

Industrial Hygiene with No Limits*

We are witnessing a momentous turning point in industrial hygiene history. The Occupational Safety and Health Administration (OSHA), with support from many employers, has "updated" permissible exposure limits (PELs) despite unions and their allies making the case that PELs are bankrupt, contaminated by corporate influence, and not protective of worker health. The way we operate on a day to day basis as practicing industrial hygienists has once again been directed toward the use of exposure limits and air sampling by this recent OSHA rule making. No single concept dominates our field more thoroughly or influences how we spend our time more strongly than these limits. If OSHA also succeeds in promulgating a generic standard for exposure monitoring, as they are proposing, we will be spending even more of our precious industrial hygiene time and talent collecting air samples. This standard would mandate collection of air samples for hundreds of chemicals in the workplace. The time has surely come to ask whether collection of such samples for comparison to PELs is a good use of an industrial hygienist's time and whether this activity benefits workers.

The reality is that for the vast majority of chemicals, we have little or no chronic toxicity data. Even when we do, we usually don't know the chemical's effects on lung function, nervous system function, immune or endocrine system function, reproductive function, or other vital bodily functions. Without such data, claims that we know what exposures are permissible and will not harm workers are false.

Testimony presented by the New Jersey State Department of Health (NJSDOH), at the hearings on OSHA's proposal to "update" the PELs,⁽¹⁾ showed a random sample of both present and proposed PELs to be grossly inadequate when compared to health-based guidelines derived from the Environmental Protection Agency's (EPA's) Integrated Risk Information System (IRIS) database.⁽²⁾

The IRIS database was developed by EPA within the last two years to collect and review systematically human and animal toxicological data on chemicals of environmental concern. It currently contains reviews of 370 chemicals and is meant to support EPA and other governmental regulators in their efforts. Yet this database was ignored by OSHA during the recent PEL rule making.

The New Jersey Department of Health used widely accepted risk assessment methodology to extrapolate from reference doses and unit risks in the IRIS database in order to calculate occupational guidelines. For 43 chemicals studied by the NJSDOH, the mean present PEL was 9.5 mg/m³, the mean proposed PEL was 7.5 mg/m³, and the mean health-based guideline was 0.004 mg/m³. Thus, the updated PEL revisions are not significant in

comparison to the reductions needed to protect public health. In fact, from a risk standpoint, OSHA's updated PELs are essentially the same as the present PELs. The New Jersey State Department of Health concluded that the proposed OSHA PELs, now adopted, were based on outdated information and weak methodology and would not protect worker health.

A recent article by Barry Castleman and Grace Ziem,⁽³⁾ as well as their testimony at the OSHA PEL hearings, documented corporate influence of the threshold limit values (TLVs[®]) and the unscientific, irregular procedures used by the American Conference of Governmental Industrial Hygienists (ACGIH) TLV Committee. Unpublished corporate communications were important in developing TLVs for 104 substances. For 15 of these, the TLV documentation was based solely on such information. The author's efforts to obtain written copies of this unpublished material, for independent scientific review, were mostly unsuccessful. Corporate representatives listed as consultants to the committee since 1970 were given primary responsibility for developing TLVs on proprietary chemicals of the companies that employed them. It was also shown that the TLV committee failed to use all available scientific data. No systematic literature searches were done in preparing documentations on hundreds of chemicals. This scandal leads to the inescapable conclusion that the ACGIH TLVs are tainted and unreliable. The Castleman/Ziem article⁽³⁾ has stirred up much controversy and some soul-searching at the ACGIH. New, upgraded operational guidelines and procedures for the Chemical Substances TLV Committee have recently been adopted.⁽⁴⁾ ACGIH now plans to hire a staff person to do literature searches for the TLV committee. They still have not acted rigorously to avoid conflicts of interest among members, however. Instead of requiring disclosure of corporate consulting relationships, they are using an honor system where members merely state upon appointment that they have no conflicts of interest. While some positive changes have been made, they do nothing to undo the damage already done by the present TLVs which were set under the old, dysfunctional system, and the changes do not go far enough to ensure that past mistakes will not be repeated.

