

# The challenges and opportunities of the Chemical Hygiene Officer

The role of the Chemical Hygiene Officer has evolved since it was first defined by OSHA's Laboratory Standard. Successful development of a laboratory safety program requires a variety of skills that go beyond the technical oversight envisioned in the Standard. This article describes how the role has evolved and how specific tools such as Safety Management Systems can be used to meet those challenges. A brief historical perspective on the role is provided to flesh out the challenges and opportunities associated with this role.

## By Ralph Stuart

Laboratories are general purpose workplaces designed to permit the safe use of a variety of hazardous materials using generic safety equipment. In general, safe laboratory work uses engineering controls such as laboratory chemical hoods and flammable storage cabinets, relying heavily on the technical training of laboratory staff to develop and follow administrative controls specific to the work at hand. The OSHA Laboratory Standard (29CFR1910.1450) recognized the importance of these administrative controls when it required the development of a Chemical Hygiene Plan and the appointment of a Chemical Hygiene Officer (CHO) for laboratories.

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Interestingly, OSHA's definition of the role of the Chemical Hygiene Officer as someone who "provides technical guidance in the development and implementation of the provisions of the Chemical Hygiene Plan" is specifically "not intended to place limitations on the position description or job classification that the designated individual shall hold within the employer's organizational structure." In other words, the CHO is not necessarily the laboratory supervisor and thus does not necessarily have the power to make final decisions as to the kind of work that will be conducted in a laboratory or how it will proceed.

This definition provides both challenges and opportunities to someone who is filling the role of the Chemical Hygiene Officer. This paper will explore both of these aspects of the job and discuss some of the tools a CHO can use to fill this role effectively.

## THE CHALLENGES

There are many aspects of the role of the CHO described by OSHA. Not only is there a significant amount of technical chemical and safety information to master, there is the need to understand government regulations and how they are enforced; a requirement to be comfortable with management information that helps the CHO understand how decisions are made within the organization; and the use of communication and leadership skills needed to develop a set of safety

recommendations and present this information in an effective way. Simply identifying and managing the skills associated with all of these different aspects of the CHO's role is a challenging proposition in itself. To aid in this process, this section will provide a brief review of these different issues.

## CHEMICAL SAFETY INFORMATION

Understanding the safety implications of chemical work underway in a laboratory requires at least a general understanding of the work itself. Identifying the hazards associated with the chemicals in use not only requires looking up specific physical and toxicological properties (such as flashpoint, pH and known incompatibilities with other chemicals), but also understanding how this information is affected by the concentrations and amounts the chemicals are used in, as well as how these hazards will change as the process proceeds. The CHO must also be able to address situations where this information is unavailable by discussing the properties of the chemicals being used with the chemists themselves to elicit whatever information is available to make reasonable predictions of these factors.

## REGULATORY INFORMATION

While the OSHA Laboratory Standard (29 CFR 1910.1450) is a reasonable and flexible approach to the laboratory

work setting, the same cannot be said of all government regulations that apply to laboratories. For example, the Laboratory Standard acknowledges that the Chemical Hygiene Plan must address issues such as proper disposal of the chemicals involved, which will be determined by EPA's RCRA regulations (40 CFR Parts 239 through 299) and state variants of these regulations. And a chemical waste disposal plan will need to address the Department of Transportation's requirements for shipment of hazardous materials (49 CFR Parts 100-185). And the transport of threshold quantities of certain waste chemicals will result in coverage of these materials by Department of Homeland Security requirements for security plans (6 CFR Part 27). Combining all of these requirements, with their varying jargon and expectations requires not only understanding the text of the appropriate regulations but also the enforcement policies of the relevant agencies and how these factors interact with each other to result in the development of a single coherent plan that answers the question "What do I do with this stuff now that I'm finished with it?"

### MANAGEMENT INFORMATION

While, as pointed out in the introduction, the CHO may not be given management authority within a laboratory organization, they need to be aware of factors that may compete with their recommendations for proper use of laboratory chemicals. Such factors can include budget limitations, deadline requirements, the facilities and equipment available to conduct the chemical work, and the level of training found in the laboratory worker population. For example, it may not be a useful approach to require the use of a laboratory chemical hood for all potentially toxic chemicals if hoods are not available in quantities that allow this requirement to be met. The CHO's time may be better spent delineating which materials require the use of a hood and which might be used with appropriate precautions in areas served by the laboratory's general ventilation while advocating for addition of more hoods in the laboratory facility over time.

### COMMUNICATION AND LEADERSHIP SKILLS

After the CHO has conducted sufficient research to develop guidance for the safe use of chemicals in the laboratories, this guidance has to be successfully communicated to the people affected. This often requires a translation of the regulatory requirements to the chemist while describing the requirements of the chemical process in the terms of the regulatory standard. Often, the success of this translation will depend on the perception of the CHO's confidence and competence by both the laboratory and regulatory parties involved. To successfully sell their recommendations, CHO's must have good communication skills, both oral and written, and the ability to provide leadership around chemical hygiene issues for a work group with multiple competing priorities.

This aspect of the CHO's role has grown significantly since the promulgation of the Laboratory Standard in 1990, as regulatory interest in hazardous materials and hazardous waste and their role in laboratories increased through the 1990s. This trend has accelerated since 11 September, 2001 and subsequent terror events. While the OSHA standard has not changed as a result of these other regulatory pressures, many other regulations that affect laboratory work have. Explaining these changes to both laboratory and regulatory audiences is a significant communication challenge.

### THE UNEXPECTED

Laboratory safety would not be an issue if all work went according to plan. No one plans to create situations that risk their own or others' health or puts their work in danger of being lost. However, it is inevitable that laboratory safety events will arise when the plan is inadequate to meet the events that transpire. These events are likely to become emergencies that involve assistance from outside agencies such as fire departments and emergency medical services. The Chemical Hygiene Officer must be able to address these events, not only in terms of emergency planning and

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response, but also in being able to use these events as opportunities for developing "lessons learned" that can be incorporated into future work. Again, this role requires not only technical knowledge but also steady leadership, both during and after the emergency.

### THE OPPORTUNITIES

While the list of challenges above can seem rather imposing, there is an equally strong list of advantages a Chemical Hygiene Officer has at their disposal.

### PEOPLE CARE ABOUT WHAT YOU DO

First, and most importantly, people care about the issues that a Chemical Hygiene Officer is required to address. As mentioned above, no one comes to work in the laboratory with the intention of suffering health effects or being the victim of an accident. While laboratory workers may react with strong emotion to the role and recommendations of a Chemical Hygiene Officer, this should be a positive sign in that it demonstrates that there is the opportunity for learning for both the laboratory worker and the CHO. Taking advantage of these opportunities for learning are when the communication and leadership skills of the CHO are most important.

### TEACHABLE MOMENTS ABOUND

While unexpected events and moments of strong emotions are significant learning opportunities, they are not the only ones. The same factors that cause accidents cause near misses. Some observers suggest that there is a near miss to accident ratio of about 300:1<sup>1</sup>; other estimates are as high as

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