received prior notification, whenever possible.

Where departments carry out or organise maintenance tasks, a record must be kept locally and a copy made available, as required.

3.4 Written Scheme of Examination (WSE) and Examination of Bulk Storage Equipment

Under PSSR 2000 (Ref. 3), 'owners' and 'users' are required to demonstrate that they know the safe operating limits of your pressure systems, and that the systems are safe under those conditions.

A WSE is a document containing information about selected items of plant or equipment which form a pressure system, operate under pressure and contain a 'relevant fluid'. An item of plant from the pressure system should be included in the WSE if its failure could unintentionally release pressure from the system

and the resulting release of stored energy could cause injury. The WSE must specify the nature and frequency of examinations and include any special measures that may be needed to prepare a system for a safe examination.

The 'owner' must ensure that a suitable WSE is in place before the system is operated. The 'owner' also needs to ensure that the bulk storage equipment is examined by a competent person in accordance with the WSE and that WSE is updated after modification or repair to the system.

Further guidance on WSE is provided by the Health and Safety Executive in the leaflet 'Written schemes of examination: Pressure Systems Safety Regulations 2000', INDG178 (Ref. 11).

Departments must allow appropriate access, address other hazards and complete any preparatory work, as required to ensure that the examination can be undertaken safely; this should be facilitated through the Departmental Point of Contact for bulk storage equipment, having received prior notification from the 'owner', whenever possible (for leased bulk storage equipment).

The competent person undertaking the examination of bulk storage equipment owned by departments shall:

- review the content of existing WSE to determine whether it is suitable in current conditions of bulk storage equipment;
- undertake the examination of bulk storage equipment properly and in accordance with WSE;
- provide a report of the examination (including any remedial actions required) to the Departmental Point of Contact for bulk storage equipment, either directly or through electronic means;
- notify the Departmental Point of Contact for bulk storage equipment about imminent danger would this be the case.

The competent person should also update the information on the asset (e.g. a 'pass' label or similar indicator) to indicate the examination result.

Any component of the bulk storage equipment that is found to be defective during examination and poses (or could pose) a risk of injury to persons must be clearly identified and the local Departmental Point of Contact and any users in the area informed, prior to the competent person leaving that area. Such repairs as required for continued safe operation must be undertaken before the equipment is brought back into use.

Where the latest date for the next examination has passed, the 'owner' ensures the bulk storage equipment is taken out of use until a satisfactory examination has been achieved.

The Examination Process Overview for not leased bulk storage equipment can be seen in Appendix C**.**

3.5 Documentation and Record Keeping

New bulk storage equipment should be accompanied by instructions in English and, where appropriate, a Declaration of Conformity (DoC).

Documentary requirements may include relevant commissioning and initial examination/test results, system drawings, specifications, manufacturer's literature and component data.

Where it is not possible to obtain these documents from the manufacturer/installer of a system, the relevant information shall be determined and recorded, by a competent person, and be subject to review by the Technical Lead.

Asset information, as provided by departments to Estates, will be held within the University centralised asset management system.

For not leased bulk storage equipment the record of examination carried out by an external contractor should be provided to Departmental Point of Contact whose responsibility is to store these records securely on the University centralised asset management system and made available to those stakeholders requiring access to them. These records should be retained in accordance with the legislation:

- A WSE must be suitable throughout the lifetime of the system.
- The last examination report produced by the competent person under the WSE must be available and any other report that could assist in assessing the safety of the system, particularly in relation to repairs and modifications.

Records of all staff and student training on pressure equipment and pressure systems shall be recorded and retained in accordance with the University Records Retention Schedule (Ref. 8).

3.6 Decommissioning

Any proposed decommissioning of bulk storage systems must be advised to Estates.

Where bulk storage equipment is to be removed, consideration must be given to its safe removal, disconnection from any connected services, and disposal.

Decommissioning of bulk storage equipment must be undertaken by a suitably competent contractor. A suitable risk assessment must be undertaken for the decommissioning and disposal work, and information about the hazards posed by other work in the area must be made available by the department to those undertaking the decommissioning work.

