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Short revision by HS 2022

UNIVERSITY OF SUSSEX

Safety Procedure/Guidance numq6/Guidance

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1. LEGAL REQUIREMENTS

1.1 The Health and Safety at Work Act (HASAWA)

8. **Section 1** of the Act requires the University to secure the health, safety and welfare of

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14. **Section 7** sets down the duties of workshop staff who must:

(a) work safely and take care for the health and safety of themselves and their colleagues, and

(b) co-operate with their employer (the University/the Workshop Supervisor) to comply with health and safety legislation.

15. **Section 37** is aimed specifically at supervisors and managers, who could be personally liable if they fail to take action when safety regulations are broken where the HSE may prosecute the individual supervisor rather than the University.

1.2 The Management of Health and Safety at Work Regulations MOHASAW

16. The most fundamental requirement is that all **managers and instigators of work, e.g. research supervisors, members of faculty and technical supervisors, must make a formal hazard and risk assessment for the tasks they wish to be undertaken**. In workshops the assessment may be a two-part process:

(a) the assessment made by the designer of the item to be constructed - taking into account the possible toxicity of the materials to be used, their strength and their suitability;

(b) the assessment to be made by the Workshop Supervisor who again needs to consider the strength of the construction as well as the safety of the workshop staff in whatever methods of work are to be undertaken, e.g. the hazards from welding operation, the risks of injury using lathes, drills and other power driven machinery.

17. Each Risk assessment must identify the **hazards** which may arise, e.g. from use of machines, welding equipment, materials, fire, noise, electricity, high pressure, gases, etc.

18. **Risks to Health** must then be considered, e.g. the hazards from use of machines, being trapped by machines, amputations caused by machines/saws, burns, eye damage from welding, fires, explosions from use of acetylene, risks from inhalation of cadmium fumes, etc.

19. Also to be considered in the risk assessment is the possibility of any breaches of safety legislation, e.g. Electricity at Work to

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Short revision by HS 2022

SPG-2-09

Acknowledgeents: Orginal written

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38. All students and visiting research workers must obey the instructions given by the Workshop Supervisor and must follow the requirement of the this code.

Entry Control

39. Each workshop shall be securely closed when proper supervision is not available and, apart from those regularly employed as operators or supervisors in workshops, permission to use any machine must always be first obtained from the person in charge.

Legislation

40. The Workshop Supervisor must ensure that copies of all relevant legislation and regulations are readily available.

Codes of Practice and Notes of Guidance

41. Mechanical Engineering Workshop Supervisors must keep a copy of the Health and Safety Executive publication, ***Health and Safety in Engineering Workshops,*** ISBN 0 717617173. The HSE has made it clear that **if the Guidance in this publication is followed, then the Workshop Supervisor will normally be exercising sufficient managerial control to comply with current health and safety law.**

42. The Workshop Supervisor must also keep copies of relevant **University Local Rules and University Safety Policies** so that they are **readily available to workshop staff**.

Safety Bookshelf /Cupboard/Boxfile

43. It is advised that every workshop has a prominently labelled bookshelf, cupboard or box file where safety advice literature and booklets are kept for reference by workshop staff.

Safe Work Rules

44. The execution of work by safe methods must always take precedence over deadlines determined by the person commissioning the work. Horseplay must never be allowed in workshops. It can result in serious injuries.

Lone Workers

45. Unless at least two persons are present, none of the fixed workshop machines may be used. Some hand held power tools may be used with the specific approval of the Workshop Supervisor. In certain areas lone working may be allowed, if agreed by the risk assessment and the Safety office, if a personal alarm device is provided to summon assistance. Refer to **the University Lone Working Policy**

3. LOCATION OF MACHINES

Machine Clearance

46. Machines must always be located within a workshop in such a way as to ensure that there is always adequate room to work without risk of endangering an operator at any other

machine nearby, or any other persons within the workshop area. The clearance between moving slideways and fixed adjacent objects should not be less than 0.5 m.

