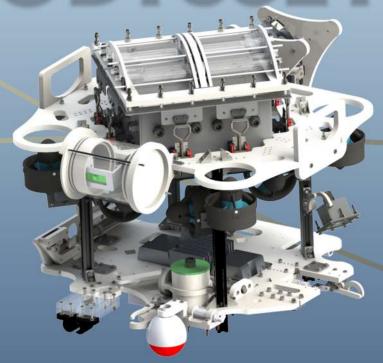# ODYSSEY

COMPANY STAFF

"## : Graduation Year

"25 Amr Khaled Alhagla || CEO
"28 Mostafa Ahmed Elassar || CFO
"25 Ahmed Mohamed Khalafallah || CTO Electrical
"24 Omar Ahmed Yackout || CTO Mechanical
"26 Hanin Osama Morsy || Vice CTO Mechanical
"24 Ahmed Sameh El Komy || Firmware Team Lead
"24 Mahmoud Hamada Yousef || Hardware Team Lead
"24 Ahmed Mohamed Sakr || Software Team Lead
"28 Abanoub Hany Zaky || Mechanical Engineer
"25 Abdelrahman Moataz || Firmware Engineer
"25 Ahmed Adel Ibrahim || Mechanical Engineer
"24 Ahmed Hassan Falah || Firmware Engineer
"25 Ahmed Ibrahim Anan || Hardware Engineer
"25 Ahmed Mohamed Mamdouh || Firmware Engineer
"25 Ahmed Mohamed Rizk || Mechanical Engineer

"25 Hussein Khaled Hussein || Software Engineer
"26 Ibrahim Mohamed Beshr || Firmware Engineer
"24 Marwan Ahmed Mostafa || Hardware Engineer
"27 Mina Emile Roushdy || Hardware Engineer
"24 Mostafa Ibrahim Hassan || Software Engineer
"25 Nezar Marwan Zolfackar || Mechanical Engineer
"27 Omar Essam Fayed || Hardware Engineer
"27 Peter Tharwat Emeel || Mechanical Engineer
"27 Phoebe Emile Roushdy || Hardware Engineer
"25 Salma Ahmed Sherif || Firmware Engineer
"24 Seif M.Amr Bassiouny || Firmware Engineer
"26 Yahya Medhat Abdelbarr || Firmware Engineer
"26 Youssef Tarek Hussein || Software Engineer
"25 Ziad Amr Ibrahim || Software Engineer

Mentors

-Abdelhamid Abdallah   -Ahmed El Tawil   -Ahmed Hindawy   -Alaa Arafa   -Alaa Shehab   -Ayman Adly
-Hagar Mohammed   -Hany Hamza   -Ibrahim Elshenhapy   -Mahmoud Ahmed   -Mahmoud Beshr
-Mahmoud El Shenawy   -Marawan Ahmed Rabea   -Mohamed Ebrahim   -Mohannad Mohamed Yehia
-Omar Samy   -Perla Hatem   -Raghad Aboeleneen   -Rozan Magdy   -Samanda Tarek

AQUAPHOTON
ACADEMY

ALEXANDRIA UNIVERSITY
FACULTY OF ENGINEERING

ALEXANDRIA, EGYPT

Job Safety Analysis

ROVS BUILT TO LAST

Job Safety Analysis

Task:	Workshop and Water Safety Analysis
Analysis by:	Workshop and Safety Director
Reviewed by:	
Date:	
Signature:	

Required Protective Equipment:

- Non-Slip Shoes
- Life Jacket (for tasks near pool)
- Protective gloves

Task	Hazard	Risk				Control	Responsible
		SV	LH	DT	RPN		
General							
Transportation							
Transporting the ROV.	Foot injury	4	7	3	84	-Wear safety shoes.	Transportation Responsible
	Hand injury	3	9	2	54	-Wear heavy-duty work gloves. -Ensure handles are well fixed. -Ensure there are no sharp edges.	
Pre-Launch							
Setting the ROV into control position.	Foot injury	3	8	3	72	-Wear safety shoes.	Mechanical Team Members
	Hand injury	4	9	2	72	-Wear heavy duty work gloves. -Ensure handles are well fixed. -Smooth all the sharp edges.	
Continued on next page...							