Departments must ensure they follow relevant University financial procedures concerning disposal of assets and the update of financial asset registers and inventory lists.

Following decommissioning and disposal, Departments must complete the Statutory Inspection Report Form (Ref. 12) in order that the bulk storage system equipment is removed from the statutory examination register and from the University centralised asset management system.

4 Operational Use

The use of any bulk storage equipment must comply with PSSR 2000 (Ref. 3).

A suitable and sufficient risk assessment must be in place for filling pressurised and non-pressurised dewars and reflected in local SOP prior to any work involving bulk storage equipment and must be enacted by the department.

The department must ensure that bulk storage equipment is operated only by personnel trained to do so, and in line with the requirements and limitations of that system.

Use of bulk storage equipment should only commence following any required user checks, any applicable examination, and an assessment that the system is operating correctly by the department.

If a health and safety incident occurs with a bulk storage system this should be recorded on the University H&S reporting system Assure.

Where there is a failure of the bulk storage equipment, an adverse incident, a significant change in the process, or other factors that could affect safe operation, the use of that system shall cease, the system should be suitably isolated, and a notice displayed to inform potential users. The system shall not be brought back into use until any relevant investigation, maintenance or examination has been completed and the system declared suitable.

Appendix D provides an overview of the user checks and fault reporting process to be used at the University of Warwick.

5 Responsibilities

The principal responsibilities for the management of health and safety are stated in the University of Warwick Health and Safety Policy (with line management/delegation of duty described in the document 'Leadership and Management of Health and Safety at the University of Warwick') and complemented by a topic specific Policy for Pressure Systems. These documents are available via the University's Health and Safety web page: https://warwick.ac.uk/services/healthsafetywellbeing/guidance/handspolicy.

The Responsibilities Grid in Appendix E details the specific accountability and responsibilities of key personnel involved in the management of bulk storage equipment. Accountability and responsibilities in relation to pressure systems in general are described in the Code of Practice for Pressure Systems, which is available on the University's Health and Safety web pages (Ref. 1).

Appendix F outlines three lines of defence for bulk storage systems.

6 References

1. University of Warwick Pressure Systems Policy and associated instructions and guidance: https://warwick.ac.uk/services/healthsafetywellbeing/guidance/pressuresystems
2. Pressure Equipment Regulations 1999: https://www.legislation.gov.uk/uksi/1999/2001/contents/made
3. Pressure Systems Safety Regulations 2000 (SI 2000/128): https://www.legislation.gov.uk/uksi/2000/128/contents/made
4. Pressure Systems Safety Regulations 2000. Approved Code of Practice (ACOP L122): https://www.hse.gov.uk/pubns/books/L122.htm
5. Provision and Use of Work Equipment Regulations 1998 (PUWER): https://www.legislation.gov.uk/uksi/1998/2306/contents/made
6. BCGA Code of Practice CP36, Cryogenic Liquid Storage at Users' Premises: https://bcga.co.uk/publications/cp36-cryogenic-liquid-storage-at-users-premises-revision-2-2013/
7. BCGA Code of Practice CP48, The Safe Filling of Third-party Owned and/or Maintained Tanks: https://bcga.co.uk/publications/the-safe-filling-of-third-party-owned-and-or-maintained-tanks-2020/
8. University Records Retention Schedule: https://warwick.ac.uk/services/sim/guidance/recordsmanagement
9. BCGA Leaflet L12, Cryogenic Tanks, Users Responsibilities: https://bcga.co.uk/wp-content/uploads/2023/07/BCGA-L12-Revision-2-19-07-2023.pdf
10. BCGA Leaflet L11, Safety Checks for Cryogenic Tanks: https://bcga.co.uk/wp-content/uploads/2021/09/BCGA-L11-Rev-2-010720.pdf
11. Written schemes of examination: Pressure Systems Safety Regulations 2000. HSE, INDG178: https://www.hse.gov.uk/pubns/indg178.htm
12. Statutory Inspection Report Form: https://warwick.ac.uk/services/healthsafetywellbeing/guidance/statest/crimson/plant_equipment_statutory_testing/

