

Noise Measurement & Control



Objectives

- Understand the difference between a sound level meter and a noise dosimeter and the uses for both
- Associate different types of measurement techniques and equipment with various reasons for noise measurement

When to Measure Noise?

- History
- Communication difficulty
- Complaints



Re-monitoring

- Annual noise sampling is NOT mandatory ☆
- Change in process or procedure that affects inclusion and/or hearing protection effectiveness



- production rates
- material processed
- production technique
- machine placement

Instrumentation

- Sound level meters vs. dosimeters
- Microphone placement
- Instrument placement
- Microphone care
- Calibration

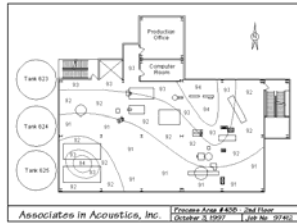


Sampling Methods

- Representative sampling
 - Job
 - Process
- Individual sampling
 - Dosimetry
- Area
 - Maps

Workplace Surveys

- Map the area or use blue prints to record sound level readings. Useful in work environments with little variability throughout the day



Workplace Surveys

- List the location and activity in a table format. Useful for areas with large variations in noise level throughout the day.

Location	Activity	Noise Level (dBA)
Salvage Area	Background	72
	Grinding	97
	Cleaning	88
Welding Area	Background	74
	TIG	86
	Air-arc	102

Sound Level Meters

- Provide on the spot measurements of sound pressure level (SPL)
 - May be used to determine employee exposure (dose).
 - If noise fluctuates, amount of time at each level must be determined (see APPENDIX A of 1910.95)



Sound Level Meters

- Type 1 (precision)
 - Accuracy +/- 1 dB
- Type 2 (general purpose) ☆
 - Accuracy +/- 2 dB
 - Need at least a type 2 with octave band capability for checking background SPL in audiometric testing rooms
 - see APPENDIX D of 1910.95
 - Need type 2 or better for exposure sampling too

Sound Level Meters

- Common features
 - Octave Band Analyzers
 - Determine the SPL in each frequency band
 - Useful for designing engineering controls
 - Peak Hold Ability
 - Useful for impact noise
- All meters should be calibrated before and after each use ☆

Noise Dosimeters

- Worn by employee to determine exposure level
 - Accumulate data throughout the work shift
 - Provide the best information regarding employee exposure (dose)
- Should be calibrated before and after each use ☆



Infrequent Exposures

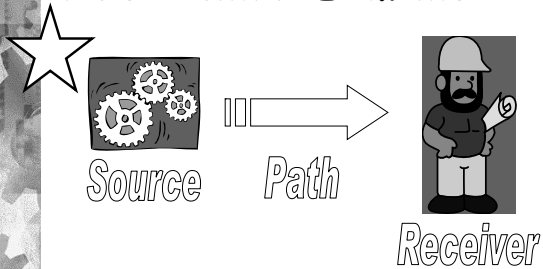
- The day OSHA inspects is reality
- Use informative signs
- Use HPD's

Synergistic Exposures

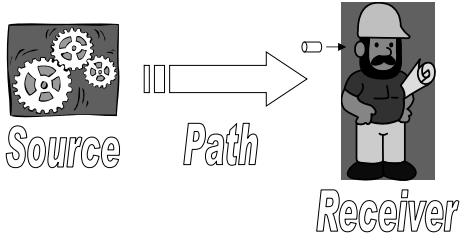
- Ototoxins
 - Heavy metals
 - Organic solvents
 - Asphyxiants
 - Drugs (some antibiotics and chemotherapy agents)

Noise in combination with an ototoxic agent can increase susceptibility to hearing loss!

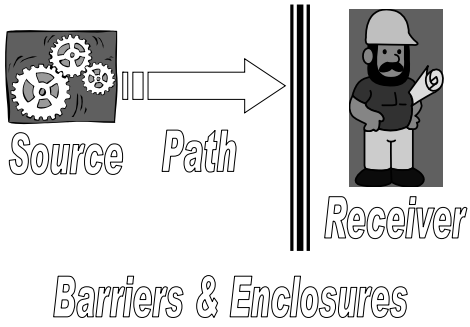
Noise Control Elements



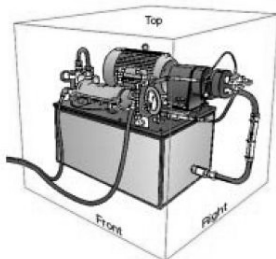
Noise Control Elements



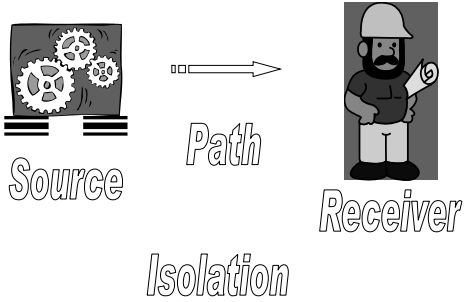
Noise Control Elements



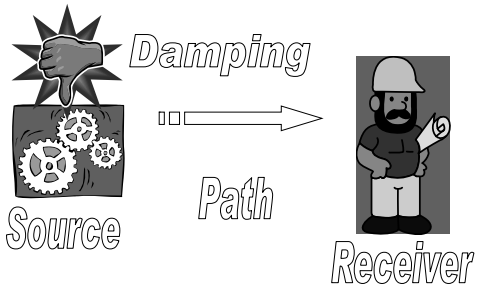
Enclosures



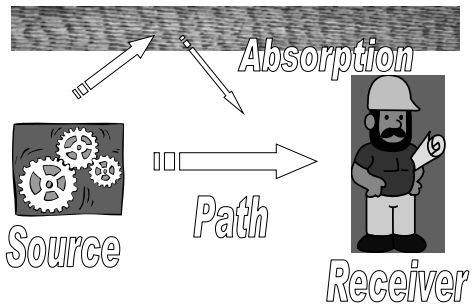
Noise Control Elements



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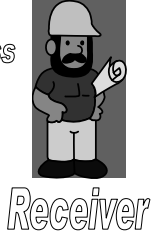
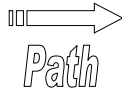


Noise Control Elements

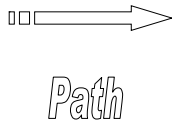


Noise Control Elements

Change Procedure or Process



Noise Control Elements



Maintenance

Time to Try It!

- Measure sound levels
 - Observe how levels change with distance
 - Measure both A-weighted and C-weighted levels
- Try some noise controls
 - Absorbent material
 - Box (enclosure)
 - Isolating material
- Have fun!