4. HOUSEKEEPING, LIGHTING, VENTILATION AND TEMPERATURE

47. See SPG-22-09 *Guidance Notes for implementing the Workplace (Health, Safety and Welfare) Regulations and incorporating Procedures for minimising the Risk of Falls on a Level*

48. The Workshop Supervisor must ensure that the working environment is satisfactory, and that any deficiencies are immediately brought to the attention of the School Safety Adviser/coordinator

Temperature

49. The workshops should always be above 13 degrees celcius when machines are operated.

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any personal clothing which comes into contact with cutting oils, is essential. (COSHH Regulations)

Lighting

56. The Workshop Supervisor shall ensure that there is always adequate lighting in the area under his control. Because it is known that the removal of one tube from a twin-tube fluorescent fitting may, under certain circumstances, produce a stroboscopic effect in relation to rotating machinery, 24-50 volt local tungsten lighting must be provided at each such machine where this is considered appropriate and fluorescent lighting be regarded only as background lighting. Staff must be warned that the stroboscopic effect can make moving machinery appear stationary. (Workplace (Health, Safety and Welfare) Regulations)

Ventilation

57. The Workshop Supervisor must satisfy himself that the ventilation in the area under his control is satisfactory having regard to the nature of the work being undertaken. This is particularly important in areas where welding and/or brazing is being carried out. These areas must be either boothed or screened and equipped with high speed local ventilation in addition to the general workshop ventilation. Staff must be aware that fumes from cadmium containing metals can kill. (Workplace (Health, Safety and Welfare) Regulation)

Painting

58. Any area in which spray painting is being carried out must be particularly well ventilated and free of all sources wh1q0.0c18(n TJETQ0.000008873 0 595.44 841.92 reW*nBT/F1 12 Tf1 0 0

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Safe Restart of Machines

76. Particular attention must be given to the control circuitry associated with all machines to ensure that when the power supply to each machine is interrupted whilst the machine is running, the machine will not automatically restart when the power is restored.

Safeguarding

77. Robots are defined as automatically controlled reprogrammable machines which may be capable of undertaking a wide range of movements, some of which may involve quite rapid movements. Since unguarded moving parts may cause injury, the HSE has issued HS(G)43 *Industrial robot safety*, which gives detailed information on methods for guarding robot systems. This document should be consulted wherever robot systems are to be installed.

Clothing when Using Machines

78. In addition to being responsible for ensuring that only competent operators are permitted to use machines unsupervised, the Workshop Supervisor must alvis (a)4(th840((a)4(t0a)9(t10 G[r1

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85. Serious accidents can occur with portable grinding tools, which must be treated as abrasive wheels, but which also must be subject to the control and testing required for portable

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Protective Clothing

93. Suitable protective clothing must be provided for the use of staff wherever this is considered necessary in the interests of their health and safety, and such protective clothing must be provided without cost to the individual, where required by the regulations. (PPEAWR)

94. Protective clothing shall be inspected/laundered/cleaned/changed as often as may be appropriate for the item concerned, and this also shall be without charge to the individual. It is especially important that overalls contaminated with cutting oils be effectively cleaned to minimise the risk of cancer from these oils.

95. Gloves of appropriate design and material are necessary and shall be provided for use when welding/brazing operations are to be carried out, but gloves should NEVER be worn when working with rotating machinery.

96. When handling very low temperature materials the correct insulating gloves must be supplied and used. For work with liquid nitrogen each glove must be loose fitting so that it can easily be shaken off if liquid splashes inside it. Advice on the suitability of gloves can be obtained from the University Safety Office.

97. Where appropriate, workshop staff are advised to wear safety shoes with reinforced toe caps - heavy metal objects, if dropped, can cause serious foot injuries!

Eye Protection

98. It is a legal requirement that an employer must provide appropriate eye protection either by means of personal eye protectors or by means of a fixed shield or shields, wherever the use of such eye protection is called for. (PPEAWR)

99. In the case of personnel who are regularly employed in a process or operation in which the use of eye protectors is required, such eye protectors shall be given into the personal possession of the individual concerned.

100. Where an individual is only occasionally engaged in a process or operation requiring the use of eye protectors, a sufficient number of eye protectors must be provided, maintained and kept readily available for use.

101. In any instance where personal eye protection is required, this must be made available for use by visitors, students and others whether or not they be employees of the University.

102. Where personal eye protection is required, the Workshop Supervisor must ensure that

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113. Due attention must be given not only to the level of noise but also to its frequency range (Hz) because the protection afforded varies greatly with frequency. In certain circumstances it may be necessary to have a frequency analysis of the noise in order to select the correct protector.

