



SAFETY POLICY IN ELECTRICAL TESTING LABORATORIES

Purpose

The purpose of this JAS-AU policy is:

- To ensure that lab workers in electrical testing laboratories are informed about hazards in their workplace.
- To protect the lab workers in electrical testing laboratories from potential health hazards.
- To establish safe work practices in electrical testing laboratories.

Scope

This policy addresses the general safety and health requirements for work in the laboratories performing various electrical or electrical-related testing.

Authorship

This publication has been written by the technical committee, and approved by the accreditation director.

Official language

The text may be translated into other languages as required. The English language version remains the definitive version.

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1. Introduction and Scope:

This policy provides minimum baseline and general basic safety management guidelines as well as a few requirements to be addressed (Some requirements may not apply specifically, as appropriate, to the scale and nature of the lab's associated risk and its defined scope, size of the lab, nature of activities, products and services as well as the organizational culture). It is essential that all involved personnel of electrical laboratories location(s) operations under accreditation; be knowledgeable of basic safety principles and lab safety requirements. This is most important for everybody's own health and safety by preventing accidents and minimizing the resulting lose, if happened.

2. Minimum Safety Baseline:

1. Essential training for all involved personal and competent on the basis of appropriate education, training or experience (e.g. electrical shocks, the use of hazardous and toxic chemicals, chemical products, or hazardous waste generation...etc).
2. Availability of (for example) fire extinguishers, emergency stop buttons, emergency contact phone numbers, and personal protective equipment...etc.
3. Maintenance and inspection procedures for critical equipment and materials.
4. Work area cleanness, tidiness, labeling and effective separation of neighborhood areas; warning signs for potential hazards and Illustrations on quick first, as needed.
5. Proper identification of potential hazards either in testing/calibration location(s) / lab (e.g. high voltage, chemicals, lasers, etc.); and visual clearance of as such to the naked eye.
6. Proper management of emergency preparedness and response.
7. Testing / Calibration Location(s)' accessibility control and authorized personnel.
8. Establish, implement and maintain periodically evaluating compliance with applicable legal requirements and other requirements.
9. Incident investigation; investigate and analyze incidents in order to:
 - a. determine underlying health and safety deficiencies and other factors that might be causing or contributing to the occurrence of incidents;
 - b. identify the need for corrective action;
 - c. identify opportunities for preventive action;
 - d. identify opportunities for continual improvement;
 - e. Communicate the results of such investigations.The investigations shall be performed in a timely manner.
10. Quarterly safety inspection at least; unless stated otherwise; result reviewed and action taken by top management.

3. General Basic Safety Management Guidelines:

3.1 Definitions:

- Hazard: Any source, situation or act with a potential for harm in terms of human injury or ill health.
- Hazard Identification: Process of recognizing that hazard exists and defining its characteristics.
- Risk: Combination of the likelihood of an occurrence of a hazardous event or exposure(s) and the severity of injury or ill health that can be caused by the event or exposure(s).
- Risk Assessment: Process of evaluating the risk(s) arising from a hazard(s), taking into account the adequacy of any existing controls, and deciding whether or not the risk(s) is/are acceptable
- Ill health: Identifiable, adverse physical or mental condition arising from and/or made worse by a work activity and/or work-related situation.
- Interested Parties: Person or group, inside or outside the workplace, concerned with or affected by the safety performance of the lab.

3.2 Hazard Identification, Risk Assessment and Determining Controls:

The lab may establish, implement and maintain a list of all available hazards, assess their risk and determine their necessary control and response; for proper occupational health and safety management. The same shall be reviewed periodically and keep records of the same.

3.2.1 Hazard Identification

Hazards can be classified into various categories or types of threats:

- a) Kinematic hazards.
- b) Energy hazards.
- c) Electrical/chemical/nuclear hazards.
- d) Human factors hazards.
- e) Misuse and abuse hazards.
- f) Environmental hazards.

The identification process shall take the following into account:

- Routine and Non-Routine activities.
- Activities of personnel having access to the lab (including contractors and visitors).