7 Document Control

Document Control			
Version Number	**Date issued**	**Author**	**Update information**
v1	10/02/2025	John Brandist M Prokešová Graham Hakes	Initial version of document.
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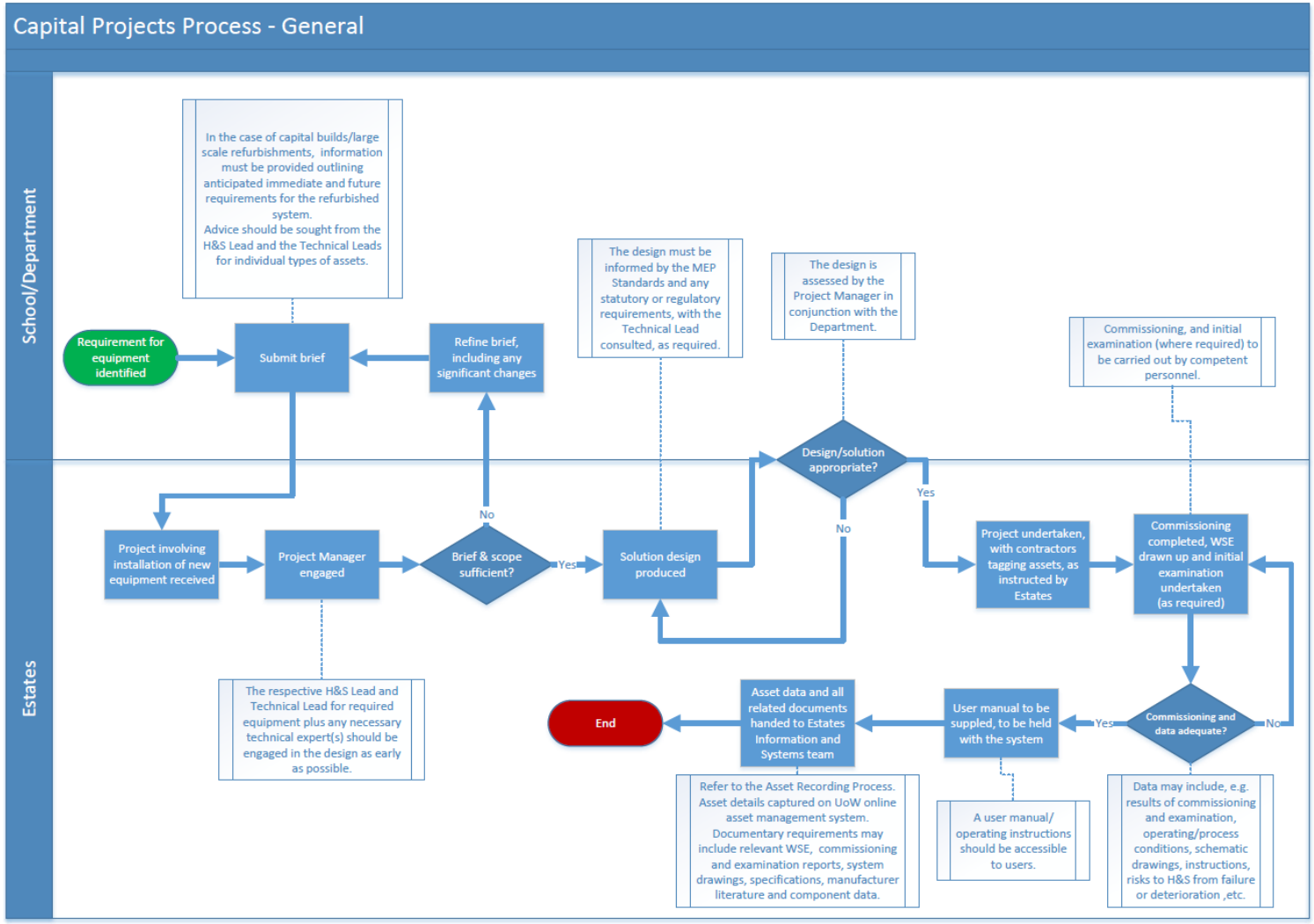
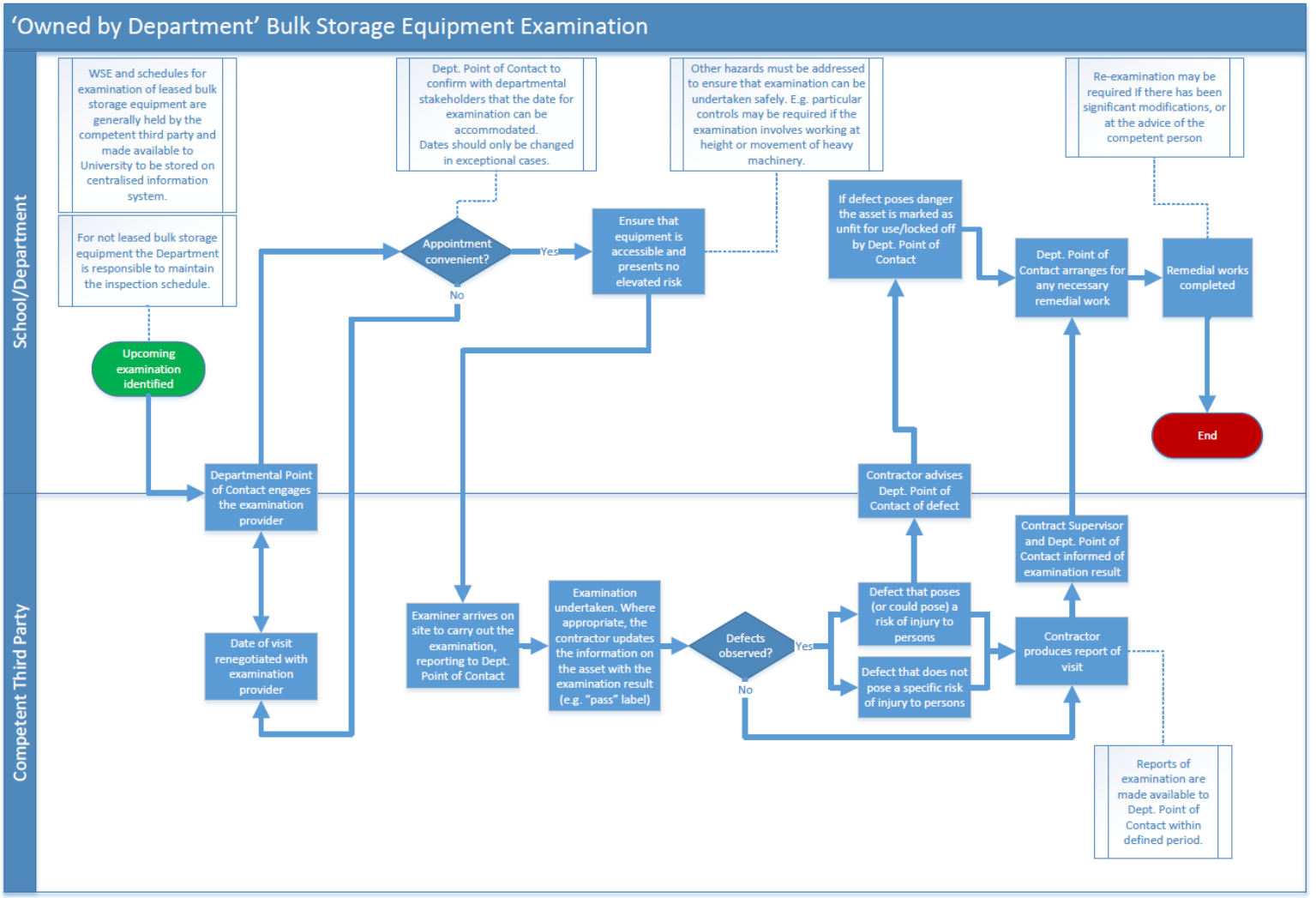
Appendix A – List of Bulk Storage Equipment at the University of Warwick

