

Knoxville Campus Policy: SALS002-K - Laboratory Audit Procedure	
Version 1	Effective Date: 07/16/2018

Environmental Health & Safety

Laboratory Audit Procedure

UTK Environmental Health & Safety Procedure LS-002

This document summarized the process of laboratory safety audits

Effective Date: 09/08/2015

Revision Date: 10/04/2016

Purpose

This protocol is intended as a guide for planning, conducting, and responding to a research laboratory safety audit.

Scope and Applicability

This protocol shall apply to all research laboratory personnel and stakeholders.

The scope of this protocol extends to research laboratories employing hazardous materials and processes. Computational labs, teaching labs, and other labs that do not employ hazardous materials are excluded. Also excluded are the UTIA laboratories.

Abbreviations and Definitions

Abbreviations

EHS: Environmental Health and Safety

OSHA: Occupational Safety and Health Administration

UTK: University of Tennessee Knoxville (Main Campus)

UTIA: University of Tennessee Institute of Agriculture

CAP: Corrective Action Plan

CHO: Chemical Hygiene Officer

Knoxville Campus Policy: SALS002-K - Laboratory Audit Procedure	
Version 1	Effective Date: 07/16/2018

LSC: Laboratory Safety Committee

Definitions

Stakeholders: Individuals, departments or colleges on campus that may be impacted by this protocol.

Major Finding: A condition or practice exists in the lab that poses an immediate risk to life and health.

Minor Finding: A condition or practice exists in the lab that poses a serious safety or compliance risk.

Observation: A condition or practice exists in the lab that represents a low safety or compliance risk.

Recommendation: A statement in the audit report that highlights prudent practices being recommended for incorporation into the laboratory safety management system.

Best Practices: Elements of the lab's safety management system that are worthy of benchmark status

Benchmark: A standard or norm by which excellent practices and/or performance may be judged

Roles and Responsibilities

EHS Department

The EHS Department is responsible for maintaining and implementing the Laboratory Audit Protocol. To accomplish this:

- EHS will maintain a current laboratory audit checklist with applicable standards and regulations.
- Audits will be scheduled throughout the year.
- Written reports and documentation will be completed and distributed to (at a minimum) the persons outlined in this document based on laboratory risk and PI response.
- Documentation and records will be maintained by the laboratory management and/or the Department of Environmental, Health and Safety (EHS).
- EHS will forward facility related issues identified during the audit to Facility Services
- Review and revise this protocol as the audit program evolves and as constructive feedback is received from stakeholders.

Knoxville Campus Policy: SALS002-K - Laboratory Audit Procedure	
Version 1	Effective Date: 07/16/2018

Principal Investigator

The Principal investigator is a faculty member or research scientist overseeing a research laboratory and has the primary responsibility for attaining and maintaining a safe laboratory environment. The PI shall ensure that faculty, student, staff and visiting scholars receive the appropriate training, instruction and mentorship necessary to work safely in his/her laboratory. In addition, the PI shall ensure that equipment and supplies are in place so that research can be conducted safely. Moreover, the PI is responsible for taking the actions necessary for his/her laboratory to comply with the University of Tennessee Policies as well as with all federal, state, and local regulations.

The PI, with assistance from EHS, shall ensure that the training programs available to laboratory personnel under his/her supervision address the hazards posed by the specific materials and equipment in his/her laboratory.

Regarding the conduct of audits, the Principal Investigator or Laboratory Supervisor has the overall responsibility for regulatory compliance in his or her laboratory. These responsibilities include:

- Meeting with EHS personnel, to walk through the laboratory during audits to discuss any findings.
- Involving other laboratory personnel in the audit process in addition to himself/herself.
- Reviewing the laboratory Audit Report, implementing corrective actions as prescribed by the written Laboratory Audit Protocol, and respond in writing to EHS as required, regarding the steps taken to mitigate or eliminate risk and bring the laboratory into regulatory compliance.
- Attaining and maintaining a safe and compliant laboratory for all lab personnel.

Department Head or Research Center Director

The Department Head is responsible for ensuring the attainment and maintenance of compliance with all applicable regulatory standards for research laboratories affiliated with his/her unit. In the event of escalation resulting from audit findings or non- response to findings, the Department Head will be notified and his or her assistance will be requested in risk mitigation and/or elimination.

Laboratory Personnel

Individual laboratory workers are responsible for:

- Assisting the EHS staff member during the laboratory audit by answering questions regarding laboratory operations
- Reporting unsafe acts or conditions and injuries or illnesses to their PI, Chemical Hygiene Officer, and/or EHS

Knoxville Campus Policy: SALS002-K - Laboratory Audit Procedure	
Version 1	Effective Date: 07/16/2018

- Participating in the creation and implementation of compliance systems and protocols to achieve safe and compliant laboratory working conditions

Chemical Hygiene Officer

The Chemical Hygiene Officer is the primary safety contact for laboratories that use hazardous chemicals. He/she is instrumental in communicating elements of this protocol, the Chemical Hygiene Plan, and Lab Safety in general. The primary role in the audit process is to work with EHS Lab Safety personnel to clearly communicate the expectations and logistics of the audit process and to follow up with labs with a risk level that warrants a re-audit prior to the next audit cycle.