- Human behavior, capabilities and other human factors.
- Identified hazards originating outside the lab capable of adversely affecting the health and safety of persons under the control of the organization within the lab.
- Hazards created in the vicinity of the lab by work-related activities under the control of the organization.
- Infrastructure, equipment and materials at the workplace, whether provided by the organization or others.
- Changes or proposed changes in the organization, its activities, or materials.
- Modifications to any management system, including temporary changes, and their impacts on operations, processes, and activities.
- Any applicable legal obligations.
- The design of work areas, processes, installations, machinery/equipment, operating procedures and work organization, including their adaptation to human capabilities.

3.2.2 Hazard Risk Assessment:

The risk of resulted hazards can be assessed based on:

- a) The likelihood of an occurrence.
- b) Severity of injury or ill health.
- c) Magnitude of the danger's exposure.
- d) Length of exposure.
- e) Short or long term effects.
- f) Frequency of occurrence.
- g) Environmental impact.
- h) Proactive approach rather reactive one.

3.2.3 Hazard Control:

When determining controls, or considering changes to existing controls, consideration shall be given to reducing the risks according to the following hierarchy:

- a) Elimination;
- b) Substitution;
- c) Engineering controls;
- d) Signage/warnings and/or administrative controls;
- e) Personal protective equipment.

3.3 Emergency Preparedness and Response:

The lab needs to establish, implement and maintain a plan(s):

- a) To identify the potential for emergency situations.
- b) To respond to such emergency situations.

This shall take into account the following:

- The needs of relevant interested parties, e.g. emergency services and neighbors.
- Periodically test its plan(s) to respond to emergency situations, where practicable, involving relevant interested parties, as appropriate.
- Review and, where necessary, revise its emergency preparedness and response plan(s), in particular, after periodical testing and after the occurrence of emergency situations.

4. Responsibilities and Communication:

The following shall be responsible, participate and consulted regarding all safety related requirements, guidelines, and instructions:

- Top Management (ultimate responsibility).
- All employees of the lab and other employees had to work inside the lab.
- Visitors.
- Customers.
- Vendors and service providers.
- Contractors and sub-contractors.
- Anyone inside lab area.

All safety related requirements, guidelines, and instructions (and their changes and updates) shall be properly and effectively communicated to all interested parties including:

- a) Internal communication among the various levels and functions of the organization;
- b) Communication with contractors and other visitors to the workplace;
- c) Receiving, documenting and responding to relevant communications from external interested parties.

5. General Requirements to be followed:

- The lab shall use personal protective equipment (PPE) as appropriate; lab must use the chemical's safety data sheet, label and/or manufacturer's instructions to identify the required level of PPE and hygiene practices needed for a particular activity.

- The lab shall restrict laboratory access to authorized persons only.
- The lab shall not allow any food, drinks, or smoking in the laboratory.
- Sandals or open shoes shall not be allowed.
- Long hair shall be tied back.
- Scarf shall be kept under lab coat.
- Never touch face, mouth or eyes while working on tests.
- Never put anything in mouth, such as pencils, pens, labels, or fingers.
- Worker shall keep working under chemical fume's hoods to reduce exposure to hazards when dealing with hazardous materials.
- Gloves shall be removed before using instruments, telephone, and cell phones.
- Laboratory coats shall be kept fastened. Avoid loose fitting items of clothing.
- If a person has an allergy to lab materials or suffer from, a medical condition which may affect him in the laboratory (e.g. diabetes or epilepsy), he/she shall ensure that his/her supervisor knows.
- Cuts on hands shall be covered with a bandage. Gloves shall be worn as extra protection.
- Hands shall be washed frequently throughout the day, after using chemicals, and before eating and leaving the lab.
- Never smell or taste a chemical or substance for identification purposes.
- Hazardous chemicals shall only be used as intended.
- Lab coats, gloves, or other personal protective clothing shall not be worn outside lab areas.
- Jewelry and ties shall not be worn when working at the lab.
- Cell phones shall not be used during process of testing/calibration.
- Music headphones shall not be used at all.
- Avoid working alone in the lab. If a person must work alone, he/she shall make someone aware of his/her location.
- Different emergency plan and responses shall be clear to all interested parties.
- Work areas shall be kept as neat and clean as possible.
- Heavy objects shall not be stored above shoulder level.
- Chemicals shall not be stored in fume hoods or on counter tops.
- Chemicals shall not be stored near sources of heat or in direct sunshine.
- Concentrated acids and bases shall be stored separately.
- Workspace shall be kept tidy and free of all unnecessary materials. Backpacks, purses, and coats should be placed in the cupboard by the front door of the lab.
- Everything shall be labeled clearly.
- Adequate space shall be ensured to perform testing/calibration activities.
- Proper type of fire extinguishers shall be maintained and its validity of operation shall be ensured.
- Floors shall be always kept clean and dry.
- Corridors, passageway and most important; emergency exits; shall be kept free and clear of all obstructions all the time.