Campus	Location	Gas	Owned/ Leased?	Legal owner	Capacity (L)	Year Manufactured
Gibbet Hill	Behind D block	Carbon dioxide	Owned - SLS	UoW	950	2004
Gibbet Hill	Behind D block	Nitrogen	Owned - SLS	UoW	950	2004
Gibbet Hill	Outside Stores	Nitrogen	Leased	BOC	1945	2009
Gibbet Hill	Rear of MCBB	Nitrogen	Owned - WMS	UoW	2000	2015
Gibbet Hill	Phytobiology Facility yard	Nitrogen	Leased	Air Products	240	2013
Gibbet Hill	IBRB yard	Nitrogen	Leased	Air Liquide	2956	2020
Central campus	Millburn House	Nitrogen	Leased	Air Liquide	20533	2019
Central campus	Millburn House	Nitrogen	Leased	Air Liquide	3000	2013
Central campus	MASB	Nitrogen	Owned - Physics	UoW	2000	2011
Central campus	MASB	Nitrogen	Owned - Chemistry	UoW	4737	2011
Central campus	MASB	Argon	Owned - Physics	UoW	3160	2013
Central campus	Physics	Helium	Owned - Physics	UoW	6160	2005
Central campus	Physics	Nitrogen	Leased	Air Liquide	3000	2020
Central campus	Physics	Nitrogen	Leased	Air Liquide	30000	1993
Central campus	Physics yard	Hydrogen	Leased	Air Liquide	Multi cylinder pack	As per cylinder
Central campus	Rear of D block	Nitrogen	Owned – Nanofabrication RTP	UoW	950	2010
Central campus	Rear of B Block	Nitrogen	Leased	BOC	3000	
Central campus	By Chemistry Solvent store	Nitrogen	Owned - Chemistry	UoW	16000	2007
Central campus	Rear of B Block	Argon	Leased	BOC	200	2007
Wellesbourne campus	PFB service yard	Nitrogen	Leased	Air Products	230	

