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Government

OSHA pushes ahead on health standards

After slow start, agency has overcome a diversity of problems, plans to publish at least 10 standards by month's end

The Occupational Safety & Health Administration finally may be coming to grips with the problem of setting health standards limiting worker exposure to potentially hazardous substances. The first fruits of a project to update standards for 400 chemical substances, announced March 18, 1974, came earlier this summer with publication of proposed standards for five ketones. Recently OSHA completed public hearings on proposed standards limiting exposure to 4,4'-methylene bis(2-chloroaniline), inorganic arsenic, and occupational noise. And the agency plans to publish at least 10 proposed standards, including ones on exposure to toluene, benzene, lead, chloroform, and beryllium by Sept. 30.

OSHA's record in the health area has, up to now, been pretty dismal. Compared to the hundreds of safety standards that are on the books, OSHA in the four and a half years of its existence has managed to come up with only 15 new health standards. And all of these were issued under emergency procedures in response to petitions filed by either the AFL-CIO or Ralph Nader's Health Research Group. The emergency procedures of the Occupational Safety & Health Act allow the Secretary of Labor to establish temporary standards, effective immediately, in case of "grave danger" to employees. A permanent standard must be published within six months after publication of the temporary standard.

The 15 standards regulate exposure to 13 chemical carcinogens, including bis-chloromethyl ether and ethyleneimine, asbestos, and vinyl chloride. In addition, OSHA has standards on the books establishing threshold limit values for 400 chemical substances. The limits were not developed by OSHA but by the American Conference of Government Industrial Hygienists in 1969. OSHA can use them only because the Occupational Safety & Health Act gave the agency two years in which to incorporate any operative occupational safety and health standards in effect at the time the new act

became effective. OSHA is now in the process of updating all of the limits to include such things as sampling and analytical techniques and medical surveillance requirements.

OSHA's efforts in the health standards area have not met with the unqualified approval of either the chemical industry or labor unions. In fact, most of OSHA's own 15 standards have been challenged in court by one or the other group, and sometimes both. Industry has claimed, as in the case of the vinyl chloride standard, that the standards are neither technically nor economically feasible. The labor unions, for their part, say that too much consideration is being given to economic and feasibility considerations and not enough to protecting the worker. For example, Fred Hoerger, assistant director for safety and environment at Dow Chemical, says that although OSHA has shown a willingness to try to understand technology on a professional basis, a whole host of legal, labor relations, and political considerations have limited the impact of basing standards on hard data. And, he adds, OSHA has not done a good job in separating opinion from fact, giving equal weight to both, in writing its standards.

On the other hand, Anthony Mazzocchi, legislative director for the Oil, Chemical & Atomic Workers International Union, says that what OSHA has been doing is attempting to come out with the least offensive standards—the ones most palatable to industry—while only nodding at those in the labor movement who are insisting on more rigid standards. According to

Mazzocchi, OSHA has failed to live up to its mandate of freeing the work place of hazards. And he points out that at the rate OSHA is going it will be a thousand or so years until anything substantive is done.

Dr. Daniel P. Boyd, head of OSHA's office of standards development, also is very concerned with the slow pace of developing health standards. He says, "It frightens me to think every day that the phone might ring and there will be another vinyl chloride out there." But he points out that, in regulating chemical health hazards, OSHA faces a number of problems that are not present in the safety area. The law says that health standards must be based on the best available evidence. This, Boyd says, "implies that there has to be some evidence, that you can't sit back and make subjective judgments about what the level should be or how you should regulate a particular substance." But given the huge number of chemicals much of this evidence is just not there.

Each year the National Institute for Occupational Safety & Health, which works with OSHA in developing health standards, publishes a list of more than 42,000 chemical substances used in industry that are considered to be possible hazards to workers' health. Boyd points out that it is difficult to go through this list and determine which chemicals present the most frequent and serious hazards. Research on the toxicology of chemicals, he says, is seemingly a very new area and for most chemicals there is no adequate knowledge of each one's toxic, carcinogenic, and mutagenic effects.

