

Actions for Environmental Health and Safety Staff

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 bench researchers to principal investigators to university leadership—should take to create and promote this approach to safety.

Environmental health and safety (EHS) personnel obviously have a strong interest and an important role in helping to build safety culture in their institutions. The report urges a stronger partnership between EHS and researchers in order to develop and sustain a strong safety culture.

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

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 safety culture arises not because of a set of rules but because of a constant commitment to safety throughout an organization. Such a culture supports the free exchange of safety information, emphasizes learning and improvement, 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.

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 through hazard analysis,
- availability and use of proper apparatus and infrastructure needed to carry out the procedure safely,
- knowledge of 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 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 safe working.

One of the major barriers to the development of safety culture in academic laboratories is the attitude among some researchers 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 one of the most dramatic possible impacts on research progress.

Safety is a core element of good research rather than 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 at the same time 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.

A STRONG SAFETY CULTURE

Currently, there is often confusion about the role of EHS in laboratory safety. Some faculty and researchers see EHS as having primary responsibility for safety. Others see EHS as a regulatory entity, acting in place of external inspectors. Still others believe EHS's primary

role is to assist researchers and principal investigators in being compliant with external regulations.

EHS staff's primary role is envisioned collaborators—partners who work with administrators, faculty, and researchers to go beyond compliance and establish a strong, positive safety culture. The National Research Council report identifies steps that everyone across the spectrum of university research should take to establish and sustain a strong safety culture. EHS should reach out to these groups as they undertake these actions, offering advice and support. The goal is to achieve a sense of collegiality and collaboration, rather than annoyance and mistrust, between EHS and research personnel.

Presidents, chancellors, and provosts should discuss safety frequently and publicly and demonstrate through their actions that it is a core value of the institution. As part of this effort, they should deploy university resources in ways that support safety and reduce existing incentives to disregard it. For example, principal investigators sometimes must use grant funds to provide personal protective equipment and dispose of hazardous waste, which creates a potential conflict between supporting safety and maximizing research productivity. Providing hazardous waste disposal and personal protective equipment to researchers from university funds will ensure that principal investigators are not forced to choose between safety measures and research productivity.

Vice presidents for research and deans of schools and colleges should, in addition to deploying funds in ways that support safety, ensure that the lines of research undertaken by the institution are ones that it has the capacity to do safely. They must make certain that everyone involved in the research enterprise knows their roles and responsibilities in supporting safety. They should work with faculty governance to



incorporate efforts to promote safety culture as an element in the criteria for promotion, tenure, and salary decisions for faculty. And they should develop reporting structures that support safety culture. One example that supports safety culture is for EHS to report through the senior research management programs, typically at the vice president level or higher—a structure that may better integrate safety management into overall research management.

Principal investigators and department chairs have responsibility for establishing strong safety culture in the laboratories

they oversee. Among other actions, they should encourage open dialog about safety concerns among researchers in their labs and establish regular times—such as “safety moments” at the beginning of lab meetings—where concerns can be raised. They should set an example by using safe practices and personal protective equipment, and they should ensure that researchers are properly trained in safety before they undertake any work. Establishing ongoing measures to support safety, such as unannounced walk-through inspections and non-punitive reporting systems for near misses, is also important. Department chairs, meanwhile, should work to build strong and cooperative relationships between their departments and EHS.

Researchers have a responsibility for supporting safety culture in the labs where they work—and the most at stake in doing so. Some of the strongest safety cultures are those where researchers have taken leadership roles. Researchers should be encouraged to take such roles—by serving on safety committees, for example, and by taking part in non-punitive walk-through inspections of other labs. The institution, meanwhile, must provide them with the equipment, training, systems, and cultural support they need to work safely.

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/Report18706>. Read, purchase, or download a free PDF of the report at <http://www.nap.edu>.