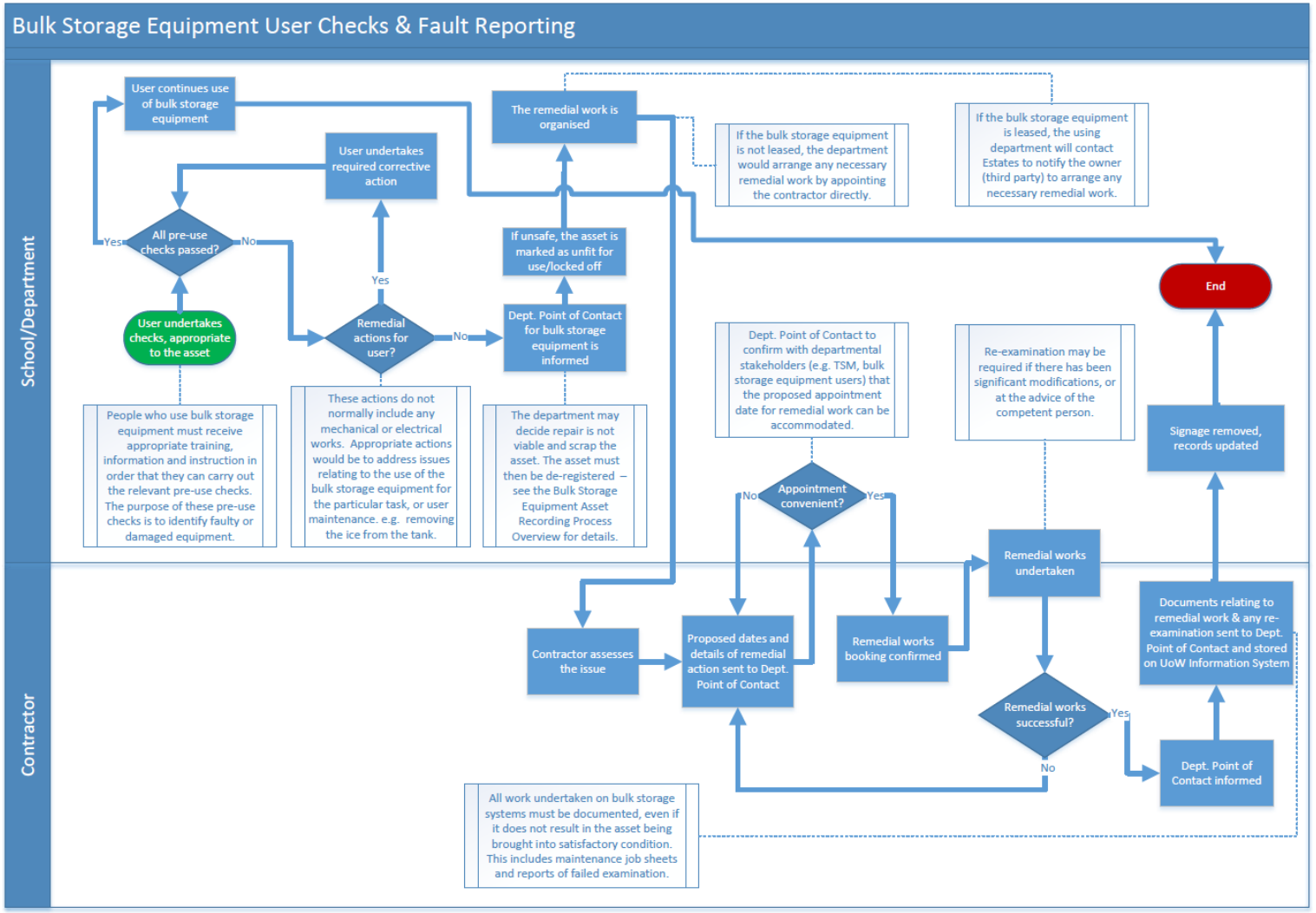
Appendix B – Capital Project Process Overview



Appendix C – Equipment Examination Process Overview for not Leased Bulk Storage Equipment



Appendix D – User Checks and Fault Reporting Process Overview for Bulk Storage Equipment



Appendix E – Responsibility Grid for Bulk Storage Equipment

Roles and Responsibilities – Statutory Inspections & Compliance (December 2024)

			ACCOUNTABLE	RESPONSIBLE			TASK	SUPPORT			INFORM	ASSURANCE				
Prog Board Area	**Statutory Area**	**Corporate Approach**	**Accountable**	**Responsible**	**Delegated Responsibility**	**Delegated Responsibility**	**As Detailed in the CoP**	**Departmental Point of Contact**	**Estates Technical Lead**	**Health and Safety Lead**	**Inform**	**First Line**	**Second Line**	**Third Line**	**Comments**
Bulk Storage	**Bulk Storage – leased**	Yes	Third party	Third party	Third party	Third party	Detailed in the CoP	Technical Services / Facilities Management / Building Manager / Technical Services Manager Deputy	Maintenance Manager, Mechanical Services	Senior Adviser, Health and Safety Services	Technical Services / Facilities Management / Building Management Users	Third party	Estates Assurance Departmental Assurance / Compliance Health & Safety Officers	Health and Safety Services Internal Audit (Governance)	Owner is the third party up to demarcation line.
Bulk Storage	**Bulk Storage – owned by Departments (not leased)**	Yes	Head of Department	Technical Services Manager	Deputy Technical Services Manager (if available)	Senior Support Team (if in place)	Detailed in the COP	Technical Services / Facilities Management / Building Manager / Technical Services Manager Deputy	Maintenance Manager, Mechanical Services	Senior Adviser, Health and Safety Services	Maintenance Manager, Mechanical Services / Users	Technical Services / Facilities Management Departmental Point of Contacts	Estates Assurance Departmental Assurance / Compliance Health & Safety Officers	Health and Safety Services Internal Audit (Governance)	Department must fulfill the responsibilities of owner as defined in PSSR 2000.

