Thai Industrial Standard

Chemical Laboratory Safety Management System Part 1: Requirements

1. Scope

1.1 This industrial standard specifies requirements for chemical laboratory safety management systems to develop a safety management system for the laboratory.

1.2 This industrial standard does not cover the requirements for radioactive materials and biological materials.

2. Definitions

For the purposes of this document, the following terms and definitions apply

2.1 Chemical laboratory:

A facility where chemicals are used in the process such as research, studying and teaching, testing, and calibration. Later in this industrial standard the term “laboratory” will be used.

2.2 Laboratory safety policy:

Intentions and direction of an organization, as formally expressing by its top management, expressed the intention and overall direction of the organization related to the safety of the laboratory.

2.3 Organization:

An entity that has its own functions with responsibilities, authorities and relationships to achieve its objectives such as government, state enterprise, institution, association, company, partnership. Organization with more than one operating unit, it may be defined as an organization.

2.4 Internal context:

The internal environment that affects the achievement of organization safety objectives.

Note Internal context comprise

- Governance, organizational structure, roles and accountabilities
- Strategies to achieve the policy and objective(s)

- Capabilities, understood in terms of resources, knowledge and competence e.g. capital, time, human resources, processes, systems and technologies
- Information systems, information flows, and decision-making processes (both formal and informal)
- Relationships with, as well as perceptions and values of, its internal interested parties
- Culture in the organization
- Standards, guidelines and models adopted by the organization
- Form and extent of contractual relationships

2.5 External context:

The external environment that affects the achievement of organization safety objectives such as new legislation, change of technology.

Note External context comprise

- Cultural, social, political, legal, financial, technological, economic and natural surroundings and market competition, whether international, national, regional or local
- Key drivers and trends relevant to the industry or sector having impact on the organization objective
- Relationships with, as well as perceptions and values of, its external interested parties

2.6 Risk:

Combination of the likelihood of occurrence of a hazardous event(s) and the severity of injury and ill health that can be caused by the event(s).

2.7 Risk management:

Coordinated activities to direct and control an organization with regard to risk.

2.8 Hazard identification:

Process of recognizing that a hazard exists and defining its characteristics.

2.9 Risk assessment:

The overall process of identifying hazards (hazard identification), analyzing the risk, and evaluating the risk..

2.10 Risk treatment:

Process of modifying the risk

Note 1 Risk treatment can involve

- Avoiding the risk by deciding not to start or continue with the activity that gives rise to the risk
- Taking or increasing the risk in order to pursue an opportunity
- Removing the risk source
- Changing the likelihood
- Changing in consequences
- Sharing the risk with another party or parties (including contracts and risk finacing)
- Retaining the risk by informed decision

Note 2 Risk treatment that deals with negative consequences is sometimes referred to as “risk mitigation”, “risk elimination”, “risk prevention” and “risk reduction”.

Note 3 Risk treatment can create new risks or modify existing risks.

2.11 Review:

Activity undertaken to determine suitability, adequacy and effectiveness of the subject matter to achieve established objectives.

Note Review can be applied to risk, risk management framework, risk management process, or risk control.

2.12 Chemical inventory:

List of chemical information for chemical handling management.

2.13 Safety data sheet, SDS:

Material safety data sheet which is a document that contains information on the chemical’s identity, hazard, toxicity, handling, storage, transport, disposal and other measures to ensure the proper and safe handling of that chemical.

2.14 Document:

Information and support medium which may be in any form including electronic information.

2.15 Record:

Document stating results achieved or providing evidence of activities performed

2.16 Monitoring:

Monitoring the implementation of laboratory safety at specified intervals.

2.17 Evaluation of compliance:

Evaluating the achievement of implementation according to plan and objectives of laboratory safety.

2.18 Top management:

A person with authority to allocate resources for safety management within the organization.

2.19 Laboratory safety officer:

A person or a group of people with competence and assigned to monitor and evaluate laboratory safety performance.

2.20 Safety management section:

A person or a group of people who has duty and responsibility to supervise the implementation of the laboratory safety management system.

3. Requirements

3.1 Laboratory Safety Policy

Organization shall set a laboratory safety policy as an integral part of their corporate policy which provides objectives, plans, and commitment of the organization to implement laboratory safety, and ensuring employee participation in establishing the policy and safety management.

3.1.1 General Principles

To have an effective laboratory safety management, top management shall define the following principles.

(1) Safety of the internal context (2.4) and the external context (2.5).

(2) Laboratory safety is an integral part of the organization's operations, an integral part of the organization's plan. It is the responsibility of the management, and it shall be managed and allocated resources as well as other projects and activities.

(3) Systematic laboratory safety process which is consistently and continuously planning, implementing, monitoring, evaluating and reviewing based on factual data and information. Effectively implement risk management strategy and respond to the change, as demonstrated in Figure 1.

