Selling a Quiet Workplace
Through “Buy Quiet” Programs

Charles Hayden, M.S., P.E.
Heidi Hudson, M.P.H.
U.S. Department of Health and Human Services
Public Health Service
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

Disclaimer: The findings and conclusions in this report are those of the author(s) and do not necessarily represent the views of the National Institute for Occupational Safety and Health (NIOSH). Mention of company names of products does not constitute endorsement by the Centers for Disease Control and Prevention (CDC), NIOSH.
Acknowledgments

- David Nelson, Nelson Acoustics
- Messer Construction (Cincinnati, OH)
- Tier1 Performance Solutions
Occupational Hearing Loss

- 22 Million workers in U.S. at risk
- Cross-cutting issue, affects workers in nearly every sector
- Currently no recovery; severely impairs quality of life
- One of most common workplace illnesses/injuries
- Significant $costs$ associated with high noise levels in the workplace.
Prevalence of hearing difficulty in top-six industry sectors, 1997-2003
Hierarchy of Controls

- Elimination
  - Design hazard out of product/process.
- Substitution
  - Reduced noise product/process.
- Engineering
  - Properly maintain.
  - Retrofit existing equipment.
  - Barriers.
- Administrative
  - Limit exposure, medical surveillance, improved work practices.
- Personal Protective Equipment
  - Ear Plugs/muffs...
Manufacturers of machinery and equipment

- Design expertise.
- Operational characteristics.
- Fatigue/life cycle analysis.
- Cause and effect.
- Most suited to eliminate or mitigate noise at its source.
Overview

- Educational and Marketing content
- Cost Benefit templates
- Document Generation and Tracking
- Overarching Tools and Equipment Database – 3rd party verification
- Existing equipment w/ sound levels

Buy Quiet
Periodic policy review by management of commitment level and cost benefit effectiveness of buy quiet program.
Determine level of commitment.

- Class A: Always purchase quietest equipment.
- Class B: Purchase equipment based on best value per cost-benefit analysis.
- Class C: Do not buy equipment more noisy than at present.
- The Level of Commitment prescribes:
  - Options in the absence of data for existing and new equipment.
  - Method for setting noise emission limit for new purchases.
  - Whether noise control options are to be purchased.
  - When to retire older, noisier equipment.
Class A: “Just Do It”

Update Inventory

Missing Data?

Yes → Request Vendor Data

Missing Data?

Yes → Reject

No → Over Limit?

Yes → Retire

No → Limit = Inv. Low + 2

Request Vendor Data

L_{PA} < 70 @ 1m

or L_{WA} < 78

Yes → Exempt

No → Incompatible Data?

Yes → NC Option?

Yes → Short List

Select Within 2dBA of Quietest

No → No → No → No
Costs of Noise Induced Hearing Loss

- Hearing conservation program.
- Hearing aids/batteries.
- Worker’s compensation claims.
- Insurance premiums.
- Decreased productivity, increased worker absenteeism and turnover.
- Noise abatement activities.
Cost Benefit Overview

![Graph showing the incremental cost of noise per person per dBA. The graph is labeled with two points: $20/dBA/yr and $70/dBA/yr. The x-axis represents average 8-hour exposure in dBA, ranging from 80 to 100, and the y-axis represents incremental cost in dollars per person per dBA.]
Cost Benefit Overview

![Graph showing the relationship between unit cost and loaded sound power level (dB(A)). The trend line indicates that quieter products are less expensive. There is a point marked as the best value, indicating the optimal balance between cost and noise level.]
Payback

• Demonstrate innovative technological advances in machinery/equipment design.
• Reduced noise induced hearing loss among construction workers.
• Demonstrate innovation in improving the quality of their customer’s lives.
• Economic benefit.
  ▫ Increase product quality and functionality.
  ▫ Advance technology.
• Quieter, safer, and healthier environment.
Payback

- Safe in Sound Awards (www.safeinsound.us)
  - NHCA
- Competitive advantage.
# Honda Quiet

**When quiet counts, count on Honda.**

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Noise Level* (in decibels)</th>
<th>Noise Level Comparisons (in decibels)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU3000iA</td>
<td>58 dB</td>
<td>Quiet: Private Office</td>
</tr>
<tr>
<td>EU1000iA2</td>
<td>59 dB</td>
<td>Normal Speech: Normal Speech</td>
</tr>
<tr>
<td>EU2000iA</td>
<td>60 dB</td>
<td>Vacuum Cleaner: Vacuum Cleaner</td>
</tr>
<tr>
<td>EU6500isA</td>
<td>60 dB</td>
<td>Curbside on Busy Street: Curbside on Busy Street</td>
</tr>
<tr>
<td>EM5000iXAB</td>
<td>68 dB</td>
<td>Rotary Mower: Rotary Mower</td>
</tr>
<tr>
<td>EB3000iXAG</td>
<td>68 dB</td>
<td>Heavy City Traffic: Heavy City Traffic</td>
</tr>
<tr>
<td>EP2500X</td>
<td>69 dB</td>
<td>Chain Saw: Chain Saw</td>
</tr>
<tr>
<td>EM3800iXA</td>
<td>71 dB</td>
<td>Auto Horn at 3 Feet: Auto Horn at 3 Feet</td>
</tr>
<tr>
<td>EB3800X</td>
<td>71 dB</td>
<td>or Rock &amp; Roll Bar: or Rock &amp; Roll Bar</td>
</tr>
<tr>
<td>EG3500iXK1A</td>
<td>72 dB</td>
<td>Jet Plane at 50 Feet: Jet Plane at 50 Feet</td>
</tr>
<tr>
<td>EM5000iSK2A</td>
<td>72 dB</td>
<td>Siren at 100 Feet: Siren at 100 Feet</td>
</tr>
<tr>
<td>EB5000iX2A</td>
<td>72 dB</td>
<td>Threshold of Pain: Threshold of Pain</td>
</tr>
<tr>
<td>EM6500iSK1A</td>
<td>75 dB</td>
<td></td>
</tr>
<tr>
<td>EB6500iX</td>
<td>75 dB</td>
<td></td>
</tr>
<tr>
<td>EG6500iXK1A</td>
<td>76 dB</td>
<td></td>
</tr>
</tbody>
</table>

* Noise levels at rated load, measured at 20 Feet / 6 Meters from the control panel side of the generator.
** Lwa is an international noise level measurement that uses a weighting factor to reflect noise.
*** "Loudness" in addition to the sound power (dB(A) level.

- Quiet
  - 50: Private Office
  - 60: Normal Speech
  - 70: Vacuum Cleaner
  - 80: Curbside on Busy Street
  - 90: Rotary Mower
  - 100: Heavy City Traffic
  - 110: Chain Saw
  - 120: Auto Horn at 3 Feet
  - 130: Jet Plane at 50 Feet
  - 140: Siren at 100 Feet
  - 140: Threshold of Pain

- Loud
Summary

- NIOSH’s web tool.
- Cost benefit.
- Competitive Advantage.
- Database.
Questions or Comments?

- Contact Information (also available on handout)
  - Chuck Hayden
    - 513-533-8152
    - chayden@cdc.gov