114. **Impact noise** - e.g. sound/pressure rise from 60-120 dBA in 0.5 ms. The ear cannot cope and instantaneous deafness will result. Great care must, therefore, be taken where impact noise occurs to ensure that even the protected

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gas, both cylinders must have flashback arrestors and hose check valves should be fitted next to the torch, where the gases are mixed, prior to combustion.

128. Make sure that the regulator you are going to use can cope with the maximum pressure in the cylinder (this is marked on the cylinder label).

129. When opening the cylinder spindle valve, only open the valve one turn. **Never** remove the valve key, it may be needed to quickly shut off the gas. Before fitting the regulator, wear safety goggles and snift the cylinder, i.e. use a quick blast of gas to remove any dirt from the cylinder connections. **NEVER** do this with hydrogen - it ignites spontaneously and the flame is invisible!

130. If a cylinder falls over, the valve will only bend. If it did sheer off, the cylinder would only spin or move at 6 kph along the floor.

Hoses

131. Hoses must be of the correct thickness to withstand the required operating pressures. They must also be in good condition, and kept clear of possible damage by cuts, cracks and burns, and contact with oils, solvents, **grease**

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solid packing material. Therefore, it is important that the cylinder is always **stored and used in an upright position**. It is also unsafe to use acetylene at a rate exceeding 20% of the cylinder contents each hour or acetone may boil off, thereby reducing the stability of the cylinder contents. To minimise the risk of flashback to the cylinder ALWAYS ensure an adequate flow of fuel gas is issuing from the blowpipe nozzle before lighting the gas (see paragraph 137).

135. In the case of all combined acetylene and oxygen apparatus, **flashback arrestors** must be fitted to both the oxygen and the acetylene cylinders. In addition, hose check valves should be fitted next to the torch.

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approximately 90 kg, so wear safety shoes with steel toe caps! Also wear **clean** gloves - this allows you to "milk churn"

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12. ELECTRICAL EQUIPMENT

Hazards

157. These include:

- Electric shock (few milli amps at more than 40 volts can kill). For resuscitation summon a local first aider and dial 3333 to get a mobile first aider. These are on radio call at all times.

- Fire or explosion - keep solvents from electrics which may spark or overheat.

- Flash burns from electric arc.

- Physical injury may occur if a person receiving a slight shock jumps backwards violently.

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The Manual Handling Operations Regulations

162. Nationally, more than 20% of accidents involving more than three days absence from work are caused by manual handling operations. Most of these accidents could have been avoided if managers and supervisors had paid more attention to examining the risk of injury and the establishment of safe systems of work. It is therefore essential that Workshop Supervisors comply with the University *Procedures and Guidance for implementing the Manual Handling Operations Regulations 1992* (SPG-15-09) All workshop staff must attend the Manual handling training course put on by the University Safety Office as part of their induction program if new staff or when they transfer into such a post if existing staff.

Lifting Appliances (Cranes, slings, hoists, etc.)

Cranes

163. When using cranes or pulleys in workshops the following rules must be observed:

- Each piece of lifting equipment must be tested before being used for the first time and a certificate of test must be obtained from the manufacturers, or, if the apparatus is 'home made', an initial inspection must be arranged through

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- The Safe Working Load and the identifying number of the pulley must be clearly marked on or adjacent to the equipment (e.g. on the gantry).

- Ropes/slings must be tag marked with the safe working load. Also the correct SWL rope must be used for each pulley block.

- Operators must be fully trained and only persons authorised by the Workshop Supervisor may use chain and rope lifting tackle.

14. PRESSURE VESSELS AND PRESSURE SYSTEMS REGULATIONS

Legal Requirement

165. Work with pressure systems is controlled by the Pressure Systems and Transportable Gas Containers Regulations.

166. Gas cylinder regulators, hoses and fittings must be properly monitored and checks made at regular safety inspections on the test date stamped on the regulator.

Advice

167.

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competent persons, whose presence is authorised by the Workshop Supervisor, may carry out electrical work in an electronics and electrical testing workshop.

179. In particular the legal requirements of the Health and Safety at Work Act 1974 and the Management of Health and Safety at Work Regulations

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Short revision by HS 2022