In addition to the lack of adequate information on the health effects of chemicals, there is the problem of getting at the information that does exist. Boyd says that OSHA usually has had easy access to the results of toxicological research done at universities, owing to their policy of open publication, and that it has done a good job of collecting the information that exists in the foreign literature. But he admits, "We haven't done a good job of collecting it from industry" where a good deal of the information resides. The exceptions, he notes, have been when industry found itself faced with a catastrophe, such as vinyl chloride or inorganic arsenic, and volunteered to come forth with the information.

Boyd would like to see the industry make more evidence available to OSHA on a voluntary basis. He has

OSHA Staff photo



Boyd: has reached its adolescent stage

tried to stimulate a more open approach to sharing information by showing industry that OSHA makes intellectually rational decisions, based on the information it has, in setting standards. He says that if industry sees "that we are not going to use emotion or political motivation to bias the information one way or another, then they are much more likely to come forward." This approach, according to Boyd, has been successful. He believes that in the past year and a half industry has gained a great deal of confidence in the way OSHA approaches standards setting. For instance, he points out that "Du Pont shared with us some of the audiometric testing results that it had experienced over the past 20 years, even before the public hearing on the proposed noise standard was held." And he thinks that more of this voluntary sharing of information will come.

But information, even when it's obtained, presents its own problems. Boyd points out, "I am sure the information we get is biased. We must face it that when it comes to OSHA there are going to be vested interests and it's human nature to present the information you have to benefit your cause rather than destroy it. For example, when I look at the information Du Pont presented I think it's very good scientific data and yet I can't tell whether [Du Pont has] gone through and thrown out all the old audiograms that didn't support [its] case." To counter this, Boyd says, OSHA does its own homework—it reviews the information it has access to and tries to evaluate the degree of bias that might be present as well as it can. But "to some extent," he adds, "you have to depend on the moralistic rationality of the industry itself."

Even when it has the needed information in hand OSHA has, in the past, not been notably swift in promulgating final standards. Since January 1972 NIOSH has transmitted 26 criteria documents to OSHA. These documents recommend numerical limits for worker exposure to industrial hazards. They also suggest requirements for medical surveillance, including examinations and record keeping; posting of warning signs; personal protective equipment and clothing; warning employees of health hazards; monitoring and record keeping; and work practices. For instance, NIOSH sent the agency a criteria document on occupational noise in August 1972, but a proposed standard was not issued until October 1974 and hearings on the proposed standard were completed just last month. And only two of the criteria documents have resulted in final standards.

Boyd admits that the criticisms leveled at the standards development office over this time lag have been valid. Boyd attributes this long delay to the fact that in the past his office just didn't have the resource capability to

handle the input it was getting. Now, he says, this situation has been corrected. He points out that when he joined the staff in May of last year there were only two or three health professionals on the staff. Since then the professional staff has more than doubled and it includes doctoral-level toxicologists, epidemiologists, environmental health specialists, and a medical officer.

Even with adequate staff it will still take more than a year, Boyd says, for OSHA to translate NIOSH's criteria documents into final standards because of the legislative and administrative constraints his office works under. The safety and health law mandates that an advisory committee, including in-house and outside experts, must be set up for each standard. Also, the public must be given at least 30 days to comment on any proposed standard. However, this period is usually lengthened to 90 days since, Boyd says, a month isn't really enough time in view of the fact that the proposals affect the whole country.

Then there are the public hearings, which can take as long as a month. Such hearings are not mandatory but must be held upon request and in the health area someone, be it the industry that is being regulated or the labor unions, is sure to do so. The hearing record is usually held open for another 60 days. In addition OSHA must prepare environmental impact statements and, after Sept. 30, an inflation impact statement for each proposed standard. Both are time-consuming undertakings.

