JOB SAFETY ANALYSIS (JSA) 2024 REPORT

SAFETY

SERVICEABILITY

RELIABILITY

Shark Tech

Labrador Straits Academy
L'Anse Au Loup, NL, CAN

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JSA Overview

The tasks that the members of Shark Tech can perform easily are listed in the accompanying document, along with step-by-step descriptions of each one. The Job Safety Analysis (JSA) helps identify potential risks associated with each stage of specific occupational duties and outlines the necessary safety precautions to reduce the risk of any incidents or injuries to the individuals performing the tasks. All Shark Tech employees working with the team's Remotely Operated Vehicle (ROV), LabraShark, must abide by the information provided in this document.

Our company Safety Officer is always monitoring employees to ensure all safety precautions are followed.

I. JSA TABLE

Task	Hazards	Controls	Responsible Person(s)	Initial:
Entering/Exiting the Pool Deck.	Slipping	Ensure the use of slip-resistant and water-resistant footwear on the pool deck to help prevent slips and falls. Ensure Personal Floatation Devices (PFDs) are worn before entering the pool area even if they are not directly involved with the ROV.	Olivia Normore-Safety Officer	
	Damaging Equipment	Shark Tech carefully packs and secures the equipment in our cases during transport so that none of it gets damaged.	Marcus Flynn-CEO	
Deck Operations Set-Up	Injury while removing ROV and additional equipment	Shark Tech company members practice setting up in accordance with the set-up flowchart(Appendix B). Shark Tech company members are also trained on how to properly lift heavier and bulkier equipment like the ROV. This training has helped eliminate injuries while setting-up for operations.`	Olivia Normore-Safety Officer	
	Miscommunication	To avoid miscommunications during the set-up process, Shark Tech has devised a deck set up list of operations (Appendix A) and a set-up flowchart (Appendix B) that help facilitate quick and successful deck set-ups.	Marcus Flynn-CEO	
Power-up	Excessive current to ROV system	To prevent the delivery of excessive current to the ROV system, there is a 25-amp fuse that connects the MATE power supply to Shark Tech's ROV.	Lucas Buckle-Electrical engineer	
Poolside Operation	Injury	To prevent injury, all Shark Techs company members are trained on proper deck operations.	Oliva Normore-Safety Officer	
	Injury to fingers while interacting with the ROV	To prevent injury to deck crew members, Shark Tech has ensured that there are no sharp corners on the ROV and designed thruster guards that meet IP-20 standards so no foreign materials or fingers can enter and be damaged by the thrusters.	Olivia Normore-Safety Officer	

Task	Hazards	Controls	Responsible person(s)	Initials
Poolside Operation	Slipping or falling in the pool resulting in risk or injury.	Even if they are not directly dealing with the ROV, staff members MUST ALWAYS wear Personal Floatation Devices (PFDs) when poolside. The poolside requires employees to always walk carefully and pay close attention to whatever they may be doing at the time.	Luke Hudson-Co-Pilot	
System breakdown	Damage to equipment	Shark Tech carefully packs and secures the equipment to avoid important equipment being damaged during transport and causing safety hazards.	Marcus Flynn-CEO	
	Misplacement of equipment	Shark Tech prevents the misplacement of equipment by always having the person in-charge of each piece of equipment, place it in its designated location.	Marcus Flynn-CEO	
	Miscommunications	Shark Tech's company members employ a set deck breakdown procedure that helps facilitate successful and quick deck breakdowns.	Marcus Flynn-CEO	

Required Training	All Shark tech company members are required to undergo basic safety training. Shark Tech deck crew members are also required to undergo Operations Safety Training, specific to poolside and mission operations. This covers all the hazards and responses above.
Required Personal Protective Equipment (PPE)	All Shark techs company members are expected to wear safety glasses and life jackets when interacting with the ROV on deck. Deck crew members are required to wear safety glasses while operating the ROV.
Task:	ROV Deck and Water Safety
Contributors:	Logan Ryland (Deck Manager) and Olivia Normore (Safety Officer)
Created:	May 2024

Appendix A: Deck Operations Checklist

Pre-Power (Pilot, Co-pilot, and Deck Crew)

- [ ] Area is clear and safe (no tripping hazards or obstructions
- [ ] All team members are wearing safety glasses
- [ ] Verify RPS power switches are off
- [ ] Tether laid out on the deck and is free of damage
- [ ] Tether is connected and secured top the RPS
- [ ] Tether is connected to strain relief and secured to ROV
- [ ] Power source connected to RPS
- [ ] Verify electronics housing is properly sealed and fasteners are tightened
- [ ] Visual inspection of electronics for damaged wires or loose connections
- [ ] Thrusters are free from obstructions

Power-up (Pilot, Co-pilot, and Desk Crew)

- [ ] Verify RPS is receiving 12V nominal
- [ ] Control computers up and running
- [ ] Ensure desk crew members are attentive
- [ ] The Co-pilot calls out, “power on!”
- [ ] Power on RPS
- [ ] Co-pilot calls out, “performing thruster test”
- [ ] Test thrusters and verify thrusters are working properly
- [ ] Verify video feeds from navigation and mission cameras
- [ ] Ensure cameras are positioned correctly
- [ ] Test electrical and pneumatic components that require pilot input (See Pneumatic System Test)

