



UCSB Audit and Advisory Services

Internal Audit Report

Lab Safety: Settlement Compliance

February 10, 2016

Performed by:

Amin Berrah, Senior Auditor

Laurie Liao, Staff Auditor

Approved by:

Robert Tarsia, Director

Report No. 08-16-0006

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AUDIT AND ADVISORY SERVICES
SANTA BARBARA, CALIFORNIA 93106-5140
Tel: (805) 893-2829
Fax: (805) 893-5423

February 10, 2016

To: John Sterritt, Director, Environmental Health & Safety
David Vandenberg, Lab Safety / IIPP Manager, Environmental Health & Safety
Alex Moretto, Chemical Laboratory Safety Officer, Dept. of Chemistry & Biochemistry

Re: **Lab Safety: Settlement Compliance**
Audit Report No. 08-16-0006

As part of the 2015-16 annual audit services plan, Audit and Advisory Services has completed an audit of campus compliance with the *UC Regents Laboratory Safety Settlement for the Department of Chemistry-Biochemistry* ("settlement"). Enclosed is the report detailing the results of our work.

The purpose of the audit was to assess whether the Environmental Health & Safety (EH&S) department and the Department of Chemistry & Biochemistry have implemented appropriate processes to ensure compliance with California Division of Occupational Safety and Health (Cal/OSHA) and settlement regulations and requirements, in accordance with UC and University of California, Santa Barbara (UCSB) policies.

The limited scope of our audit included an overview of departmental practices implemented since the settlement's execution in 2012. Our testing of settlement compliance procedures focused on processes in place during fiscal year 2015-16.

The audit found no instances of non-compliance with the settlement agreement in the areas included in the scope of our work. Although we also found that there are adequate processes and internal controls in place to ensure compliance in those areas, we did identify opportunities to enhance some processes to help make them more systematic and effective.

We greatly appreciated the assistance on this project provided by EH&S and Department of Chemistry & Biochemistry personnel. If you have any questions, please contact me.

Respectfully submitted,

A handwritten signature in black ink that reads "Robert Tarsia". The signature is written in a cursive style with a long horizontal line extending from the end.

Robert Tarsia
Director
Audit and Advisory Services

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cc: Chancellor Henry Yang
Vice Chancellor Administrative Services Marc Fisher
Steven K. Buratto, Chair of Department of Chemistry & Biochemistry
UCSB Audit Committee
Senior Vice President and Chief Compliance and Audit Officer Sheryl Vacca

PURPOSE

The purpose of this audit was to determine whether the University of California, Santa Barbara (UCSB) campus has implemented appropriate processes to ensure compliance with the 2012 *UC Regents Laboratory Safety Settlement for the Department of Chemistry-Biochemistry* (settlement agreement). This audit is part of our fiscal year 2015-16 audit services plan.

SCOPE, OBJECTIVES AND METHODOLOGY

This limited-scope audit focused on the implementation of laboratory safety training practices and standard operating procedures created in response to the 2012 settlement agreement. The audit included settlement compliance procedures in place as of October 1, 2015; our testing of training monitoring processes focused on the 2015-16 fiscal year.

The scope of the audit did not include all areas of laboratory safety; our objectives were limited to ensuring that:

- Principal Investigators (PIs) and other laboratory personnel are completing a lab safety training program based on the UC Laboratory Safety Training policy.
- Standard operating procedures (SOPs) have been developed by campus laboratories and meet minimum settlement requirements.

Our preliminary work emphasized:

- Gaining an understanding of settlement terms related to lab operations.
- Gaining and documenting an understanding of critical settlement compliance requirements relevant to the scope of the audit, including applicable UC and UCSB policies and procedures.

To accomplish our objectives, we:

- Compared a listing of laboratories being monitored by the UCSB Environmental Health & Safety (EH&S) department for settlement purposes to a listing of campus laboratories from the annual "space audit" performed by Space Management within the Office of Budget and Planning, to ensure the EH&S list encompasses all applicable campus laboratories affected by the settlement.

- Reviewed and tested lab safety training procedures and documentation, including evaluating whether there were adequate processes and internal controls in place to ensure that all appropriate laboratory personnel complete training required by the settlement.
- Assessed whether all personnel in our audit period have completed appropriate in-person or online lab safety training program by comparing the most recent semi-annual PI certifications to training records maintained by the UC Learning Center.
- Judgmentally selected five laboratories based on number of personnel to perform walkthroughs of current processes and procedures with knowledgeable personnel, including review of training documentation for the last certification period.
- Determined whether all laboratories selected for testing have implemented site-specific SOPs that are occasionally reviewed for completeness, as required by the settlement.
- Made additional observations during the performance of the audit.

