

EVALUATION OF A NEW METHOD FOR ASSESSING THE EFFICIENCY OF RESPIRATORS AGAINST FUNGAL SPORES IN AGRICULTURAL ENVIRONMENTS.

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Agricultural workers are frequently exposed to high concentrations of airborne fungal spores. Very little information is available on the protection provided by respirators against fungal spores and other particles in agricultural workplaces. We have developed a setup for determining the efficiency of respirators directly on a human subject. The setup allows simultaneous collecting of fungal spores and non-biological particles inside and outside N95 filtering face-piece respirators. It includes two identical sampling lines, each consisting of a sampling probe, Tygon tubing, a sampling chamber, an optical particle counter (measurement range 0.7–10 μm), a 25-mm cassette with a 3- μm polycarbonate filter for fungal spore sampling, and a 10 L/min personal sampling pump. In this study, we tested the new method in the laboratory (with NaCl test particles) and in the field (in a swine and a poultry farm during animal feeding). The protection factor, PF, was determined by dividing the number concentration of particles outside the respirator by the number concentration inside the respirator. The laboratory tests were performed using a manikin with artificially created leakages. Increasing the total leak area from 2 to 8 mm^2 decreased the PF from 25 to 10 when the total airflow through the respirator was 50 L/min. Increasing the flow rate from 10 to 95 L/min decreased the PF from 13 to 6 when the total leak area was held constant at 8 mm^2 . The field-testing with human subjects showed PF values between 19 and 109 for the total concentration of particles. The PF values varied with particle size, increasing with an increase in the optical particle diameter. The PF for culturable fungal spores ranged from 1.2 to >96 and was generally lower than that determined for the total dust in the respective particle size range.

150. PERFORMANCE OF AIR-PURIFYING RESPIRATORS AGAINST WEAPONS OF MASS DESTRUCTION.

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During the past year, the National Institute of Occupational Safety and Health has released standards for the certification of air-purifying respirators (APRs) to be used by individuals (a) responding to incidents associated with weapons of mass destruction (WMDs), and (b) attempting to escape from areas having WMDs. Analysis of the many comments regarding the use and limitations of such devices from first responders and others performing rescue and cleanup-related tasks at the WTC and Pentagon sites served as the basis for the standards criteria.

The standards quantify, among other things, the minimum required effectiveness that APRs must have against chemical warfare agents and a broad range of toxic industrial compounds/toxic industrial materials (which may also be present during a terrorist event).

Respirator manufacturers, in response to the newly adopted performance criteria, have developed devices meeting the appropriate certification standards. This presentation will address: extensive laboratory testing and technical hurdles overcome by respirator manufacturers to meet the certification standards; laboratory results for APRs when tested against the newly adopted standards; examples of APRs meeting the certification standards; factors to consider when selecting and using respirators when a potential for exposure to WMDs exists; and the future direction of respiratory devices for protection against WMDs.

Podium 121. Management/Leadership Papers 151–159

151. BEST PRACTICES IN EHS LEADERSHIP.

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We all know that leadership is important in the creation of a culture that supports and promotes strong EHS performance. To improve EHS leadership, it is important to understand what specific practices constitute strong EHS leadership, and which of these represent the prevalent performance gap. To explore these questions, an EHS leadership practices model was developed based on literature and direct observation. Then direct reports of more than 300 executives from more than 20 companies, ranging from senior corporate executives to site leadership, were surveyed about the executives' EHS leadership practices. The practices examined included those that create expectations, those that create demand for results, and those that develop capabilities with the organization.

Results of this survey indicated that weakness was most often seen in practices related to developing capabilities (such as feedback and collaboration). In addition, certain patterns were identified. For example, some leaders tend to be weak in practices that set expectations, while others are strong in setting expectations and demanding results, but are weak in developing the organization. These results help leaders to recognize specific improvement areas and help EHS professionals to diagnose the leadership situation. With that knowledge, interventions to strengthen leadership can be designed.

152. IS THERE A DIFFERENCE BETWEEN A MANAGEMENT SYSTEM AND SAFETY CULTURE?

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Purpose and reasons for work: One of the hot topics of discussion today for many company health and safety professionals is the debate of implementing either a management system or a culture. Which is more important? How do you define each? Area they necessarily independent of each other?

Experimental procedures and discussion: With more than 20 years of practice in implementing a management system and proposing a culture for work site through the U.S., OSHA expects that by implementing the management system proposed by their Program Management Guidelines, a corporate culture is created or modified, where involvement and teamwork raises safety awareness and behavior to the point where everyone owns responsibility for safety, not just workers, not just management, and not just H&S professionals. Site and company specific examples of the system elements will be compared and contrasted to an expectation of culture, explaining how one influences the other, and vice versa.

The application for this approach is universal for companies, whether a small work site of 10 people, or large conglomerates of Fortune 50 companies. All companies try to instill a culture in their staff, where certain business philosophies become universal. This is no less important in a safety and health program.

The conclusion, seen after visiting over 250 companies during the past 13 years, is that there is a definite and symbiotic relationship between having systems in place and an ability to develop, implement, or change a culture of an organization. We have also found that there are distinct sequences of events that are followed to achieve both culture and systems improvements concurrently.

This topic should appeal to any site or corporate person with H&S responsibilities.

153. A LEARNING MODEL FOR ACQUIRING SYSTEMS THINKING SKILLS DURING THE TRANSFORMATION TO EHS MANAGEMENT SYSTEMS.

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The increasing emphasis on management systems as a means for achieving continual EH&S performance within industry and government is creating new demands on EH&S professionals to acquire new sets of core competencies. A core competency often overlooked in the transformation to management systems is the capacity to understand and utilize systems thinking in the design and implementation of the system. Acquiring competency in systems thinking involves a paradigmatic shift from the traditional mode of inquiry known as analytical thinking or analysis. This paper describes the approach taken by a multinational chemical company to incorporate an organizational learning system for acquiring system thinking skills as part of a global initiative to design and implement EH&S management systems. The

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