

KAMIKAZE



## Company Staff

"26 Abdelaziz Serour > CEO	"27 Mohamed Samir > Electrical Engineer	"27 Ahmed Eldesoky > Mechanical Engineer
"27 Menna Allah Ramadan > CFO	"26 Habiba Niazy > Electrical Engineer	"27 Youssef Adel > Mechanical Engineer
"26 Omar Mohamed Hussein > Mechanical CTO	"27 Mariam Niazy > Electrical Engineer	"27 Mohamed Gamal > Mechanical Engineer
"27 Basmala Ehab > Vice Mechanical CTO	"26 Kareem Aboelmahasen > Mechanical Engineer	"28 Ahmed AlaaEldin > Mechanical Engineer
"27 Zeyad Elbaky > Vice Mechanical CTO	"27 Islam Abdunasser > Mechanical Engineer	"28 Youssef Mekky > Mechanical Engineer
"27 Ahmed Loay Elattar > Electrical CTO	"28 Omar Desoky > Mechanical Engineer	"27 Omar Farahat > Software Engineer
"28 Rahma Elwazzan > Vice Electrical CTO	"27 Marko Hannna > Mechanical Engineer	"28 Youssef Mohammed > Software Engineer
"27 Abdelrhman Shaheen > Software CTO	"27 Hamza Ashraf > Mechanical Engineer	"26 Ahmed Anwar > Software Engineer
"27 Anas Badr > Vice Software CTO	"27 Nada Mostafa > Mechanical Engineer	"26 Kareem Yasser > Software Engineer
"27 Nadine Mostafa > Vice Software CTO	"26 Mohammed Hassona > Mechanical Engineer	"27 Tasbih Othman > Software Engineer
"26 Ahmed Attia > Software Consultant	"26 Ammar Adel > Mechanical Engineer	"27 Abdelrahman Eldenary > Software Engineer
"26 Marawan Tarek > Electrical Engineer	"26 Yara Hesham > Mechanical Engineer	"27 Saifeldeen Mohamed > Software Engineer
"27 Omar Hossam > Electrical Engineer	"26 Habiba Mamdouh > Mechanical Engineer	"28 Marwan Essam > Software Engineer
"27 Ahmed Rashwan > Electrical Engineer	"27 AlaaEldin Manaa > Mechanical Engineer	"28 Ziad Al-Junaidi > Software Engineer

## Job Safety Environmental Analysis



## Mentors

Prof. Amr El-Tawil

Dr. Victor Parque

Dr. Haitham El-Hussieny

## 1 Introduction

This report provides an in-depth analysis of job safety for both electrical and mechanical tasks. It discusses all potential hazards, the safety measures taken, and the team members responsible for each task.

Environmental and Personal Protective Equipment Considerations	Emergency Procedures
<ul style="list-style-type: none"> <li>• Safety goggles</li> <li>• Gloves</li> <li>• Lab coats/aprons and non-loose clothing</li> <li>• Closed-toe shoes</li> <li>• Proper ventilation</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Electrical Shock:</b> Immediately shut down power and seek medical assistance.</li> <li>• <b>Fire (from soldering or electronics):</b> Use a fire extinguisher, evacuate if necessary.</li> <li>• <b>Cuts/Burns:</b> Apply first aid, use bandages, seek medical attention if needed.</li> <li>• <b>Water Leakage on Electronics:</b> Shut off power, remove Kamikaze from water, dry components thoroughly.</li> </ul>

