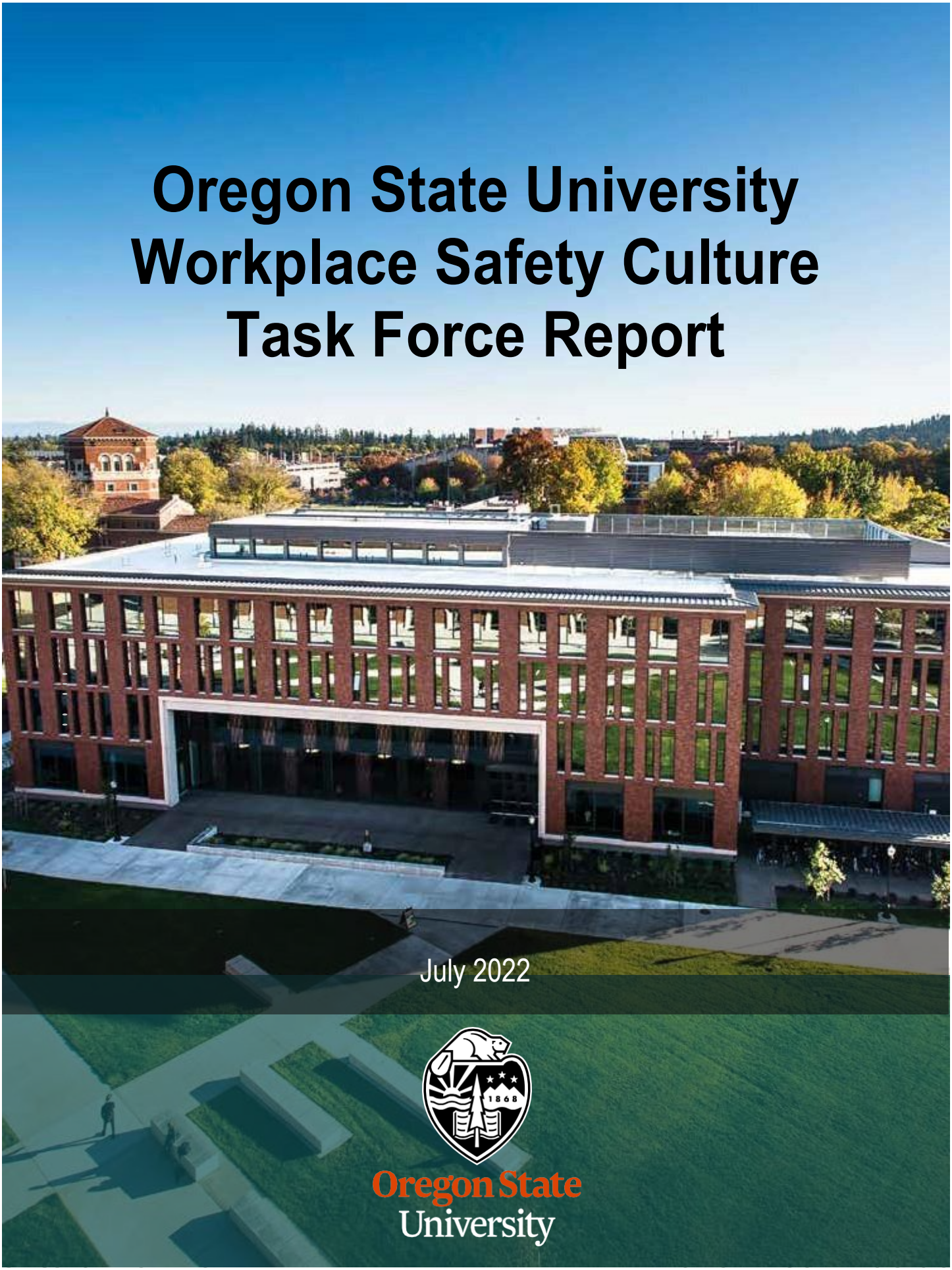
Oregon State University Workplace Safety Culture Task Force Report



July 2022

Oregon State University

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Task Force

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The Workplace Safety Culture Task Force was charged by the Provost and Executive Vice President, Vice President for Finance and Administration, and Vice President for Research. The task force was asked to develop recommendations that align with best practice recommendations from the Association of Public and Land-Grant Universities (APLU) and support the university's goal to foster and strengthen a university-wide culture that values and emphasizes workplace safety and adopts efficient and effective safety and health measures (see Appendix 1, Workplace Safety Culture Task Force Charge). The task force met six times between October 2021 and May 2022. Meetings were facilitated by Environmental Health and Safety, with robust discussion and participation from all attendees.

Safety Culture

Safety culture refers to an "organization's shared values, assumptions, and beliefs regarding workplace safety or, more simply, the importance of safety within the organization *relative to other priorities*. A strong, positive safety culture arises not because of a set of rules, but because of a culture that supports the free exchange of safety information, emphasizes learning and improvement, and assigns greater importance to identifying and solving problems rather than placing blame. High importance is assigned to safety all the

time, not just when it is convenient or does not threaten personal or institutional productivity goals."[1]

There has been a shift from focusing exclusively on check-the-box compliance towards the development of a strong safety culture. This change has produced benefits in industries such as aviation and health care. Several health care studies have shown that organizational factors are the most significant predictors of safe work behaviors. For example, studies concerning standard precautions to prevent the transmission of bloodborne pathological diseases have shown that compliance increased when employees felt their institution had a strong commitment to safety and when the institution focused on interventions at improving support for employee health and safety. A strong safety culture has been shown to be predictive of lower injury rates, lower workers' comp claims, increased job satisfaction, and decreased turnover.[2]

Challenges in higher education

A series of accidents over the past several years that involved serious injuries and fatalities – including an explosion that severely injured a graduate student at Texas Tech University during the handling of a high-energy metal compound, and a flash fire in a laboratory at UCLA that killed a research assistant – inspired many universities to examine workplace safety culture at their own institutions.

With any serious event, it is all too common for attention to be focused on the actions and decisions of the individuals involved in the immediate activities preceding the event. Modern accident causation theory recognizes that incidents are not the result of a single malfunctioning piece of equipment or the erroneous actions of one person, but instead are the result of a number of failures and deficiencies at many levels within an organization and its technical community. Focusing safety improvements at the immediate level of accident causation has limited reach and impact because doing so misses the underlying organizational factors that influence and contribute to an incident. Examining higher-level system deficiencies within an organization and making safety changes at those levels have a much greater preventative impact.[3]

Acknowledging the above statements, the following can pose unique challenges to the development of a strong, positive safety culture in a higher education environment:

- *The specialized, hierarchical and decentralized structure of academic institutions.* Many PIs are essentially running their own small businesses related to their research program, including: gaining funding, employing graduate students/postdocs, monitoring budgets, and disseminating knowledge - in addition to instruction, advising, and service. Safety and health can sometimes feel like one more matter they need to just take care of to move forward.

- *High turnover and the relative inexperience of laboratory workers in the academic research environment.* In general, 60-80% of the people doing laboratory research change every 4-5 years. Graduate students cycle through a laboratory every 2-6 years and undergraduates on a 1-2 year

[1] Safety Science Promoting a Culture of Safety in Academic Chemical Research Report, National Research Council, Pg 2
[2] OSHA Organizational Safety Culture – Linking Patient and Worker Safety
[3] Texas Tech University Lab Explosion Report, Chemical Safety Board, Pg 5

cycle. This makes it very difficult to achieve a foothold on fostering a culture of safety. Many PIs spend little time in the laboratory (especially as their careers progress), which leaves safety and health responsibilities often to a senior graduate student or postdoc. This lack of continuity in responsibility is a challenge.

- *Aging infrastructure.* Many university buildings and facilities are 50 years or older, yet they house research laboratories that are attempting to complete 21st century experiments. It can be very difficult to properly (and cost-effectively) retrofit these spaces with the appropriate engineering and administrative safety controls that the research requires.

OSU is not alone in the challenges it faces in fostering a culture of safety. Several institutions and international professional societies – as well as OSU's own College of Engineering – have completed similar analyses and arrived at parallel conclusions (see Appendix 2, Oregon State University's College of Engineering, Ad-hoc Safety Task Force Final Report, January 2021).