Exposure limits are theoretically helpful to workers. However, if we don't get the numbers right, and it looks like ACGIH and OSHA usually have not, then they are harmful. Exposure limits allow us to state, in a pseudoscientific way which is hard for workers to rebut, that exposures are safe, when no one really knows whether they are or are not.

There are other reasons why exposure limits should be reevaluated.

The End of Exposure Limits

The time has come for all responsible industrial hygienists to stop using PELs and TLVs. We must realize that every time we

*The opinions expressed in this article are those of the author and do not necessarily represent the official policy or opinion of the New Jersey State Department of Health.

use them, we are actually *endorsing* them. We are saying that we believe what Dow and DuPont may have thought they could live with in a TLV is what is safe for workers. No doubt there are some decent PELs and TLVs. But they are all suspect until we have independent scientific review of which are which. This is going to take a long time, although it might go faster if ACGIH and OSHA discover the IRIS database. In the New Jersey State Department of Health study, only 4 of 43 PELs were close enough (no more than double) to the health-based guidelines to be useable. So the odds are not good that any given TLV or PEL is decent.

Industrial Hygiene without PELs and TLVs

It won't be as awful as you might think to practice industrial hygiene with no limits. In fact, I predict it will be more fun. It will really mean getting back to practicing the full spectrum of our industrial hygiene skills and perhaps adding a few new exposure and health assessment tricks to our trade. We can practice industrial hygiene the old-fashioned way—by observing workers!

We can change the nature of our investigations to spend less time looking at instruments and numbers and more time observing the work process as it is carried out, checking on control measures, and talking to workers. Workers are the best source of information about what is really happening in the workplace. Of course, all worker interviews must be strictly confidential and conducted in private if we expect to earn their cooperation and confidence.

A tool we would do well to add to our repertoire is conducting health effects interviews of workers. Guidance and questionnaires for such interviews for use by nonmedical occupational health personnel have recently been prepared by an occupational physician at the New Jersey State Department of Health.⁽⁶⁾ Whatever else we do during our industrial hygiene evaluations, it would seem essential to find out whether workers report health complaints or symptoms. Isn't that really what occupational health is all about? Documenting worker health complaints and symptoms can be thought of as the ultimate assessment of exposure.

Writing Good Reports

Failure to write a report or writing a report which is easily misinterpreted as a "clean bill of health" will undermine even the best industrial hygiene evaluation. When I first worked for OSHA in 1974, we would always write industrial hygiene reports as well

as issue citations after an inspection. That practice has ceased under the pressure for higher numbers of inspections. This short-sighted valuing of quantity of inspections over quality of results must end. Every OSHA industrial hygiene inspection as well as every other industrial hygiene inspection by a consultant, corporate, or government industrial hygienist should result in a complete report of findings and recommendations which goes to the employer, employees, and the union representing employees, when there is one.

By conducting such evaluations and exposure assessments and writing such reports, we will be applying disinfecting sunlight to the workplace. We will be resisting being defined narrowly as technicians who collect air samples, and we will be insisting that we be allowed to use all of our industrial hygiene skills, knowledge, and professional judgement. We will be seeing the occupational health "forest" despite the PEL "trees."

We will be declaring that, given how limited our science is, controls should and must be put into place even when the causes are not known or fully understood, let alone quantified. We will be refusing to be caught in the "Catch 22" of PELs and TLVs which says (a) nothing can be done without proving "overexposure" and (b) no one can prove overexposure because the limits have been set too high.

We will be in harmony with our code of ethics, which states that we should maintain an objective attitude toward the evaluation of health hazards regardless of external influences, which we now realize includes TLVs and PELs.

We will be practicing industrial hygiene with no limits.

REFERENCES

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