This audit was conducted in conformance with the *International Standards for the Professional Practice of Internal Auditing*.

BACKGROUND

On July 27, 2012, the UC Regents and the Los Angeles District Attorney reached a settlement in connection with a laboratory accident that occurred at the University of California, Los Angeles (UCLA) in December 2008, which led to the death of a researcher performing an experiment with a pyrophoric substance. As part of the settlement, UCLA and other UC campuses are required to certify that laboratory safety procedures are compliant with relevant Cal/OSHA Title 8 General Industry Safety Orders,¹ as well as document certain laboratory safety training procedures and SOPs related to certain hazardous chemicals.

The campus tracks compliance of the settlement requirements and submits report results every six months to the UC Office of the President. This reporting is required until the end of the term of the settlement, which is four years from the date of the settlement.

*California Division of Occupational Safety and Health*²

The California Division of Occupational Safety and Health (Cal/OSHA), protects workers from health and safety hazards on the job in California workplaces through its research and standards, enforcement, and consultation programs. Cal/OSHA also oversees programs promoting public safety and the safe use of pressure vessels (e.g., boilers and tanks). Cal/OSHA has been responsible for conducting the administrative investigation and enforcement of settlement terms and conditions.

¹ Including but not limited to *California Code of Regulations Title 8 Sections 5164, 5191, 5194, 3203, and 3380-3387*.

² Cal/OSHA - California Department of Industrial Relations website

UC Center for Laboratory Safety³

The UC Center for Laboratory Safety (UCCLS) was established in March 2011 in the wake of the accidental death that occurred at UCLA. While implementing changes to UCLA's research laboratory safety measures, it became clear that no data existed to evaluate safety measures objectively. Research on accident rates and laboratory safety in academic institutions was scarce; as a consequence, the effectiveness of safety policies as a basis for improving safety was unclear. UCCLS aims to fill this gap by conducting and promoting research on laboratory safety.

The UCCLS also provides SOP templates developed based on a format following the National Academy of Science *Laboratory Chemical Safety Summary Sheets* (LCSS). The information provided is mainly limited to applicable health and safety information on a chemical. These sheets are not an SOP by themselves, but serve a starting point for "laboratory personnel having the most experience and knowledge and who are routinely involved in the experimental process" to write a complete SOP.

The UCSB Chemical Laboratory Safety Officer and outside UC consultants vetted these SOP templates at the time of the settlement, and UCSB directs laboratories affected by the settlement to utilize SOP templates from the UCCLS repository.

UCSB Environmental Health & Safety⁴

EH&S is responsible for promoting a safe and healthful environment for research and instruction within the campus community. Through education, auditing and monitoring, technical consultation, and the provision of direct services, EH&S assists the campus in meeting its obligations for compliance with state and federal health, safety, and environmental regulations.

Programs and services provided include areas such as Biological Safety, Emergency Planning, Environmental Health, Fire Prevention, General Safety, Hazard & Exposure Assessments, Hazardous Waste, Industrial Hygiene, Injury & Illness Prevention, Lab Safety & Chemical Hygiene, Personal Protective Equipment, Radiation Safety, and Risk Management.

The nature of the settlement affects employee health and safety standards, which falls directly under the responsibility of UCSB EH&S to anticipate and respond to health and safety issues⁵.

³ UC Center for Laboratory Safety website

⁴ UCSB Environmental Health & Safety website

⁵ UCSB Environmental Health & Safety Policy 5400

Department of Chemistry & Biochemistry⁶

The Department of Chemistry & Biochemistry represents all branches of chemistry, including materials, inorganic, organic, physical, theoretical, analytical, and biochemical. The department features a strong collaborative research environment, which is fostered by the creation of interdisciplinary research units, including the Materials Research Laboratory, California Nanosystems Institute, Center for Bioengineering, Center for Polymers and Organic Solids, Center for Energy Efficient Materials, Institute for Collaborative Biotechnologies, and the Institute for Energy Efficiency.

UC Learning Center

UC Learning Center is an online learning management system that automates the administration of training and employee development. Workers at all UC campuses can access the UC Learning Center to view their training history. In addition, departments can have designated administrators provided access to all the training records for individuals associated with their department. UCSB EH&S utilizes the UC Learning Center to maintain and administer training related to the settlement.

Relevant Policies

Policies and procedures considered most relevant to the scope of this audit include:

- *UC Laboratory Safety Training*, which was adopted in November 2013 to satisfy Cal/OSHA requirements for documentation of occupationally-related safety training, and also to improve safety awareness. Under this policy, all *lab workers* must complete a Fundamentals of Laboratory Safety orientation (live or online) in order to be given access to their lab(s) by their department. A new secondary requirement is for a training needs assessment to be performed for each laboratory worker.