One problem OSHA has not had, according to Boyd, is political interference in standards setting. He attributes this to the fact that the framers of the occupational safety and health act were very shrewd in recognizing that OSHA would be dealing with issues that could be very political in nature and so mandated that standards must be based on the written record. Thus, he says, "Whereas subjective judgments can be made about what the written record implies, the standards can't be catastrophically disoriented from what the record says or the courts would throw it out."

Boyd concludes that "OSHA has been an infant and it now has reached its adolescent stage and I think you are going to see a great many changes in strategy that reflect that growth. I hope there will be a change in the compliance philosophy—one turning from a more punitive philosophy to one that is more helpful in that it integrates some kind of consultation, training and education, and identification of hazards to employees and employers." And he hopes that soon there will be a whole stream of final and proposed standards, either updating the 400 threshold limit values or keeping up with NIOSH's criteria documents.

Janice R. Lung, C&EN Washington

Federal Alert— new regulations

This listing covers regulations appearing in the Federal Register from July 29 through Aug. 21. Page numbers below refer to those issues.

PROPOSED

Environmental Protection Agency—Specifies how states should enforce drinking water standards and defines role of federal enforcement when states don't take action; comments by Sept. 15 (Aug. 7, page 33228).

Spells out levels of natural and man-made radioactivity allowed in drinking water (chemical and microbiological contaminant levels were proposed previously); comments by Sept. 25 (Aug. 14, page 34323).

Amends secondary treatment rules to delete effluent limitations for fecal coliform because chlorine disinfectant is suspected of forming carcinogenic compounds in drinking water; comments by Oct. 14 (Aug. 11, page 34522).

Amends effluent limitation guidelines for the organic chemicals manufacturing point source categories: ethylene oxide, methyl amines, ethylene glycol, and oxochemicals, as a result of protests from manufacturers over original standards promulgated in April; comments by Sept. 15 (Aug. 15, page 34409).

Nuclear Regulatory Commission—Substitutes terminology "as low as reasonably achievable" for "as low as practicable" in rules affecting design and effluents of light-water-cooled reactors (Aug. 6, page 33027).

Occupational Safety & Health Administration—Limits work place exposure to coke oven emissions to 0.3 mg per cu m over an eight-hour time-weighted average concentration; comments by Sept. 15 (July 31, page 32268).

FINAL

Consumer Product Safety Commission—Orders about 1650 manufacturers to submit chemical formulations of specified consumer products; chemicals include flame-retardant chemicals, paints, varnish, and rust removers; previous April order was rescinded because of technicalities; by Oct. 20 (Aug. 21, page 36617).

Environmental Protection Agency—Spells out emission standards for new stationary sources in the phosphate fertilizer industry; effective immediately (Aug. 6, page 33151).

Food & Drug Administration—Covers safety standards for laser products; effective Aug. 2 (July 31, page 32251).

Establishes chemical standard of identity for lactose nutritive sweetener; effective Oct. 14 (Aug. 12, page 33820).

Department of Health, Education & Welfare—Limits government reimbursement to pharmacist for prescriptions under medicare and Medicaid to the lowest-priced generally available drug; effective immediately (July 31, page 32333).

Lifts moratorium and spells out conditions for fetal research; effective immediately (Aug. 8, page 33525).

CONCENTRATES

Science

The ability of alfalfa to withstand winter frost is related to the type of phospholipids in the taproots and crown buds, scientists from Cornell University told a meeting of the American Society of Agronomy in Knoxville last week. In hardy varieties, changes in fat content of cell membranes from saturated phospholipids to unsaturated phospholipids, they say, promote winter survival. The unsaturated phospholipids make the membranes more flexible and thus less vulnerable to puncture wounds caused by growing ice crystals.

