



Job Site Safety Analysis (JSA)

Required Personal Protective Equipment	Required Safety Training
<ul style="list-style-type: none"> • Safety Glasses • Closed-toed, non-slip shoes • Non-loose clothing • No dangling jewelry 	<ul style="list-style-type: none"> • Emergency shutdown procedures • Deployment and retrieval techniques • Tether management protocol • Safety checklist • De-energization protocols <ul style="list-style-type: none"> ○ When emergency situation - someone yells “STOP” and power is immediately cut to all critical systems - pneumatics and electronics

Step	Task	Potential Hazard	Control	Responsible Person (s)
Entering pool deck area	ROV and equipment movement	Tripping Muscle Strain Tether	<ul style="list-style-type: none"> • Utilize proper lifting posture (don't lift with your back but with your knees) • When possible, have two members carry ROV • No horseplay • Spotter in front guides everyone and removes obstacles • Ensure adequate slack in tether to prevent propagation of a fall 	All members
Pre-Launch Setup	Initial System Inspection	Electrocution	<ul style="list-style-type: none"> • Keep electronics away from pool edge • Have power unplugged while inspecting 	Deployment members
	Surface Station Setup	Electrocution	<ul style="list-style-type: none"> • Keep electronics away from pool edge • Ensure surface station setup is placed securely and is not unstable • Ensure equipment is powered off before connecting to wall • Verify equipment is not wet 	Pilot and Co-Pilot(s)

	Tether Setup	Electrocution Tripping	<ul style="list-style-type: none"> ● Keep electronics away from pool edge ● Ensure all connections are secure ● Cables are tied off to an anchor point ● No loops in the tether large enough to catch limbs ● Verify equipment is not wet ● No horseplay near tether 	Deployment members
	PPE Check	Tripping Pinching	<ul style="list-style-type: none"> ● Ensure proper PPE and attire is worn ● No horseplay around near pool edge or in pool 	All members
Power up checks	Electronic Power up	Electrocution Pinching	<ul style="list-style-type: none"> ● Have a member ready to emergency de-energize ROV from now until official de-energization ● Verify equipment is not wet or damaged ● Ensure power switch is off and tether is detached before plugging in power box ● Ensure connector is securely attached ● Ensure everyone is clear of ROV before power up ● Ensure power indicator shows minimal wattage draw 	Pilot and Co-Pilot(s)
	Pneumatic power up	Pinching Embolicism Electrocution	<ul style="list-style-type: none"> ● Verify equipment is not wet or damaged ● Ensure Air compressor is OFF before plugging into wall ● Ensure pressure relief on compressor is closed ● Ensure everyone is clear of ROV before power up ● Have regulators set to minimum pressure then increase to 40 psi ● Disconnect pneumatics whenever pneumatics are not required (on surface) (ball valve on regulator) ● NEVER attempt to block leaks with fingers 	Pilot and Co-Pilot(s)
	Power-on System Inspection	Electrocution Pinching	<ul style="list-style-type: none"> ● Ensure power indicator and leak sensors do not read abnormal behavior ● Ensure everyone is clear of ROV during tests 	Deployment members Pilot and Co-Pilot(s)

Poolside operation	Deploying the ROV into pool	Tripping Electrocution Pinching Muscle strain	<ul style="list-style-type: none"> ● Ensure deployment area is clear of tripping hazards ● Ensure tether is managed by an employee during deployment. ● Utilize proper lifting posture (don't lift with your back but with your knees) ● Always have two people deploy ROV ● Ensure powered tools are de-energized during deployment <ul style="list-style-type: none"> ○ Disconnect tether pneumatics ○ Electronic lock on thrusters and tools 	Deployment members
	ROV Operation	Electrocution Tripping Pinching Drowning	<ul style="list-style-type: none"> ● If leak detected, power cut off immediately at power box ● No horseplay near pool ● Licensed lifeguard on duty if pool is >6' (human height) and if less, at least one person ready to jump in ● If people in water, they must stay away from ROV during operation or have electronics locks enabled before contacting ROV 	All members
	Retrieval of ROV	Tripping -> drowning Electrocution Pinching Muscle strain	<ul style="list-style-type: none"> ● Ensure retrieval area is clear of tripping hazards ● Ensure tether is managed by an employee during retrieval. ● Utilize proper lifting posture (don't lift with your back but with your knees) ● Always have at least two people retrieve ROV ● Ensure powered tools are de-energized during retrieval <ul style="list-style-type: none"> ○ Disconnect tether pneumatics ○ Electronic lock on thrusters and tools 	Deployment members
System breakdown	Pneumatic de-energization	Pinching Embolism Electrocution	<ul style="list-style-type: none"> ● Ensure everyone is clear of ROV ● Power off compressor then unplug power ● Turn regulators to minimum pressure ● Vent compressor tanks with release valve ● Ensure cables are disempowered before detaching wires ● NEVER attempt to block air with fingers 	Pilot and Co-Pilot(s)

	Electronic de-energization	Pinching Electrocution	<ul style="list-style-type: none"> ● Ensure everyone is clear of ROV ● When switching off power box, wait for power indicator to shut off before moving on ● Ensure equipment and hands are not wet 	Pilot and Co-Pilot(s)
	ROV cleanup	Muscle strain Slipping	<ul style="list-style-type: none"> ● Utilize proper lifting posture (don't lift with your back but with your knees) ● When possible, have two people deploy ROV ● Do not be distracted while carrying, washing and drying off ROV 	Deployment members
	Surface Station cleanup	Electrocution	<ul style="list-style-type: none"> ● Keep electronics away from pool edge ● Verify equipment is not wet ● Turn off electronics before disconnecting power 	Pilot and Co-Pilot(s)
	Electronics check	Electrocution Pinching	<ul style="list-style-type: none"> ● Ensure power is off and disconnected before removing electronic enclosure lid ● Ensure equipment is not wet and have a dry towel ready ● Have ROV at least 2' away from pool edge ● Utilize one hand rule (touch electronics with only one hand and other behind back) 	Electronics troubleshooting team
Exiting pool deck area	ROV and equipment removal	Tripping Muscle Strain Tether	<ul style="list-style-type: none"> ● Utilize proper lifting posture (don't lift with your back but with your knees) ● When possible, have two members carry ROV ● No horseplay ● Spotter in front guides everyone and removes obstacles ● Ensure adequate slack in tether to prevent propagation of a fall 	All members