Building on an established foundation

This report reflects the next level of maturity for OSU's workplace safety efforts. In March 2016, the Executive & Audit Committee approved a model for developing action plans to mitigate the top risks that may hinder OSU's ability to achieve the objectives outlined in its strategic plan. The university identified laboratory/workplace safety as one of those top risks. Considerable work has been done in this area since that time. Appendix 3 details initiatives and efforts that have already been implemented. The task force recommendations in this report build on that foundation. Details and progress have been reported on an annual basis:

- 2021 Board of Trustees Workplace Safety, including Risk Management Report
- 2020 Board of Trustees Workplace Safety, including Risk Management Report
- 2019 Board of Trustees Lab Safety Risk Management Report

Best practices

In developing recommendations to strengthen and promote a culture of safety at OSU, the task force reviewed national best practices, including:

- Association of Public & Land-Grant Universities (APLU) Guide to Implementing a Safety Culture
- National Research Council (NRC) Promoting a Culture of Safety in Academic Chemical Research
- American Chemical Society (ACS) Creating Safety Cultures in Academic Institutions

Task Force Recommendations

The Task Force recommendations are organized in three overarching categories: leadership commitment; training and learning; and continuous improvement.

Leadership Commitment

1. Perform Safety Perception Survey in Fall Term 2022 administered through the National Safety Council (NSC). This survey aligns with APLU Guide to Implementing a Safety Culture in Our Universities and can be used to help validate recommendations of the Task Force.
    - FY23 – EH&S has made preliminary arrangements to perform Safety Perception Survey beginning October, 2022.
2. Establish University Health and Safety Committee (UHSC) structure to facilitate, support, and direct safety culture improvement to include:
    a. Institute a Safety Advisory Committee in each College. A Safety Advisory Committee representative from each College should serve on the UHSC.
        - FY23-24 – Each college to institute a college level Safety Advisory Committee and establish a representative to serve on the UHSC.
    b. Encourage appointment of Department/Unit Safety Coordinators (DUSC) within colleges, units and departments to assist in day-to-day safety activities. DUSC representatives should serve on College Safety Advisory Committees. See Appendix 4 for UHSC committee structure recommendations.
        - FY23-24 – Revise UHSC structure lead by EH&S in consultation and approval from VPFA. UHSC is appointed by and reports to the VPFA.
3. Send recurring safety messages (from the President on down) emphasizing commitment to workplace safety with reference to university policy, roles and responsibilities.
    - FY23 - Task Force recommends senior leadership send safety commitment message following approval of Task Force recommendations. SAVPA/EH&S will provide annual safety commitment message reminders.
4. Routinely discuss safety at college leadership and faculty meetings. Review accident and injury report trends, compliance status, etc... (Dean's Safety Reports)
    - FY23 - EH&S will develop Dean's Safety Reports utilizing new EH&S information management system. Dashboard reports will highlight colleges and departments safety compliance status including accidents and injuries information.
5. Include safety responsibilities in PD's and safety expectations/responsibilities should be part of performance evaluations.
    - FY23-24 – Conduct a review with Human Resources and EH&S to evaluate revisions to position descriptions and performance evaluation templates to include safety performance criteria.
    - FY23 - EH&S will develop Safety Culture Performance Metrics template that provides recommendations to improve workplace safety culture throughout the university. The

template will include leading indicators to measure progress. The goal is to proactively measure successes to improve OSU's safety culture.

- FY23 - EH&S will develop a Safety Culture Improvement webpage.

6. Prioritize safety and allocate safety resources as part of regular budgeting processes at the department, college, and university levels.
    - FY23-24 - Develop guidelines for allocation of safety resources in the budgeting process.

Training & Learning

7. Include safety information in course curriculum (within the syllabus or instructor/Canvas web page) at the start of each term, as appropriate for the class type and potential risks.
    a. Encourage research and teaching laboratories and shops to adopt formal risk assessment process such as the American Chemical Society (ACS) RAMP process. The RAMP concept provides a framework for making safety an integral part of education and practice.
8. Develop Student Led Safety Teams (SLST) in COE, COF, COA, CEOAS and COS to help strengthen academic research safety culture from the bottom up. Facilitate partnering with Chemistry Department Student Led Safety Team.
    - FY23-24 – EH&S will work with COE, COF, COA, CEOAS and COS Associate Deans for Research to expand SLST. Associate deans within respective colleges to assign college-level oversight/sponsorship of the SLSTs. Chemistry department in partnership with EH&S launched the first SLST in 2021. EH&S will facilitate partnering with the Chemistry Department to provide example of SLST structure to other colleges.
9. Expand Campus Safety (top-level) homepage to include Workplace Safety (Safety Culture) information. Link to colleges and departments that cover all categories of safety (i.e., labs shops, agriculture, extension, etc.)
    - FY23 – EH&S will work with DFA IT and Public Safety to develop top level homepage for DFA.
    - FY23-24 – Each college to develop/expand their health & safety webpage information.
10. Sponsor Annual Safety Event that promotes workplace safety and health.
    - FY24 – EH&S will facilitate development of annual event in coordination with Office of Research and other stakeholders to promote stewardship of workplace safety.

Continuous Improvement

11. Institute a continuous improvement system as referenced in Appendix 5 that provides feedback, reassessment, and ongoing training and learning opportunities.
    a. Perform periodic safety culture surveys to measure progress.
        - FY24 – EH&S will facilitate performing follow-up safety perception survey 12-18 months after completing the first survey.
    b. Provide safety reports to Deans and reports from their Safety Advisory Committees for feedback and trend tracking.

- FY24 – Recommend SAVPA/EH&S meet with senior administration committees and cabinet (e.g., President's Cabinet, Provost Council of Deans, Executive Risk Committee) to discuss continuous improvement progress.

c. Promote academic and industrial/government partnerships that allow academic researchers to learn from strong and well-designed safety cultures in industrial and government laboratories.
    - FY23 - EH&S will meet with Colleges Associate Deans for Research Fall Term 2023 to discuss promotion of industrial/government partnerships to enhance safety culture.

d. PIs and managers should perform periodic safety self-assessments of their labs, shops and workplaces. Partner with labs and shops on campus for peer reviews.
    - FY24 – EH&S will meet with Colleges Associate Deans for Research to develop working group to discuss and promote self-assessments and peer reviews.

Appendix 1 - Workplace Safety Culture Task Force Charge

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oregonstate.edu

17 September 2021

2021-22 Workplace Safety Culture Task Force

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Dan Kermoyan, Assistant Director, Environmental Health and Safety, DFA
Laurel Kincl, Associate Professor, College of Public Health and Human Sciences
Michael Lerner, Chair Department of Chemistry and Professor, College of Science
Anthony Veltri, Assoc Prof, College of Public Health and Human Sciences - *Ad Hoc/Guest Speaker*
Chris Viggiani, Associate Vice President for Research Integrity, Office of Research
Adrienne Wonhof, Director of Operations, College of Forestry

We write to invite you to serve on the Workplace Safety Culture Task Force, chaired by Paul Odenthal, Senior Associate Vice President for Administration, in the Division of Finance and Administration.

In alignment with best practice recommendations from the Association of Public and Land-Grant Universities (APLU), the work of the Task Force will directly support the University's goal to foster and strengthen a university-wide culture that values and emphasizes workplace safety and adopts efficient and effective safety and health measures.

As part of its work, the Task Force will:

- Evaluate current OSU workplace safety programs, policies, procedures, education, training, and oversight;
- Review national reports, including the *APLU Guide to Implementing a Safety Culture at Our Universities*, best practices, and current trends in safety metrics regarding laboratory, shop, research, and workplace safety issues – including hazardous materials, hazardous operations, and equipment (e.g., compliance, near misses, incidents);
- Develop recommendations on how to enhance workplace safety culture in all domains of the university, including initiatives for training, messaging and communication, policy and procedure integration, resource creation, governance, and in other areas, as appropriate.

The Task Force will provide recommendations in a written report to the Provost, the Vice President for Finance and Administration, and the Vice President for Research by June 2022.

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Please contact Gigi Bruce, Chief Assistant to the Provost, to accept or decline this invitation. Thank you for your consideration.