(4) The framework for safety management is described into 7 coherent elements based on the nature of activities and knowledge, to properly implement and easily to monitor and measure by the top management, and to improve and correct the situation as soon as it occurs. These are important factors in preventing and mitigating risk, the framework is shown in Figure 1.

7 elements of the laboratory safety management framework are:

(1) Responsibility and authority;

(2) Chemical Management;

(3) Waste Management;

(4) Physical Characteristics of Laboratory;

(5) Emergency Preparedness and Response;

(6) Training and Awareness;

(7) Documentation.

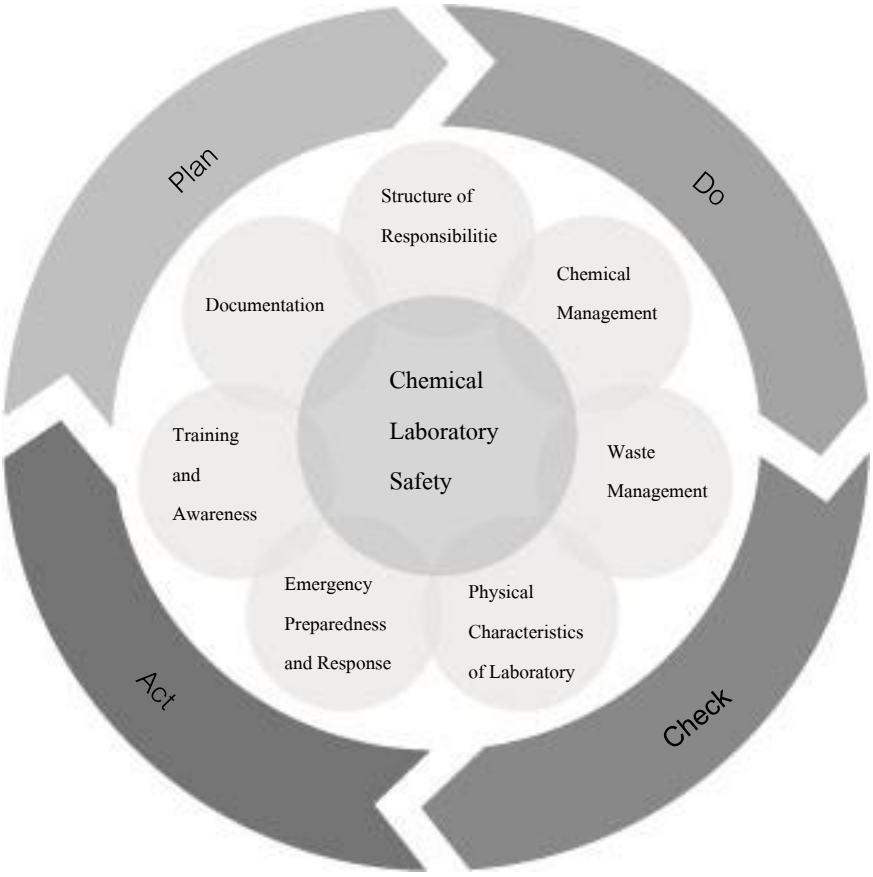


Figure 1. General principles in management of laboratory safety. [3.1.1 (3) and (4)]

3.1.2 Safety management process

Everyone in the organization takes responsibility for laboratory safety management. Top management shall provide resources and encourage the cooperation and participation in the organization, including monitor the efficiency and effectiveness of the laboratory safety mangement systems according to the objectives and targets of the organization, and make awareness of safety for employees at all levels as a culture in the organization.

3.2 Planning

The organization shall plan the process needed to reduce the risk by implementing the measures to prevent the hazard that may occur to the operators. The plan shall comply with legal requirements and other requirements.

3.2.1 Risk management

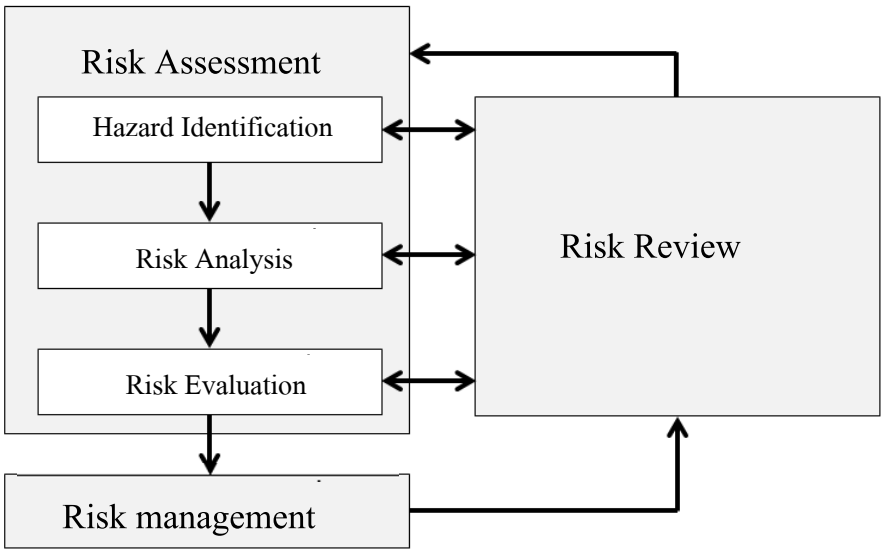
Risk management process is shown in Figure 2, composed of the following steps:

