

IH&S 527: Noise Control Engineering

Chapter 1: Background

By Steven E. Guffey, PhD, CIH

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Bad things about noise


- Hearing loss prevalent in the working population
- Masks informative sounds, reducing warnings and other information
- Masks speech, reducing communication in the workplace
- Annoying
- Problems in the community

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Some Statistics about Hearing Loss

- 5-30 million workers exposed to noise (@ or >85dBA)
- 10 million US workers have hearing loss
- 28 million US citizens have hearing loss
- Far more important than most other occupational diseases


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Facts of Hearing Loss

- Permanent hearing loss is one of 10 leading occupational injuries
- Preceded by temporary hearing loss
- Noise is frequently cited by OSHA


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Tinnitus

- 36 million Americans suffer from "Tinnitus"
- These are sounds heard in the head in the absence of an actual sound source
- Can be disabling
- Dramatically affects the quality of life


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Historical Background

- 1831: Blacksmiths' Deafness (mainly Tinnitus)
- 1882: Steam boiler workers (mainly hearing loss)
- 1896: Hearing protection consisted of individual attempts to protect ears by wool, cotton, etc.
 - Rejected by many


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Historical Background . . . 2

- Prior to industrial revolution, hearing loss was noted in:
 - Battle grounds
 - Blacksmithing (due to impact noise)
- Following industrial revolution:
 - Hearing loss became a common injury
- After WW-II:
 - Returning soldiers caused swell in hearing impaired numbers
 - Increased recognition
 - Armed services establishes "Aural Rehab Centers"
 - Field of "Audiology" was created


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Historical Background -- Regulations

- 1948
 - Air Force Regulations (DO the Air Force)
- 1969:
 - DOL -- Walsh-Healy: 90dBA for 8 hrs, with 5 dB exchange rate, 140 dB peak
- 1971:
 - Walsh Healy standard became applicable to all general industry w/the creation of OSHA


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Historical Background . . . Regs. 2

- 1972: NIOSH Criterion Document suggests reduction to 85 dBA
- 1974: OSHA revision:
 - An action limit of 85 dBA
 - Instill a noise conservation program:
 - Maintain Audiograms (baseline, aging, associated w/hearing chronic exposure)
 - Hearing protection provided and made available
 - Maintain records
 - Training


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Historical Background . . . Regs. 3

- 1982, 1983:
 - OSHA amendments to hearing conservation regulation
- 1998:
 - NIOSH revised criteria stays with 85 dBA with 3dBA exchange rate
- DOD:
 - Action Limit = 82dBA


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Historical Background . . . 3 Compensation

- Was rare in the early part of the century, since in most cases did not lose jobs, no loss of earnings occurred.
- 1948: NY court of Appeals granted compensation to a man who had not lost wages
- 1950: Wisconsin - same


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Historical Background . . . Hearing Conservation Programs

- Investigations started about 1950: K.D. Kryter monograph described safe and hazardous exposures
- Few company-wide noise conservation programs, except Du Pont (since 1956)
- Roger Maas instituted hearing conservation
- Many companies served by employers mutual Liability Insurance Company of Wausaw
- By 1998 (see Table 1.1)
 - Small companies: monitoring, audiometry rare, hearing protection for minority
 - Medium companies: monitoring and audiometry rare, hearing protection for large minority
 - Large companies: monitoring, audiometry for minority; hearing conservation 84%

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Value of Hearing Conservation

- On-the-job communication
- Productivity
 - Study of English weavers found 12% increase in productivity when given hearing protection
 - Study of Indian and Egyptian weavers: lower noise associated with better work attendance and better productivity
- Lost-time accidents; health:
 - Study of boiler plant workers: with hearing protection came fewer injuries, medical problems and absences
 - Schmidt found that cotton
- Health
 - 35 textile workers with hearing protection had lower cortisol levels and reduced fatigue and post work irritability

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The End Questions?



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