

SAFETY MANUEL SPARC 5665 - 2018



Captain: Mina Dündar
Asst Captain: Bilge Berfin İmren

1. Introduction	4
2. Safe Conduct	4
3. Pit Safety	5
4. Electrical Safety	6
5. Robot & Batteries & Tools	7
5.1.1 Robot	7
5.1.2 Lifting the Robot	7
5.2.1 Battery	7
5.2.2 Battery Spills	8
5.3.1 Power Tools	8
5.3.2 Hand Tools	8
6. Fire Extinguishers	9
7. Working Alone	9
8. Safety Documentation & Records	10
9. Incident Reporting	10
10. Workshop (5 'S' Principles)	11

“ Safety is the most important thing we do.”

Zach Robinson, Xcel Energy
Nuclear Support Training Supervisor
Monticello Nuclear Generating Plant

GENERAL WORKSHOP RULES

1. SAFETY GLASSES MUST BE WORN.
2. ASK WORKSHOP SUPERVISOR BEFORE USING EQUIPMENT. YOU MUST HAVE BEEN INDUCTED AND DEEMED COMPETENT!
3. VISITORS MUST REMAIN WITHIN MARKED WALKWAYS.
4. LONG HAIR MUST BE TIED BACK.
5. CLEAN MACHINES AFTER USE.
6. HEARING PROTECTION SHOULD BE WORN WHEN USING MACHINERY.
7. NO LOOSE CLOTHING.
8. NO RUNNING.
9. WEAR CLOSED-TOE AND CLOSED HEEL SHOE.

1. 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.

Mission Statement: To provide the tools, training, and oversight for FIRST Team 5665 to operate in a safe manner in all aspects of their work including in the competition.

2. Safe Conduct

The following recommendations detail the standard behavior for all personnel working within the pit area:

- Never adopt a casual attitude in the workshop and always be conscious of the potential hazards.
- Ensure that personal clothing is suitable to the workshop conditions. Thongs or open footwear should not be worn in the workshop area. Singlets, tank tops or similar clothing are not suitable for wearing in the pit area.
- Always wear eye protection when using power operated hand or machine tools, or while performing physical tests that could lead to eye damage.
- 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.
- Never run in the pit area.
- Do not carry out any work in isolation in the pit area; ensure that at least a second person is within call.
- Do not handle, store or consume food or drink in the pit area.
- Regard all substances as hazardous unless there is definite information to the contrary.
- Before any work is carried out in the pit area, permission must be obtained from the Pit Area Supervisor. Never undertake any work unless the

potential hazards of the operation are known as precisely as possible, and the appropriate safety precautions are adopted. Take additional care when carrying or moving any potentially hazardous material or substance.

- 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 workshop supervisor, any requirement for maintenance.

- Ensure that all safety equipment remains accessible to the workshop personnel at all times.

- Keep safety information and emergency procedures prominently displayed at all times in the pit area. Include in the safety information, the telephone numbers of:

For Emergency Services call: 911.

First Aider: Batuhan Can : +905392611441

Mina Dünder. : +905380405450

FIRST AID BOX LOCATIONS

l) Pit Area – on the shelves

3. Pit Safety

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:

- Pit dimensions are 10'x10'x10', do not try to add to your space by setting up in another area!

- 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.

- 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 all equipment is turned off.
- No spilling out into the aisle - keep your robot, tools and supplies inside your pit.
- If contractors are working in your area, make known to them any hazards that may exist in your area, i.e. flammable liquids, dusts, combustible material.

4. Electrical Safety

Do these before working on robot:

- Turn it off by opening the main circuit breaker, and unplugging the batteries before working on it.
- Vent any compressed air and open the main vent valve.
- Relieve and compressed or stretched springs.
- Lower any robot arms or devices that could fall.
- Respect Electricity!
- Inspect AC electrical cords routinely to make sure that they are in good condition.
- Do not overload electrical fixtures.
- Do not daisy chain outlet strips.

5. Robot & Batteries & Tools

5.1.1 Robot

- Don't put your hands in the robot while it is on.
- Don't work on the robot if it is on an unstable surface.
- Release compressed air, turn off robot and relieve other sources of energy before working on it .
- Do not drive too close to people.
- Notify people before enabling.

5.1.2 Lifting the Robot

- Make sure no one is working on the robot.
- Robot is turned off.
- Communicate!
- Keep a good grip with gloves on.
- Lift with legs, not back.
- Turn with your feet- do not twist.

5.2.1 Battery

- Check before using.
- Do not use a dropped battery.
- Do not use a damaged looking battery.
- Check battery wires.
- Tight connection.
- Well insulated.
- Do not pick up by the wires.

5.2.2 Battery Spills

- Material Safety Data Sheet(MSDS).
- Battery Spill Kit.
- Splash proof goggles.
- Gloves .
- Baking soda.
- Notify mentor and safety captain.
- If needed, get medical assistance.

5.3.1 Power Tools

- Have a mentor present.
- Use the right tool.
- Know how to use the tool.
- Don't distract users.
- Don't be distracted.
- Don't leave the tool running and unattended.

5.3.2 Hand Tools

- Use the right tool.
- Know how to use the tool.
- Do not use the tool if it is broken.
- Work on stable surface.
- Watch out for sharp edges.

6. 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. For use 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.

7. Working Alone

Team SPARC 5665 has established rules that ensure the safety of staff and students who may be required to work alone on the pit area.

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, or 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 must not work alone in the air are 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 pit area can be used to contact the emergency services. If this is necessary, area security should also be informed.

8. Safety Documentation & Records

These are the primary safety documents and records that the team maintains:

- FIRST SAFETY Manual
- 5665 Safety Manual
- MSDD: Material Safety Data Sheet (for chemicals - Battery)
- Safety Training Records
 - Safety Checklist (Inspect tools and equipment before using identify any hazards in work area and check for good housekeeping.)
 - Incident Reporting (Must report ANY type of injury to Safety Captain or lead mentor and also report ANY near misses or potential safety issues.)

9. Incident Reporting

- When an accident or near miss happens, immediately tell your Sub Team Lead, team Captain or safety Captain.
- Document the incident in the Corrective Action Log (see Safety Captain).
- Write down the incident and cause of the incident in you sub team notebook.
- Correct the situation that caused said incident and make sure does not happen again.
 - Replace damaged or worn equipment.
 - Retrain students on safe behavior and safe practices.
 - Learn from your mistakes and the mistakes of those around you.

10. Workshop (5 'S' Principle)

- **Sort** : Sort through items un put in group, needed or not needed.
- **Straighten**: Organize the work area.
- **Shine**: Do regular cleaning to your work area.
- **Standardize**: Use inspection list at before starting the work.
- **Sustain**: Make 5S a way of life :)