workers and the public against the risk of adverse health effects from acute exposures and further protect against risk for effects from long-term exposure. Recognition of the health implications of each of the various exposure criteria is essential to ensure appropriate decisions are made during potential exposure events.

84.

UPDATING IDLH VALUES: A WORK IN PROGRESS. A. Weinrich, H. Ahlers, NIOSH, Cincinnati, OH.

NIOSH developed the Immediately Dangerous to Life and Health (IDLH) values beginning in 1974. In 1994, NIOSH reviewed all IDLH values to insure they were adequately protective, adding 10% of the lower explosive limit as a new criterion. NIOSH currently recommends IDLHs for 398 of 620 substances for which it has recommended exposure limits.

Although NIOSH introduced IDLHs as respirator selection criteria, their application has spread, including specific references in regulations and routine use by emergency responders. In 1998, NIOSH began reevaluating the IDLHs. Two NIOSH-funded studies reviewed 50 IDLHs. Based on available toxicity data, at least 14% were questionably protective and approximately 20% were over-protective.

NIOSH has begun a process to revise IDLH documentations. This process includes developing standard protocols to assure IDLH documentations and resulting values are transparent. This presentation expands on results from the review studies and discusses progress to date, including draft protocols inferred below, for consistently applying various data. Issues surrounding concerns and roadblocks to protocol development are addressed, in part to elicit substantive responses to the following questions:

- Does low potential for significant airborne exposure make an IDLH value unnecessary?
- Is the exposure data hierarchy of inhalation > intraperitoneal > ingestion generally appropriate?
- Is the tenBerge, $C^n * t$, relationship best for time-scaling acute inhalation exposure data, even when inadequate data require using default values for "n"?
- How protective is the default relationship, human IDLH = (30-minute LC50, any species)* (0.1)?
- Are assumptions of 70-kg weight and 10 M^3 inhaled air volume appropriate for IDLHs?
- Is an animal-to-human data uncertainty factor of 1 generally appropriate for IDLHs?
- Should limited data suggesting genotoxicity or carcinogenicity potential from acute exposures drive an IDLH value?
- What are the ramifications of basing future IDLHs on toxicity data alone?

85.

PRACTICAL RISK ASSESSMENT FOR PRACTICING INDUSTRIAL HYGIENISTS: CARCINOGEN CLASSIFICATION. F. Mirer, International Union, UAW, Detroit, MI.

Carcinogen classification is the hazard identification step in risk assessment. Terminology for carcinogens incorporated into hazard communication programs is frequently inconsistent because of competing classification schemes: the OSHA cancer policy and Hazard Communication standard; International Agency for Research on Cancer (IARC); National Toxicology Program (NTP); and the ACGIH TLV® committee. Although the OSHA cancer policy is treated as a "dead letter," it is still legally in effect, applying consistent criteria which appropriately separate hazard identification from dose-response (quantitative) assessment. OSHA positive classes are Category I and II potential occupational carcinogens. IARC criteria for substances "known," "probably," or "possibly" carcinogenic to humans permit exclusion of some agents which would meet the OSHA definitions. NTP criteria for substances "known" or "reasonably anticipated" to be carcinogenic to humans permit exclusion of substances which meet the IARC definitions of "possibly" carcinogenic, and downgrading of substances termed "known." Both IARC and NTP contaminate hazard identification with consideration of mechanism, more properly a part of dose-response assessment. The ACGIH applies categories "A1 – Confirmed Human Carcinogen," "A2 – Suspected Human Carcinogen," and "A3 – Confirmed Animal Carcinogen with Unknown Relevance to Humans." The A3 category contaminates the hazard identification function with implicit dose response assessment and exposure assessment functions, leading to an opaque process to downrate substances both IARC and NTP would list as "possible" or "reasonably anticipated." The example of diethanolamine, a frequent ingredient or contaminant in metal working fluids (MWF) illustrates the impact of these differing criteria. NIOSH concluded there was substantial evidence for cancer among workers exposed to MWF, with additional evidence accumulated since. The National Toxicology Program found clear evidence for carcinogenicity by skin contact in mice in four experiments. Diethanolamine is not listed by either IARC or NTP, but does meet the OSHA Category I definition.

86.

OCCUPATIONAL EXPOSURE LIMITS ADJUSTMENT TO UNUSUAL WORK SCHEDULES: ONE CORPORATION'S APPROACH. E. Shaw, ExxonMobil Corporation, Coral Gables, FL.

The topic of Occupational Exposure Limits (OEL) Adjustment to Unusual Work Schedules goes as far back as 1975, when two researchers from a major petrochemical corporation, Brief and Scala, published a highly recognized paper on the subject. Since then, there have been multiple theories and models addressing the question of when and how to adjust OELs for application to non-standard work shifts. These ranged from simple linear schemes to physiologically-based toxicokinetic models. Yet, as of today, no single model has emerged as the most accepted, creating uncertainty within the hygiene community.

In 2003, the industrial hygiene group of that same petrochemical corporation developed a procedure that aimed at making the OEL adjustment process consistent among the company's hygienists worldwide. This presentation will provide a brief review of the literature, present the decision-tree-based procedure, and show the technical basis of why a specific adjustment model was selected over others.

This presentation gives an example of theory being put into practice; the end result of extensive research and peer discussion that will provide not only a reference document in the topic of OEL adjustment, but specific concepts that can be applied in the development of similar procedures by other industrial hygienists.

87.

EVALUATION OF AN ARTIFICIAL INTELLIGENCE PROGRAM FOR ESTIMATING OCCUPATIONAL EXPOSURES. K. Johnston, M. Phillips, T. Hall, University of Oklahoma, Oklahoma City, OK; N. Esmen, University of Illinois at Chicago, Chicago, IL.

EASE is an artificial intelligence program developed by the United Kingdom's Health and Safety Executive to assess exposure. EASE computes estimated airborne concentrations based on a substance's vapor pressure and the types of controls in the work area. Though EASE is intended only to make broad predictions of exposure from occupational environments, some industrial hygienists might attempt to use EASE for individual exposure characterizations. This study investigated whether EASE would accurately predict actual sampling results from a chemical manufacturing process. Personal breathing zone TWA monitoring data for two volatile organic chemicals—a common solvent and chloroprene monomer—present in this manufacturing process were compared to EASE-generated estimates. EASE estimated concentrations for specific tasks were weighted by task durations reported in the sample data record to yield TWA estimates from EASE that could be directly compared to the actual measured TWA data. One-hundred seventy-four full-shift personal samples of chloroprene and 130 full-shift personal samples of the solvent were selected from 7 areas of this manufacturing process. The correlation between EASE TWA estimates and measured TWA values was 0.196 for chloroprene and 0.201 for the solvent, indicating poor predictive value. The results from the EASE model gener-

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