# Job Safety Analysis (JSA)

**Company:** impROVise

<table>
<thead>
<tr>
<th>Activity</th>
<th>Potential Hazard</th>
<th>Control Risk</th>
<th>Responsibility</th>
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</table>
| Using hand tools (hand drills, screwdrivers, hammer) | • Physical injury from sharp objects, blades, drills bits. | • Safety goggles  
• Gloves  
• Implement danger labels for moving parts and sharp edges | Engineer |
| Using Power tools (power drills, pillar drills, soldering irons) | • Physical injury from sharp objects, blades, drills bits.  
• Burns from soldering iron. | • Safety goggles  
• Gloves  
• Ensure items have time to cool down before storing.  
• When not in use, turn off. | Engineer |
| Fixed machinery (Laser cutter, 3D printer, Vacuum former) | • Fire risk from high temperatures.  
• Physical injury; burns from hot parts | • Do not use a 3D printer in close proximity to flammable materials  
• Wait five minutes before removing anything from the printer  
• Have precautionary materials nearby, such as fire extinguishers, or fire blankets | Engineer |
| Electrical safety | • Fumes/ fires that may be the result of electrical short  
• Electrocution | • Double check power connections  
• Fuses are added to prevent overload  
• Heat shrink and insulated tape are used to cover | Engineer  
Safety manager |
### ROV operating in the water
- Potential shorts from improperly sealed connections
- Tripping hazards from cables leading into the water
- Use both silicone and heat shrink for all connections.
- Develop and use a tether management protocol.
- Put strain relief on all cables and secure systems at the surface.
- Implement danger labels for moving parts and sharp edges.

| Tether manager Engineer Pilot Co-pilot |

### ROV design and construction
- Sharp edges from jubilee clips or other objects
- Screws sticking out.
- Heavy for lifting
- Trip on the tether
- Design thrusters and propellers to be both inboard and shrouded at all times.
- Wear gloves when working on the ROV.
- Large or heavy items or equipment, use a cart or other form of safe transportation or have two people carrying this at a time.
- Always lift from the legs.
- Make sure that someone is on tether management and hazard signs are displayed.

| Engineer |
### Personal Protective Equipment (PPE):

- Safety goggles and closed toe shoes to be worn at all times when working around or with the ROV.
- Hearing protection for use with power tools and loud machinery.
- Gloves to be worn with hot tools.

### Recovering the ROV from the water

- Slipping into the water
- Heavy lifting
- Electrical safety
- Tripping over tether
- Disconnect main power line before handling the ROV
- Two people need to carry this out at a time, one person on tether and one person carrying the ROV

<table>
<thead>
<tr>
<th>Safety manager</th>
<th>Retrieval and deployment person</th>
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### Unscheduled maintenance

- Electrical faults
- Mechanical faults
- Physically damaged in transit
- Asses the problem before performing any maintenance
- Do not assume systems are okay without checking them first
- Thorough visual electrical inspections, especially of high power components.

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### Electrical safety - Fuses

- Electrical faults
- 25amp fuse in the main power line
- 10 amp fuses for the cameras
- Main power on/off switch

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