



Faculty of Engineering

Workshop Safety Guidelines

**CONISTON FSAE
WORKSHOP
SAFETY MANUAL**

Student Name: _____

OH&S Induction Acknowledgement.

- FSAE activities at Coniston are to be carried out within designated FSAE areas. Non FSAE activities will require the approval of the Workshop Manager, Ron Marshall Bld 2.G05 Ph: 42 213092.
 - Coniston FSAE workshop is governed by the same rules and regulations as the University engineering workshops.
 - It is a requirement that Students wishing to work at Coniston FSAE workshop undertake this Safety Induction and be trained on the appropriate equipment before commencing activities in the workshop. Students seeking approval can contact either Steve Selby, Coniston B Ph: 42 252373, Dr Oliver Kennedy, Bldg 8.109 Ph: 42 213 357 or Dr Weihua Li, Bld 8.110 Ph: 42 213490.
 - After hours access – Security must be advised of after hours access preferably 30 mins before commencement. Security uses a messaging service after hours if they are not present to receive calls – Leave a message with the service stating the location e.g. Coniston and the expected duration – this message will be logged and forwarded to security.
 - The workshop safety guidelines must be read and signed before any work is carried out.
1. I have read, and understand this document. I agree to follow all the guidelines set out in this document.
 2. I have completed the required induction for the Coniston FSAE Workshop.
 3. I have received instruction and identified risks involved when using tools and equipment:

Student/Staff Name: _____ Student/Staff Number: _____

Student/Staff Signature: _____ Date: _____

Induction Date: _____ Trainer's Name: _____

Trainer's Signature: _____

Academic Supervisor's Name: _____ Date: _____

Academic Supervisor's Signature: _____

2.	Introduction	4
3.	Staff and Students	4
4.	Safe Conduct	4
5.	Housekeeping.	6
6.	Emergency Procedures (displayed clearly in Lab/Workshop)	6
7.	Engine Dynamometer	7
8.	Fire Extinguishers	7
9.	Gas Cylinders - Compressed & Liquefied Gasses	7
9.1	<i>Moving Cylinders</i>	7
9.2	<i>Storage of Gas Cylinders</i>	8
10.	Working Alone	9
11.	After Hours Access	9
12.	Program Review	10
	General Workshop Rules	11

2. Introduction

The workshop contains many potential safety hazards. However, with proper control these hazards can be eliminated. This manual is intended to outline the basic workshop safety requirements.

Upon arriving and leaving, students and visitors will need to sign in and out of Coniston, in the book, located in front of the office.

3. Staff and Students

All students who undertake work in the workshop must take reasonable care of their own health and safety and the health and safety of others by:

- Taking action to avoid, eliminate or minimise hazards of which they are aware;
- Complying with all occupational health and safety instructions, policies, and procedures including departmental safety manuals;
- Making proper use of all safety devices and personal protective equipment (PPE)
- Complying with the instructions given by emergency response personnel such as building wardens and first aiders
- Not willfully placing at risk the health and safety of any other person
- Seeking information or advice where necessary before carrying out new or unfamiliar work
- Maintaining dress standards appropriate for the work being done. Appropriate protective clothing and footwear must be worn at all times
- Only consuming or storing food and drink in designated areas. Food is strictly forbidden in the workshop.
- All lifting equipment, including chain blocks, pendant hoist controls, and abbey lifting frames are to be used by Technical Staff only unless training and authorization has been approved.
- Being familiar with emergency and evacuation procedures and their location and if appropriately trained, the use of emergency equipment
- Reporting all incidents, hazards and 'near miss' incidents to their supervisor.

4. Safe Conduct

The following recommendations detail the standard behavior for all personnel working within the workshop.

- (a) Never adopt a casual attitude in the workshop and always be conscious of the potential hazards.
- (b) Ensure that personal clothing is suitable to the workshop conditions, e.g. Safety footwear with steel capping. Thongs or open footwear **MUST** not be worn in the workshop area. Singlets, tank tops or similar clothing are not suitable for wearing in the workshop.
- (c) Long hair is to be tied back when operating equipment e.g. drills, mills, etc.

- (d) Short sleeved shirts for machining and long sleeve for welding operations – no loose clothing around machines.
- (e) Eye protection **MUST** always be worn in the workshop area.
- (f) Use protective clothing and devices appropriate to the type of operation being carried out, giving due consideration to the work being carried out in the vicinity.
- (g) Never run in the workshop.
- (h) Never indulge in reckless behavior in the workshop
- (i) Always exercise care when opening and closing doors and entering or leaving the workshop.
- (j) Do not carry out any work in isolation in the workshop; ensure that at least a second person is within call -refer to section 10 of this manual.
- (k) Do not handle, store or consume food or drink in the workshop.
- (l) Do not store food or drink in a refrigerator, which is used to store workshop materials.
- (m) Do not smoke within any University building.
- (n) Regard all substances as hazardous unless there is definite information to the contrary.
- (o) Before any work is carried out in the workshop, permission must be obtained from group leaders or team leader in charge. Never undertake any work unless the potential hazards of the operation are known as precisely as possible, and the appropriate safety precautions are adopted. Any arc or flame producing activity is not to commence until the immediate area has been cleared of dusts. Many materials, which are nonflammable in a lump state, become quite volatile when in powdered or dust cloud form.
- (p) Take additional care when carrying or moving any potentially hazardous material or substance.
- (q) Warning signs and barriers are to be erected at entrances to the workshop before any testing is carried out when using materials of an excessively dusty nature, or are toxic or otherwise unpleasant.
- (r) Keep all fire-escape routes completely clear at all times.
- (s) Label all safety equipment and maintain it in good operating condition. Check and inspect safety equipment for correct operation in accordance with the manufacturer's instructions and report, to their supervisor immediately, any requirement for maintenance.
- (t) Ensure that all safety equipment remains accessible to the workshop personnel at all times.