Inspect and Test Pneumatic System (Pilot, Co-pilot)

- [ ] Verify all pneumatic lines on RPS and ROV are properly connected to the MATE air supply
- [ ] Verify that the compressor is switched on
- [ ] Adjust pressure regulator to 40 PSI
- [ ] Activate pneumatic system and open main valve
- [ ] Verify there are no leaks and pneumatic lines are securely connected while under pressure
- [ ] Activate pneumatic tools and verify the pressure returns to 40 PSI after the tool is shut off

ROV launch (Pilot, Co-pilot, and Desk Crew)

- [ ] The pilot calls out, “ROV surfacing”
- [ ] Desk crew calls out, “ROV on surface. Disable thrusters”
- [ ] Co-pilot calls out, “thrusters disabled”
- [ ] Deck Crew call out, “hands on”, and remove ROV from the water
- [ ] Co-pilot calls out, “safe to remove ROV”
- [ ] After securing the ROV on deck, Deck Crew calls out, “ROV secured on deck”
- [ ] Co-pilot powers down RPS
- [ ] Team begins demobilizing

Leak Detection (Pilot, Co-pilot, and Desk Crew)

- [ ] Immediately power down the ROV and RPS systems and remove the ROV from the water if a mission is occurring
- [ ] Visually inspect ROV to identify the source of the leak. Do not disassemble any part of the ROV until the source of the leak is detected
- [ ] Install pressure testing equipment and use soapy water to verify the source of the leak
- [ ] Create a plan and repair the leak
- [ ] Check all systems for damage and verify proper operation
- [ ] Document the source and cause of the leak and detail the corrective actions and design changes made.

Pit Maintenance (All Team Members)

- [ ] Pit is well organized and free of debris
- [ ] All tools, cables, and equipment are safely stored in their designated spaces and there are no tripping hazzards
- [ ] Check electrical cords and correct any electrical hazards
- [ ] Check supplies and organize a shopping list if anything is needed for repair RPS, ROV and tether are clean, dry and stored
- [ ] Protective caps for electrical connectors are in place
- [ ] ROV, RPS and tether have been readied for use on the next mission run

Loss Of Communication (Pilot, Co-pilot and Deck Crew)

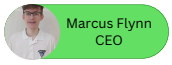
- [ ] Cycle power on RPS to reboot ROV
- [ ] If no communication, power down ROV, retrieve via tether
- [ ] If communication restored, confirm there are no leaks, resume operations
- [ ] If communication has not been restored, begin troubleshooting procedures and isolate the issue. Determine if the issue is with hardware or software
- [ ] Document the problem and detail the corrective actions made to solve the problem

Figure 2. Shark Tech Operations Checklist by Logan Ryland And Olivia Normore

Appendix B: Deck Set-up Flowchart

Deck Set Up Flow Chart

Deck Crew Members:


Marcus Flynn
CEO


James Penney
Pilot


Luke Hudson
Co-Pilot


Logan Ryland
Deck Manager


Lucas Buckle
Tether Manager


Christian Roque
Prop Manager


Finlay Jones
Float Technician


Owen Hudson
Prop

Phase 1: Unloading

- Brings out all the necessary documents
- Bring out the compressor & places on deck
- Removes laptop from case & places on table
- Bring out the control box & places on table
- Bring out controller and places on table
- Carefully carries ROV container to the deck
- Brings out laptop for the float
- Carries in the float & places it on deck

Phase 2: Physical ROV Set-Up

- Connects power supply to extension cord
- Connects control box to MATE power supply & monitor
- Removes ROV from container and carefully carries it to the deck
- Connects controller to control box
- Arrange props in our desired order

Phase 3: Power-Up

- Connects compressor to control box and power on
- Launch Excel on laptop
- Connect controller to power supply and then to control box
- Launch Arduino and open comm link on Laptop

Phase 4: Confirmation Testing

- Confirms visuals from all 4 cameras
- Test out motors to confirm connection between the control box
- Testing claw, confirms functionality
- Confirm connection between surface Arduino and float

Phase 5: Launch

- Grips onto the Irregation system
- Gets tether untangled and ready for ROV deployment
- Attach Irrigation system to the claw and lowers the ROV
- Lowers float into the water

Appendix C: Shark Tech Training Tracking Log

Team Member Name and Position	Basic Safety Training	Operations Safety Training
Marcus Flynn - CEO ‘26	☑	☑
James Penny - Pilot ‘26	☑	☑
Luke Hudson - Co-Pilot ‘25	☑	☑
Logan Ryland - Deck Manager ‘24	☑	☑
Lucas Buckle - Electrical Engineer ‘24	☑	☑
Christian Roque - Lead Prop Designer ‘25	☑	☑
Finlay Jones - Float Technician ‘25	☑	☑
Owen Hudson - Prop Designer ‘25	☑	☑
Olivia Normore - Safety Officer ‘27	☑	☑
Yashveen Gunput - CFO ‘27	☑	
Julian Flynn - Lead Technical Writer ‘25	☑	
Brandon O’Dell - Technical Writer ‘24	☑	