Corporate Approach where arrangements for statutory inspection and compliance are centrally managed by Estates.

R = Responsible who is in charge of recommending what work is done and making sure it happens.
A = Accountable who has final decision power on the work.
T= Task who actually does the work (or arranges for it to be done).
S = Support who is involved to provide support to the work.
I = Informed who is informed that the work has been done (or will be started).
A = Assurance who is checking that the work is done and procedures are followed.

E.1 Duties of the Estates Technical Lead for Bulk Storage

Appointed by the Director of Estates or other member of the Estates management team, the Estates Technical Lead for Bulk Storage (the Technical Lead) shall be the lead advisor within the University on matters relating to the technical and engineering aspects of bulk storage systems. The Technical Lead, working with the H&S Lead and supported through engagement of competent personnel or consultants, as necessary, is responsible for:

- ensuring they maintain and keep up to date technical knowledge of industry standards and best practice concerning bulk storage systems and understanding of the relevant legislation, ACOPs and sector guidance, communicating any updates that may impact others in the organisation;
- providing technical advice to the accountable person, and any other person with allocated responsibility in this document, on the engineering aspects for bulk storage systems that must be achieved with respect the discharging of their duties. These include, but are not necessarily limited to, specification, design, procurement, maintenance, servicing, examination, inspection and operation of bulk storage systems;
- providing internal technical guidance in relation to the selection, procurement and installation of new assets, maintenance, servicing, examination, inspection and operation of bulk storage systems;
- identifying any technical training and awareness required, across the University;
- supporting the development of policy and the creation and update of departmental SOPs;
- reviewing requests for new bulk storage systems, as advised to them by Departments or Capital Programmes, and advising on suitability with the new or existing building infrastructure;
- providing technical advice concerning the generation of documents essential to system compliance, where these have not historically been in place;
- highlighting any non-compliance discovered or reported to them, to the person responsible, escalating if required.

The Estates Technical Lead for Pressure Systems will also assume (or delegate to an appropriately trained and competent person) the responsibilities of the Estates Technical Lead for Bulk Storage. For details on the duties of the Estates Technical Lead for Pressure Systems see the Code of Practice for Pressure System.

E.2 Duties of the Health and Safety Lead for Bulk Storage

Appointed by the Director of Health and Safety, the Health and Safety Lead for Bulk Storage (the H&S Lead) shall be the lead advisor within the University on matters relating to bulk storage safety. The H&S Lead, working with the Estates Technical Lead and supported through engagement of competent personnel or consultants, as necessary, is responsible for:

- ensuring they maintain and keep up to date knowledge of the health and safety legislation and associated Regulations, ACOPs or sector guidance concerning bulk storage systems, communicating any relevant updates that may impact others in the organisation;
- providing advice to the accountable person, and any other person with allocated responsibility in this document, on the health and safety standards and regulations that must be achieved with respect to the discharging of their duties. These include, but are not necessarily limited to, design, procurement, maintenance, servicing, examination. inspection and use of bulk storage systems;
- providing internal guidance in relation to the creation and installation of new assets, maintenance, servicing, examination and inspection and use of bulk storage systems;
- identifying any health and safety training and awareness required, across the University.
- supporting the development of policy and the creation and update of departmental SOPs;

- reviewing requests for new bulk storage systems, as advised to them by Departments or Capital Programmes, and providing health and safety advice;
- providing health and safety advice concerning the generation of documents essential to system compliance, where these have not historically been in place;
- highlighting any non-compliance discovered or reported to them, to the person responsible, escalating if required.

The Health and Safety Lead for Pressure Systems will also assume the responsibilities of the Health and Safety Lead for Bulk Storage. For details on the duties of the Health and Safety Lead for Pressure Systems see the Code of Practice for Pressure System.

