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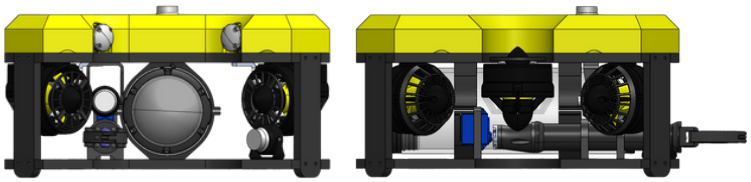

JOB SAFETY ANALYSIS (JSA) 2024 REPORT

Company: SFROBOTICS (9th Year)
Team Name: Mariner Mayhem
City: St. Francis, WI
Home Country: USA

JSA TABLE:

Task	Hazards	Controls	Resonsible Person(s)	Initial(s)
Entering/ Exiting the Pool Deck	Slipping	All Members are required to have either a cap or hair tied back and wear closed-toed shoes while on deck to avoid personal injury.	Desiree Halsey, CFO	_____
	Damaging Equipment	*SFROBOTICS* Members ensure careful transportation of equipment to avoid possible equipment damage and environmental damage.	Andre Moreno, Software Lead	_____
Deck Operations Setup	Miscommunication	To avoid miscommunications prior to set up, *SFROBOTICS* has devised a deck set-up checklist (**pg. 2**) and flow chart (**pg. 3**) to effectively move through deck set-up.	Andre Moreno, Software Lead	_____
	Personal Injury	*SFROBOTICS* practices deck set-up and all members are trained on safely hauling heavier equipment to prevent personal injury	Emmitt Esselstrom, CEO	_____
Power Up	Excess Current to ROV Systems	To prevent the delivery excess current to ROV systems, a 25-amp fuse which connects the MATE PSU to *SFROBOTICS's* ROV.	Emmitt Esselstrom, CEO	_____

JSA TABLE: Created by Andre Moreno and reviewed by Desiree Halsey, and Emmitt Esselstrom. Document updated May 2024.

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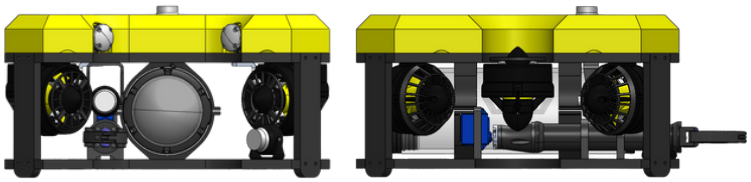

JOB SAFETY ANALYSIS (JSA) 2024 REPORT

JSA TABLE:

Task	*Hazards*	Controls	Responsible Person(s)	Initial(s)
Poolside Operations	Personal Injury	All *SFROBOTICS* members have undergone through proper deck operations procedures as well as wearing proper safety gear, such as safety glasses, to prevent personal injury while handling ROV equipment.	Desiree Halsey, CFO	_____
Deck Operations Breakdown	Mishandling Equipment	*SFROBOTICS* members ensure proper handling of equipment post-session to prevent damage to the ROV equipment.	Andre Moreno, Software Lead	_____

Training	All SFROBOTICS team members are required to participate in Safety Training that consists of a review of SFROBOTICS safety practices in addition to a review of safety in SFROBTOICS ROV Operations.

Required Personal Protection Equipment (PPE)	All SFROBOTICS team members are required to wear safety glasses whenever interacting with the ROV on the pool deck. Team members are required to wear safety glasses while operating the ROV.

Deck Operations Checklist

Deck Operations Checklist: Created by Andre Moreno and reviewed by Desiree Halsey, and Emmitt Esselstrom. Document updated May 2024.