Sincerely,

Edward Feser
Provost and Executive Vice President

Mike Green
Vice President for Finance and Administration

Irem Tumer
Vice President for Research

Appendix 2 – College of Engineering Ad-hoc Safety Task Force Final Report, January 2021

Oregon State University
College of Engineering

Oregon State University College of Engineering
Ad-hoc Safety Task Force Final Report
January 2021

Task Force Members:
Brady Gibbons, Associate Dean for Research (Chair)
Tarrigon Van Denburg, COE Facilities Operations and Safety Manager
John Gambatese, Professor, School of Civil and Construction Engineering
Tom Doyle, OSU Director of Environmental Health & Safety
Dennis Barlow, Director of Safety Services, Associated General Contractors of Oregon
Chris Myers, Worldwide Safety Lead for 3D Printing, Hewlett-Packard Corporation

Overview:
In August of 2020, Dean Scott Ashford established an ad-hoc college-wide safety task force to evaluate and assess the culture of safety within the college of engineering at Oregon State University. He tasked Brady Gibbons, the COE Associate Dean for Research, to lead a team of internal and external environmental health and safety experts to participate in this review. The task force reviewed college policies, university policies, college infrastructure and research laboratories, and held several meetings over the Fall term of 2020. This report is a summary of the findings of the task force and recommendations for strengthening the safety culture within the college of engineering. It is envisioned that this task force is just the beginning of an intensive effort to further evolve a positive culture of safety throughout the college.

Introduction:

The college of engineering (COE) at Oregon State University (OSU) is comprised of 205 faculty members, approximately 9,500 undergraduate and graduate students, 69 instructors, 75 research personnel, and 118 staff. The research enterprise is an integral part of the college – undergraduate and graduate students at all levels participate, and with expenditures of $50M per year it is a critical element of their educational experience. Five schools comprise COE:

- School of Chemical, Biological, and Environmental Engineering
- School of Civil and Construction Engineering
- School of Electrical Engineering and Computer Science
- School of Mechanical, Industrial, and Manufacturing Engineering
- School of Nuclear Science and Engineering

As one may imagine, with this variety of disciplines there are myriad research laboratories spread over at least 17 buildings across the Corvallis campus, in addition to research occurring in the field. This presents several challenges to implementation of a consistent approach to environmental health and safety (EH&S). Although the University EH&S team is well equipped to provide our principal investigators (PIs) with best practices and oversight, the overall safety culture within the college could be further fostered – with more standardized implementation throughout the COE community. In discussing the types of research occurring across the college, the task force concluded that the COE safety culture varies not just between research groups, but also between schools and even from building to building.

The task force was put together with internal and external experts on EH&S matters. The external members were selected from some of our most strategic industrial research partners and bring a wealth of industrial setting EH&S experience. That said, the members realize that academic research settings bring several unique challenges when compared to industry. Some of these include:

- Many PIs approach their research groups as if they are running their own businesses, but what they produce can be quite varied. However, in all cases it involves gaining funding, employing graduate students/postdocs, monitoring budgets, disseminating knowledge, etc. (of course in addition to instruction). Owing to this, it's common that EH&S is seen as more of a compliance effort rather than a culture. This is not to say they 'don't care' about EH&S – it's simply just one more matter they need to take care of to move forward.
- Compounding the above point, in general 60-80% of the people *doing* the laboratory research change every 4-5 years. This makes it very difficult to achieve a toehold on fostering a culture of safety. Most PIs spend little time in the laboratory (understandably), which leaves EH&S responsibilities often to a senior graduate student or postdoc. This lack of continuity in responsibility is a challenge.
- In many cases COE buildings/facilities are 50 years or older with only minor renovations, yet they still house PIs research laboratories where they are attempting to complete 21st

century experiments. It can be very difficult to properly (and cost-effectively) retrofit these spaces with the appropriate engineering and administrative safety controls these experiments demand.

In compiling this report, and investigating numerous sources of additional information, it became clear that OSU COE is not alone in the challenges we are faced with to foster our safety culture. Several institutions and international professional societies have completed similar (and much more thorough in some cases) analyses and have arrived at very parallel conclusions – and these have undoubtedly help shape the recommendations presented here. Appended to this report are links to some of these, as well as other excellent resources for moving forward.

Finally, it is critical to note that overall COE is meeting the required University-wide EH&S protocols. EH&S staff and COE PIs regularly work together to identify issues and resolve them – this has been of particular note as EH&S at OSU has grown their presence over the past decade. That said, implementation across schools does not seem to always be consistent and some PIs that have been at OSU for longer periods (perhaps when there was less emphasis on EH&S protocols) can be more reticent to agree to more oversight of laboratories that they feel have been run safely and productively until now. The task force feels these disparities are a result of each school approaching their efforts in different ways. A stronger college-wide implementation plan could address this. We recognize there is room to grow – The goal is for PIs not to see EH&S efforts as simply something they must comply with. It should be woven into their daily activities both professionally and personally.

What follows are the task force's overall findings regarding the culture of safety in COE, along with a list of recommendations to sustain and further the incorporation of EH&S within our collective research enterprise.

Findings:

- Overall COE follows the required University-wide EH&S protocols.
- There appears to be no mechanism/instrument to regularly evaluate and assess what PIs, students, and staff feel regarding the culture of safety in COE.
- COE (compared to peers and aspirational peers) has fewer postdoctoral appointees and research faculty. This results in the PIs generally having the most EH&S experience in a given laboratory. However, most PIs spend little to no time in their laboratories conducting research. This results in graduate assistants becoming the primary point of contact for experimental equipment, and even entire laboratories.
    - Turnover in these positions then becomes a significant challenge to maintaining consistent EH&S approaches.
- Although University-wide EH&S protocols are followed, they are not always implemented in a consistent fashion from school to school. The University EH&S team does their utmost to disseminate best practices and procedures across campus, but it

takes full and coordinated (college-wide) participation from PIs/students/staff to ensure they are applied consistently and regularly.

- Both engineering and administrative controls to safety are not implemented consistently across the college. Signage, standard operating procedures, hazard analyses, lockout/tagout procedures, 'stop work' policies, seem to vary. This was largely noted during the tour of COE facilities in October 2020.
- During the COE facilities tour it was noted in some cases EH&S implementation seemed to differ between undergraduate student club spaces and PI research laboratories (largely inhabited by graduate students). This may imply there is a difference between communicating EH&S policies and procedures between the undergraduate and graduate students. Whether this is a result of curricular differences or simply happenstance is unclear.
- Metrics to assess and evaluate COE's effectiveness at what is being implemented are lacking. The concept of 'continuous improvement' does not seem to be widely applied.
- It was unclear to what extent each school safety advisory groups were engaged in activities proactively addressing EH&S issues among their PIs. The charge/mission of the college-wide safety advisory group was also unclear.

Recommendations and Reasoning:

- COE should implement a college-wide survey to assess and evaluate the general safety culture within the college. This should be done as soon as reasonably possible.
    - Task Force member Tom Doyle is working with COE Prof. Ean Ng already on this effort. Approval from college leadership is needed to move forward.
- Promoting a culture of safety should be both a top-down and bottom-up effort.
    - The task force stressed that college and unit leadership should demonstrate that safety is a core value of our institution. This will undoubtedly trickle down to faculty as they see and align with what the leadership demonstrates as important to the future of the college.
- Include efforts to promote a strong safety culture in faculty, staff (where appropriate), and graduate student annual performance evaluations, as well as promotion and tenure decisions.
    - The task force agreed that incentives are necessary to emphasize how important EH&S is to our institution. It also acknowledges the level of effort it will take from all PIs to incorporate these best practices into all research groups.
- Formally implement EH&S in graduate and undergraduate curricula. The goal here is to better prepare our graduates for the workforce with regards to EH&S. Some methods to do so discussed by the task force included:
    - Required EH&S seminars for new graduate students (1 term) – this is a best practice followed in the Department of Chemistry at OSU.

    - All undergraduate lab classes should add a course learning outcome dedicated to EH&S. The syllabi should additionally discuss the approach to EH&S for the class.
- Develop formal metrics to assess and evaluate all our EH&S procedures (in tandem with university EH&S).
- Develop a formal communication plan once results of the safety culture survey are analyzed. In doing so the college should:
    - Provide a stronger charge to the college Safety Advisory Committee in terms of what the expectations are for addressing any issues noted from the survey.
    - Ensure all schools have an active and engaged Safety Advisory Committee, with members of each also participating on the college level committee if this is not already the case.
- Ensure administrative and engineering controls are consistently implemented throughout the college. In doing so the task force discussed:
    - It's important to provide resources when feasible. Not only does this relieve the PI, but it demonstrates a commitment from the college to EH&S.
    - Communication between PIs, PIs and students, and all with leadership is critically important to evolving a positive culture of safety in the college.

Summary

Sustaining and fostering a culture of safety is difficult. The recommendations above hopefully put COE on a path to doing so. We certainly recognize not all will buy-in immediately, but with education and resilience success is realizable. A strong partnership with our EH&S staff will also enable these efforts. We are fortunate to have a dedicated group with whom to work. The ultimate outcome is to ensure our graduates leave with an understanding of the importance of EH&S in their personal and professional lives.