ROVS BUILT TO LAST

Job Safety Analysis

Task	Hazard	Risk				Control	Responsible
		SV	LH	DT	RPN		
Setting up and Breakdown the tether.	Tangled Tether	8	9	2	144	-Ensure there are no loops in the tether.	Tether Man
	Tether Damage	7	4	3	84	-Roll the tether on a roller when transporting to prevent any excessive tension. -Ensure the strain releif is holding the tether on both the ROV's side and the Top-Side Control Unit (TCU)'s side.	
	Tripping over Tether	5	6	2	60	-Keep away from the tether to avoid tripping over it.	
Setting up and Breakdown Power Supply.	Over Voltage	8	6	4	192	-Double check the voltage reading when setting up the power supply.	Electrical Team Members
	Electro-cution	9	5	4	180	-Immediately switch OFF the power supply if any fault is detected. -Make sure there are no exposed wires.	
Setting up and Breakdown Air Pump.	Over Pressurized	8	6	3	144	-Double check and adjust the pressure regulator.	Mechanical Team Members
	Air Injury	6	5	5	150	-Check all the pneumatic connections. -Check the air inlet valve is OFF before connecting to the compressor.	
Checking Buoyancy and sealing.	Water Leak	9	5	4	180	-Ensure all glands are well fixed. -Check all the connections before putting the ROV into the water.	Mechanical Team Members
Dry system operation test.	Electrical System Failure	9	4	5	180	-Check all the electrical connections before testing.	Electrical Team Members & Mechanical Team Members
	Electro-cution	10	6	2	120	-Check there are no loose wires.	
	Frame Damage	10	5	3	150	-Put the ROV on a suitable stand to avoid damaging the frame.	
	Manipulator Damage	4	5	3	60	-No obstacles between manipulator jaws.	
	Finger Injury	9	3	2	54	-Always keep fingers away from the thrusters in order to avoid direct contact with them.	

Job Safety Analysis

Job Safety Analysis

Task	Hazard	Risk				Control	Responsible
		SV	LH	DT	RPN		
Launch							
Putting the ROV into the water.	Back Injury	9	5	3	135	-Kneel down using legs to avoid back bending when putting the ROV into the water.	Tether Man & Payload Specialist
	Hand Injury	5	6	2	60	-Wear heavy duty work gloves. -Ensure there are no sharp edges in the ROV.	
	Foot Injury	5	5	2	50	-Wear safety shoes.	
	Tripping	5	6	3	90	-Keep away from the tether to avoid tripping over it.	
	Slipping	6	8	2	96	-Wear non-slip shoes. -Avoid being near the pool edge.	
	Drowning	9	2	3	54	-Wearing life jackets for those who cannot swim.	
ROV Operation.	Tripping	5	6	3	90	-Keep an eye on the tether to avoid tripping over it.	Tether Man & Payload Specialist
	Slipping	6	8	2	96	-Wear non-slip shoes.	
ROV Retrieval.	Back Injury	9	5	3	135	-Kneel down using legs to avoid back bending when retrieving the rov from the water.	Tether Man & Payload Specialist
	Hand Injury	5	6	2	60	-Wear heavy duty work gloves. -Ensure there are no sharp edges in the ROV.	
	Foot Injury	5	5	2	50	-Wear safety shoes.	
	Tripping	5	5	3	75	-Keep away from the tether to avoid tripping over it.	
	Slipping	6	9	2	108	-Wear non-slip shoes. -Avoid being near the pool edge.	
	Drowning	9	2	3	54	-Wear life jackets while near the pool.	

ROVS BUILT TO LAST

Job Safety Analysis

 In our safety analysis a Failure Mode and Effects Analysis (FMEA) is applied which is a structured approach to discover potential failures that may exist within the process.

Calculating the Risk Priority Number (RPN) by evaluating the severity (SV), Likelihood (LH) and Detection (DT) of risks to prioritize which ones are the most urgent.

Where each category has it's scoring matrix with a 1-10 scale.

- Severity (SV): 1 is for the lowest risk of damage and 10 for the highest risk of damage to the users.
- Likelihood (LH): 1 is for the least probability of risk occurrence and 10 for the highest probability of risk occurrence.
- Detection (DT): 1 denotes that the process won't likely catch a failure, and 10 means that the process will likely catch a failure.
- Risk Priority Number (RPN) = Severity x Likelihood x Detection. According to RPN hazards are sorted from largest to smallest, where risk reducing procedures are made to reduce over all risk.

Risk Priority Number (RPN)	Description	Recommendation
190 and Higher	Catastrophic	Stop
140-189	Unacceptable	Action
50-139	Acceptable	Monitor
5-49	Desirable	No action