2022
Safety Guidelines

Mukwonago BEARs
FRC Team 930

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1.0 Introduction

Team 930 Safety Mission:
Here at Team 930 safety is a top priority, we aim to implement safe practices in our everyday activities. Through a rigorous safety training program at the beginning of each season, and continued use of PPE we strive to make Team 930 a safer place.

Commitment to Safety:
Implementing safety within all aspects of the team is critical to the success and development of Team 930. All students and mentors working with or within range of the robot are required to wear safety glasses at all times. Safety training and rules are examined at the start of each competition season and we do a yearly safety training with the local fire department.

2.0 Personal Safety

Daily Safety:
Team 930 employs daily use of PPE equipment such as safety glasses required for all team members to be in a room with any mechanical equipment or the robot. We have also updated our supply of safety glasses this season, as to keep all pairs from excessive wear and tear.

Durable clothing is required for working on the robot to ensure that no one gets cut by any sharp objects or machines. Pants made out of a thick material are strongly recommended. Yoga pants or pants with excessive holes are not allowed. Short sleeves with no midriff exposed and no loose clothing or jewelry are the safest options for machine work and are an expectation for our team. Long hair is required to be pulled back at all times while in the machine shop or working on the robot.

Arrive Prepared:
Before every competition we put together a list of everything that we need to bring and mitigate any chaos that comes with last minute scrambling. This list ensures not only that we don't forget anything, but also that all necessary safety equipment gets brought to each and every event.

First Aid:
Team 930 keeps a first aid kit in the main meeting room that is always kept fully stocked with supplies. It travels with us to all events where the robot is present including demos and competitions. There is an AED next to the main staircase where we meet, with an additional specialized first aid kit.

3.0 Tool Safety

Hand Tools:

Handsaw:

- Wear safety glasses, use back and forth cutting motion with more force on the direction the teeth go

Impact Driver/Drill:

- Wear safety glasses, put in a battery pack, put in a drill bit by spinning chuck, press directional button, pull trigger and gently press down, then slowly pull up

Grinder/Dremel:

- Wear a facemask, plug it in, put metal in vice, make sure people are aware of the fact you are about to cut, squeeze trigger, retrieve items

Sawzell:

- Wear safety glasses and optional face shield, put in a battery pack, put in the correct blade for the material you want to cut (big teeth = wood, little teeth = metal), mark the line of what you want to cut, remove safety, pull trigger, replace safety, remove blade

Heat Gun:

- Use safety glasses, plug in, move switch to either low or high heat, use fanning motion across heat shrink, but be careful not to melt the wire, switch off, unplug, keep the heated tip away from other cords to eliminate melting

Zip-Tie Gun:

- No protection required but safety glasses are recommended, tighten zip-tie around object, insert end of zip-tie in gun, set it to zip-tie size, pull trigger until zip-tie tightens and the end breaks off

Screwdriver:

- No protection required but safety glasses are recommended, take the screw and put the tip on your material, use either phillips(+) or regular(-) screwdriver, turn screw clockwise to put screw in and

counter clockwise to remove with pressure on the head of the screw

Hammer:

- No protection required but safety glasses are recommended, take the nail and put it on the surface, strike the head of the nail to insert, use a pry bar or claw on the hammer to remove. Please watch your fingers while using the hammer!

Adjustable Wrench:

- No protection required but safety glasses are recommended, adjust to bolt/nut size and turn right to tighten or left to remove

Ratcheting Wrench and Socket:

- No protection required but safety glasses are recommended, take ratchet and find the correct size socket for nut/bolt, attach socket to ratchet, flip switch for direction, reverse to remove. Best used with a wrench to hold in place

Box Cutter/Box Knife:

- Gloves optional but recommended, use only to mark wood or cut thin material surfaces such as tape and cardboard. Use the button on the top to slide the blade to the required depth(¼ - ½”) and cut. Always cut away from the body

Rivet Gun:

- Use safety glasses, insert the long end of the rivet into the gun, insert the rivet into metal, squeeze the trigger and remove the long end. Use a drill to remove the rivet

Soldering Iron/Gun:

- Safety glasses required, beware of toxins from solder. Use alligator clips and use proper stance, heat exposed wire with iron, contact the iron with solder and melt it on the wire. Pull to test strength once cooled, slip heat shrink over and use the heat gun as previously instructed

Machine Tools:

Bandsaw:

- Wear a face mask and proper safety glasses. Grab your piece of wood and turn on the machine. Keep hands away from the blade at all times. Slowly push the wood forward, but don't force it. Turn off the machine and retrieve the wood once the blade has come to a complete stop. Your hands should be 6" away from the blade on a table saw as well as the band saw.

Drill Press:

- Wear a facemask and proper safety glasses. Insert drill bit using chuck and chuck key, and put the stage at the correct height. Place your material on the stage, and clamp it securely to the workplace. Turn on the machine, grabbing the handle and slowly pressing down to drill a hole. Slowly guide the bit up, repeat if necessary. Turn off the machine and remove the material.

Miter:

- Use a face shield. Mark the wood and move the miter saw to the angle you want to cut at. Pull the trigger and press down, retrieving the wood after the blade comes to a complete stop.

