Job Safety Analysis (JSA)

Allan Hancock College : Deep Sea Dogs

JSA Approved by CEO Fiona McGinnis and Safety Officer Colson Pusley

Analysis

Date	
Time	

Company Safety Precautions / PPE

Safety Glasses	Provided to Company Members
Work Gloves	Provided as needed
Non-Slip Shoes	Worn by Pilots / Drive team

Incident Prevention / Issue Awareness

Hazard Type	Risk of Injury & Details	Prevention Measures
ROV Tether	Medium Risk. The ROV tether is attached between the back of the ROV and back of the drivers station. It runs between the pool and drivers station creating a tripping hazard for any members of the drive team.	To prevent tripping hazards we have attached the tether to a cable reel which allows it to stay organized and close to the ground. This helps eliminate the tripping hazard since it is no longer blocking the walkway for the drive team and gives us more space between the station and pool.
Water Leaks / Spills	Medium Risk. The ROV is built to be waterproof but that does not mean methods used to seal out water will always work. If water makes it into the ROV it could present a hazard to the drivers and drive team if compromised areas are	To prevent any electrical contact with a ROV that has water leaked into the electronics we will determine the risk of removing the ROV and turn off all connected power sources to stop any further hazards with removing it from the pool.

	touched or release currents into the pool. If there is not a leak inside the ROV the other case could be water brought from the ROV to our other equipment spilling on it and potentially causing safety issues.	We are able to prevent spills from the ROV inside our cases or near equipment by using a towel / blanket to dry it off before storage. This is a simple solution but helps prevent any issues that could be caused by contacting our equipment with water.
Scrapes / Cuts / Bruises from Contact with ROV	Medium Risk. Our ROV despite being lightweight and relatively simple still has hazards when safety measures are being worked on or are removed from the ROV. Team members could potentially cut or scrape themselves on propellers / non deburred pieces of the frame. If the tether or ROV was dropped or fell on someone it could cause scrapes or bruises.	The ROV has the appropriate / approved competition graded shrouds attached over the motors. This allows us to not only keep the motors protected but ourselves when we are testing or making repairs to the ROV. All protruding elements or pieces with the ability to be touched are properly deburred / sanded to prevent any scrapes or cuts.
Slipping	High Risk. Slipping is a common issue at any location that features a pool. Being near a pool means there is exposure to water and wet floors which are a major tripping hazard. This is a further issue combined with the small walk space in the competition area and equipment laid out in the walkways to the pilot stations.	Company members on the drive team are expected to follow basic pool rules (No running, Pay attention to surroundings, etc..). Members are also expected to wear appropriate non-slip shoes or water shoes to prevent potential slips due to puddles.
Falling into Pool / Drowning	High Risk. Company members who launch the ROV into the pool need to be right next to the edge of the pool to properly launch the ROV. This means there is a potential hazard of falling into the pool and drowning if there were complications.	Members on the drive team are expected to have multiple people present to launch the ROV into the pool to prevent potential falls into it. Members are stationed towards the back of the ROV so the front will launch into the pool and they can maintain a safe distance from the ROV to the pool. Members who are launching the ROV also are expected to have the ability to swim and if not are stationed away from the pool to help eliminate the risk of pool related hazards.

Lifting ROV / Carrying Equipment	Low Risk. To practice / demonstrate the product we need to bring the ROV, control station, tether reel, and power station. Transporting the equipment itself is approximately 20 kg spread between the drive team. Equipment has the risk of getting caught on handles / being dropped/	Equipment is always transported either in one tote or between 5-6 people. This allows us to distribute the weight of the components while still carrying everything to our destination. Wires and tether are held in a single spot to prevent them from being caught on anything.
Electrical Related Hazards	Soldering Iron: Medium Risk. Soldering irons are able to reach high temperatures easily in order to melt solder needed to fuse wires or fix circuits. Soldering not only exposes the person to potential toxic fumes but can put them at risk for burns. Electrocution: High Risk. Working with anything power related has a risk of electrocution. Working close to water alongside electronics only increases this risk. Exposed Wires / Circuits: High Risk. Exposed wires are dangerous because any leaks as mentioned in water leaks could cause electrical currents to travel through the water and shock someone.	Soldering Iron: Using “helping hands” to assist with soldering helps prevent burns from holding the wires to the iron. If a situation with a wire requires someone to hold it it should be held towards the back of the wire to prevent burns. Electrocution: To prevent any potential problems related to electrocution all materials exposed to water or in the general area of water will be powered off until it is safe to do so. Materials near the pool that need power will be placed in an area that will not be in contact with any fluids. Exposed Wires / Circuits: Identified exposed wires in the tether will be repaired immediately and undiscovered shorts or exposed wires will be caught and repaired prior to entering the pool.
Mechanical Related Hazards	Motors / Shrouds:Medium Risk. Motors with the propellers exposed can be a hazard since when spinning they could potentially harm the people working on the ROV. Tools: Medium Risk. Tools used by our company include saws, wire cutters, PVC cutters, and various other sharp objects. Any kind of tool can be dangerous if used improperly.	Motors / Shrouds: Testing motors without the shrouds is done without any members standing next to the ROV to prevent any injuries. Tools: Team members are trained on the proper usage of all tools required to make repairs or build the ROV. Some tools are used with gloves to help add an extra layer of safety due to the increased hazards with certain repairs or build processes.

Natural Disasters / Emergencies	High risk. Unforeseen natural disasters are uncommon in Tennessee however still require preparation in the chance there is an emergency. Potential issues within the venue, hotel, or city also require preparation.	In order to combat potential issues with unforeseen natural disasters or emergencies we have an emergency plan to meet up in specified areas of the venue depending on the situation. All team members travel in groups to make sure we have someone to rely on in an emergency.