Appendix C of the policy outlines various federal and state safety training mandates, such as relevant Cal/OSHA Title 8 General Industry Safety Orders,⁷ which establish minimum laboratory safety training requirements for all University workers regardless of their title.

- *UCSB Laboratory Safety Manual and Chemical Hygiene Plan*, which is a single document that serves as the standard campus laboratory safety manual and chemical hygiene plan, developed to address policies and procedures in place that minimize the exposure of laboratory employees to chemicals.
- *UC Personal Protective Equipment*, which is a policy intended to help protect laboratory workers from injury, meet Cal/OSHA requirements, and bring more consistency to UC personal protective equipment practices. Among other subjects, the policy states when and where individuals must wear long pants, closed-toe shoes, safety eyewear, and lab coats.

⁶ UCSB Department of Chemistry & Biochemistry website

⁷ Including but not limited to *California Code of Regulations Title 8*, Sections 5164, 5191, 5194, 3203, and 3380-3387.

SUMMARY OPINION

The audit found no instances of non-compliance with the settlement agreement in the areas included in the scope of our work. Although we also found that there are adequate processes and internal controls in place to ensure compliance in those areas, we did identify opportunities to enhance some processes to help make them more systematic and effective.

Audit observations and management corrective actions are detailed in the remainder of the audit report.

DETAILED OBSERVATIONS AND MANAGEMENT CORRECTIVE ACTIONS

A. Opportunities to Make Compliance Monitoring More Systematic and Effective

As we have stated, our audit found no instances of non-compliance with the settlement agreement in the areas included in the scope of our work. Although we also found that there are adequate processes and internal controls in place to ensure compliance in those areas, we did identify opportunities to enhance some processes to help make them more systematic and effective.

Laboratory Space – There may be an opportunity for a better systematic process to review and update the list of laboratory facilities that need to be monitored under the settlement agreement. Space Management within the Office and Budget & Planning performs an annual “space audit” to account for space in campus facilities; the last space audit attributes 150 rooms to laboratory facilities, but these are identified as individual rooms and not by laboratory facility, which can be comprised of multiple rooms. An annual reconciliation of the space audit with the list of laboratories monitored under the settlement agreement would provide additional assurance of the adequacy of existing processes for tracking laboratory space.

Training Documentation – We determined that there is generally adequate monitoring of whether lab personnel are completing required lab safety training program based on the campus Laboratory Safety Manual. We did identify some minor concerns, which appeared to primarily result from limitations in UC Learning Center data:

- We could not locate documentation of completed training for one of the 99 employees we reviewed.
- Additional steps were required to verify completion of training by employees showing an incomplete training status or who could not be located in the UC Learning Center data extract we used for our reviews. Verifying completion of training required an employee with administrator-level system access, or the retrieval of backup documentation in the form of sign-in sheet logs for live training, auto-generated e-mail confirmation, or other backup documentation that corroborates the completion of training.

Standard Operating Procedures – Consistent with the settlement agreement, Cal/OSHA requires all applicable laboratory facilities to comply with Title 8 requirements for SOPs. We determined that UCSB SOPs have generally been approved and maintained centrally, and that PIs and appropriate personnel have certified their understanding of applicable SOPs, as required. We did identify an opportunity to enhance processes to ensure applicable chemicals have an appropriate SOP in use: there are existing annual chemical inventory processes that may be a good opportunity to verify SOP certifications and provide additional assurance of compliance. This would be done by ensuring there are SOPs in each laboratory for each inventoried chemical.

We recommend the following potential enhancements to existing processes:

- Supplement existing processes with an annual reconciliation of the space audit with the list of laboratories monitored under the settlement agreement, which would help ensure that the list is current and complete and also may assist in other laboratory safety work.
- Determine if there are possible improvements in the use of the UC Learning Center that would improve the usefulness of the data for compliance monitoring.
- Incorporate verification of SOP certifications into existing annual chemical inventory processes.

MANAGEMENT CORRECTIVE ACTIONS

EH&S and the Department of Chemistry & Biochemistry agree to evaluate an action plan that:

- Supplements existing processes with an annual reconciliation of the space audit with the list of laboratories monitored under the settlement agreement.
- Assesses whether there are possible procedures to improve use of the UC Learning Center that would increase the usefulness of the data for compliance monitoring.
- Encourages departments to supplement existing processes with checks for completeness of SOPs.

Audit and Advisory Services will follow up on the status of this management action plan by June 1, 2016.