

Noise Regulations, Monitoring, and Controls in the Telecommunication Industry



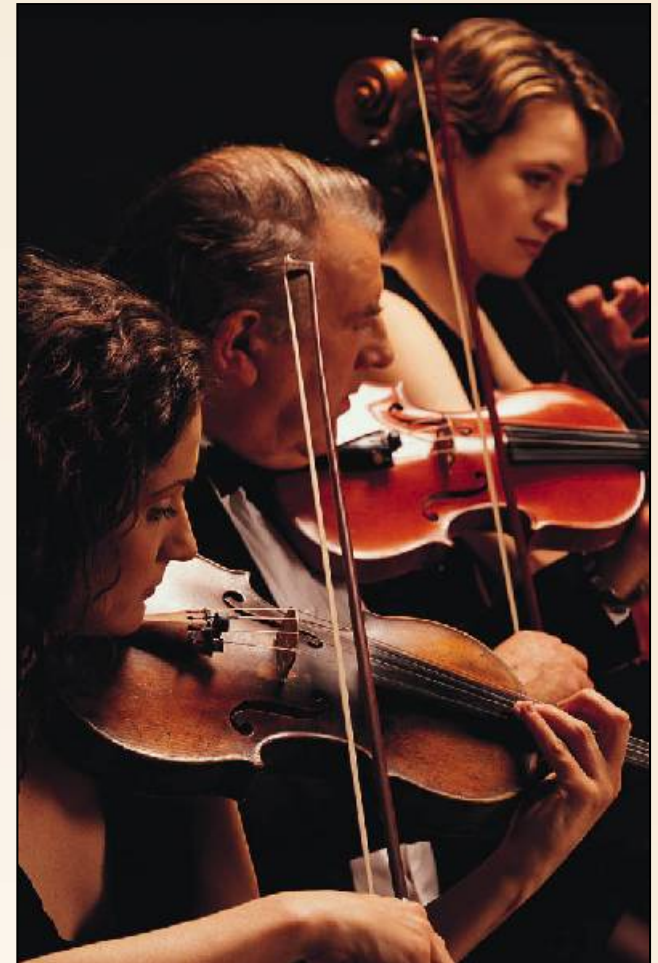
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Objectives

- ◆ Issue with noise
- ◆ Regulations, Laws, and Ordinances
- ◆ Types of Noise
- ◆ Sources of Noise in the Telecommunication Industry
- ◆ Sampling/Analyzing
- ◆ Noise Controls
- ◆ Available Technologies

Issue with Noise

- ◆ Employee hearing loss
 - Do not get used to noise; gradually lose hearing
 - Once damaged, cannot be repaired or replaced
- ◆ Good community neighbor
 - Prevent community disturbances



Regulations, Laws, Ordinances, and Guidelines

- ◆ Hearing Conservation (Employee Protection)
 - Occupational Safety and Health Administration (OSHA) Regulations
 - 29 CFR 1910 Subpart G (General Industry)
 - 29 CFR 1926 Subpart D and E (Construction)
 - Permissible Exposure Limits (PELs) in decibels A scale (dBA)
 - 90 dBA 8 hour Time Weighted Average (TWA)
 - 140 dBA – Peak – impulsive/impact noise
 - 85 dBA – Action Level (requires monitoring)
 - Uses 5 dBA increments of dose

Regulations, Laws, Ordinances, and Guidelines

- ◆ Hearing Conservation (Employee Protection)
 - American Conference of Governmental Industrial Hygienists (ACGIH)
 - Threshold Limit Values (TLVs)
 - 85 dBA 8 hour Time Weighted Average (TWA)
 - 140 dBC – Peak – impulsive/impact noise
 - Uses 3 dBA increments of dose
 - Department of Transportation (DOT)
 - DOT-FHWA: Vehicle Interior Noise Levels, 38 FR 30880, 1973, 49 CFR 393.94
 - Maximum of 90 dBA at operator ear position
 - Major noise sources - exhaust, intake, and engine.

Regulations, Laws, Ordinances, and Guidelines

Duration of Exposure (hrs/day)	Sound Level dB(A)	
	ACGIH	OSHA
16	82	85
8	85	90
4	88	95
2	91	100
1	94	105
1/2	97	110
1/4	100	115*
1/8	103	---
No exposure	***	**

* No exposure to continuous or intermittent noise in excess of 115 dB(A).

** Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

*** No exposure to continuous, intermittent, or impact noise in excess of a peak C-weighted level of 140 dB.



Regulations, Laws, Ordinances, and Guidelines

- ◆ Community Noise Control
 - Affects daily operations, equipment/facility design and location
 - Zoning an important part of planning
 - Local Ordinances
 - Different everywhere – important to research
 - Example: Denver Noise Ordinance - Revised Municipal Code RMC, Chapter 36

Regulations, Laws, Ordinances, and Guidelines

- Denver Noise Ordinance - Revised Municipal Code RMC, Chapter 36

Table A: Allowable Sound Pressure Levels (in dB(A)) with Time of Day Allowance
TABLE INSET:

	Receptor Premises							
	Residential		Commercial		Industrial		Public	
Source Premises	7am--10pm	10pm--7am	7am--10pm	10pm--7am	7am--10pm	10pm--7am	7am--10pm	10pm--7am
Residential	55	50	65	60	80	75	75	70
Commercial	55	50	65	60	80	75	75	70
	[60]	[60]						
Industrial	55	50	65	60	80	75	75	70
	[65]	[65]						
Public	55	50	65	60	80	75	75	70
	[60]	[60]						

[60] The numbers in brackets are the allowable limits that comply with exemption 14.

The noise source shall be measured at any point along the property line of the receptor premises or within the property line of the receptor premises to determine compliance with this chapter.

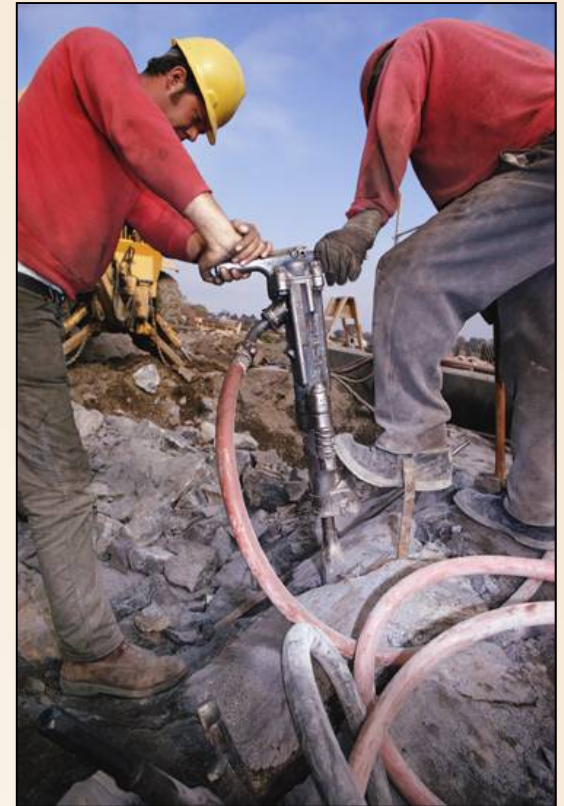


Types of Noise

- ◆ Pitch or frequency
- ◆ Loudness
 - Whisper 10 decibels
 - Street sounds 70 decibels
 - Sander 85 decibels
 - Sporting event 100 decibels
 - Mowing the lawn 101 decibels
 - Motorcycle riding 112 decibels
 - Concerts 125 decibels
 - Shooting range 130 decibels

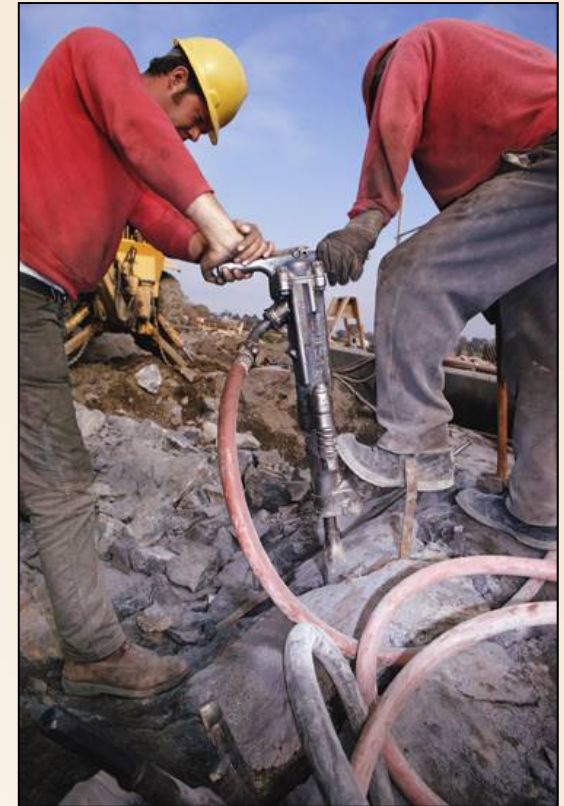
Sources of Noise in the Telecommunication Industry

- ◆ Facilities
 - Switching equipment
 - Cable vaults
 - Mechanical rooms
 - Boilers
 - Chillers
 - Maintenance shops
 - Grinders
 - Buffers
 - Drills
 - Emergency generators



Sources of Noise in the Telecommunication Industry

- ◆ Network
 - Construction
 - Trenching
 - Tree cutting/trimming
 - Use of any power tools
 - Manholes/Utility vault work
- ◆ Site Specific
 - Airports
 - Railyards