Safety Contacts

The Safety Contact is the primary contact for Laboratories that do not use hazardous chemicals. He/she is instrumental in communicating elements of this protocol and lab safety in general. The primary role in the audit process is to work with EHS Lab Safety personnel to clearly communicate the expectations and logistics of the audit process and to follow up with labs with a risk level that warrants a re-audit prior to the next audit cycle.

Procedures

Introduction

Laboratory audits are required by the Occupational Safety and Health Act (OSHA) Laboratory Standard and serve as key elements of UTK's policy to ensure that a safe, healthy working environment is provided for students, faculty, staff and visitors. Laboratory PIs or supervisors have the responsibility of maintaining their laboratory area in a manner that controls hazards and minimizes risk.

Scheduling

Audits shall be scheduled so as to minimize disruption of laboratory activities. Lab personnel are required by this policy to give feedback on the audit schedule in order to align all parties involved and confirm engagement in the audit process. Under certain circumstances such as a filed complaint or an OSHA violation, an unannounced laboratory audit may occur.

Notice of Laboratory Audit

Prior to the audit of a laboratory, a notice will be sent to PIs in a selected department that have research labs under their purview. The notice will inform the PI of an upcoming audit and outline the evaluation criteria. The notice will contain a calendar with the schedule of pre- assigned audit dates and times for each PI in the department. Copies of the Notice of Laboratory Audit will be sent to the Department Head

Knoxville Campus Policy: SALS002-K - Laboratory Audit Procedure	
Version 1	Effective Date: 07/16/2018

or Research Center Director, the Associate Dean for Research of the College, the Assistant Vice Chancellor for Research and Engagement and the Director of EHS. A response by the PI to the notice is required to confirm receipt and acceptance of the assigned schedule. The PI is asked to suggest an alternative date and time for the audit of each laboratory if the pre- assigned time is not suitable. If a response is not received, the audit will be conducted on the pre-assigned date/time and the Department Head will be notified that the audit was conducted without the engagement of the PI or his/her designee.

Laboratory Audit

The laboratory audit will involve:

- Meeting with the PI to discuss the specific work performed in the laboratory, the people working in the laboratory, and the types of materials and procedures used.
- Surveying the laboratory based on the pre-set criteria outlined in the notice of upcoming laboratory audit, using either the laboratory audit form or focused variations of the form.
- Answering any questions the PI or designated staff member may have regarding the audit and informing them that a written report of the audit findings will be forwarded to them in the near future with a copy to the relevant departmental, college, laboratory, and safety personnel.

Laboratory Audit Report

Each laboratory audit will be documented in a laboratory audit report and the reports will be maintained to identify laboratory hazards, recurrent problems, and hazard/risk remediation that have been completed. Copies of the report will be sent to the Principal Investigator of the laboratory being audited, the Department Head or Research Center Director, the Chemical Hygiene Officer or Safety Contact, the Director of EHS, and laboratory personnel assisting in the audit.

Follow-Up/Re-Audit

If a laboratory is found to be deficient in an area that results in a major or minor finding, it will be pointed out to the PI who accompanies the Environmental Health and Safety staff member during the audit.

If there is a need for corrective action in any laboratory, the PI will adhere to the response appropriate to the finding:

Knoxville Campus Policy: SALS002-K - Laboratory Audit Procedure	
Version 1	Effective Date: 07/16/2018

Finding Significance	Response to Finding
<p>Major Finding</p> <p>Immediate Risk to Life and Health. Examples are: High risk hot work; High inhalation hazard chemicals being worked with outside the fume hood; conductor exposed on power cord; High risk use of pyrophoric chemicals; Reaction scale-ups without the proper risk assessment and controls; Poor housekeeping that poses an immediate risk of injury or exposure; other activities or processes at the discretion of the auditor</p> <p>Numerical value = 0 points per major finding</p>	<ul style="list-style-type: none"> • Immediate corrective action is required • High risk lab work is suspended up to and including a “stop work” order on the entire lab until a solution is implemented or the high risk is mitigated • A written corrective action plan (*CAP) is required within three business days. • Completion of corrective action plan items from the full audit or a progress report is required within 10 days. • A re-audit by EHS of the major findings will occur after 10 days of the original audit
<p>Minor Finding</p> <p>Serious Risk Examples are: Multiple damaged power cords, open containers of waste, incompatible chemical storage; labels missing from chemicals; poor housekeeping that may create a serious hazard; other activities or processes at the discretion of the auditor</p> <p>Numerical value = 1 points per minor finding</p>	<ul style="list-style-type: none"> • A written corrective action plan is required within three business days. • Completion of corrective action plan items from the full audit or a progress report is required within 10 days. • A re-audit by EHS or the Department Head or his/her designee will occur after 10 days of the original audit or during the next audit cycle as warranted by risk
<p>Observation</p> <p>Low risk non-compliance. Examples are: one cord with damaged outer coating; inadequate chemical labeling; poor housekeeping that doesn’t pose an immediate hazard; other activities or processes at the discretion of the auditor</p> <p>Numerical value = 2 points per observation</p>	<ul style="list-style-type: none"> • A written corrective action plan is required within three business days. • Completion of corrective action plan items from the full audit or a progress report is required within 10 days. • A re-audit will occur during the next audit cycle

