Applied Microbiology
&
Biotechnology Laboratory

"sustainable is attainable"

Standard Operating Procedure

AMBL-002-F

Prepared:	07/29/2018
Revised:	07/29/2018
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Conducting and Reporting Safety Audits

SOP SUMMARY

This SOP describes the procedure for performing and reporting internal audits of how safety is implemented within the environmental engineering laboratory, or in the field, including the CECMEE Field Station. Findings from a safety audit are intended to document the implementation of safety and to identify where improvements are possible.

ENVIRONMENTAL HEALTH AND SAFETY

Hazards Assessment: This procedure does not contain hazards.

Safety Equipment and Engineering Controls: This procedure does not require the use of safety equipment or engineering controls.

Personal Protective Equipment (PPE): This procedure does not require the use of PPE unless the audit is conducted in close proximity to a procedure or location where PPE is required by the project or experimental plan. In that case, PPE specified by the particular procedure or the project is required.

Analysis-derived Wastes and Disposal:

Waste Generated	Hazardous (Y / N)	Disposal
This procedure does not generate wastes.	N	None

PROCEDURE DESCRIPTION

1.0 Introduction and Applicability

A safety audit evaluates whether safety policies and procedures are being used, and whether the communication and training of these policies and procedures are effective. The safety audit described in this procedure is considered as an internal audit and is applicable to the assessment of the overall safety system implemented by a class, a project, or experimental research. The safety audit does not apply to the overall safety system of the laboratory. The overall assessment of the laboratory's safety system occurs during external audits conducted by NAU Environmental Health and Safety (EHS). Additionally, a safety audit is not intended to review whether safety protocols associated with specific laboratory or field methods and procedures are being followed; that is the purpose of a Safety Performance Review. However, when conducting a safety audit and either inappropriate laboratory conditions or procedures are observed, these observations should be noted and brought to the attention of the Laboratory Manager. In the event an immediate hazard is perceived, the auditor should request that the condition or activity be immediately corrected.

A safety audit is typically conducted by the Laboratory Manager or others designated by the Laboratory Manager to conduct the audit. Individuals conducting safety audits should be external to the course, project or experimental study that is being audited, however self-audits are also encouraged. A safety audit may be either requested, conducted unannounced or triggered by observations that deem an audit would be beneficial.

2.0 Definitions for Terms and Abbreviations Used

Previously defined terms and abbreviations used are found in SOPs that precede this SOP and are not repeated here.

a. Safety System. A safety system is represented by the documented policies, procedures, and training that a particular class, project, or experimental research activity has made available and is using to support the safe conduct of laboratory activities by everyone involved. This includes documentation on the appropriate and safe use of the laboratory space, its equipment, supplies, chemicals and laboratory-generated wastes, as well as activity-specific safety-related documentation.

b. Safety Audit, Minimum-level. A minimum-level safety audit assesses evidence as to whether the basic requirements of the EHS-CHP and SOP 002A are in place, whether all appropriate safety training has been completed prior to conducting laboratory activities and whether

additional safety requirements specific to a class, project or experimental study have been created or need to be created. The minimum-level safety audit does not assess whether those safety requirements specific to the class, project or experimental study are being effectively used. Essentially, the minimum-level safety audit checks that an appropriate safety system is in place and would generally be conducted prior to the conduct of laboratory activities.

c. Safety Audit, Routine. A routine safety audit of a class, project or experimental study assesses whether the safety policies and procedures required by the NAU Office of Environmental Health and Safety's Chemical Hygiene Plan (EHS-CHP), the Environmental Engineering Laboratory's Laboratory Safety Standard (SOP 002A) and the additional safety requirements specific to a class, project or experimental study, are in place and being effectively used. The routine safety audit extends the minimum-level safety audit by determining that the safety system is effectively being used. This requires evidence that the safety system is being used and that there is a deliberate effort to maintain up-to-date training and overall improvement of the activity-specific safety system. A routine safety audit would generally be conducted at any time throughout the conduct of laboratory activities.