Resources and reference materials the task force used to as references to prepare this report:

- OSU Enterprise Risk Priorities https://leadership.oregonstate.edu/oarc/risk-enterprise
  - Current OSU enterprise risk priorities
    - 2020 ERM
    - 2019 ERM
  - Lab safety report to the OSU Board of Trustees (October 2019)

- Guidelines on implementing or improving safety culture at academic institutions:
  - American Association for Public & Land-Grant Universities – https://www.aplu.org/projects-and-initiatives/research-science-and-technology/task-force-laboratory-safety/
  - National Research Council – https://www.nap.edu/catalog/18706/safe-science-promoting-a-culture-of-safety-in-academic-chemical
  - American Chemical Society – https://www.acs.org/content/dam/acsorg/about/governance/committees/chemicalsafety/academic-safety-culture-report.pdf

- University Safety Culture Initiatives
  - University of Michigan Research Smart Initiative (based on guidance from AAPLGU, ACS and NRC)
    - https://research.umich.edu/research-smart/research-smart-about-us
  - Research Smart Safety Committees
    - https://research.umich.edu/research-smart/research-smart-safety-committees
  - Colorado State Research Safety Culture
    - https://www.research.colostate.edu/research-safety-culture/
  - University of Utah Lab Safety Culture Task Force
    - https://cmes.utah.edu/safety/Final-Lab-Safety-Report.pdf
  - UC Center for Laboratory Safety
    - https://cls.ucla.edu/
  - Stanford – Advancing the Culture of Safety
    - https://web.stanford.edu/dept/EH&S/cgi-bin/lsctf/

- Publications
  - Building a Sustainable Student-Led Model to Promote Research Safety in Academic Laboratories
    - https://pubs.acs.org/doi/pdf/10.1021/acscentsci.9b00562
  - Self-Designing Safety Culture: A Case Study in Adaptive Approaches to Creating a Safety Culture
    - https://pubs.acs.org/doi/pdf/10.1021/acs.chas.0c00005

As described above, the parallel conclusions of these studies to ours are not surprising. Academic institutions of all shapes and sizes are faced with very common challenges. Appended below are excerpts from the National Research Council's report: *Safe Science: Promoting a Culture of Safety in Academic Chemical Research*. Much of what is found there is consistent with ours, and others', observations.

SAFE SCIENCE

Actions for Deans and Vice Presidents for Research

Interest in promoting safety in academic research laboratories has grown in recent years, following high-profile incidents in which researchers were injured or killed. Many colleges and universities want to go beyond complying with regulations to fostering a safety culture: affirming a constant, institution-wide commitment to safety and integrating safety as an essential element in the daily work of researchers.

A report from the National Research Council, *Safe Science: Promoting a Culture of Safety in Academic Chemical Research*, identifies steps that everyone involved in research and other activities using chemicals—from researchers to principal investigators to university leadership—can take to create and promote this approach to safety.

Vice presidents for research and deans of schools and colleges have substantial responsibility and influence in establishing and sustaining a strong, positive safety culture in their institutions. They should take a range of actions to do so, such as ensuring that their institutions undertake research only when they have the capacity to do so safely, establishing policies and deploying resources in ways that support safety, and articulating clear roles and responsibilities around safety.

SAFETY CULTURE IN THE LABORATORY

An ideal laboratory safety culture ensures that anyone who enters a laboratory, from inexperienced students to senior investigators, understands that they are entering an environment that requires special precautions. They are aware of the hazards posed by the materials they and others in the lab are working with, and they are prepared to take immediate and appropriate measures to protect themselves and their co-workers, especially in the case of unexpected events. At a minimum, laboratory safety includes:

- awareness of the physical and chemical properties and health hazards of laboratory reagents and equipment being used, gained by conducting hazard analysis,
- availability and use of proper apparatus and infrastructure needed to carry out the procedure safely,
- knowledge of and ability to execute any additional special practices necessary to reduce risks,
- use of proper personal protective equipment,
- access to a well-organized workspace that facilitates unrestricted movement about the laboratory and appropriate segregation of materials and processes, and
- familiarity with emergency procedures, including the use of safety showers, fire extinguishers, and eye stations.

A strong, positive safety culture encourages all laboratory workers to place the highest priority on these practices. It is not enough to provide safe equipment, systems, and procedures if the culture of the organization does not encourage and support working safely.

One of the barriers to the development of safety culture in academic laboratories is the attitude that safety practices inhibit research productivity. But the occurrence of a serious incident in a laboratory, in addition to being a tragedy in itself, stops research and is certainly one of the most dramatic possible impacts on research progress, as anyone who has experienced or witnessed such an incident can attest.

Safety is a core element of research, not an impediment to it. Laboratory safety is needed not only to protect the health of the students and researchers involved but also to provide a positive example to younger scientists that laboratory research can be done safely and efficiently. Like publishing papers and acquiring grants, conducting research safely is key to the success of a research group, and it must be held in high academic esteem.

WHAT IS SAFETY CULTURE?

Safety culture refers to an organization's shared values, assumptions, and beliefs specific to workplace safety—or more simply, the relative importance of safety within the organization.

A strong, positive safety culture is not a culture of compliance. A strong safety culture arises not because of a set of rules but because of a constant commitment to safety throughout an organization. A positive safety culture supports the free exchange of safety information and assigns greater importance to solving problems than to placing blame. High importance is assigned to safety at all times, not just when it is convenient or does not threaten personal or institutional productivity goals.

Promoting a Culture of Safety in Academic Chemical Research

PROMOTING A CULTURE OF SAFETY

Vice presidents for research, deans, and other senior university leaders should take the following steps to help establish and sustain a strong safety culture in their institution's laboratories:

Demonstrate that safety is a core value of the institution. Deans and vice presidents for research should not only talk about safety but also demonstrate a concrete, ongoing commitment to laboratory safety. Faculty's perceptions about the institution's commitment to safety play a significant role in their actions. For example, if they perceive that deans and chairs will not provide resources for necessary or recommended safety and environmental procedures or for safety-related updates to facilities, they may be understandably skeptical of the same administrators' appeals to prioritize safety. And if faculty perceive that deans, chairs, and colleagues value grant income and research productivity above all else when deciding raises, tenure, promotions, and award nominations, they may adjust their efforts accordingly.

Incorporate efforts to foster a strong, positive safety culture as an element in the criteria for promotion, tenure, and salary decisions for faculty. The core missions of academic institutions—teaching, research, and service—are the criteria that many institutions currently use to make decisions about faculty tenure, rank, salary, and awards. Faculty members align their efforts with these criteria. Deans and vice presidents should work with the provost and faculty governance to add efforts to establish and promote safety to these criteria. Doing so will allow faculty members to align their work on safety to institutional expectations. This change will also allow institutions to recognize the substantial work required to identify the hazards associated with research, mitigate their risks, sustain a group culture of safe practices, and train and educate a constantly changing group of researchers.

Align research plans with resources available for safety. Providing resources for safety is the responsibility of institutions. To develop a safe and successful research program, provosts, deans, vice presidents for research, chairs, and individual laboratories must consider the resources they have available for safety when exploring options for research programs and selecting areas to pursue. Research should not be launched or expected when resources are inadequate for proper safety.

Institutions or units that face financial constraints should not conduct research less safely to try to compete with institutions that have more resources. Excellent research can be conducted in low-resource environments with proper planning and judicious choices about research areas that match funding and infrastructure levels.

Establish policies and deploy resources in ways that encourage and enable safety. Each institution should have a comprehensive risk management plan for laboratory safety that addresses prevention, mitigation, and emergency response. And university leaders should develop policies—with input from departments, faculty, researchers, and environment health and safety personnel—that govern practices that affect safety, such as whether and under what conditions researchers may work alone in laboratories.

Designing and renovating laboratories with safety as a priority. The design of new laboratory buildings and the renovation of current facilities should provide adequate fume hoods, proper space for safe operation of laser experiments, and areas where students can work and eat that are separated from areas where experimental work is going on.

Articulate roles, responsibilities, and accountability clearly. Currently many faculty members are unaware of their responsibility for fostering safe practices in their laboratory research programs. Universities should ensure that all those involved in research—including principal investigators, laboratory researchers, and environmental safety & health personnel that support safety—understand their roles and responsibilities regarding safety.