Lathe:

- Always know where the EStop button is in case of an emergency. Always secure materials and tighten tools before running. Keep all appendages away from the machine at all times. Beware of aluminum flash which can be extremely sharp.

CNC Mill:

- Always know where the EStop button is in case of an emergency. Always work with the doors closed and securely clamp in all materials. Keep hands and arms outside of the enclosure while it is running. Beware of aluminum flash while it is running and don't touch the cutting ends of any end mills or drill bits.

CNC Router:

- Always know where the EStop button is in case of an emergency. Always hold down materials securely and ensure tightness of collets. Keep hands away from the spindle while it is running and don't touch any cutting ends.

Electrical Cord Safety:

Inspect electrical cords for equipment and extension cords regularly to ensure they are in good condition. Do not overload any electrical outlets or power strips by plugging in multiple power strips or extension cords to one another. Make sure that all wires are tucked away and are not trip hazards.

4.0 Robot Safety

General Safety:

Make sure the robot is disabled before any work is done and make sure that everyone is clear of the roboty before enabling. Always yell out enabling and have a hand on the “kill” switch while running. Inspect your surrounding areas before enabling the robot to ensure that the floor is clear and the robot cannot endanger a team member or itself.

Transporting the Robot:

Think before you move. Always have a plan in place for where the robot is going to go, before transporting it, whether it is by cart or by lifting. Having a good plan eliminates wasted time and energy, but also prevents any sort of injury to a team member or the robot. Ensure that you have control over the cart at all times while transporting the robots and make sure that the buddy system is in place while moving the robot, especially in and out of the trailer.

Stored Energy:

After all matches have been completed, release all stored energy in the robot, especially in the pneumatic system. Open the main valve and release the air pressure, making sure that all gauges read 0.

Battery Safety:

Before use, inspect the battery for any signs of damage, such as cracks, leaking, or bent terminals. If any damage is seen, report it to the nearest mentor or safety representative.

Always have 2 hands on a battery, holding it by the cables is not acceptable. Never disconnect the battery by its cables, always pull on the cable connectors to disconnect it. If a battery is dropped, report it to a mentor so they can remove it from the competition rotation.

Always check in and out before and after use of a battery. Place the battery in the respective charging and cooling spaces on the battery cart after use.

If any spills occur, alert a mentor and use the battery spill kit kept in our charging cart.Put on gloves and pour a base on the acid (baking soda for example) to neutralize it. Put it in a water-tight, sealable bag. Wash any acid off of the gloves and properly dispose of the battery.

5.0 Competition Safety

General Competition Safety:

- Permission slips are required to attend any competition
- Medical forms must be completed and turned in
- Student's Slack must have all notifications on for the competition slack channel
- All room numbers and assignments must be registered with the mentors
- Buddy system is always in place especially while outside of the hotel
- Hotel rooms will always be locked
- Never open up the hotel room to strangers
- Do not leave your hotel room after curfew
- Do not enter a hotel room with someone who is not on our team
- Never leave the hotel without mentor approval
- Never leave the event early without pre approval and a legal guardian

Travel Safety:

- Always stay with your car, never switch cars for any reason
- Do not wander away from the hotel, venue, or rest stop

- Always use the buddy system and alert a mentor if you leave the immediate area
- Do not get into a car that is not your designated transportation
- Always wear your seatbelt and do not distract your driver

Pit Safety

Setup and Construction

During the construction of the pit, be sure to note all rules concerning pit builds. No team structures may be more than 10 feet above the ground, including sponsor banners, or displays. Do not daisy train any electrical cords or power strips. Do not use structures that are not meant to be stood on as a ladder. Design the pit so that all necessary components are easily accessible at all times and everything has its proper place, neatly stored away.

During Construction

Follow all posted safety rules in the pits, keep the walkways clear and all pit components in the pits. Always make sure that the robot is secured and disabled before any work is done. Do not work on unstable surfaces. Before leaving, make sure that the pit is swept and everything is in its proper position for the return the next morning.

Pit Station Requirements

Safety glasses are required at all times while in the pits. All students will be wearing a name button to identify themselves in lieu of a traditional lanyard which can get caught easily while in the pit.

There must be at least 2 team members in the pits at all times. Only people who need to be in the pit are in the pit, this is heavily enforced to reduce crowding and chaos in case of an emergency. Refer to the pit schedule for your assigned time to be in the pits.

Any child under 12 must be accompanied by a parent or guardian at all times while in the pit. No strollers are allowed in the pits.

Walking areas must be clever at all times during competition. The robots and team members will stay within their clearly outlined pit boundaries to keep paths clear for other robots or teams.

No food or drinks will be allowed in the pits and all garbage will be collected and disposed of daily.

6.0 Competition Safety Pack List

- ☐ First Aid kits
- ☐ Hair ties
- ☐ Fire Extinguisher
- ☐ Safety binder
- ☐ Goggles bin
- ☐ Gloves
- ☐ Ear protection
- ☐ Battery spill kit
- ☐ Broom and dustpan

7.0 Future Safety Goals

Team 930 seeks to further our current safety procedures by getting the entire team First Aid and CPR certified. We want to lead by example for safety procedures both in and out of robotics. By using safe practices in team members everyday lives we can help change our community and save lives. We also want to use our experiences with fire and emergency training to teach other teams what to do in case of an emergency both at competition and at their home fields.