

	Jobs Safety Analysis (JSA)		Date : 20/5/2024
			By: Oliver Horvath Co-Safety Officer
JOB/ACTIVITY NAME: Mechanical Engineer, Electrical All Active Poolside Employees		JSA #: Version 5	
DEPARTMENT/GROUP NAME Red Sea Robotics	BLDG/AREA LOCATION(s): The KAUST School, CMR Robotics Lab	OTHER INFORMATION: All employees are required to follow the specific protocols when working on the ROV and while working in the lab	
REQUIRED PERSONAL PROTECTIVE EQUIPMENT FOR ENTIRE JOB Safety Glasses Safety Shoes Chemical Goggles Hard Hat		REQUIRED TRAINING -Lab Safety Course -Pool Safety and Swimming Aptitude Test -First Aid Basic Course -Pinch Points Lesson and Blade Safety Rules -Safe Heavy Lifting Course	

Basic Steps	Potential Hazards	Controls	Responsible Persons
ROV Enclosure Test	Enclosure Explosion due to high pressure Pressure pump glass gauge breaking	Employees must wear safety glasses, safety shoes and must have a face shield Gradually increase the pressure and check the stability in the enclosure after pressure is increased each time	Engineers Float Engineers
Entering and Exiting the pool deck	Slipping Damaging Equipment	Employees must wear closed toed safety shoes while near the pool and employees must ensure there is no loose hair or clothing In order to prevent any equipment from getting damaged Red Sea Robotics uses an industry grade cart to carry the ROV and packs foam around the ROV	Safety Officers CEO

<p>Poolside Operations <u>Set up</u></p>	<p>Wire Strain Loss of Footing Tether Wrapped around foot Electrocution Back Strain Miscommunication</p>	<p>Employees must properly use strain relief for all wires in order to ensure maximum wire safety</p> <p>Employees must wear proper closed toe safety shoes and must also be aware of their surroundings while also having their hands free in order to brace for any falls</p> <p>Employees must keep an eye on the tether operator in order to inform them if they may trip on the tether or it may be wrapped around their foot</p> <p>Employees must properly sheath the tether and have a fuse attached to it to the proper amperage</p> <p>Employees must attend proper training on how to pick up and lift heavy objects without any back injury or strain from the ROV and placing it in the water</p> <p>Employees must listen to the CEO's mission training and speak in a clear manner at a loud enough volume</p>	<p>Tether operator Pilot Co-Pilot</p>
<p>Power Up</p>	<p>Electrocution Overload of Current</p>	<p>Employees must use the standard fuse for their given Amp calculations specific to our ROV 15 amps</p> <p>Employees must be aware of any open currents that may occur and must ensure that each wire has proper sheathing and is properly covered</p>	<p>Electrical Engineers Deck Operators</p>
<p>Poolside Operations</p>	<p>Drowning Trauma from slipping Electrocution Trauma to finger</p>	<p>Employees must wear closed toed shoes while working at the pool</p> <p>Employees must check the ROV by testing the pressure and testing for any leaks inside the enclosure</p>	<p>CEO Safety Officers Float Engineers Tether Operator</p>

		<p>Divers must be warned when ROV goes in the water and Lifeguards must be on duty while testing at pool</p> <p>Proper guards must be added to each propeller and warning labels must be respected by all operators</p>	
Piloting the ROV	<p>Electrocution</p> <p>Computer Fire</p>	<p>Employees must ensure that the tether of the ROV is properly attached to the required fuse</p> <p>Control system must be properly cooled in order not to overheat</p> <p>Control system must be on a proper solid surface in order to prevent it from knocking over in the pool</p>	<p>Pilot</p> <p>Co-Pilot</p> <p>CEO</p>
System Breakdown	<p>Equipment Misplacement</p> <p>Equipment Damage</p> <p>Faulty Communications</p>	<p>All equipment is stored in its proper labeled container and each team member is aware of the position of certain equipment</p> <p>In order to prevent any equipment from getting damaged Red Sea Robotics uses an industry grade cart to carry the ROV and packs foam around the ROV with proper planned spots for each part</p> <p>Each member is aware of their position on deck and knows their role communicated by the CEO before the mission task</p>	<p>CEO</p> <p>All Deck Operators</p>

Safety Checklist for lab and Pool usage for Engineer and Pilot Safety

Precaution	YES	NO
Personal Protective Equipment (PPE) <ul style="list-style-type: none"> - Ensure all team members are wearing proper closed toe shoes during poolside operations - Ensure all team members have no loose clothing or hair that may get stuck inside the ROV apparatus 		
Emergency Procedures <ul style="list-style-type: none"> - Have a clearly defined emergency plan with First aid kits nearby, and also have planned evacuation routes and access to emergency first response - Have a lifeguard nearby in order to ensure pool safety for all members during the mission tasks and use of the ROV 		
ROV Safety <ul style="list-style-type: none"> - Ensure the waterproof encapsulate has a proper vacuum with no leaks - Ensure that the tether is properly wired with proper strain relief and sheathing - Ensure that fuses are present on all electronics 		
Loss Of Communication <ul style="list-style-type: none"> - Power down ROV and notify all divers in the pool of your error - Power down the control system and attempt to retrieve the ROV using the tether - When communication is restored attempt to troubleshoot and find and fix the error 		
ROV Retrieval <ul style="list-style-type: none"> - Pilot calls our ROV surfacing and operators picking up the ROV must notify everyone else on pool deck - After ROV is secure on deck Co-Pilot and Piloting team notifies the rest of the team that the ROV is being powered off - Team demobilization and team leaves pool premises 		