- (u) Keep safety information and emergency procedures prominently displayed at all times in the workshop and each laboratory. Include in the safety information, the telephone numbers of:

Fire brigade	000
Ambulance	000
Safety officer	Wayne Ireland Ph: 42 214724
Hospital	42 298233. (Casualty)
Police	000
Wollongong Police Station	4226 7899
UoW Security.	4221 4555
Alternate Emergency	IOH Wollongong – 32 Swan St 42 296111

FIRST AID BOX LOCATIONS. Coniston B

- I) Workshop— on wall in north eastern corner
II) Workshop— on wall in centre

5. Housekeeping.

Housekeeping is an important component in the workshop to ensure risks of injury from potential hazards in the environment are controlled. The following precautions are to be taken to ensure the safety of personnel within workshop:

- Floors are to be kept tidy and dry
- Benches are to be kept clean and free from chemicals and apparatus that are not being used.
- Aisles and exits are to be kept free from obstructions.
- Bottles and glassware are to be kept off the floor.
- Access to all emergency equipment (fire extinguishers, first aid kits) is to be kept free from obstruction.
- Work areas and equipment are to be thoroughly cleaned after use.
- If last to leave the workshop, make sure equipment is turned off.
- If contractor/University staff is working in your area, make known to them any hazards that may exist in your area, i.e. flammable liquids, dusts, combustible material.

6. Emergency Procedures (displayed clearly in Lab/Workshop)

In the event of fire or other emergency that may endanger staff and students the following procedures apply -

- In the event of a fire alert others in the immediate area. Then dial 000 (from university phone) and ask for the Fire Brigade and give details. Call security, 4221 4555, and inform them of the fire and its location.

- Inform the nearest building warden or workshop supervisor.
- When an alarm is raised proceed quickly to the nearest exit, as directed by the building warden.
- After leaving the building proceed as directed to the assembly area (park on eastern side of Tate Street, opposite workshop.). Do not return to the building until the "All Clear" is given by the building warden].
- Do NOT leave the assembly area, even if not returning to the building, without firstly notifying the building warden.

7. Engine Dynamometer

- Students using the engine dyno will need to be trained under qualified operators and fill out a log book of running operations, before being signed off to run the dyno themselves.
- Hearing and eye protection is mandatory when running the dynamometer

8. Fire Extinguishers

This equipment is provided in the workshop to extinguish minor fires only. If there is any risk from the fire, the building should be evacuated. Before using a fire extinguisher, read the instructions ensuring that it is appropriate to the type of fire.

Water Type Extinguisher - Colour coded red. To be used on solids fires only. Not to be used on electrical or chemical fires.

Carbon Dioxide Extinguisher [CO₂] - Colour coded red with a black band. For use on electrical and flammable liquids fire - It should be noted that this extinguisher can be safely used on all types of fires, however when gas dissipates re-ignition can take place.

9. Gas Cylinders - Compressed & Liquefied Gasses

Compressed, liquefied or dissolved gases are categorised as Class 2 dangerous goods and sub-categorised as:

Class 2.1	Flammable gases identified by a red dangerous goods diamond (e.g. Butane)
Class 2.2	Non-flammable and non-toxic gases identified by a green dangerous goods diamond (e.g. Nitrogen)
Class 2.3	Poisonous gases identified by a white dangerous goods diamond (e.g. Ammonia).

In instances, where the gas presents multiple hazards, additional diamonds indicates the subsidiary risks. For example, Chlorine Class 2.3 (toxicity) and Class 5.a (oxidising agent)

9.1 Moving Cylinders

The majority of accidents involving gas cylinders occur while moving them from one location to another. The following control measures should be used to reduce the potential for an accident:

- The use of purpose-built trolleys or other suitable devices for gas cylinder transportation.

- Shutting the cylinder's valve, disconnecting and removing associated distribution equipment.
- A requirement that only properly trained personnel are permitted to move cylinders.
- Use properly designed lifting equipment for the movement of larger gas cylinders.

9.2 Storage of Gas Cylinders

The guidelines for the storage of gas cylinders are detailed in Australian standard AS 4332-The Storage and Handling of Gases in Cylinders. For more information please refer to AS 4332.

The following table outlines the quantities described as 'minor storage' of gases in cylinders.