Contribute to and use cross-institution information on near misses. A near miss is an undesirable or unexpected event that could have resulted in an injury or property damage had the timing, space, or sequence of events happened under slightly different conditions. It also represents a learning opportunity to share experiences with others. Establishing an anonymous

SAFE SCIENCE

Actions for Principal Investigators and Department Chairs

Interest in promoting safety in academic research laboratories has grown in recent years, following high-profile incidents in which researchers were injured or killed. Many colleges and universities want to go beyond complying with regulations to fostering a safety culture: affirming a constant, institution-wide commitment to safety and integrating safety as an essential element in the daily work of researchers.

A report from the National Research Council, *Safe Science: Promoting a Culture of Safety in Academic Chemical Research*, identifies steps that everyone involved in research and other activities using chemicals—from researchers to principal investigators to university leadership—should take to create and promote this approach to safety.

As principal investigators, you have enormous influence over the culture in the laboratories, which you lead. In many ways, you set the tone for the standard of safety that will be implemented. The principal investigator and the entire institution are responsible for promoting safety and providing the resources and training needed to work safely. Day-to-day actions and practices that lead to safe laboratories demand that you, as PIs, encourage participation, commitment, and leadership among your research team (or group), whose safety is at stake.

ELEMENTS OF A STRONG LABORATORY SAFETY CULTURE

An ideal laboratory safety culture ensures that anyone who enters a laboratory, from inexperienced students to senior investigators, understands that they are entering an environment that requires special precautions. They are aware of the hazards posed by the materials they and others in the lab are working with, and they are prepared to take immediate and appropriate measures to protect themselves and their co-workers, especially in the case of unexpected events. At a minimum, laboratory safety includes:

- awareness of the physical and chemical properties and health hazards of laboratory reagents and equipment being used, gained by conducting hazard analysis,
- availability and use of proper apparatus and infrastructure needed to carry out the procedure safely,
- knowledge of and ability to execute any additional special practices necessary to reduce risks,
- use of proper personal protective equipment,
- access to a well-organized workspace that facilitates unrestricted movement about the laboratory and appropriate segregation of materials and processes, and
- familiarity with emergency procedures, including the use of safety showers, fire extinguishers, and eye stations.

A strong, positive safety culture encourages all laboratory workers to place the highest priority on these practices. It is not enough to provide safe equipment, systems, and procedures if the culture of the organization does not encourage and support working safely.

One of the barriers to the development of safety culture in academic laboratories is the attitude that safety practices inhibit research productivity. But the occurrence of a serious incident in a laboratory, in addition to being a tragedy in itself, stops research and is certainly a dramatic impact on research progress, as anyone who has experienced or witnessed such an incident can attest.

It is part of the academic culture for researchers to work long hours, late at night, and often alone. These practices may reflect a pressure to produce results, influenced by power dynamics that are antithetical to the advancement of a strong safety culture. No amount of productivity justifies carrying out hazardous procedures alone and with inadequate sleep.

Safety is a core element of responsible research, not an impediment to it. Good science is safe science, fostering a productive and secure work environment. Like publishing papers and acquiring grants, conducting research safely is key to the success of a research group, and it must be held in high academic esteem.

ACTIONS FOR PRINCIPAL INVESTIGATORS

Academic research faculty play primary roles in laboratory safety and in developing and maintaining an effective safety culture within their research groups. Principal investigators should take the following steps to promote this kind of culture:

Encourage open and ongoing dialog about safety. Graduate students and other research staff are dependent, financially and educationally, upon principal investigators' grants and research projects. This sense of dependence may inhibit them from raising safety concerns because of fear that the principal investigator will feel that they are less focused on

Promoting a Culture of Safety in Academic Chemical Research

productivity. In addition, the risk of losing peer collegiality or approval might make co-workers reluctant to confront fellow students who are not following good safety practices. Principal investigators should take active steps to counter these dynamics and foster a culture where safety is discussed regularly and where students can raise concerns without fear of retaliation. For example, some departments regularly begin each laboratory meeting or faculty meeting with a "safety moment" when any safety-related issues or concerns can be discussed, and these are widely viewed as successful. Further engagement with Environmental Health and Safety, to help develop these safety moments, would encourage even greater collaboration.

Serve as a role model by exhibiting good safety behavior. If principal investigators enter the lab to talk to students without proper attire and personal protective equipment, this sends a message that those higher up on the laboratory hierarchy routinely engage in unsafe behavior, which may inhibit those lower in the hierarchy from raising safety concerns. Principal investigators should wear long pants, closed-toe shoes, and personal protective equipment whenever they go into the lab, even just to talk to a student who is working. Failure to dress properly sends the wrong message and reinforces the impression that safety is not a high priority for the principal investigator and the group.

Empower researchers to assume leadership roles in establishing safety practices within research groups and for entire departments. In general, the laboratories with the best safety culture are those where the individuals working at the bench are actively involved in establishing safety culture and safety practices—a finding consistent with much of what has been learned from experts on safety culture in other industries. Departments and principal investigators should empower students and postdocs to assume leadership roles in establishing safe practices within research groups and also for entire departments. A department safety committee driven by graduate students and postdocs, along with faculty involvement, can be a powerful platform for promoting safety culture.

Ensure that a hazard analysis is conducted prior to conducting any experimental procedure. Hazard analysis is a process to assess risks and to ensure that those risks are mitigated or eliminated before initiating any laboratory work. Many types of hazard analysis exist, and particular types may be suitable to certain situations; regardless of the approach used, it is important for researchers to assess the hazards in any experiment before it is undertaken. The principal investigator and all researchers involved in an experiment should incorporate hazard analysis into lab notebooks prior to an experiment and into thesis and dissertation proposals. If a procedure yields unexpected results, the hazard analysis should be revisited.

Insist that everyone who works in the lab receives proper safety training. Most lab researchers in academia are still in the training phase of their professional development, and students arrive at laboratories with widely varying—and sometimes very little—knowledge of safe practices. Department chairs and principal investigators should ensure that everyone who works in the lab receives comprehensive, lab-specific safety training. Requiring researchers and other lab workers to complete safety training before they are issued laboratory keys or passwords is a simple way to ensure that researchers have been properly trained. Because a large proportion of research workers in U.S. laboratories are from other countries, principal investigators should also ensure that cultural or language barriers do not impede either training or ongoing discussion of safety issues.

Complement initial basic safety training with ongoing actions and activities to encourage safety and promote a strong, positive safety culture in the research lab. This step will ensure that collective experience and knowledge about safety are integrated with actual lab work, practiced, and maintained. Among these activities should be—

- **Walkthroughs and unannounced inspections.** These should be carried out regularly to assure that personal protective equipment is being used, hazard analysis has been conducted, etc. These should be non-punitive, at least at the outset, since the inspections are intended to promote safety culture, not produce "gotcha" rule violations. Including researchers' peers—probably from other laboratories—in inspection teams promotes the right kind of discussion.
- ***Coaching and mentoring.*** One strength of scientific research—a strong apprenticeship ethic where more experienced researchers mentor younger scientists in doing research—should be leveraged to enable new researchers to receive hands-on training in safety practice from more-experienced researchers.

SAFE SCIENCE
Actions for Laboratory Researchers

Interest in promoting safety in academic research laboratories has grown in recent years, following high-profile incidents in which researchers were injured or killed. Many colleges and universities want to go beyond complying with regulations to fostering a safety culture: affirming a constant, institution-wide commitment to safety and integrating safety as an essential element in the daily work of researchers.

A report from the National Research Council, *Safe Science: Promoting a Culture of Safety in Academic Chemical Research*, identifies steps that everyone involved in research and other activities using chemicals—from researchers to principal investigators to university leadership—should take to create and promote this approach to safety.

As researchers, you have enormous influence over the culture in the laboratories where you work. Some of the strongest laboratory safety cultures are those in which researchers have taken the lead in establishing that culture. The entire institution is responsible for promoting safety and providing you with the resources and training you need to work safely. But the day-to-day actions and practices that lead to safe laboratories demand the participation, commitment, and leadership of those who actually do the research, whose safety is at stake.

ELEMENTS OF A STRONG LABORATORY SAFETY CULTURE

An ideal laboratory safety culture ensures that anyone who enters a laboratory, from inexperienced students to senior investigators, understands that they are entering an environment that requires special precautions. They are aware of the hazards posed by the materials they and others in the lab are working with, and they are prepared to take immediate and appropriate measures to protect themselves and their co-workers, especially in the case of unexpected events. At a minimum, laboratory safety includes:

- awareness of the physical and chemical properties and health hazards of laboratory reagents and equipment being used, gained by conducting hazard analysis,
- availability and use of proper apparatus and infrastructure needed to carry out the procedure safely,
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- use of proper personal protective equipment,
- access to a well-organized workspace that facilitates unrestricted movement about the laboratory and appropriate segregation of materials and processes, and
- familiarity with emergency procedures, including the use of safety showers, fire extinguishers, and eye stations.