TABLE I: Safety Guidelines and Emergency Procedures

## 2 Job-Safety Analysis for Mechanical Tasks

Task	Hazard	Risk Level	Safety Measures	Responsible Team Member
<b>Transporting Kamikaze</b>	Falling, Slipping, Back Injury	Low	<ul style="list-style-type: none"> <li>• Maintain a clean and obstacle-free workspace.</li> <li>• Wear non-slip footwear to avoid slipping.</li> <li>• Reduce the amount of weight lifted.</li> </ul>	Abdelaziz Serour - CEO
<b>Using sharp tools</b>	Hand injury, Eye injury	High	<ul style="list-style-type: none"> <li>• Wear safety gloves and safety glasses.</li> <li>• Use tools correctly and store them safely.</li> <li>• Use personal protective equipment (PPE).</li> </ul>	Mechanical and Electrical Team
<b>Pneumatic system</b>	Exceeding the maximum pressure allowed	High	<ul style="list-style-type: none"> <li>• Use a pressure relief valve set at 10 bar, the allowable pressure for the tank.</li> <li>• Regularly inspect and maintain the system.</li> </ul>	<ul style="list-style-type: none"> <li>• Basmala Ehab - Vice Mechanical CTO</li> <li>• Ammar Adel - Mechanical Member</li> </ul>
<b>Drill press</b>	Hand injury, Finger injury	Medium	<ul style="list-style-type: none"> <li>• Keep hands away from moving parts.</li> <li>• Secure materials with designated clamps before drilling.</li> </ul>	Mechanical Team

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Task	Hazard	Risk Level	Safety Measures	Responsible Team Member
<b>Sealing Components</b>	Improper sealing, Water leakage, Pressure failure	High	<ul style="list-style-type: none"> <li>• Ensure all seals are properly fitted and tightened.</li> <li>• Perform pressure tests before deployment.</li> <li>• Inspect seals for wear or damage regularly.</li> </ul>	Zeyad Elbahy - Vice Mechanical CTO
<b>Tether and cable connections</b>	Entanglement hazards	Low	<ul style="list-style-type: none"> <li>• Organize and secure cables properly.</li> <li>• Monitor Kamikaze movement to prevent entanglement.</li> <li>• Regularly inspect tether for wear or damage.</li> </ul>	<ul style="list-style-type: none"> <li>• Tether man</li> <li>• All team memeber</li> </ul>
<b>Operating thrusters</b>	Finger damage, Thrusters blade damage	High	<ul style="list-style-type: none"> <li>• Always operate with shrouds mounted on thrusters.</li> <li>• Always keep hands away from moving thrusters.</li> </ul>	Omar Hussien - Mechanical CTO

TABLE II: Task Hazards and Controls for Mechanical Tasks

### 3 Job-Safety Analysis for Electrical Tasks

Task	Hazards	Risk Level	Safety Measures	Responsible Team Member
<b>Soldering Electronic Components</b>	Fire hazard, Electrical hazard, Chemical inhalation, Toxic material, Eye injury	High	<ul style="list-style-type: none"> <li>• Turn off soldering iron when it's not used.</li> <li>• Remove combustible materials from work area.</li> <li>• Know the location of fire extinguishers and first aid kits in case of emergency.</li> <li>• Perform work in a well-ventilated area.</li> </ul>	Electrical Team
<b>Setting Up the Power Supply</b>	Potential overvoltage leading to equipment damage, Fire hazards due to electrical faults or short circuits	High	<ul style="list-style-type: none"> <li>• Check the voltage reading that it shows nominal 48V.</li> <li>• Use control status indicator LED.</li> <li>• Use fuses on powerlines preventing drivers and DC-DC converters from burning out.</li> </ul>	Electrical Team
<b>Maintenance of Electrical Equipment</b>	Electric shock, Possibility of equipment damage if not maintained properly	Medium	<ul style="list-style-type: none"> <li>• Verify all power in the control box is off and wait 5 sec.</li> <li>• The operator must wear non-electrically conducting gloves.</li> </ul>	Ahmed Elattar – Electrical CTO
<b>Ensuring ROV Communication</b>	Loss of communication will result in losing control of the ROV and could destroy the ROV and objects around it, Risk of signal interference leading to communication breakdown	Low	<ul style="list-style-type: none"> <li>• Implementation of reliable communication protocols within the logical range to prevent loss of control.</li> <li>• Avoidance of excessive distances between the joystick and Kamikaze to maintain signal accuracy.</li> </ul>	Electrical and Software Team

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Task	Hazards	Risk Level	Safety Measures	Responsible Team Member
<b>Management of Tether and Cable Connections</b>	Entanglement hazards, leading to interruption of operations or equipment damage, Cable damage if not handled properly	High	<ul style="list-style-type: none"> <li>• Be mindful of where you place the tether and how far the ROV is from it.</li> <li>• Regular inspection of cables for signs of wear or damage.</li> </ul>	Electrical Team

TABLE III: Hazards and Controls for Electrical Tasks