



S.C.O.T.S. BOTS FRC TEAM #4776

Safety Manual

By: Dylan Portuesi, Safety Captain 2015
Edited by: Kim Portuesi, Community Outreach Mentor

Safety:

- Definition: The procedures and processes implemented into a work environment to ensure the protection of the individual workers.
- S.C.O.T.S. Bots takes safety seriously and is responsible for keeping students and mentors safe at all times

Mission Statement:

- Our goal is to mentor high school students one on one and provide experiences that mimic real world engineering but make learning fun.
- We strive to empower students to work independently to solve problems and make effective decisions.
- We encourage students to explore their passions and develop a personal skill set that will further contribute to their educational and career goals.

Purpose:

- Power tools and equipment are potentially dangerous if not used properly which makes SAFETY principles EXTREMELY important.
- S.C.O.T.S Bots mentors and students should always make SAFETY their number one priority.
- All team members must know and demonstrate safe and professional behavior at all times when building or conducting business.
- To continually maintain a zero occurrence of accidents and injuries

Competency:

- S.C.O.T.S Bots students are required to become competent in machine safety prior to use
- Competencies will be granted after the student has been trained in proper use of the tool, and can demonstrate it safely.
- Students should not use tools if they have not been adequately trained to do so
- Every team member is required to identify any and all tools used by the team.
- Machine competencies may vary depending on the degree of difficulty.
- Machine shop competencies will be checked off, signed by the machine shop instructor, and kept on file.

Shop Safety:

- Limit distractions in the shop where students are working.
- Students should not be in the shop without a mentor present.
- Students must ask permission from a mentor before using tools and machinery.
- No food or drink on or around the machines.
- No running, horseplay, or practical jokes allowed.
- Keep machine shop clean, tidy and free of safety hazards.
- Only one student at a time should operate machinery, unless assisted by someone.
- Report any unsafe conditions and practices, such as, any defects in machinery or tools, lighting, safety guards, power cords, etc.
- Tools and machines not in use should be stored properly.
- Students should always have a buddy while working in the shop.
- Clean up all solvents, paints, saw dust, or metal shavings from drilling prior to moving on to another task.

Proper attire:

- FIRST approved safety glasses must be worn at all times when working on the robot, in the shop, or in the pits.
- Ear plugs when noisy.
- Hair longer than shoulder length must be tied back.
- Loose fitting clothing is not permitted in the shop.
- No gloves, scarves, or neckties.

- No jewelry such as watches, necklaces or bracelets.
- Close toe footwear must be worn at all times

Emergencies:

- In the case of life threatening accidents or injuries, call 911, tell them who and where you are and follow their instructions. Send someone to watch for EMS.
- All injuries, no matter how small, should be reported to a mentor.
- Know the location of first aid kit, eye wash station, epi-pen station and AED.
- Know the location of fire extinguishers and emergency exits.
- Seek help from a student or mentor who is certified in first aid.
- All incidents regardless of the nature, should be reported.

Tool Etiquette:

- If a tool is being used by someone, ask permission to borrow it before you take it.
- When you borrow a tool from someone or take it out of the tool box or off a work bench, return it when you are done in the same condition and make sure tools are clean and in proper working order.
- End of the Day Clean UP! - Clean ANY and ALL messes you make BEFORE you go!

Design Safety

- Know the locations and ratings of circuit breakers used in design
- Wire size appropriate for the design
- Observe battery safety guidelines
- Attention to sharp corners and edges
- Shields for moving parts and pinch points
- For the protection of all team members as well as game equipment, mitigate all hazards that could cause injury such as; pinch points, entanglement hazards, and impaling projections.

Pre-lifting procedures:

- Ensure all transporters have their PPE
- Secure all moving parts on the robot
- Ensure the robot is powered off
- Have 2-4 people lift the robot
- Discuss the path you are going to take
- Ensure path is clear of debris

During the lift:

- Have someone to supervise and coordinate lift
- Each lifter's feet should be close to the robot
- Lift with your legs, not your back
- Use the hand holds on your robot to safely lift it
- Make sure the cart is stable and will not roll away

- Have at least two additional people stay with the robot as it is moved on the cart
- Exercise caution when moving the robot through a crowd.

Pit Guidelines:

- Always wear safety glasses when in the pits, on the practice field, or on the competition field.
- 10 foot by 10 foot work area at all Competitions
- Banners and structures cannot exceed 10 feet.
- Don't operate grinders or create sparks in the pits.
- Don't run in the pits or the stands.
- Warn others in the pit when transporting the robot on the cart.
- Warn others before using a tool or enabling the robot.
- PAY ATTENTION! Most accidents occur because one or more persons are not paying attention.
- Watch out for people using tools and transporting robots. Guidelines only make the pit safer, they don't make it completely safe.
- Turn off the robot before working on it and disconnect the battery before working on its electrical components.
- Wear gloves when lifting or carrying the robot.
- Keep the pit area clean and neat with all tools put away and the floor swept.
- Know where the fire exits, first aid kits, and MSDS sheets are.

- No “daisy chaining” to get power in the pits. (Daisy chaining means to power a power strip via an extension cord or to hook multiple power strips together to obtain more outlets.)
- Secure all valuables in the pit area to prevent damage or loss.
- Children must be accompanied by an adult at all times, while in the pit!

Battery Safety Guidelines:

- Periodically inspect your battery for any evidence of damage, such as a cracked case or leaking electrolyte.
- Bent terminals can also be a potential leak source.
- After each competition round, inspect the battery.
- Check your battery prior to competing in each round.
- Keep the battery charging area clean and orderly.
- Place your battery charger in an area where cooling air can freely circulate around the charger because battery chargers can fail without proper ventilation.