A strong, positive safety culture encourages all laboratory workers to place the highest priority on these practices. Safe equipment, systems, and procedures are not enough if the culture of the organization does not encourage and support working safely.

One of the major barriers to the development of safety culture in academic laboratories is the attitude that safety practices inhibit research productivity. But the occurrence of a serious incident in a laboratory, in addition to being a tragedy in itself, stops research—certainly a dramatic impact on research progress, as anyone who has experienced or witnessed such an incident can attest.

It is part of the academic culture for researchers to work long hours, late at night, and often alone. These practices may reflect a pressure to produce results, influenced by power dynamics that are antithetical to the advancement of a strong safety culture. No amount of productivity justifies carrying out hazardous procedures alone and with inadequate sleep.

Safety is a core element of responsible research, not an impediment to it. Good science is safe science, fostering a productive and secure work environment. Like publishing papers and acquiring grants, conducting research safely is key to the success of a research group, and it must be held in high academic esteem.

ACTIONS TO CREATE A STRONG SAFETY CULTURE

The university, the department, and the principal investigator are responsible for providing a safe work environment and encouraging a culture that promotes safety. For example, the university and principal investigator should ensure that you have:

- comprehensive, lab-specific safety training before you start work in the lab,
- opportunities for guidance and mentoring about safety issues, along with other research-related issues,

Promoting a Culture of Safety in Academic Chemical Research

- personal protective equipment, including lab coats, and
- regular opportunities to bring up safety concerns and questions without fear of retaliation, in an environment where the focus is on solving problems rather than assigning blame.

You should also take steps to build and sustain a strong safety culture in the lab where you work, by initiating or participating in the following activities:

Participate in and encourage open, ongoing dialog about safety. Researchers should bring up concerns and questions they have about safety; principal investigators should set up mechanisms to help this happen. For example, some departments regularly begin each laboratory meeting or faculty meeting with a "safety moment" when any safety-related issues or concerns can be discussed, and these are widely viewed as successful. Forming a department safety committee driven by graduate students and postdocs can be a powerful safety practice as well.

Conduct a hazard analysis prior to conducting any experimental procedure. Hazard analysis is a process to assess risks and to ensure that those risks are mitigated or eliminated before initiating any laboratory work. Many types of hazard analysis exist, and particular types may be suitable to certain situations; regardless of the approach used, it is important for researchers to assess the hazards in any experiment before it is undertaken. The principal investigator and all researchers involved in an experiment should incorporate hazard analysis into lab notebooks prior to an experiment. If a procedure yields unexpected results, the hazard analysis should be revisited.

Take part in ongoing activities to encourage safety. Doing so will ensure that collective experience and knowledge about safety are integrated with actual lab work, practiced, and maintained. Examples of such activities are—

- ***Walk-throughs and unannounced inspections.*** These are intended to assure that personal protective equipment is being used, hazard analysis has been conducted, etc. These should be non-punitive, at least at the outset, since the inspections are intended to promote safety culture, not produce "gotcha" rule violations. As researchers, your presence on inspection teams—and that of your peers from other laboratories—will promote the right kind of discussion.
- ***Reporting system.*** A reporting system aims to reduce the potential for incidents by giving researchers a place to report near misses and injuries, share lessons learned, propose ideas, and give feedback to the department. A near miss is an undesirable or unexpected event that could have resulted in an injury, incident, or property damage had the timing, space, or sequence of events happened under slightly different conditions. It also represents a learning opportunity for sharing experiences with others. Allowing anonymous reporting may make researchers more willing to report near misses.

The success of such measures depends on establishing a nonthreatening atmosphere. For example, if near-miss reporting is to make an impact, the identity of the person involved and the person who reported it should not matter. Instead, the focus should be on addressing the threat of the danger and eliminating it as quickly as possible. A positive safety culture supports the free exchange of safety information and assigns greater importance to solving problems than to placing blame.

If you worry that stress is leaving you unable to work safely, seek assistance. Given the highly competitive nature of academic research, researchers often feel stress from striving to meet deadlines, make reports, and achieve milestones in completing one's degree. The level of stress can distract researchers from disciplined safety practice and may overwhelm an individual's capacity to function safely in the laboratory. Most universities have counseling and stress management resources available to students and staff that need them. You should not hesitate to use these resources or to suggest them to a colleague in need.

The National Research Council report ***Safe Science: Promoting a Culture of Safety in Academic Chemical Research*** was written by an independent committee of experts including members from university administration, chemistry faculty, behavioral sciences, EHS, private industry, and national laboratories. It was sponsored by the National Science Foundation, U.S. Department of Energy, National Institute of Standards and Technology, American Chemical Society ExxonMobil Chemical, and E. I. du Pont de Nemours and Company.

This pamphlet is one of a series summarizing ***Safe Science: Actions for...Laboratory Researchers, Principal Investigators and Department Chairs, Environmental Health and Safety Staff, Deans and Vice Presidents for Research,*** and ***University Senior Leaders.*** *They are available at* http://dels.nas.edu/Report/Report/18706. Read, purchase, or download a free PDF of the report at http://www.nap.edu.

ver. 1

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Appendix 3 – APLU Recommendations and OSU Progress to date

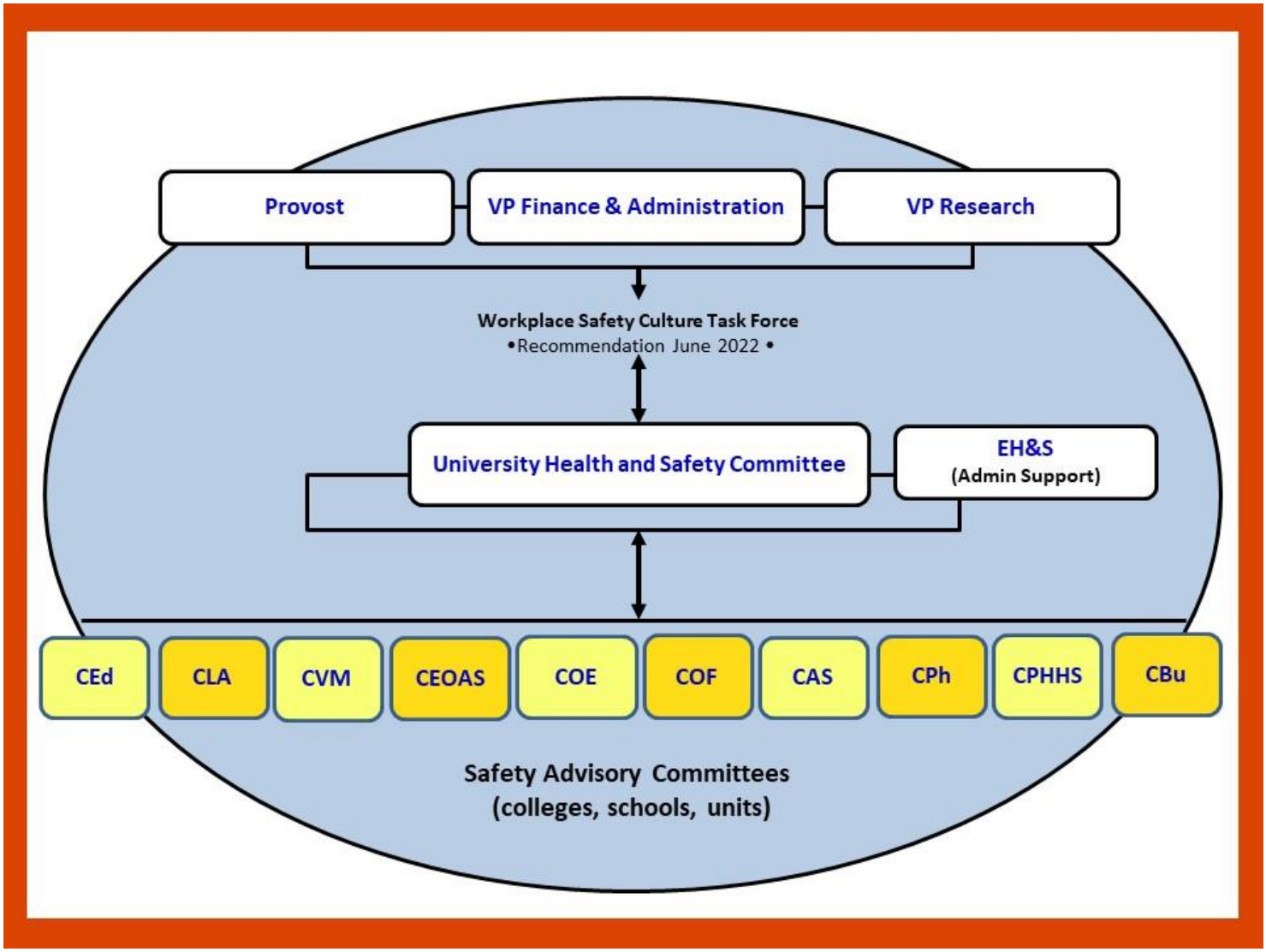
APLU Recommendations	OSU progress as of June 2022
• Renew commitment to improve the culture of safety for all academic research, scholarship, and teaching.	✓ Advancing Lab Safety commitment made by President Ed Ray in 2015 https://ehs.oregonstate.edu/announcement/advancing-lab-safety. The letter was from the Provost and the VPs of F&A and Research.
• Designate a campus lead and leadership team to begin the process. The president/chancellor considers appropriate committees to help implement a culture of safety, including a safety committee of faculty, Environmental Health and Safety (EH&S) officers, and other representatives who can provide formative feedback to researchers, educators, and staff.	✓ Enterprise risk priorities are approved by the Executive and Audit Committee of the Board of Trustees. Laboratory/Workplace Safety has been designated as a priority risk (2019-2021) and assigned to Board of Trustees Academic Strategies Committee for regular reporting and planned mitigation strategies. See Office of Audit, Risk and Compliance Enterprise Risk Management Reports https://leadership.oregonstate.edu/oarc/risk-enterprise Board of Trustees Academic Strategies Committee 2021 Workplace Safety, Including Risk Management Report https://leadership.oregonstate.edu/sites/leadership.oregonstate.edu/files/asc_2b_workplace_safety_0.pdf Board of Trustees Academic Strategies Committee 2020 Workplace Safety, Including Risk Management Report https://leadership.oregonstate.edu/sites/leadership.oregonstate.edu/files/asc_2b_workplace_safety.pdf Board of Trustees Academic Strategies Committee 2019 Lab Safety, Including Risk Management Report https://leadership.oregonstate.edu/sites/leadership.oregonstate.edu/files/tab_ae_risk_mgmt_rpt_lab_safety.pdf
• Conduct campus dialogues with stakeholders to develop a shared vision of safety that aligns with the institutional mission and to develop an action plan.	✓ New University Health and Safety Policy adopted 7/16/2021 https://policy.oregonstate.edu/UPSM/07-001_health_safety_policy.
• Develop effective safety policies, procedures, and management systems, and identify the resources necessary for implementation. They establish recognition and reward systems and integrate these into tenure and promotion, hiring, and annual performance reviews.	✓ 2021-22 Workplace Safety Culture Task Force charged by Provost, Vice President Finance and Administration and Vice President of Research in September, 2021.
• Clearly articulate the roles and responsibilities of all stakeholders.	✓ New safety and health information management system (BioRAFT) is being implemented. BioRAFT is a certified loss control and risk mitigation solution for