Class of Gas	Maximum aggregate water capacity, litres
2.1	500
2.2	2000
2.2, with class 5.1 Subsidiary risk	1000
2.3	50

Where gases of mixed classes are kept in minor storage, the aggregate quantity of all gases shall not exceed 2000 litres and the quantity of each subclass shall not exceed that given in the table above.

The following precautions shall be observed for minor storage and handling of gas cylinders:

- Gas cylinders are to be kept away from artificial sources of heat, i.e. radiators, boilers or steam pipes; and kept clear.
- Gas cylinders shall be provided with adequate ventilation at all times.
- Classes of gas cylinders shall be segregated within the store, but need not be separated.
- Outdoor storage of Class 2 cylinders shall be separated from other dangerous goods by 3 metres. They shall not be less than 1m from any door, window, air vent or duct.
- All gas cylinders are to be secured in the upright position by chain or other means to prevent falling

Indoor storage of gas cylinders should be avoided wherever possible. However where it is not reasonable to have an outdoor cylinder and reticulation system, the keeping of gas cylinders shall incorporate a risk management approach. Specific precautions, which a risk assessment is to include, would be:

- The total capacity of gas in cylinders allowed for any particular indoor location shall include cylinders in use, spare cylinders not in use, and used cylinders awaiting removal.
- The total capacity of the gases kept shall not exceed one minor storage quantity per 200 m² of floor area. Where the floor area exceeds 200m² any arrangement which results in an undue concentration of cylinders shall be avoided.

- Indoor minor stores of gases in cylinders shall be separated from other minor stores of gases or other dangerous goods stores by a minimum distance of 5 m.
- Except for Class 2.2 gases having no subsidiary risks, there shall be no minor storage in basements.
- Where cylinders are kept inside a building or a confined area, e.g. a shipping container, that building or area shall be adequately ventilated by natural air movement or equivalent.

10. Working Alone

The faculty of engineering has established rules that ensure the safety of staff and students who may be required to work alone on University property.

Working alone refers to situations where people may be exposed to risks because:

- the area they are working in is remote from others or isolated from the assistance of others because the nature, time or location of their work; or
- it involves the operation or maintenance of equipment, the handling of a hazardous substance; or
- The work is dangerous for a person to perform alone.

Where any of the above is applicable, working alone must be avoided.

For working alone, the following apply:

- Staff and students may work alone in office environments, however, they must have completed the after hours access permission form.
- Staff and students must not work alone in workshops/laboratories where medium to high risk equipment is to be used.
- Emergency assistance – a means of communication to gain assistance in an emergency is available. The telephone in the engineering workshop can be used to contact the emergency services. If this is necessary, University security should also be informed.

11. After Hours Access

It is important that the Working Alone guidelines and Risk Management Guidelines be followed at all times – see above.

Normal operating hours for the FSAE work area are Monday – Friday, 7.30am – 4.00pm. During these times, technical staff are available, to monitor the operations of the area.

Postgraduate and Undergraduate students, requiring access to the FSAE work area after hours, must apply to the Dean of Engineering on the appropriate form. The after hours access form, must be authorized by both the academic and technical staff FSAE co-ordinators and a copy of the OH&S Induction acknowledgement form (page 2) must be attached

When working after hours, the completed after hours access form and Student ID, must be available for inspection by Faculty Staff or Security. If not, you will be required to leave the workshop immediately.

In general:

- Ensure that the doors of buildings are securely closed and locked after entering and leaving the building.
- Alarm has been activated/deactivated
- Ensure that you are familiar with the safety rules and emergency contact numbers (displayed in workshop entrance).
- Report to University Security any breaches of security or suspicious behaviour.
- Do not give anyone else security codes or keys.
- Do not provide access to buildings to unauthorised persons.

No equipment may be operated unless:

- Two persons are present.
- The operator has received training in its use.
- You have permission to use the equipment.

A breach of any of the conditions will result in after hours access being immediately cancelled. Any future request for after hours access will require personal consultation with the Dean of Engineering.

12. Program Review

As part of a continuous improvement system, this manual shall be reviewed on a regular basis, or upon recommendation of the Faculty of Engineering Workplace Advisory Committee [WAC].

GENERAL WORKSHOP RULES

- 1. SAFETY GLASSES MUST BE WORN.**

- 2. SAFETY FOOTWEAR MUST BE WORN WHEN WORKING IN THE WORKSHOP.**

- 3. ASK WORKSHOP MANAGER BEFORE USING EQUIPMENT. YOU MUST HAVE BEEN INDUCTED AND DEEMED COMPETENT!**

- 4. VISITORS MUST REMAIN WITHIN MARKED WALKWAYS.**

- 5. LONG HAIR MUST BE TIED BACK.**

- 6. CLEAN MACHINES AFTER USE.**

- 7. TAKE CARE WHEN USING COMPRESSED AIR.**

- 8. HEARING PROTECTION SHOULD BE WORN WHEN USING MACHINERY.**

- 9. WORKING ALONE AFTER HOURS IS NOT PERMITTED (Normal Workshop Hours 7.30AM – 4PM)**