Task Group	Individual Tasks
Pre-Power Up	• Area is clear and safe • All members are wearing appropriate attire and safety wear • Verify all power prior to prep is off • Verify tether is secure, knot-free, and free of damage • Power source is correctly connected to topside enclosure • Verify all electronics are securly connected and damage-free • ROV is free form obstrucitons
Power Up	• Verify topside enclosure is receiving 12V • Surface laptop is powered on and running ROV software • Announcer calls out *"ROV is powered!"* • Power on topside enclosure • Announcer calls out *"Preforming pre-launch tests!"* • Test all ROV systems(thrusters, lights, claw, cameras)
ROV Launch	• Members on pool call out *"Launching!"* • ROV is carefully placed into water • ROV is checked for bubbles, leaks, failed systems. • If no issues persist, announcer calls out *"Flying Out!"*
ROV Retrieval	• Annoucer calls out, *"ROV surfacing"* • Pool side members call out, *"ROV Surface, disable systems"* • Annouceer calls out, *"Systems disabled"* • Pool side member carefully removes ROV from water • Post-removal, pool side member calls out, *"ROV on deck"* • Pilot powers down all system. • Team begins area break down
Leak Detections	• Power down all systems (ROV and topside enclosure) • Remove ROV from water • Inspect ROV for leak and locate source of leak • Use soapy water and pressure tools to verify source • Check systems for any liqud damage or assess potential hazards • Document occurance and create plan to change design
Loss of Communication	• Annoucer calls out, *"ROV DC"* • Power Cycle PSU and reboot systems • If communication restores, verify system integrity and resume mission • If LoS presists, retireve ROV via tether • if LoS persists, being to troubleshoot possible sources of LoS • Document LoS occurance and create plan to resolve issue.
Pit Maintenance	• Pit is organized, clean, and free of unecessary obstructions • All equipment and cables are safely stored and create no hazard • Verify electrical cords/outlets to not present possible hazard • Inventory supplies and create list(s) of potential items needed upon disaster • Verify ROV and all systems are clean and safely stored preventing hazard or possible damage • ROV is ready available to go for next run

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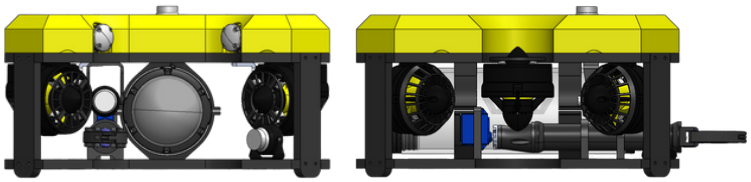

JOB SAFETY ANALYSIS (JSA) 2024 REPORT

Deck Setup Flow Chart	Unloading	ROV Set Up	Power Up/ Communication Setup	Testing	ROV Launch
Emmitt Esselstrom (Pilot/ Operations) 	Verify table is clear and ready to be loaded with materials	Plug topside enclosure into PSU and connect USB and CAT cable into laptop	Turn on PSU	Ensure ROV receives joystick input, claw and camera tilt is funcitonal	Confirm systems(thrusters, claw) are functional upon submersion
Andre Moreno (Co-Pilot/ Announcer) 	Grab surface laptop, monitor and peripherals.	Plug monitor into laptop and lay out plans	Verify ROV is receving communication (network and cameras)	Ensure all cameras are receiving proper communication	Verify camera systems are functional upon submersion
Desiree Halsey (Tether/ Props) 	Go to pool side with ROV and tether	Ensure tether is tangle free and ready to be fully extended	Postion tools needed for missions for quick access	Double check tether and ROV for any potential hazards	Lower ROV into water
Brady Thorne (Operations) 	Unload ROV, push cart aside	Verify all connecitons are secure and do not present a hazard	N/A	Double check all connections surface-level are secure	Keep Time

Cole Cushing (Back Up) 

Deck Setup Flow Chart: Created by Andre Moreno and reviewed by Desiree Halsey, and Emmitt Esselstrom. Document updated May 2024.

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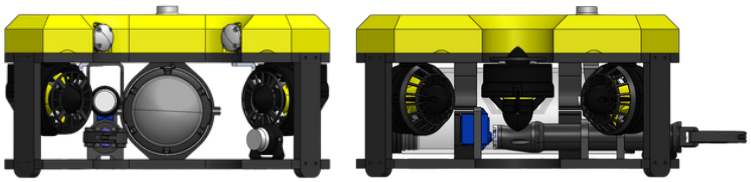

JOB SAFETY ANALYSIS (JSA) 2024 REPORT

Company: SFROBOTICS (9th Year)
Team Name: Mariner Mayhem
City: St. Francis, WI
Home Country: USA

Training Log:

Team Member	Safety Training	ROV Operations Training
Emmitt Esselstrom Role(s):	☑	☑
Andre Moreno Role(s):	☑	☑
Desiree Halsey Role(s):	☑	☑
Brady Thorne Role(s):	☑	☑
Cole Cushing Role: Back Up (if available)	☑	

Training Log: Created by Andre Moreno and reviewed by Desiree Halsey, and Emmitt Esselstrom. Document updated May 2024.