3.0 Purpose and Frequency of Safety Audits

The purpose for conducting a safety audit is to ensure that each activity conducted in the laboratory has a functional and effective safety system. Each activity must not only be conducted with knowledge of and access to applicable safety policies and procedures, but these policies and procedures must be used. Since policies and procedures are communicated to laboratory users during training, the process of conducting a safety audit and reporting the audit's findings are considered part of this laboratory's overall safety training program.

Safety audits are conducted as needed, and are not necessarily intended to be schedule on an annual or otherwise routine frequency. A safety audit may be conducted at any time, and is typically initiated under the following conditions.

1. Initiated by Request. A safety audit may be requested by a course instructor, supervising faculty or other project lead, or a department chair. This is generally considered a request for safety training and the audit would be conducted as a routine safety audit.
2. Initiated by Lab Manager. A safety audit may be initiated by the Laboratory Manager prior to the conduct of any laboratory activities or when there is an observable reason for suspecting that a functional and effective safety system is either not established, not

used, or has otherwise been compromised. While the audit may generally be conducted as either a routine or a minimum-level safety audit, a minimum-level safety audit is specifically conduct prior to the conduct of laboratory activities.

3. Initiated by Change in Activity. A safety audit is required when there has been a significant change in a course, project, or experimental research activity. Examples of significant changes include, but are not limited to, changes in the course instructor, the analytical or test methods used, the project's or research personnel (the semester-by-semester change of students in a course is not considered a significant change), the equipment, supplies or chemicals used, and the approach for conducting the activity or experimental study. The audit may be conducted as either a routine or a minimum-level safety audit, keeping in mind that the focus should be based on what has changed.

4.0 Preparing for the Safety Audit

a. Acquire Documentation. Obtain a copy of the EHS-CHP, SOP 002A and all documentation specific to the class, project or experimental study that you will audit, including incident reports. Each class, project and experimental study must have documentation that identifies the activities conducted, the procedures performed, and the hazards and the required safety practices that are associated with these activities and procedures.

b. Review Documentation. It is necessary to review and become familiar with all documentation related to the planned safety audit. While familiarity with the EHS-CHP and SOP 002A may be well established, reviewing these documents in the context of the activity being audited, is still important. Thoroughly reviewing the documentation that is specific to the class, project or experimental study audited is particularly important.

c. The Safety Audit Checklist. A standardized audit checklist is available as a separate document. In most situations, this checklist is adequate for both the minimum-level and routine safety audits. If necessary, edit this checklist to customize it to any unique aspects of the activity's safety system that would not otherwise covered in the audit.

d. Additional instructions or information needed for developing the safety audit checklist are included in the template between brackets "[ ]" and once the checklist has been developed, delete these additional instructions prior to using the checklist.

5.0 Conducting the Safety Audit

a. Schedule the Audit. It is not possible to conduct an audit without the cooperation of the primary contact (instructor, supervising faculty member, project-lead, etc.). Coordinate with this individual to establish a time when an interview may be conducted. Allow at least 1 hour for this interview and ensure that it includes an opportunity to walk through the areas where the work is being conducted. Additional time will be necessary for field activities.

b. Preliminary Assessment. To the extent possible, conduct a preliminary assessment of the elements on the safety audit checklist. Mark-up and comment on the checklist as necessary to document this preliminary assessment.

c. Interview the primary contact. During the meeting with the primary contact verify the preliminary assessment findings and complete the assessment of the remaining elements on the checklist. When walking through an area where work is being conducted, do not place yourself in close proximity to that activity unless it is essential to completing the audit – this is generally not the needed. However, when in close proximity to a potentially hazardous activity, use the appropriate PPE.

d. Before completing the interview, review the checklist to ensure that all of the safety audit elements have been adequately documented, and verify any elements that appear to remain uncertain, ambiguous or present a discrepancy. Make corrections as needed.

e. Ensure that you inform the primary contact or supervising faculty member that additional verification of information, if necessary, will be conducted through e-mail communications. The results of these additional verifications are also clearly documented on the Safety Audit Checklist form, as well as the communications being saved.

