Safety and Incident Management Plan for Applied Thermodynamics Lab

Mechanical and Production Engineering Department
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Introduction

The Applied Thermodynamics Lab at Ahsanullah University of Science & Technology (AUST) is dedicated to providing final-year Mechanical Engineering students with practical, interdisciplinary knowledge in thermodynamics, heat transfer, and fluid dynamics. This lab is equipped with various apparatus, including a boiler demonstration unit, a cooling tower, and a refrigeration demonstration unit, supporting applied learning through hands-on experiments. This safety plan outlines the protocols for preventing and managing incidents, fulfilling the accreditation requirements.

Safety Rules and Practices

To ensure a safe and controlled environment, the following safety rules and procedures are strictly enforced:

- **Personal Protective Equipment (PPE)**: All lab users must wear PPE, including lab coats, safety goggles, and gloves, during lab activities.
- **Restricted Access**: Access to the lab is restricted to authorized students and staff. Students must be supervised by the Lab In-Charge or Lab Assistant while conducting experiments.
- **Equipment Use and Handling**: All equipment must be operated according to the manufacturer's guidelines and lab-specific instructions. Malfunctioning equipment must be reported immediately to the Lab In-Charge.
- **Emergency Exits and Fire Safety**: Emergency exits are kept unobstructed at all times, and fire extinguishers are easily accessible.
- **Proper Waste Disposal**: Hazardous waste, such as used fluids and residues, must be disposed of in designated containers following safety and environmental regulations.

Incident and Accident Prevention Procedures

The following procedures are in place to minimize the risk of incidents:

- **Routine Inspections**: The Lab In-Charge conducts routine safety inspections to identify potential hazards and ensure equipment is safe for use.
- **Equipment Maintenance**: All equipment, including the boiler and cooling tower, undergoes regular maintenance to ensure it functions properly and safely.
- **Safety Training**: All students are required to complete safety training before using any lab equipment, which includes proper PPE usage, emergency protocols, and equipment handling.
- **Emergency Drills**: Periodic emergency drills familiarize students and staff with evacuation routes and procedures in the event of a fire or other emergencies.

Provisions for Managing Accidents and Health Hazard Conditions

In the event of an accident or health hazard, the following provisions are in place to ensure safety and provide immediate response:

- **Emergency Contacts**: Contact information for the Lab In-Charge, Warden, Assistant Warden, and emergency medical services is posted prominently in the lab.
- **First Aid Kit**: A fully stocked first aid kit is available in the lab to treat minor injuries, such as burns or cuts.
- **Fire Extinguishers and Safety Showers**: Fire extinguishers and safety showers are located in accessible areas within the lab for use in emergencies.
- **Emergency Response Protocol**: In case of an emergency, the Lab In-Charge is notified immediately and, if required, contacts the Warden and Assistant Warden to coordinate with the AUST Fire/Disaster Safety Team.
- **Evacuation Procedure**: For major incidents, such as fire or chemical spills, all personnel should follow the designated evacuation route to the assembly point outside the building.

Roles and Responsibilities

Lab In-Charge

The Lab In-Charge has overall responsibility for lab safety, incident prevention, and response management. Responsibilities include:

- Conducting regular safety checks and equipment maintenance.
- Providing initial safety training to students and staff before lab activities.
- Responding to incidents and coordinating with the Warden and Assistant Warden during emergencies.
- Reporting safety concerns to the Department Head and ensuring corrective measures are implemented.

Lab Assistant/Attendant

Working under the Lab In-Charge's supervision, the Lab Assistant is responsible for:

- Assisting in the setup and maintenance of lab equipment.
- Monitoring students during experiments to ensure adherence to safety protocols.
- Reporting any equipment issues or safety concerns to the Lab In-Charge.

Warden and Assistant Warden

As members of the AUST Fire/Disaster Safety Team, the Warden and Assistant Warden:

- Assist in evacuating personnel during emergencies.
- Coordinate with emergency services when needed.
- Report incidents to the Campus Safety Task Force for further action.

Lab-Specific Incident Prevention Plan

The following experiments are conducted in the Applied Thermodynamics Lab, each with specific safety precautions:

1. **Performance Test of a Cooling Tower**: Protective clothing must be worn to avoid exposure to high temperatures and water spray. Ensure that the cooling tower is stable and secure before testing.
2. **Effect of Condenser Pressure on Refrigeration System Performance**: Safety precautions are essential when handling the refrigeration system, especially in the condenser area. PPE is required to prevent accidental exposure to refrigerants.

Conclusion

The Applied Thermodynamics Lab upholds rigorous safety standards to protect students, faculty, and staff. Through established safety protocols, incident prevention practices, and emergency response measures, the lab is committed to minimizing risks and ensuring prompt and effective incident management. Regular reviews of the safety plan are conducted to ensure compliance with accreditation standards and adaptation to evolving safety requirements.