

# Noise Control: How to Plan for OSHA's New Interpretation

Designing to achieve the desired reduction in noise without excessive capital cost and negative operational impact is often a delicate balance.

BY MIKE TAUBITZ



**O**SHA is making noise about noise and industrial employers need to be thinking about how they might retrofit plants as a result.

Industry has had nearly three decades of relative peace and quiet with its noise control programs. Since 1983, OSHA has typically not cited employers who deployed personal protective equipment and a hearing conservation program to address noise, rather than using engineering and administrative controls. The exceptions were for noise so loud that it borders on 100 dBA when the most effective hearing protection is used or in cases where the controls cost less than an effective hearing conservation program. In practice, controls are usually more expensive, so citations for failure to use them have been rare. However, that could change.

Employers in construction and general industry are likely to have a new category of expenses — and potential OSHA citations — to worry about if the agency's "proposed interpretation" on noise regulations goes into effect.

That's because OSHA now proposes to interpret 29 CFR 1910.95(b)(1) and 1926.52(b) as written.

These sections of the two noise standards are almost identical. They say, "When employees are subjected to sound exceeding those listed [in tables within the standard], feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of the tables, personal protective equipment . . . shall be provided and used to reduce sound levels within the levels of the table."

The agency said administrative or engineering controls would be considered economically feasible "if they will not threaten the employer's ability to remain in business or if the threat to viability results from the employer's having failed to keep up with industry safety and health standards."

## Lessons from the Past

Old-timers who started their careers in the '70s will remember that OSHA and state agencies were particularly aggressive on noise control. Noise was a new challenge for industry with few easy solutions.

Industries such as automotive that frequently used

new machines and processes due to ongoing model changes had the opportunity to apply the hierarchy of controls on new machines. This opportunity often afforded feasible and significant improvements. When companies had engineers include requirements for noise reduction in bid specifications, it opened the door to get the “biggest bang for the buck.”

Notice the term “noise reduction” and compare it with “noise control.” Reduction includes elimination or substitution, which is typically feasible only in the concept and design stages of procurement. If the opportunity to try new tooling or processes is missed, all work done after the order is placed becomes extra cost and retrofit. For many, the integration of noise along with other hazard eliminations and controls in the design and procurement process was the seed for the ideas of safety through design that began in the 1980s and continued in the '90s. These concepts are consistent with the current NIOSH PtD, Prevention through Design, effort.

**Design Tips for Dealing with Noise**

During concept and design, engineers, working with the supplier, should first focus on the concepts of elimination and substitution. Typically, however, there is

residual unwanted sound, and noise enclosures can be added where necessary as part of the integrated design. Some tips:

- Where feasible, such enclosures might only cover the noise source, thus allowing access to other parts of the machine for planned — or unplanned — maintenance.
- Full machine enclosures require more floor space and other considerations, such as:

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- Access by employees for tool change, troubleshooting, and maintenance
- Lighting for employees to see the machine
- Ventilation for air contaminants
- Finding suitable materials for noise abatement that did not pose a fire hazard or maintenance problem due to materials' absorbing air contaminants, such as oil mist

Designing to achieve the desired reduction in noise without excessive capital cost

and negative operational impact is often a delicate balance. Let us assume that the cost of an enclosure and the needed floor space meet the test of feasibility. However, the enclosure must also allow work to be done. The more frequently employees must go inside the enclosure, the bigger the challenge. If employees view opening and closing the access doors as interfering with their work, it may be a battle to have the doors adequately closed and secured each time the task is concluded.

As with all mechanical devices, the door or access point may get out of adjustment and not allow fast and easy securing after a number of years. Remember that any little crack will allow the noise energy to escape. It's easy to talk about maintenance, but noise enclosures require special consideration for making sure sound does not escape.

**The Challenges of Retrofitting**

Though challenging, applying the hierarchy of controls for new processes to new machines is a cakewalk compared to tackling existing machinery and equipment. Some of the additional challenges and constraints include:

- The opportunity of elimination or substitution is no longer an option.
- The footprint of space allocated for a machine or process did not consider the space necessary to add an enclosure.
- All of the problems discussed above are magnified when dealing with existing machinery.
- Costs of retrofitting are often much higher than if included in design.
- The efficiency of the control may not be as good as when “designed in.”

**Noise Measurement: Compounding the Problem**

First, noise is waste energy and travels in any direction. Decibels are a logarithmic measurement with equipment that requires careful calibration. For those not familiar with noise measurement, it is easy to misjudge the effort it takes to make small improvements. A 3 dbA (decibels using A scale) reduction is a 50 percent decrease in sound power. That is a huge improvement with little to show in the way of measurement.

Establishing the eight-hour TWA (time-weighted average) for an employee is

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made simpler with today's dosimetry technology, but identification of the noise source(s) may not be so easy. Multiply how sound levels “add” due to multiple noise sources, and the problem begins to compound. The sound power (noise) affecting an employee may be coming from many different sources. Using accurate measurement is key to prioritizing and developing feasible controls.

**Recommendations for Industry**

- Make sure that you have an accurate “map” of all areas.
  - The map should identify sound level exposures of employees.
  - Whether integrated or a separate map, the sound power of major noise sources also must be identified.
- Ensure your hearing conservation program is in full compliance, including training, audiometric testing, identification of high noise areas, PPE, etc.
- Identify jobs where administrative controls can be used (e.g., rotating employee assignments to lessen the time spent doing work in a high-noise area).
- Get engineers and operations personnel to identify potential

machines where engineering controls might be applied and assess:

- Technical requirements for noise reduction
- Cost
- Operational impact
- Floor space
- Ease of use by employees
- Maintenance issues
- Expected life cycle
- Return on investment and cost benefit analysis
- Feasibility using OSHA's proposed new guidelines

The recommendations described above require significant time and effort. If and when OSHA comes knocking on your door, it is better to have a good offense and be prepared with answers to their questions. If you are cited, you will be on the defensive and facing a very complex — and costly — challenge. Costly even if you were to prevail with your analysis. The time to start is now. **OHS**

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**2011 WORLD OF CONCRETE HIGHLIGHTS**

The educational program for World of Concrete 2011 this month at the Las Vegas Convention Center features sessions on trenching and excavation, pre-operations planning for risk management, responsibility for safety on the job site, and scaffold users' safety awareness, as well as leadership and motivation strategies.

World of Concrete is one of the world's largest construction conferences, held annually inside and outside the convention center, with hundreds of exhibitors showcasing their products. More than 80,000 attendees have come to the show in previous years.

Many of the safety exhibitors at this year's Jan. 17-21 conference (visit <http://twitter.com/worldofconcrete> for information) will be displaying fall protection PPE and equipment, including harnesses, lifelines, anchorages, scaffolding, hoists, work cages, and barriers. Others will offer eyewear, gloves, hard hats, high-visibility and cooling apparel, hearing protection, and respirators. One exhibitor offers in-vehicle safety cameras to help drivers avoid collisions and backing accidents.

Conference organizers say World of Concrete is the most comprehensive commercial concrete and masonry event offered. Its agenda includes industry-specific certifications and exams, interactive demonstrations and competitions, the sixth annual Women in Concrete Luncheon & Forum on Jan. 19, and a Greensite section in the Central Hall highlighting green products.

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