6.0 Reporting Safety Audit Findings

a. A Safety Audit Findings form is used to report the findings of the safety audit and corrective actions, if needed. This form is available as a separate document to this SOP.

b. The Report of Safety Audit Findings consists of the following.

   1. The completed Safety Audit Checklist, and
   2. The Safety Audit Findings reporting form.

c. The Report of Safety Audit Findings is submitted by routing to the following in the sequence indicated.

   1. The activity's primary contact,
   2. The Department Chair,

3. The Laboratory Manager, and
4. The Environmental Engineering Laboratory file folder (located on the R-drive)

d. All findings and any corrective actions included must be clearly and unambiguously presented.

e. It should be noted that one of the findings and cited corrective actions resulting from a Safety Audit may be that a Safety Performance Review is recommended or required to be conducted. In some cases this may also involve a safety performance violation requiring that immediate laboratory activities be ceased (see 7.0.f).

7.0 Addressing the Safety Audit Findings

a. Once receiving the Safety Audit Findings reporting form, findings that cite corrective actions must be addressed. Findings that do not cite a corrective action do not need to be addressed.

b. Correction to or missing safety policies and procedures that are related to the laboratories overall safety system, EHS-CHP or the laboratory safety standard (SOP 002A) is the joint responsibility of the Laboratory Manager and Laboratory Director, in consultation with EHS when appropriate.

c. Correction to ineffective or missing safety policies and procedures that are specific to a class, project or experimental study is the responsibility of the primary contact, in consultation with the Laboratory Manager when appropriate.

d. Documentation of how the corrective actions are addressed must be submitted to the Laboratory Manager. Documents that are attached to an e-mail communication are the preferred form of submitting this documentation.

e. The documentation that communicates the status of how each corrective action has been addressed must be submitted within 30 days following the date of the Report of Safety Audit Findings, and then every 15 days thereafter until all corrective actions have been implemented or otherwise adequately addressed.

f. An audit finding representing a safety performance violation that could lead to exposure as opposed to an incomplete or ineffective safety system, must be corrected as soon as possible before any additional laboratory activities are conducted. In certain instances, any ongoing laboratory activity must be ceased and laboratory access will be suspended until the conditions leading to the violation are corrected. A follow-up safety performance review must be conducted to verify that the corrective actions have been taken. This type of finding must be communicated to the primary contact as soon as it is discovered.

8.0 Retaining Records of Safety Audits

a. The records documenting the safety audit include,
    1. The completed Safety Audit Checklist,
    2. The Safety Audit Findings reporting form,
    3. The communications documenting how the findings are addressed and corrected.

b. These records are retained in the Environmental Engineering Laboratory file folder located on the R-drive as scanned or printed copies of the original documents or e-mail communications (pdf format).

c. Each Safety Audit is contained in a separate folder

c. The location of these records is intended to allow them to be openly reviewed by department personnel. Any dissemination of these records outside the department, to EHS for example, should be coordinated through the Laboratory Manager.

d. The duration for how long these records are retained is a minimum of 6 years beyond the date when a specific safety audit was completed. The intent of this duration is so that at least a 6-year period will be available should they be needed for information included in an ABET self-evaluation study report.

9.0 Forms used to Conduct and Report a Safety Audit

a. There are two forms used for conducting and reporting the a safety audit; these are,
    1. The Safety Audit Checklist template form, and
    2. The Safety Audit Findings reporting form.

b. Both forms are separate documents included as part of this SOP by reference, and may be found below the location of this SOP on the AMBL's Standard Operating Procedures web site.