(1) Risk Assessment;

(2) Risk Management;

(3) Risk Review.

The organization shall communicate the risk to relevant parties to understand the basics of decision making and reason for what to do, and review the risk management process in a timely manner and when the incident occurred.



3.2.2 Legal and other requirements

The organization shall identify and access the legal and other requirements that are applicable to it, and determine how they apply to the laboratory safety management. These requirements shall be taken into account in the relevant procedures.

Where the laboratory safety management system requirements specified in this industrial standard conflict with the law, abide by the law.

3.3 Implementation

The organization shall implement these requirements for chemical laboratory safety management system to comply with the objectives and policy of the laboratory safety. In addition, the safety operation practice shall be in place for all relevant procedures. Details are as follows;

3.3.1 Responsibility and authority

Top management of the organization shall determine the organization structure, authority and responsibility for safety. At a minimum, 2 levels of hierarchy of responsiblity shall be appointed, as follows:

(1) Safety management section;

(2) Laboratory safety officer.

3.3.2 Chemical management

The organization shall establish the requirement for chemical mangement in the following areas:

(1) Chemical data management, including chemical directory;

(2) Safety Data Sheet;

(3) Chemical Storage;

(4) Chemical Handling and Transporting.

3.3.3 Waste management

The organization shall establish the requirement on classification, treatment, and disposal of waste. In order to reduce adverse effects on the environment and to prevent danger from handling, storage, and disposal of waste, there are requirements in the following areas:

(1) Waste Data Management;

(2) Waste Collection;

(3) Disposal;

(4) Reduction of Waste.

3.3.4 Physical characteristics of the laboratory

The design of new laboratory or the modification of existing laboratory shall take into account the safety concerns and potential risks. Architectural and construction details shall be in line with the type of risks that may occur. Laboratory design shall consider the physical characteristics of the laboratory in the follow areas:

(1) The architecture;

(2) The interior design: furniture, tools and equipment;

(3) The structural engineering;

(4) The electrical and lighting engineering;

(5) The sanitary and environmental engineering;

(6) The ventilation and air-conditioning engineering;

(7) The emergency and communmication systems.

The design or modification of ~~improve~~ laboratory shall be approved by the safety management section of the organization per hierarchy of responsiblity.

3.3.5 Preparedness and emergency response

The organization shall set safety regulation that cover personnel safety and laboratory safety. The emergency procedure shall be implemented to prepare and respond to emergency situation. The organization shall set emergency preparedness and response procedure to minimize the potential impact, and periodically test and exercise the plan. The organization shall inspect and test the emergency response equipment at regular intervals to ensure that it will be operational in an emergency situation. The organization shall review the emergency preparedness and response procedure after periodical testing and after the occurrence of emergency situations.

3.3.6 Training and awareness

The organization shall plan to train personnel at all levels to have the adequate knowledge, skills, and experience on how to manage laboratory safety. There shall be an evaluation of personnel competence prior to work. The organization shall establish the process to make personal safety awareness.

3.3.7 Documentation

The organization shall control documents related to safety to ensure that they are reachable and up to date. The laboratory shall have a safety manual that is appropriate to the scope of the laboratory. The organization shall establish records as evidence to demonstrate conformity to the requirements in the laboratory.

3.4 Monitoring and evaluation of compliance

The organization shall continuously monitor performance and evaluate compliance at least once a year that covers the 7 elements of the laboratory safety management framework. The information obtained from the monitoring shall be used for performance evaluation. The nonconformity shall be appropriately managed and recorded as management review input.

3.5 Management review

Top management shall demonstrate commitment to continual improvement by reviewing the organization's laboratory safety management system, at planned intervals. The input of management review shall include:

3.5.1 The efficiency and effectiveness of the overall elements in the laboratory safety management system that has been implemented.

3.5.2 Laboratory safety policy, including the change in other issues related to both internal and external contexts based on the monitoring results (2.16) and evaluation of compliance of the laboratory (2.17).