24. BUILDINGS SYSTEMS

24.1.1 Contents:

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24.2.1 Aim: To describe several core buildings systems and the associated health and safety implications of these.

24.3.1 Vacuum Systems:

- The installed vacuum system within the laboratories is a dry vacuum system;
- Liquids should not be directly drawn into the system; and
- If there is a risk of liquids entering the system, then arrangements must be made to ensure that adequate traps and collection bottles are in place prior to the tap connection.

24.4.1 CO_2 Manifolds:

- A number of the University buildings on the Edinburgh bioQuarter campus are equipped with a centralised piped CO_2 system that feed outlets throughout some laboratory areas;
- The pipe-work, where provided, terminates with a sprung loaded spigot connection that shuts the line on removal;
- The main line pressure has been set to provide an adequate feed pressure to CO_2 incubators and should not be adjusted without prior consultation with other users; and
- It is important that users fully understand that anything causing a local leak could lead to a total loss of CO_2 throughout the building.

24.4.2 Building ventilation systems may be shut-off for periods of time, either for maintenance or to conserve power outwith *hours of expected building occupancy* (see Section 9 of this Manual for definition). In laboratories with piped supplies of CO_2, perhaps to supply CO_2 incubators, staff should be aware, and locally generated risk assessments for work outwith hours of expected building occupancy should take account of the potential for a room to be partially flooded with CO_2. Staff should know where ventilation shutdown override switches are located and how to use these to ensure adequate air changes before commencing work outwith hours of expected building occupancy. Further information on safe working within laboratories is available at Section 14 of this Manual.

24.5.1 Liquid Nitrogen:

- Liquid nitrogen is fed into Room GU402 of the Chancellor's Building from a 2,000 litre tank situated at the rear of the building;
- Due to the long length of piping from the Chancellor's Building main tank leading into the building, it has been found that there are considerable losses due to venting-off large quantities of nitrogen gases, often requiring attendance over weekends and holiday periods to replenish reservoirs. Users are, therefore, encouraged to fill Dewars towards the end of each week, before the final end-of-week replenishment of the main reservoir on Friday afternoons, otherwise the reservoir will be run down even before the weekend commences (full details are contained in Section 14 of this Manual);
- E0.09, the liquid nitrogen plant room in the QMRI, is fed from a 4,000 litre liquid nitrogen storage tank;
- The liquid nitrogen plant room serving the CRM building is also fed from a 4,000 litre storage tank;
- BOC have responsibility for ensuring that adequate stock levels are maintained at all times; and
- As there is a serious risk of personal injury, the decanting of liquid nitrogen must *only* be carried out by authorised personnel who have received appropriate training, and a "buddy system" must be used so that no person is alone within the room and unsupported at any time.

24.5.2 Further information on safe handling of cryogens and operation of liquid nitrogen plant rooms is available at Section 14 of this Manual and should be consulted by all room users.

24.6.1 Autoclaves and Pressure Cookers:

- Centralised autoclaves are provided in the Chancellor's Building in rooms FU4252 and FU432;
- Centralised autoclaves are provided in the QMRI in rooms E1.51, E2.52 and E3.28; and
- Centralised autoclaves are provided in the CRM building in rooms G0.03 and G0.04.

24.6.2 Hazards associated with autoclaves include those associated with creation of high temperature steam inside pressure vessels, loading and unloading operations, and failure to sterilise contaminated waste.

24.6.3 Autoclaves should be operated only by persons who have been adequately and appropriately trained to use them correctly. Protective clothing should be available in the loading/unloading area, including an impervious apron, heat-resistant gauntlet-type gloves, suitable heavy-duty footwear or overshoes, and a full-face visor.

24.6.4 Before each use, a visual inspection should be made of seals, valves, metal surfaces intended to come into contact during operation, dials, gauges and other

instruments to check that these are undamaged. All faults and defects must be reported to the senior laboratory manager and steps taken to ensure that the equipment is not used again before inspection by a competent person, and that such repairs as may be necessary have been completed and the equipment recertified as safe for use.

24.6.5 All autoclaves and other pressure vessels (including pressure cookers and other gas pressure vessels such as gas cylinders) must be notified to a designated engineering insurance surveyor, and inspected at the statutorily required interval. Notification of newly acquired equipment within Edinburgh bioQuarter, and arrangement of inspections and repairs, should be made through Buildings Managers to ensure compliance with the relevant safety regulations.

24.6.6 Where an autoclave is used to decontaminate or make-safe waste, the process must be validated at least annually and at any other times when the previous test may no longer be valid (such as part of re-commissioning after maintenance work). Records of validation should be kept for five years.

24.6.7 Detailed guidance on autoclaves is provided on the University's Health & Safety Department website. Workers in the University must refer to and follow the guidance at:

https://www.ed.ac.uk/health-safety/guidance/laboratories/pressure-vessels

24.7.1 Laboratory Decommissioning: When laboratories are vacated, for example due to relocation or change of use, it is necessary to ensure no hazardous materials are left behind and, where appropriate, the fixtures and fittings have been decontaminated and made safe for future use or removal. A checklist that can be used to record the laboratory has been suitably decommissioned is provided at:

https://www.ed.ac.uk/health-safety/online-resources/checklists

24.7.2 On completion, the checklist should be displayed at all entrances to the laboratory and the originator should retain a copy for their records. A completed decommissioning checklist does not precludes the need for maintenance staff and contractors to be issued with a Laboratory Permit to Work before commencing work in such an environment (see Section 22 of this Manual).

24.7.3 If radioactive materials have been used in the laboratory, a Decommissioning of Radiation Laboratories Checklist must also be completed. Further details and a copy of this checklist are available at:

http://www.docs.csg.ed.ac.uk/Safety/rpu/cop/lab_decom_checklist.pdf

24.8.1 Further information: Further information on building systems, policies and procedures may be obtained from Buildings Managers.

24.8.2 Further information on laboratory decommissioning may be found at:

https://www.ed.ac.uk/health-safety/guidance/laboratories-workshops/lab-management

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