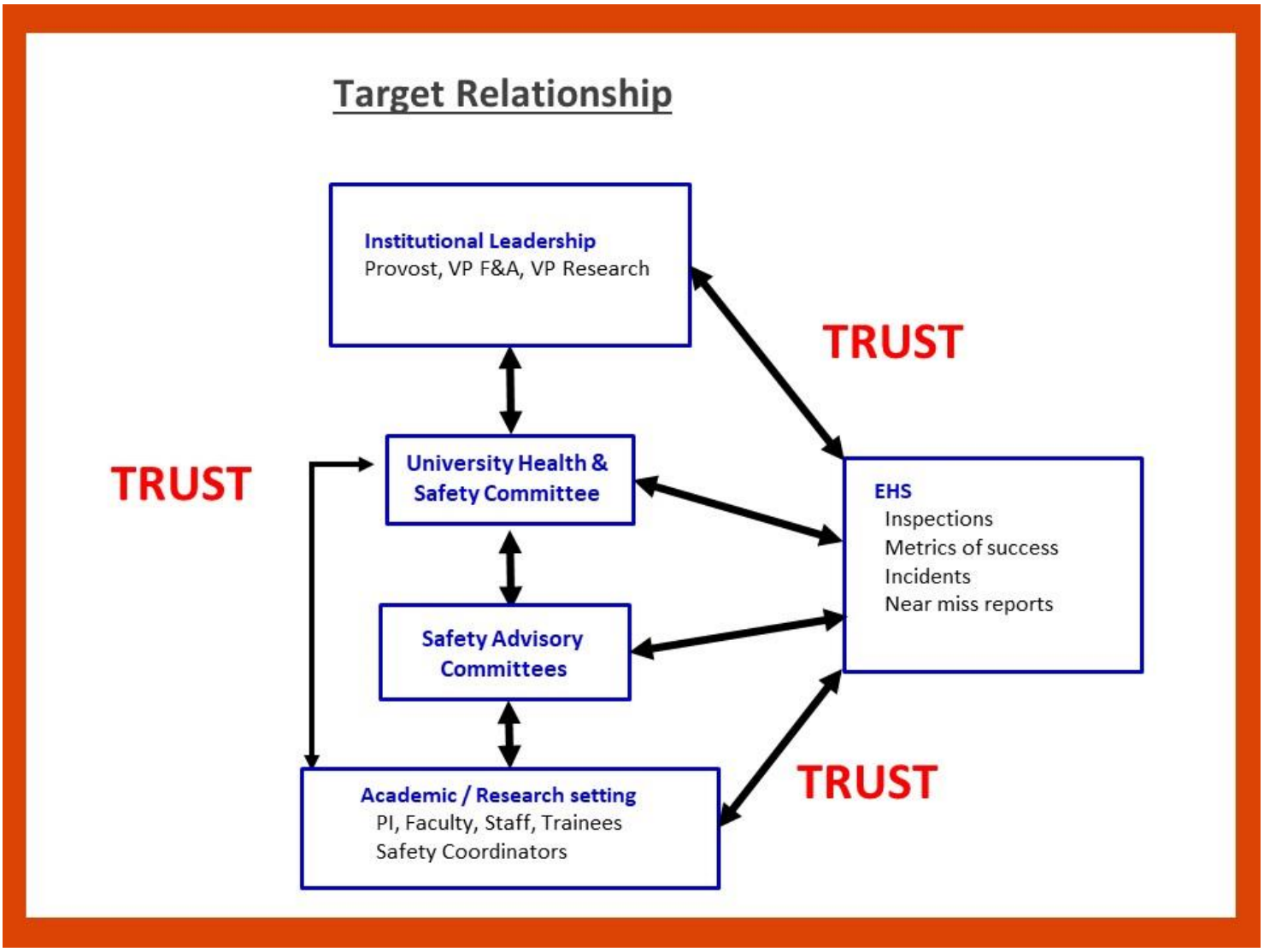
APLU Recommendations	OSU progress as of June 2022
	educational institutions. The new system provides a comprehensive enterprise wide safety information management solution that is scalable and readily allows OSU to accurately know who is in our workplaces, the hazards involved, and where the work is being performed. The new system will provide faculty, staff and students the tools to track and manage safety for themselves and their lab, shop or workspace. New system will provide compliance dashboards.
• With the faculty, embed safety communication in laboratories, classes, departments and throughout the wider campus.	✓ EH&S is invited periodically to speak to various labs and departments throughout the university on various safety topics (e.g., lab safety, hazardous material use and disposal, safety culture, construction safety, ergonomics, etc.)
• With the faculty, work to create a trusting and safe culture. They encourage the development of a generative cultures based on open dialogue, reporting, and learning from near misses, as described by the National Academy of Sciences.	✓ EH&S sponsors Department Unit Safety Coordinators (DUSC) meetings 2-4 times per academic year.
• Develop a risk assessment process for laboratory safety that is integral to all activities conducted in the laboratory or the field.	✓ Safety Beaver Buzz Newsletter is published on quarterly basis.
• Establishes a unified administrative reporting model that connects responsibility for development and implementation of academic safety policies. The model should fall under one administrative pillar in the institution and should include faculty, EH&S officers, and administrative leaders	✓ An Ad-hoc Safety Task Force in College of Engineering (COE) was initiated in 2020. Final recommendations from COE Task Force align with university wide Workplace Safety Culture Task Force recommendations. Task Force proposed recommendation to enhance engineering curriculum by including hazard analysis/risk assessment as part of curriculum.
• Empower undergraduate students, graduate students, postdoctoral fellows, and staff to voice safety questions and concerns to their faculty supervisors, EH&S offices, and/or safety committee.	✓ Chemistry Department established Chemical Safety Seminar Course (CH 607) for graduate students.
• Works to strengthen collegial and collaborative relationships between faculty and EH&S staff.	✓ Chemistry Department launched first Student Lead Safety Team at the university.
• Works to enhance effective working relationships with first responders.	✓ Near Miss Reporting system has been developed utilizing Insurance and Risk Mgmt. Services (IRMS) Advocate system https://oregonstate2-gme-advocate.symplicity.com/public_report/index.php/pid928375. New BioRAFT information management system has feature called ObserveNow that will

