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OUTLOOK FOR OCCUPATIONAL NOISE REGULATIONS IN THE UNITED STATES

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There are few activities that move as slowly as the regulatory process in the U.S., especially in a controversial agency like the Occupational Safety and Health Administration. It seems that OSHA responds with a two-year time constant. The Occupational Safety and Health Act was passed in 1970, extending the coverage of OSHA's existing noise standard to all American workers whose exposures exceeded an 8-hour average noise exposure level of 90 dB. In 1972 the National Institute for Occupational Safety and Health sent OSHA a criteria document[1] recommending the permissible exposure level to be reduced to 85 dB. That initiated the process of revision. In 1974 OSHA issued a proposal[2], which retained the 90-dB permissible exposure limit but called for hearing conservation programs at 85 dB. In 1976 the last set of public hearings was held, followed by a 5-year hiatus (the only deviation from the 2-year pattern), and on January 16, 1981 OSHA issued the requirements for hearing conservation[3] as an amendment to the existing noise standard. That is not the end of the story, however, because a new administration was inaugurated just four days after the standard was published. Unfortunately the Reagan Administration branded the hearing conservation standard a "midnight" standard and delayed its effective date, which meant that it could not be enforced. After the AFL-CIO filed suit against the new administration for illegally delaying the effective date, most of the standard was let out in August of 1981.[4] Then, after the predictable 2-year interval, the final portions were issued on March 8, 1983.[5] The logical question to emerge from all of this is: What will happen in 1985? One thing that will certainly take place in Washington is an inauguration. The central figure in that event will have a great deal to do with the future of noise standards in the U.S.

Before speculating on 1985 and beyond, it would be useful to give some explanation of the regulatory events to date. OSHA's 1975 proposal

stirred considerable controversy. The two major issues were the permissible exposure limit and the method of complying with that limit. Two government agencies (the Environmental Protection Agency and the National Institute for Occupational Safety and Health) sided with the labor unions to support the 85-dB limit, to be achieved with engineering controls. Industry groups favored OSHA's proposed 90-dB limit and urged OSHA to allow companies the option of complying using ear protection. Hearing conservation programs were favored by all parties, at least as an interim measure. After much deliberation and a good deal of foot dragging, OSHA finally decided to issue the hearing conservation requirements as an amendment to the existing noise standard, and to postpone any decision on the permissible exposure limit and the method of compliance. These two issues are still in limbo.

The final version of the hearing conservation amendment calls for a program consisting of five major elements: noise exposure monitoring, audiometric testing, hearing protectors, employee training and education, and record keeping. Details of the final role are listed in the Federal Register for March 8, 1983.[5] A lengthy preamble explains the changes from the 1981 version. The preamble to the January 16, 1981 version is also an extremely useful reference, in that it explains and interprets all of the original requirements, many of which are in effect today.[3]

Now that the hearing conservation amendment is in place, OSHA can concentrate once again on revising the old noise standard. In addition to the hearing conservation requirements, the standard contains a 90-dB permissible exposure limit with a 5-dB exchange rate between level and duration, and an advisory ceiling of 140 dB (peak sound pressure level) for impulse noise. These levels must be achieved by engineering or administrative controls whenever feasible.[6]

Any attempt to revise the standard, especially in view of today's complex requirements for "regulatory analyses" should raise a host of difficult questions. If OSHA intends to change the permissible exposure limit, the agency must decide what percentage of the exposed population the standard should protect. OSHA has estimated that a level of 90 dB protects only 71% to 79% of the population after a working lifetime. Eighty-five dB protects about 85% to 90%, and 80 dB protects 95 to 100%. OSHA must also examine the evidence on the extra-auditory effects of noise. Is 85 or 90 dB sufficient to protect workers against possible health problems? With respect to the exchange rate, should OSHA adopt the 3-dB rule or is the evidence on the beneficial effects of intermittency strong enough to justify the retention of 5 dB? The agency must also examine the issues of impulse noise effects and the appropriate method of measuring impulses.

Questions also arise in any consideration of changing the compliance method. Are there some noisy processes that are indeed technologically infeasible to control, or is it entirely a matter of economics? How much should employers have to pay to control noise? Should there be minimum per/worker expenditures? Should OSHA adopt innovative regulatory alternatives such as lower levels for new plants, lower levels to be phased-in over time, or different compliance periods for different industries? Should OSHA allow combinations of hearing protectors and engineering controls to achieve compliance with the permissible exposure limit? If so, how much attenuation should be assumed from hearing protectors? And more importantly, how will anyone know how much attenuation individual workers are actually receiving?

At present OSHA is analyzing the material in the noise standard's docket in preparation for issuing a proposal. Rumor has it that the agency will propose to raise the permissible exposure limit to 100 dB, retain the 85-dB level for the initiation of hearing conservation programs, and give employers the option of using either engineering controls or hearing protectors between the two levels.

Legally, OSHA would have a very difficult time defending a permissible exposure limit of 100 dB because of the magnitude of hearing loss that would occur at this level. Using the data and prediction method of Burns and Robinson, an estimated 64% of the exposed population would suffer handicapping hearing loss after a lifetime's exposure.[7,8] Using Baughn's data and method, it would be about 80%.[9] Hearing protectors would, of course, be relied upon for at least 10 to 15 dB of attenuation in all workers. However, numerous field studies have shown that the average real world attenuation from ear plugs is only about one-third of the laboratory estimate, and the standard deviation is about three times larger. Elliott Berger,[10] who summarized over 10 field studies on the subject, found that the average ear plug Noise Reduction Rating (NRR), subtracting one instead of two deviations, was only 5 dB. The average ear muff NRR was 12 dB. If two standard deviations were subtracted, a lot of protectors would look like amplifiers.

Where will all of this leave us in 1985? Inertia will give us at least part of the answer. One and one-half years probably isn't enough time for OSHA to prepare a proposal and a regulatory analysis, and have them approved by the Office of Management and Budget and the White House. Politics will give us additional insight. If the Democrats prevail in the 1984 election, there will be a stronger OSHA and a greater emphasis on engineering controls as opposed to personal protection in all occupational hazards. If the Republican administration continues, some sort of "performance range," such as the 85- to 100-dB range, will almost undoubtedly appear. Regardless of the outcome of the election, there is a strong trend to accept hearing protectors, especially when they are backed up by a good audiometric testing program, at least as an interim method of compliance. The

extent to which engineering controls prevail in the future depends almost entirely upon the response of the professional community. Engineers and other specialists must rise to the challenge and inform OSHA about the cases where noise control has proved to be successful and cost effective. Trade associations and corporate legal staffs flood the record with statements about the impracticality and extravagance of noise control. To counterbalance all of the negativism, OSHA should hear about the successes, where productivity and energy efficiency have been improved. Acousticians must do their part to ensure informed and intelligent regulatory decisions.

Note

Persons wishing to submit evidence to the OSHA record should send it to Docket OSH-011, Technical Data Center, Room S-6210, U.S. Dept. Labor - OSHA, Washington, DC 20210 (USA).

Free single copies of OSHA standards are available from the OSHA Publications Office, Room S1212C, at the above address.

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9. W. Baughn, "Relation Between Daily Noise Exposure and Hearing Loss Based on the Evaluation of 6,835 Industrial Noise Exposure Cases," AMRL-TR-73-53, Wright-Patterson AFB, Ohio (1973).
10. E. Berger, "Using the NRR to estimate the real world performance of hearing protectors," Sound and Vibration (Jan. 1983).