Office of Safety, Health & Environment

NUS Occupational health and safety (OH&S) management system standard for laboratories - Part A: Requirements

Issue Date : 19 October 2007
Version No. : 2.0
Last Review : -
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Foreword

This OH&S Management System standard has been developed by the NUS Office of Safety Health and Environment (OSHE) in response to the need for a formal occupational health and safety management system standard against which the Principal Investigator (PI)’s safety management systems for laboratories may be assessed and certified.

This standard is an adaptation of the Occupational Health and Safety Assessment Series (OHSAS) 18001:2007 and OHSAS 18002:2000 specifications. The complementary Singapore Standards SS506-1 and SS506-2 were also reviewed during the preparation of this Standard.

The requirements specified in this standard shall apply to all PIs currently employed by NUS who are managing or performing work within a laboratory (lab). The requirements of key elements of lab level Safety Management System are specified in Part A of the standard. Part B of the standard (Guidance Notes) provides explanatory notes/examples to assist in developing and implementing safety management system.
Introduction

PIs are increasingly concerned with achieving and demonstrating sound occupational health and safety (OH&S) performance by controlling their OH&S risks, consistent with the NUS OH&S policies and objectives.

This OH&S Management System standard specifies requirements for an OH&S Management System to be established at the PI level. It is intended to apply to all types and sizes of laboratories and to accommodate diverse research and investigative conditions. The basis of the approach is shown in Figure 1 below.

Figure 1 — OH&S Management System model for NUS Lab-based OH&S Management System standard

NOTE: This OH&S Management Standard is based on the methodology known as Plan-Do-Check-Act (PDCA). PDCA can be briefly described as follows.

— Plan: establish the objectives and processes necessary to deliver results in accordance with the University’s OH&S Policy and the PI’s commitment to managing OH&S risks in the lab.
— Do: implement the necessary control to reduce the risk to acceptable levels.
— Check: monitor and measure the performance of these controls.
— Act: take actions to continually improve performance of the OH&S Management System.

This laboratory-based OH&S Management System is a subset of the NUS Occupational Safety and Health Management system (SMS@NUS). The relation between the SMS@NUS and the laboratory SMS specified in this Standard is shown in the following diagram:
NUS Occupational Health and Safety Management System
– SMS@NUS

Faculty / Research Institute / Center SMS

Departmental SMS

Laboratory SMS

*NUS Occupational Health and Safety (OH&S) Management System Standard for Laboratories*
1 Objective
The aim of this OH&S Management System standard is to provide the PI with a framework for managing occupational health and safety within the laboratory in order to minimize the risk of workplace ill-health and injury.

2 Scope
This OH&S Management System standard is applicable to any PI who wishes to:
   a) establish an OH&S Management System to eliminate or minimize risk to lab members, and other interested parties (visitors, contractors, service personnel, etc) who may be exposed to OH&S risks associated with the lab activities;
   b) implement, maintain and continually improve an OH&S Management System;

The extent of the application of this standard will depend on factors such as the nature of the laboratory activities, the risks and complexity of these activities.

3 OH&S Management System elements

3.1 General requirements
The PI shall implement, maintain and continually improve his or her lab-based OH&S Management System in a documented manner in accordance with the requirements detailed in this standard.

3.2 Commitment to OH&S Management System
The PI shall manage the occupational safety and health risks associated with his or her laboratory activities by:
   a) Implementing the policies established by the university;
   b) Defining roles and responsibilities for managing OH&S in the laboratory;
   c) Ensuring the availability of resources essential to establish, implement, maintain and improve the OH&S Management System;
   d) Establishing a lab-based OH&S Management System that is appropriate to the nature and scale of the OH&S hazards associated with the lab's activities;
   e) Continually improving OH&S management and performance;
   f) Complying with applicable legal requirements as well as NUS OH&S policies, standard operating procedures and safety standards at the minimum;
   g) Providing the framework to set and review OH&S objectives within the lab group; and
   h) Communicating to senior management OH&S hazards that are beyond the PI's management control.

3.3 Planning

3.3.1 Hazard identification, risk assessment and determining controls
The PI shall conduct ongoing hazards identification, risks assessment, and determination of necessary controls for all the lab activities, including both day-to-day activities and those conducted only periodically or on an ad-hoc basis. The results shall be documented and kept up-to-date through periodical reviews.

In addition to activities carried out by the lab personnel, the PI should also consider hazards and risks arising from the activities of contractors and visitors, as well as those arising from the use of products and services supplied by vendors.
The PI shall ensure that all the identified OH&S risks and determined controls are taken into account when establishing, implementing and maintaining its OH&S Management System.

The PI shall have procedures in place to reassess risks and review established risk controls whenever there is an occurrence of an incident or a significant change to lab activities, materials and hazards, personnel, equipment etc.

