

COMPANY SAFETY ANALYSIS

Of L.P.R.O.V.Design 2016

GENERAL TASK:

TASK	POTENTIAL HAZARD	PREVENTIVE MEASURES
Hand tools (including saws, tube cutters, screw drivers, knives, scissors, etc.)	Physical injury (including bleeding, cuts, infection, loss of minor limbs, etc.).	<ul style="list-style-type: none"> -Users of tools must make sure other personnel are not in a radius of the length of their hand and the tool. -Personnel are to be in pairs. While one does the task the other supervises. -Use the proper tools for the job.
Power tools (including solder, drill, etc.)	Physical injury (including cuts, burning, deep wounds, etc.), electrical injury, irritant (including gas fumes, dust residue).	<ul style="list-style-type: none"> -Use safety glasses/goggles. -User has to be aware if other personnel is in your area. -Have a teammate or guardian supervise. -Disconnect power tool and/or turn off when not in use. -Use the proper tools for the job.
Electrical safety (anything and everything using electricity including battery, pluggable devices, hand held devices, ROV, Etc.)	Electrical injury, burning (from electricity), shock, heart attack.	<ul style="list-style-type: none"> -After using device, disconnect and/or set power off. -Liquid fluids can't be near electrical devices. -Remove jewelry. -Keep away metal objects.
Lifting objects (including heavy, fragile, long, big, etc.)	Back injury, foot injury (if the object falls), hurting others (if it's a long two person object), hands and/or fingers crush (if placing down the heavy object without caution).	<ul style="list-style-type: none"> -Lifting fragile objects with precaution. -Never lift heavy objects alone, get someone to help you lift the heavy object. -Take precaution if there's anything or anyone in your way. -Lift with your legs.

ROV construction	Minor limbs getting crush between objects, cuts, etc.	-Work in groups of two or three. -Pay attention on where you place your fingers and your teammates.
ROV maintenance	Electrical shock (when doing test), burning (if electronics needs to be replaced by soldering).	-Making sure not to work on wet surfaces. -Personnel soldering must be with other personnel supervising, if accident where to happen, First Aid must be used to help the person.
Other (straps, adhesive, PVC pipes, etc.)	Physical injury (including blood loss in a minor limb, being hit with a tube, etc.), poisoning (from Cyanoacrylate, better known as super glue).	-Pay attention to what you or your teammates are doing! -DO NOT PLAY with the PVC tubes. -Be careful when handling adhesive.

Job at worksite:

TASK	HAZARDS	PREVENTIVE MEASURES
Releasing/Recovering the ROV from water	Back injury, electrical injury, falling in the water, drowning	-Life vest (to prevent drowning) -Lift with the legs and if object is heavy, two or more people must carry it -Communicating when placing ROV, removing ROV, and warning teammates/staff -When placing and removing ROV, all systems must be turned off
Safety check and setup	Electrical shock, cutting, minor limbs crushing	-All systems must be turned off when doing a checkup, and when turning on ROV to test it, be worry if you, your teammates, or others don't have fingers or hands in the

		<p>way of propellers and/or claw</p> <p>-Work calmly and effective</p>
Practice in the day/night	<p>-Hyperthermia, sunstroke, sun burn, dehydration, in the day</p> <p>-hypothermia (extreme cases)</p>	<p>-A tarp is placed over the control center(where the ROV is operated) to protect from sun damage</p> <p>-Sun block must be brought, hats are optional</p> <p>-water bottles must be brought</p>
SCUBA diving	<p>Nitrogen poisoning, drowning, hypothermia, lung explosion, the bends, decompression sickness, death</p>	<p>-All SCUBA divers must be trained and have experience.</p> <p>-Having a partner is advised, depending on the situation, you could be alone only if somebody snorkeling is watching you from the surface and can get to you in case of an emergency.</p>
Packing ROV	<p>Back injury, minor limbs crushed, electrical shock, minor cuts</p>	<p>-Have assistance in packing ROV, and lift with the legs.</p> <p>-Turn off ROV before packing.</p> <p>-We make sure that the ROV doesn't have sharp objects attached to it, but be weary of its surroundings.</p>
Handling ROV (while in the water ,and ROV operator is driving)	<p>Electrical shock, cuts, minor limbs crush(by mechanical arm),tripping on cable, cable operator falling to the water and drowning</p>	<p>-Only two people with life jackets are allowed in close proximity to the pool to work with the cable.</p> <p>-One teammate will be on one side handling the cable, the other teammate will be the retriever on the other side.</p>
Working close to water	<p>Falling, drowning</p>	<p>-Life jackets.</p> <p>-Watch your step.</p>
Emergency maintenance	<p>Electrical shock(while testing electronic attachment), cuts</p>	<p>-Be wary.</p> <p>-Turn off ROV if not testing; if testing make sure to</p>

		communicate so personnel can remove limbs from close proximity to ROV or CONTROL -Work efficiently.
Power source (battery).	Electrical shock, Short circuit, explosive, corrosive, burning, fire	-BE EXTRA CAREFUL! When handling this piece of equipment. -Put insulator on charge ends of the battery while in storage to prevent a short circuit. -Safety glasses. -The use of Anderson power pole is require; use a proper mechanical crimper. (Mechanical crimper is to join two pieces of metal)
Reaching places as quickly as possible	Slipping, tripping, falling, fracturing, twisting (ankles, wrist, Etc.)	-FAST WALK or jog slowly. -Watch your step. -Don't run.

Requirements:

- Experience with computers and other machinery.
- Prior experience with handling and/or controlling the ROV.
- Experience using hand tools, and power tools.
- Willing to work with other people as a team
- Dedication

Personal safety equipment:

- Safety glasses
- Life vest
- Safety Helmet
- Closed toes shoes
- Mask