

# JOB SAFETY ANALYSIS

Safety Information for SURO Robotics 2016



TASK	POTENTIAL HAZARDS	CONTROLS
1. Using hand tools (hacksaws, hand drills, files, screwdrivers, hammers, etc.)	A. Physical injury such as from sharp edges, blades, drill bits or heavy objects	I. Make sure tool users are qualified to use hand tools II. Make sure tool users use required PPE III. Avoid carelessness and do not work when tired IV. Use the right tool for the task
2. Using power tools (power drills, sanders, soldering irons, etc.)	A. Physical injury such as from sharp edges, blades, drill bits or heavy objects B. Physical injury from improper use C. Physical injury from fumes (such as from soldering) D. Potential chemical contamination from substances such as lead solder	I. Make sure tool users use required PPE II. qualified to use power tools III. Use proper ventilation at all times IV. Use proper PPE at all times V. Use Reduction of Harmful Substance (RoHS) compliant lead solder, or lead-free solder
3. Electrical safety	A. Fumes/fires that may result from electrical shorts B. Static discharge	I. Double check power connections II. Use proper PPE III. Always be properly grounded when working with electronics
4. ROV operation in the water	A. Potential shorts from improperly sealed connections B. Tripping hazards from cables leading into the water	I. Use both silicone and heat-shrink for all connections, both submerged and at the surface II. Use isolated power supplies in circuits III. Always use Ground Fault Circuit Interrupters IV. (GFCIs) when operating near water V. Put strain relief on all cables and secure systems at the surface VI. Develop and use a tether management protocol
5. General ROV design and construction	A. Potential physical hazards to others and the environment	I. Implement danger labels for moving parts and sharp edges II. Cover/eliminate sharp edges III. Use a 25A fuse with 25cm of the power source on the positive line IV. Put strain relief on all cables and secure systems at the surface V. Develop and use a safety checklist/protocol

### **Required Training:**

- Experience with all hand and power tools prior to their use
- awareness of safety hazards on ROV

### **Required Personal Protective Equipment (PPE):**

- Safety glasses and closed toe shoes for all work on or around the ROV and its peripheries, no matter the circumstances
- Gloves and masks for use with potentially hazardous substances