APLU Recommendations	OSU progress as of June 2022
	replace IRMS Advocate System for university wide Near Miss reporting. The ObserveNow feature turns personnel on site into eyes and ears to spot and report safety concerns and safety successes (https://www.bioraft.com/observnow-information-kit#whatisobservnow). ✓ COE Industrial Eng. student's capstone project developed near miss reporting system for COE clubs (https://ehs.oregonstate.edu/osu-student-club-safety).
• Implement routine hazard analyses and includes them as integral components of undergraduate and graduate education; thesis, dissertation, and funding proposals; and experimental design for all experiments.	✓ EH&S performs workplace (labs, shops, farms) safety assessments every 18 months.
• Implements a process to report incidents and near misses so that the campus community can learn from these incidents.	✓ Insurance and Risk Management Services has developed Risk Assessment Tools to help in making risk-informed decisions throughout the university https://risk.oregonstate.edu/risk-assessment-tools.
• Provides laboratory safety education and training for students, faculty, EH&S staff, and department heads.	✓ Safety advisory committees have been established in COE, Forestry, Chemistry, CAS, CEOAS, and Veterinary Medicine.
• Ensures undergraduate and graduate science and engineering curricula include an emphasis on safe practices.	✓ Director of EH&S meets with Director of Compliance on monthly basis to discuss university safety compliance issues.
• Conducts self-assessment and bench-marking using measures that can provide feedback on whether it is moving to a safer culture.	✓ Research Risk and Compliance Committee has been established with membership from senior administration, research administration, faculty and EH&S.
• Develops a continuous improvement system that provides feedback, reassessment, and on-going training and learning opportunities.	✓ EH&S anonymous "Report a Safety Concern" has been established https://ehs.oregonstate.edu/.
• Develops a system of accountability, including peer-to-peer accountability.	✓ EH&S Hotline 541-713-SAFE established to report urgent safety concerns
• Promotes academic and industrial/government partnerships that allow academic researchers to learn from strong and well-developed safety cultures in industrial and government laboratories.	✓ Established single webpage to prominently promote the many university efforts and ongoing available services dedicated to integrity, sexual misconduct reporting and support, Title IX compliance, equal opportunity, safety and other important commitments https://oregonstate.edu/hotline-and-sexual-misconduct-reporting-and-services
	✓ Safety plans are sent to emergency response agencies/authorities having jurisdiction (e.g., fire department, hospitals).

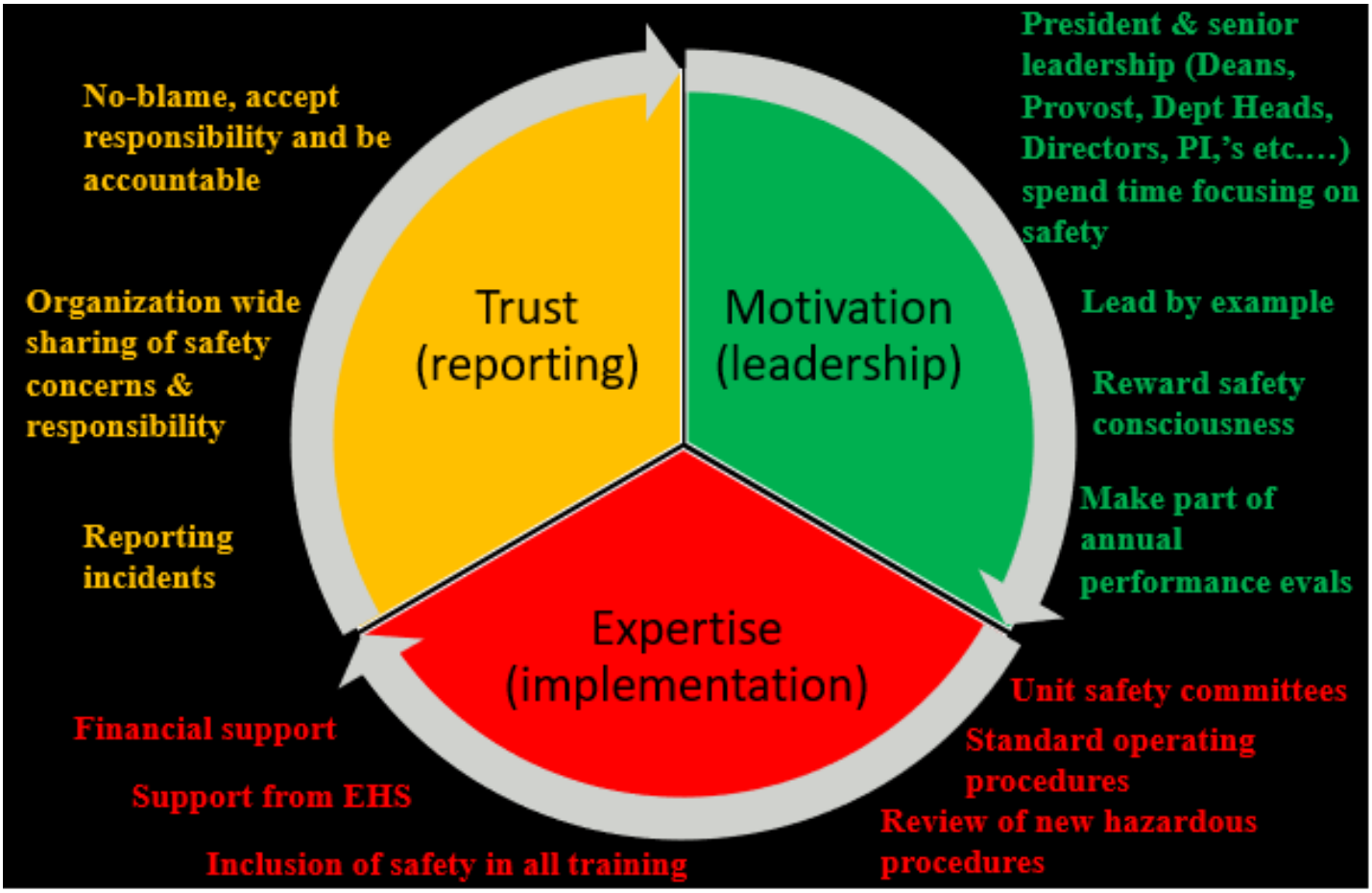
APLU Recommendations	OSU progress as of June 2022
	✓ University facilities are jointly inspected by CoC Fire Department and EH&S personnel on annual basis.
	✓ EH&S has contracts with CFD for confined space rescue.
	✓ EH&S hosts seminars with Haz Mat Region 5 and the National Guard Civil Support Team.
	✓ EH&S publishes hazard analysis information on website including library of safety instructions https://ehs.oregonstate.edu/safety-instructions and SOP Template Library https://ehs.oregonstate.edu/sop-template-library
	✓ EH&S promotes the development of standard operating safety procedure during periodic workplace safety assessments
	✓ Lab safety registration is performed periodically. Lab safety registration serves two important functions: 1) to help identify and address various hazards in labs; and 2) to provide Principal Investigators with a comprehensive tool for recognizing hazards and compliance issues in research.
	✓ EH&S has developed Safety Training for the university including a training needs tool, training materials, and maintenance of training records (https://ehs.oregonstate.edu/training). Between 2020 and 2021 EH&S added approximately 60 new training modules to the university's learning management system and provided 9,910 workplace safety training sessions in 2020 and 9,203 in 2021.

Appendix 4 – University Health and Safety Committee (UHSC) Structure Recommendation




Target Relationship
Institutional Leadership
Provost, VP F&A, VP Research
TRUST
TRUST
University Health & Safety Committee
EHS
Inspections
Metrics of success
Incidents
Near miss reports
Safety Advisory Committees
TRUST
Academic / Research setting
PI, Faculty, Staff, Trainees
Safety Coordinators

Appendix 5 – Safety Culture Continuous Improvement Process

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