Battery Spill Clean-up:

- In the event of a spill refer to your battery clean-up kit.
- Follow material handling instructions on MSDS sheets
- Don acid resistant rubber or plastic leak proof gloves
- Surround the spill with specialized absorbent material, such as, baking soda to neutralize and to contain the spill.
- Cover the entire spill with the absorbent to neutralize the acid

- Scoop the material into your bucket and then dispose of the waste properly in a non-metallic lead proof container.
- Follow procedures in the FIRST Safety Manual for any skin or tissue that comes in contact with battery acid.

Stored Energy Guidelines:

- Disconnect the electrical power source once the robot is switched off
- Safely release all excess pneumatic energy (compressed air)
- Safely relieve tension from any compressed outstretched springs and tubes

Traveling Safety:

- When traveling, stay in a group
- The buddy system is very important especially in a strange area.
- Keep your cell phone and some extra money with you at all times
- Make sure you have your chaperone's number and that you keep in touch with them
- Give any medications you need to your mentors and take them when needed
- Keep all unnecessary belongings at home

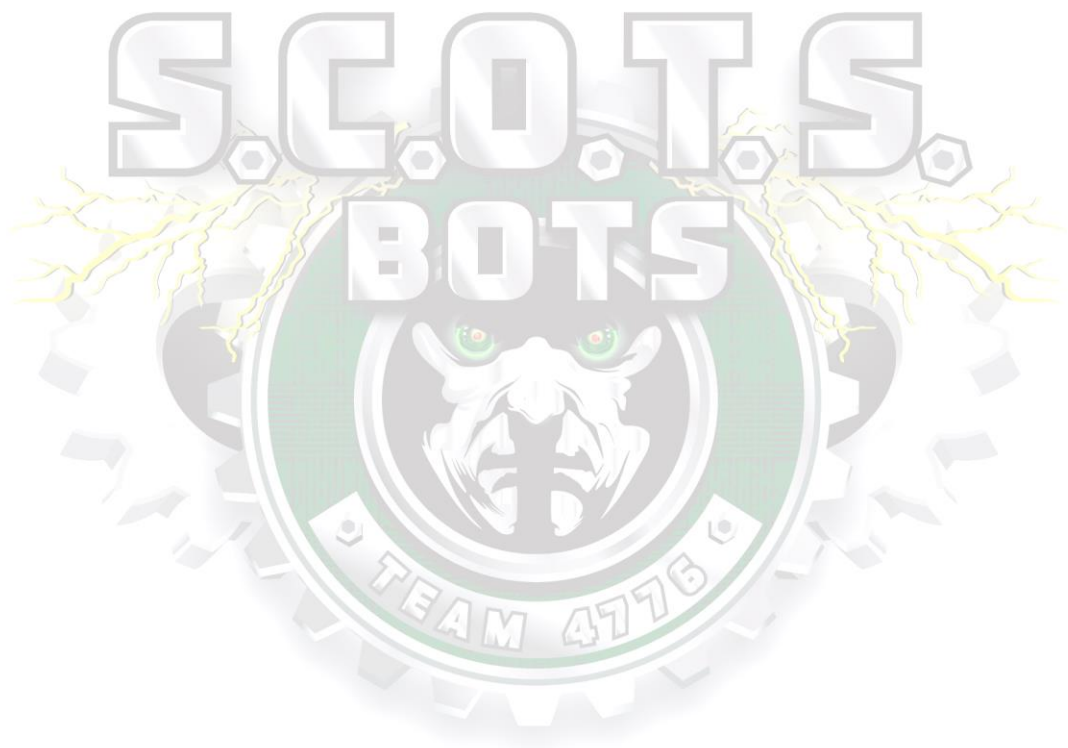
Responsibilities of a Safety Captain:

- Encouraging the team to practice safe Coordinating, delivering, and tracking the safety training for the individual team members
- Providing training information to the safety advisors at competitions
- Responding to any safety questions or concerns that are reported
- Seeking guidance, when appropriate, from mentors
- Conducting routine safety inspections of the work site, especially the build area
- Conducting safety inspections at competition and correct unsafe practices
- Being familiar with all emergency procedures
- Being knowledgeable about the Material Safety Data Sheets
- Presenting your safety program to the Safety Advisors at events

Safety Advisor Questions:

- What does UL stand for? (Underwriter Laboratories)
- Tell us about your Safety training program. (machine instruction)
- Can we see some of your documents? (training, supplies)
- Tell us about your Safety outreach. (demos, presentations)
- Where is your fire extinguisher? (the location and how to use it)
- What are the 3 types of fire? (A paper, B liquid, C electrical)
- Where is your battery spill clean-up kit? (easy to access)
- What is the definition of a safety captain? (responsibilities)
- How long does it take for a smoke detector to expire? (10 years)

- How do you promote safety at the competition? (safety outreach at competitions)
- How do you promote safety in the shop?
- Anything else you'd like to tell us? (interesting facts / allergies)



Safety Checklist

- First Aid Reference Sheets
- First Aid Kit
- Material Safety Data Sheets (**MSDS**)
- Safety Glasses
- Gloves: acid-resistant and leak-proof and work
- Closed-Toe Shoes
- Hearing Protection
- Fire Extinguisher/Fire Blanket
- Baking Soda (to neutralize acids)
- Hair Ties/Bobby Pins
- Broom and Dustpan
- Disable Switch
- Injury/Accident Reports
- Every team member's medical info and emergency contact

It's Easy to be “Green”

- Carpool
 - Have team members carpool to meetings
 - Save gas by having one person pickup food
- Recycle
 - Cans, plastic bottles
 - Use recyclable water bottles
- Batteries
 - Turn in old batteries in container marked “Old Batteries”
 - Recycle trash used during meetings and build sessions by placing them in marked containers.
- Turn off all lights & computers when leaving
- Purchase recycled products