Safety and Incident Management Plan for Fluid Mechanics and Machinery Lab

Mechanical and Production Engineering Department
Ahsanullah University of Science & Technology (AUST)

Introduction

The Fluid Mechanics and Machinery Lab is a key facility for undergraduate Mechanical Engineering students at Ahsanullah University of Science & Technology (AUST). This lab plays a crucial role in educating students in the fundamentals of fluid mechanics and machinery, while also supporting advanced research. In order to comply with accreditation requirements, this document outlines a comprehensive plan to prevent and manage incidents and accidents in the lab. The plan also addresses the procedures for handling emergencies and the roles of the Lab Assistant/Attendant, Lab In-Charge, and the AUST Fire/Disaster Safety Team, including the designated Warden and Assistant Warden.

1 Safety Rules and Procedures

The following safety rules and procedures are in place to ensure the safe operation of the lab and to minimize the risk of incidents and accidents.

1.1 General Safety Rules

1. **Personal Protective Equipment (PPE):** All lab users must wear safety goggles, lab coats, and gloves while working in the lab.
2. **Equipment Handling:** Machinery such as pumps, turbines, and the wind tunnel must be operated only under the supervision of the Lab Assistant/Attendant or Lab In-Charge.
3. **Electrical Safety:** Electrical equipment must be properly grounded and maintained. Ensure that no electrical devices are used near water or other liquids.
4. **Chemical Safety:** Fluids and chemicals used in the lab must be handled according to proper safety protocols. Material Safety Data Sheets (MSDS) for all chemicals are available in the lab.
5. **Emergency Equipment Awareness:** All users must be familiar with the location of fire extinguishers, first-aid kits, and emergency eyewash stations.
6. **Prohibited Activities:** Smoking, eating, and drinking are strictly prohibited in the lab.

7. **Clean Workspaces:** Lab benches and work areas must be kept clean and free from clutter.
8. **Reporting Hazards:** Any malfunctioning equipment or unsafe conditions should be reported to the Lab In-Charge immediately.

1.2 Specific Safety Protocols

1. Regularly inspect fluid mechanics setups to check for leaks or other safety hazards.
2. Never exceed the recommended pressure and flow rate limits on fluid mechanics equipment.
3. Moving parts of pumps and turbines must be guarded to prevent accidental contact.
4. Ensure that proper shutdown procedures are followed after experiments.

2 Incident and Accident Management

This section outlines the procedures for managing incidents and accidents in the lab. It defines the roles and responsibilities of the Lab Assistant/Attendant, Lab In-Charge, and other key personnel.

2.1 Roles and Responsibilities

2.1.1 Lab In-Charge

The Lab In-Charge is responsible for the overall safety and operation of the lab. Key responsibilities include:

- Enforcing safety protocols and ensuring that all lab users comply with safety rules.
- Conducting regular safety inspections and ensuring that safety equipment is functional.
- Reporting incidents and accidents to the departmental safety committee and filing accident reports.
- Notifying the designated Warden and Assistant Warden from the AUST Fire/Disaster Safety Team in case of emergencies.

2.1.2 Lab Assistant/Attendant

The Lab Assistant/Attendant supports the Lab In-Charge and is responsible for:

- Assisting students with safe equipment operation.
- Ensuring that all lab equipment is used properly and safely.
- Administering first aid in case of minor injuries and notifying the Lab In-Charge in case of serious incidents.
- Reporting unsafe conditions or equipment malfunctions to the Lab In-Charge.

2.1.3 AUST Fire/Disaster Safety Team (Warden and Assistant Warden)

In case of a significant emergency such as a fire or hazardous chemical spill, the Lab In-Charge will contact the designated Warden and Assistant Warden from the AUST Fire/Disaster Safety Team. Their responsibilities include:

- Coordinating the evacuation of the lab and ensuring that all individuals are accounted for.
- Ensuring that emergency services are contacted if needed.
- Providing post-incident evaluation and reporting under the supervision of the Campus Safety Task Force.

3 Emergency Procedures

3.1 Accident Reporting Procedure

1. Any accident or injury must be immediately reported to the Lab In-Charge.
2. The Lab In-Charge will assess the severity of the incident and notify the Warden and Assistant Warden if necessary.
3. The Lab Assistant/Attendant will provide first aid as required.
4. A written accident report must be filed within 24 hours of the incident.

3.2 Fire Safety Protocol

1. In the event of a fire, activate the nearest fire alarm and evacuate the lab using the designated exit routes.
2. The Lab In-Charge will notify the Warden and Assistant Warden for assistance with evacuation.
3. Use fire extinguishers only if the fire is small and can be safely contained.
4. All lab personnel must gather at the designated assembly point and await further instructions from the AUST Fire/Disaster Safety Team.

3.3 Chemical Spill Response

1. Immediately inform the Lab In-Charge and evacuate the area if necessary.
2. The Lab Assistant/Attendant will use a spill containment kit for minor spills.
3. For larger spills, the Lab In-Charge will notify the Warden and Assistant Warden for further instructions.
4. If direct contact with hazardous chemicals occurs, use the emergency eyewash station.

3.4 First-Aid Response

- Minor injuries should be treated using the first-aid kit available in the lab.
- For severe injuries, the Lab In-Charge will contact medical services and notify the Warden and Assistant Warden.

4 Provisions for Health Hazard Conditions

The lab is equipped with several provisions to manage health hazards and prevent accidents:

4.1 Emergency Equipment

- **Ventilation:** Proper ventilation is ensured to avoid the buildup of harmful fumes.
- **Eyewash Stations:** Available in the lab to provide immediate assistance in case of chemical exposure.
- **First-Aid Kits:** Located in the lab and regularly inspected to ensure they are stocked with essential supplies.
- **Fire Extinguishers:** Placed strategically throughout the lab and checked periodically.
- **Safety Signage:** Clear signs indicate exits, hazardous areas, and the locations of emergency equipment.

4.2 Safety Drills and Training

- **Safety Drills:** Fire and evacuation drills are conducted at least once per semester. Participation is mandatory for all lab users.
- **Safety Training:** All students and staff must complete safety training before using lab facilities. This includes instruction on proper equipment use and emergency protocols.
- **Lab Inspections:** Regular safety audits are conducted by the Lab In-Charge to ensure compliance with safety standards.

5 Conclusion

This safety plan for the Fluid Mechanics and Machinery Lab ensures that all necessary precautions are taken to prevent incidents and accidents. The roles of the Lab Assistant/Attendant, Lab In-Charge, and the AUST Fire/Disaster Safety Team (including the designated Warden and Assistant Warden) are clearly defined to ensure quick and effective responses in case of emergencies. This plan is designed to meet the accreditation requirements and provide a safe learning environment for students.