Note: The H&S Lead is not an Engineer or technical person, but someone with the necessary Health and Safety background, experience, and training to be able to interpret the associated Regulations, ACOPs or sector guidance, etc. They would typically be a chartered Health and Safety professional (CMIOSH) responsible for interpretation of law/HSE requirements and advising others within the University accordingly.

E.3 Duties of Heads of School/Department for Bulk Storage

Heads of Schools/Departments, supported by their respective managers and personnel, are responsible for:

- ensuring local implementation of the Pressure Systems Policy, this Code of Practice and the associated arrangements, instructions and guidance, in areas under their control;
- ensuring that bulk storage systems under the control of department (not leased from third party) are regularly maintained, and inspected as prescribed by the WSE created for these systems;
- ensuring that departmental procedures (SOPs, work instructions, local emergency procedures) are created and communicated, detailing how an activity or process using bulk storage systems within that department is to be carried out, managed and monitored;
- identifying the Departmental Point of Contact(s), to act as the primary interface(s) to Estates and users with regards to bulk storage (see E.5);
- ensuring the production and review of suitable and sufficient risk assessments for activities involving bulk storage systems under their control;
- ensuring the identification, implementation and monitoring of control measures concerning risks from bulk storage systems under their control;
- ensuring that local arrangements including training are put in place concerning the filling and decanting of cryogenic liquids or liquified gases within pressure systems under their control;
- ensuring that departmental assurance checks are carried out at agreed intervals, documented and made available to the Director of Health and Safety and the Director of Estates or their nominated deputies;
- ensuring that they have visibility of reports relating to examination, preventative maintenance and remedial maintenance of bulk storage in the areas under their control.

E.4 Duties of Technical Services Managers/Facilities Managers for Bulk Storage

- ensuring that any person under their control required to undertake work on bulk storage equipment has sufficient competence to safely complete the task, and that any relevant arrangements have been made to mitigate risks to safety;
- ensuring that work involving use of bulk storage equipment is risk assessed and that the identified control measures adequately cover the risk of uncontrolled release of cryogenic liquids under pressure;
- ensuring bulk storage equipment is used in accordance with the user manual/operating instructions and within design parameters;

- ensuring that the Technical Lead and H&S Lead (or other competent persons, as appropriate) are consulted regarding any proposed modifications to existing bulk storage systems before any changes are made;
- cooperating with arrangements for maintenance, examination and remedial works, providing local technical and facilities support, as required;
- ensuring that departmental checks are carried out to provide assurance that activities relating to pressure systems maintenance and examination are being performed in compliance with the Policy and arrangements. Thus, providing a 'first line of defence' for assurance, as illustrated in Appendix F;
- escalating any non-compliance discovered or reported to them, to the Head of School/Department.

In many departments the Technical Service Manager/Facility Manager will also assume the responsibilities of the Point of Contact for Bulk storage systems.

E.5 Duties of Point of Contact for Bulk Storage (School/Department)

Departmental Point of Contact(s) for Bulk Storage are responsible for:

- validating that all bulk storage systems used within their department or facility are included in the list of UoW bulk storage equipment (see Appendix A) and later in the University centralised asset management system;
- for bulk storage systems under the control of department to locally timetable and facilitate maintenance/inspection visits, examination and remedial works related to bulk storage systems);
- informing end users when bulk storage equipment has failed examination, ensuring it is marked as unfit and taken out of use, until remedied;
- for bulk storage systems under the control of department monitoring and escalating to Technical Service Manager/Facilities Manager, reports of defects, failure, or issues with regards to bulk storage systems.

E.6 Duties of Users of Bulk Storage Equipment

Staff and students using bulk storage system are responsible for:

- ensuring they operate bulk storage system as per training and with correct PPE;
- undertaking any user checks of the bulk storage system that may be required;
- not using the bulk storage system inappropriately or for anything other than its intended purpose;
- following the operating procedures, including any local emergency procedures in the event of a failure of the bulk storage equipment;
- maintaining safe working environment when filling the pressurised and non-pressurised Dewars with cryogens;
- reporting any observed defects without delay to Departmental Point of Contact.

Appendix F – Three Lines of Defence