First visual sighting of an x-ray-emitting star comes from Dartmouth College astronomers at the college's Kitt Peak, Ariz., observatory. Dr. Forrest I. Boley and Richard L. Wolfson have photographed a star near the constellation Orion flaring at more than 1000 times its normal intensity. The star's location strongly suggests that it is also the source of the highest-strength x-rays ever recorded from a celestial source. The star's visible spectrum indicates no emission or absorption lines—indicating an extremely hot body of uniform temperature.

A digital television system for astronomy, developed by University of Arizona astronomers, is sensitive enough to detect individual photons of light coming into a telescope and record them for immediate playback. As a result, the astronomers say, it is possible to see objects 100 times fainter than previously possible. The system is based on a special television tube—a silicon intensified target tube—that records 64,000 points of light simultaneously. The information then is sent in digital form to a computer, which removes the image's noise. Photographs or a spectrogram can be produced.

Education

College enrollment will increase more than 3% in the 1975-76 academic year, predicts the U.S. Office of Education. The number of students in degree/credit programs at colleges and universities will climb from 9 million to 9.3 million, and there will be a concomitant increase in the size of instructional staff, up 3% to 650,000 from last year's 630,000. Small increases in the number of graduate and professional degrees are expected in the upcoming academic year, but practically no change will occur at the bachelor's level. Last year 975,000 bachelor's degrees were conferred.

Technology

A solar energy water heating system is beginning one-year test operation in an apartment complex in El Toro, Calif., south of Los Angeles. The system is part of a three-year \$790,000 project sponsored by NSF and Southern California Gas Co. to determine the economic feasibility of solar hot water heating in this region. The system's 48 rooftop collectors covering 908 sq ft are expected to pro-

vide 90% of the summertime energy requirements and 70% of the year-round requirements for hot water heating for the 32-unit complex.

Streams are relatively undisturbed and water quality generally good, according to a study by the U.S. Geological Survey of its hydrologic bench-mark network, a system of stations established some 10 years ago to monitor streams in their natural state. Surveying 57 stations in 37 states, the Geological Survey found only three samples containing a metal in excess of U.S. Public Health Service drinking water standards. Samples were analyzed for arsenic, barium, cadmium, chromium, cobalt, copper, lead, mercury, selenium, silver, and zinc. Although widespread, pesticide residues occurred at "very low" concentrations.

B. F. Goodrich has a new system for reducing PVC resin hazards. The continuous stripping process results in polyvinyl chloride resins with such low residual vinyl chloride levels that processors and fabricators "probably won't" need special safeguards for their workers. The system, which will be in operation at all five Goodrich PVC plants by Jan. 1, also has been licensed to other PVC makers.

Simulated dives to 1600 feet were completed successfully last week by divers at the University of Pennsylvania (C&EN, Aug. 18, page 4). Previous practical working dives had not been carried out to much more than 600 feet. In six "dives" to 1600 feet from a base depth of 1200 feet—reached the first time in 40 minutes and subsequently in 20 minutes—the divers showed no appreciable adverse symptoms or physiological or performance changes. All four divers succeeded in carrying out timed maintenance work on an oil wellhead at 1600 feet, two of them with performance at least equal to their normal sea level capacity.

Crop production can be increased in the tropics by adding soluble silicates to the soil. Working in a lab with Brazilian soils, Cornell University scientists find that basic slag will react with soil minerals to reduce soluble aluminum and also increase efficiency of phosphorus fertilizers, which can become bound by the soil. The Cornell scientists told the American Society of Agronomy meeting that in older soils of the humid tropics, high acidity coupled with high concentrations of soluble aluminum stunts root development and reduces water uptake and plant growth.

Latin America's natural resource base can reasonably be presumed to be about twice that of the U.S., according to a U.S. Geological Survey geophysicist. Dr. Bernardo F. Grossling notes that Latin America has 19% of the world's prospective petroleum area, yet currently produces only 8% of the world's oil. Because of a lack of basic drilling and petroleum exploration, he says, "published data are completely inadequate and grossly underestimate the energy resource potential."