Noise Monitoring and Analyzing the Results

- ◆ Monitoring program and strategy
 - Target areas
 - Survey high noise potential areas with a sound level meter
 - Area diagrams of sound level readings
 - Determine areas that at 85 dBA or greater and conduct personal noise sampling
 - New process development/equipment purchase
 - Repeat monitoring

Noise Monitoring and Analyzing the Results

- ◆ Equipment:
 - Sound level meters
 - Usually used for quick readings-determine high noise areas
 - Both in Type 1 and 2
 - Noise dosimeters
 - Used for measuring personal employee exposure
 - Usually Type 2
 - Type
 - Type 1 / Class 1 - Environmental, building acoustics, road vehicle; tolerance +/-0.7 dB
 - Type 2 / Class 2 - Noise at work, basic environmental, motor sport; tolerance +/-1.0 dB
 - Most regulations state that Type 2 or Class 2 meter is adequate



Noise Reduction Controls

- ◆ Engineering Controls
 - ◆ Reduce noise at the source
 - ◆ Location of noise source
 - ◆ Interrupt the noise path
 - ◆ Reduce reverberation and structural vibration
 - ◆ Examples:
 - Noise suppression shields and mufflers
 - Noise absorption materials on walls
 - Vibrations absorption pads under equipment
 - Locate of noise generating sources away from residential or other noise-sensitive receptors



Noise Reduction Controls

- ◆ Administrative
- ◆ Procedural changes to reduce source duration or exposure to the source
- ◆ Examples:
 - Operate noisy equipment on second or third shifts
 - Rotate employees through high-noise areas
 - Limit run time for noisy equipment when possible

Noise Reduction Controls

- ◆ Personal Protective Equipment – Hearing Protection Devices (HPD)
- ◆ Devices worn to protect personal hearing loss
- ◆ Examples
 - Ear plugs
 - Earmuffs





HPD Noise Reduction

- ◆ HPDs must reduce employee noise exposure below an 8-hour TWA of 90 decibels (OSHA PEL)
- ◆ Employees with STS, noise exposure reduced below an 8-hour TWA of 85 decibels
- ◆ Noise reduction ratio (NRR)
 - Lab versus real world
 - Ear plugs: use 1/3 of NRR
 - Earmuffs: use 1/2 of NRR



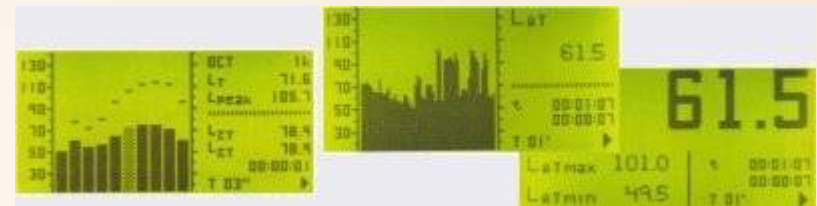
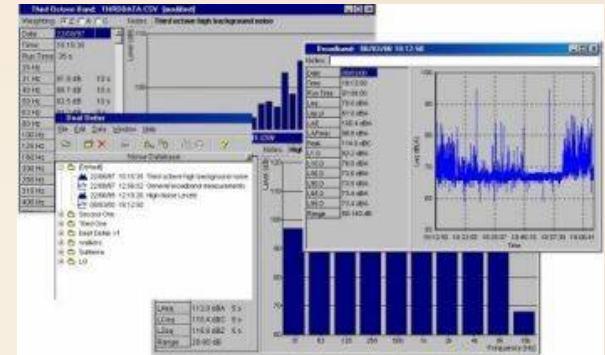
Hearing Protection Use

- ◆ Voluntary use
 - ◆ Exposed to an 8-hour TWA of 85 decibels
- ◆ Mandatory use
 - ◆ Exposed to an 8-hour TWA above 85 decibels
 - ◆ Exposed to an 8-hour TWA of 85 decibels but have not had a baseline hearing test
 - ◆ Employees who have suffered STS hearing loss and are exposed to an 8-hour TWA of 85 decibels

Available Technologies

Pulsar 30 - Real-Time Analyzer

- ◆ Type 1 or Type 2
- ◆ Simultaneous frequency and time weightings (A, C, & Z; Fast, Slow, Impulse, Peak)
- ◆ Real time Octave Band Filters.
- ◆ Single Measurement Range 23 to 140 dB - **no range selection required.**
- ◆ Software
 - Analyzer
 - Capture



Available Technologies

doseBadge

- ◆ Type 2
- ◆ No wires or controls on the badge to catch or knock
- ◆ Suitable for ISO, OSHA, MSHA, AICHE and ACGIH noise applications
- ◆ Noise measurement span from 70 to 130 dB(A)
; True Peak reading from 120 to 140 dB(C)
- ◆ 115 dB(A) Sound Level flag
- ◆ Reader controls doseBadges by infra-red
- ◆ Display the results of measurement on its display or transfer to a computer



Questions

Questions?