Knoxville Campus Policy: SALS002-K - Laboratory Audit Procedure	
Version 1	Effective Date: 07/16/2018

<p>Recommendation</p> <p>In compliance but not best practice. Potential for degrading into non-compliance</p> <p>Numerical value = 2 points per recommendation</p>	<ul style="list-style-type: none"> • Evaluated at next audit cycle.
<p>Best Practice</p> <p>Benchmark program element</p> <p>Numerical value = 4 points per best practice acknowledgement</p>	<ul style="list-style-type: none"> • The program element will be re-evaluated for sustainability during next audit cycle

*CAP – The corrective action plan (CAP) must include the action items that will address the findings and the dates when the action items will be completed.

Escalation

The annual laboratory safety audit results in an email transmitting the audit report from the EHS Laboratory Safety Specialist to all affected PIs, the Department Head or Research Center Director, the Chemical Hygiene Officer or Safety Contact, the Director of EHS and the relevant lab personnel assisting with the audit. This report will indicate any safety compliance issues found during the audit. The protocol for escalation of each audit level is listed below:

Major Findings

If major findings have been discovered in the laboratory, the Director of EHS will be notified during or immediately after the audit is completed. If the PI was not present or was non-responsive to the request to suspend high risk lab work, the Director of EHS will notify the PI that the audit has resulted in major findings and immediate action will be required. If the PI is responsive, and agrees to cease the operations that resulted in the major finding, the PI will then begin to follow the response plan outlined in the table above. If the PI is not responsive, the Director of EHS will notify the Assistant Vice-Chancellor of Research. In the absence of the Assistant Vice-Chancellor of Research, the EHS Director will notify the Associate Dean of the College. The implementation of the escalation process at this point will be determined by the College Administrators and the Office of Research and Engagement. Copies of the audit report will be sent to appropriate levels of administration based on the escalation process.

Knoxville Campus Policy: SALS002-K - Laboratory Audit Procedure	
Version 1	Effective Date: 07/16/2018

Minor Findings

If minor findings have been discovered in the laboratory, the audit report will request a response plan according to the table above. If no corrective action plan is provided within the stated period, the audit findings will be escalated according to the Major Findings protocol above, possibly leading to a “stop work” for that process or laboratory.

Observations

During the first audit cycle, observations will not be escalated. If the observations have not been mitigated or eliminated during the next audit cycle, they will be escalated according to the Minor Findings protocol.

Recommendations

Not escalated.

Best Practices

Best practices will be compiled at the end of each audit cycle and made available for other labs to use as benchmarks.

Departmental Summary

At the completion of each department’s audit cycle, a summary report for the department’s audits will be sent to the Department Head or Research Center Director, the Associate Dean of the College, the Assistant Vice Chancellor of Research and Engagement, the affected PIs, the Chemical Hygiene Officer or Safety Contact and the Director of EHS. The summary will include, at a minimum, a synopsis of the major and minor findings revealed during the audits, the individual labs that require follow-up by departmental personnel and departmental best practices.

Record Keeping

Audit reports, transmission emails, and any documentation of follow up activities will be kept by EHS and the affected PIs.

Training and Information

No specific training is required by this policy; however, all attempts shall be made to communicate the audit protocol to the campus research community. Communication pathways may include:

- LSC – Laboratory Safety Committee

Knoxville Campus Policy: SALS002-K - Laboratory Audit Procedure	
Version 1	Effective Date: 07/16/2018

- Other Committees
- Office of Research and Engagement
- Chemical Hygiene Officers
- Safety Contacts
- Safety training provided by EHS
- Direct emails to affected parties
- Other methods

References

29 CFR 1910.1450 OSHA Laboratory Standard

Disclaimer

The information provided in these guidelines is designed for educational use only and is not a substitute for specific training or experience.

The University of Tennessee Knoxville and the authors of these guidelines assume no liability for any individual's use of or reliance upon any material contained or referenced herein. The material contained in these guidelines may not be the most current.

This material may be freely distributed for nonprofit educational use. However, if included in publications, written or electronic, attributions must be made to the author. Commercial use of this material is prohibited without express written permission from the author.

Appendices

[LS-002 Lab Audit Protocol \(downloadable pdf of complete document\)](#)

[Appendix A: Lab Inspection Checklist Guide](#)