- Spills shall be reported and cleaned up immediately.
- Cabinet doors and drawers shall be closed to prevent accidental fall down.
- Cutting tools shall be kept sharp; as they are less likely to cause an accident than dull ones.
- Fingers shall be kept away from the beaters and blades in appliances.
- Knives and other tools shall be used for their intended purposes only.
- Broken glass shall be swept up immediately; by using dustpan and brush, not hands, to pick up broken glass.
- Sharp knives and other sharp objects shall not be left in a sink full of water.
- Appropriate tools shall be used to handle hot objects.
- Electrical cords shall be kept away from water and hot objects.
- Before using an electrical appliance, hands shall be dry and person is standing on a dry surface.
- Heat sources shall not be left unattended by any mean.
- The main power supply shall be located to be turned off in case of an emergency.
- A comfortable temperature, humidity, and air movements shall be maintained for the worker in the laboratory, taking into consideration the requirements of the test procedure.
- Laboratory equipment shall be used by trained and authorized personnel only.
- Instruction manuals for equipment shall be accessible to every authorized person.
- Installation, modification, and repairs of analytical equipment shall be carried out by authorized maintenance engineers.
- When using knives, cut/slice shall be used away from your body. As well, when handing a knife, it shall be handed by the handle, not the blade at the receiving side.
- Electric appliances shall be unplugged before cleaning and shall not be immersed in water for cleaning. Some parts may be taken out to be cleaned with other glassware, but these parts should wiped down with a damp cloth.
- Gas cylinders shall not be used without formal training, those shall be stored externally and well fitted. Cylinder trolley shall be used to move gas cylinders, all connections of the gas cylinder shall be checked using soap solution only.
- Never use glassware under pressure or vacuum unless it is designed for the job and suitably shielded.
- Heat-resistant glassware shall be used for the preparation of solutions that generate heat (e.g., not bottles or graduated cylinder).
- Dirty glassware shall not be put back in with clean glassware.
- Laboratories shall be equipped at least with the following (depending on the nature of tests carried out in the lab): Fume hoods, biological safety cabinets, eyewash units, emergency showers, first aid kits, flammable storage cabinets, smoke detectors, heat detectors, suitable firefighting system, fire extinguishers, and emergency electrical generators.
- Periodical inspection shall be carried of the conditions of emergency equipment.
- All lab workers shall locate and know how to use and operate emergency equipment.

- All lab workers shall familiarize themselves with the content of first aid kit and its use.
- All instructions shall be readily available for using of emergency equipment.
- Some lab workers shall be assigned and trained on first aid principles.
- Any equipment or work areas that may have been in contact with hazardous materials shall be decontaminated.
- Waste shall be always cleaned up.

6. References:

- [1] Pandey, A. and Anbu, M., Laboratory Safety Manual: Including Chemical Hazards and Safety Procedures.
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- [4] RAPEX Risk Assessment Methodology, Federal Institute for Occupational Safety and Health, Germany.
- [5] Dr. J.S. Olfert, General Orientation to Safety in Mechanical Engineering, Online Presentation.