### 3.3.2 Legal and other requirements

The PI shall taken into account applicable legal requirements, NUS OH&S policies, standard operating procedures, best practices and other university requirements when establishing the lab’s OH&S management system. The NUS OH&S policies and SOPs are accessible at:

www.nus.edu.sg/osh/manuals.htm

The PI shall communicate relevant information on legal and other requirements to all laboratory personnel.

### 3.3.3 Objectives and programme(s)

The PI shall participate in university, faculty or department-level OS&H programmes. The PI should consider additional objectives and developing additional programmes where applicable.

### 3.4 Implementation and operation

#### 3.4.1 Resources, roles, responsibility, accountability and authority

The PI shall manage the OH&S risks in the lab by:

- a) ensuring the availability of resources essential to establish, implement, maintain and improve the OH&S Management System.
- b) defining roles, allocating responsibilities and accountabilities, and delegating authorities, to facilitate effective OH&S management. These roles, responsibilities, accountabilities, and authorities shall be documented and communicated.

The PI shall ensure that staff and students in the laboratory take responsibility for aspects of OH&S over which they have control, including adherence to applicable NUS OH&S requirements.

#### 3.4.2 Competence, training and awareness

The PI shall ensure that any staff or student performing tasks within the lab that may impact OH&S is competent on the basis of appropriate education, training or experience. Such educational, training and experience background of each lab members should be recorded and regularly updated.

The PI shall identify training needs associated with its OH&S risks and its OH&S Management System. When defining the training needs of staff and students, consideration should be made to the following:

- a) Mandatory training courses under the NUS Structured Safety Training System (SSTS)
- b) Induction training courses organized at the Faculty, Research Institute and Departmental level
- c) Training courses to address laboratory-specific needs.

More information on the mandatory safety courses under the SSTS programme may be found at [http://www.nus.edu.sg/osh/training/safety.htm](http://www.nus.edu.sg/osh/training/safety.htm)
3.4.3 Communication, participation and consultation

The PI shall establish, implement and maintain a procedure(s) for:

- internal communication of OH&S information, including hazards and risks and components of the OH&S Management System, among the various levels and functions of the laboratory group, and with persons working for or on behalf of the PI,
- receiving, documenting and responding to relevant communications from external interested parties. All communications with government authorities should be coordinated through OSHE,
- updating departmental safety committee, faculty safety officer and OSHE on lab specific safety matters.

3.4.4 Documentation and document control

The OH&S Management System documentation shall include documents, including records, determined by the PI to be necessary to ensure the effective planning, operation and control of processes that relate to the management of its OH&S risks.

3.4.5 Operational control

The PI shall identify those operations and activities that are associated with identified risks where control measures need to be applied.

The PI shall establish, implement and maintain:

a) operational controls as derived from the risk assessments of all lab-based activities;
b) stipulated operating criteria and conditions for equipment, for which their absence could lead to deviations which could result in OH&S incidents;
c) operational controls related to the identified OH&S risks from purchasing of equipment, materials and services; and
d) operational controls related to the identified OH&S risks to and from contractors and other visitors to the lab.

All control measures should be communicated to all relevant parties, including lab personnel, suppliers, contractors and visitors as required.

The PI shall implement control measures established at the University, Faculty or Department where applicable. Any additional operational controls shall be consistent with University, Faculty and Departmental level policies and SOPs.

3.4.6 Emergency preparedness and response

The PI shall identify possible emergency situations in the laboratory and ensure appropriate university-level emergency procedures are followed. Where applicable, the PI shall develop lab-specific emergency procedures to complement university-level procedures. The PI shall ensure laboratory staff and students participate in NUS emergency response training and drills.

3.5 Checking

3.5.1 Performance measurement and monitoring

The PI shall monitor and measure OH&S performance on a regular basis. This shall include: monitoring of the extent to which the OH&S objectives are met;

a) monitoring of the effectiveness of controls by carrying out regular inspection;
b) recording of data and results of monitoring and measurement.
c) evaluating compliance with legal and other requirements when appropriate.
If equipment is required to monitor or measure performance, the PI shall establish and maintain procedures for the calibration and maintenance of such equipment, as appropriate. Records of calibration and maintenance activities and results shall be retained.

3.5.2 Incident investigation, corrective action and preventive action
The PI shall investigate and analyze incidents in order to identify the needs for corrective and preventive action. The investigations shall be performed in a timely manner and the results documented.

All accidents and incidents for both lab-based and non-lab based activities are to be reported centrally via OSHE’s Accident and Incident Reporting System (AIRS).

3.5.3 Internal audit
The PI shall conduct internal audits to ensure that the OH&S Management System is properly implemented and maintained.