Safer by Design – Loose Plant
“Noiseless” & Safer Back-Up Alarms

BroadBand Sound
Natures Natural Alarm Sound

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“Noiseless” & Locatable Sound – Safer by design

Safer by Design

• The need for change
• Effective backup alarm requirements
• Why broadband is better than tonal beepers
• Concerns
• Benefits
The Need

• Fatalities still occur where tonal alarms are fitted.
• Broadband will reduce the risk
• Atlantic Alliance specifies broadband
• UK … all major mining companies
• Authorities – increasing demand
• USA
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Effective Back-Up Alarms

• Counter the hazard caused by backing vehicles colliding with people.

• Affective alarms:
  – Enable quick identification of hazard location
  – Give minimal false alarms
  – Are not masked by other sounds or person’s (at risk) hearing impairment
Why broadband is safer

• Enable quick identification of hazard
  – Broadband is locatable sound
  – Tones create standing waves which cause confusion
  – Not masked by other sounds or hearing impairment
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Relative Impact Zones

Tonal Range

BroadBand Zone
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Why broadband is safer

- Enable quick identification of hazard
- Minimal false alarms

![Graph showing False Alarm Rate vs. Response Rate](image)
Concerns

- Regulation compliance
- Recognition
  - Instant ... Hear, Look (locatable), Learn
Benefits

• Improve safety
• Improve working environment
• Eliminate noise complaints
  • Improve neighborhood relations
  • Eliminate neighborhood objection during the permitting process (planning permission)
• Reduce risk of hearing causing impairment
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Conclusion

• Broadband backup alarms are:
  – Safer by design
  – Socially more responsible for both neighbors and co-workers
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Any Questions

Lafarge
Port of Houston
Hanson
City of Seattle
Aggregate Industries
Waste Management
North West Glacier
Iowa DOT
Teichert
NYC
Tilcon
City of Austin
Tarmac
Texas DOT
Granite Rock
Scottish Environmental Protection Agency
Cemex
BP
Olcastle
etc
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Comparison

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Tonal</th>
<th>Broadband</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loudness (equal dBA)</td>
<td>Quieter</td>
<td>Louder</td>
</tr>
<tr>
<td>False Alarms</td>
<td>More likely</td>
<td>Less Likely</td>
</tr>
<tr>
<td>Locatability</td>
<td>Poor</td>
<td>Good</td>
</tr>
<tr>
<td>Confusion</td>
<td>Likely</td>
<td>Unlikely</td>
</tr>
<tr>
<td>Stridency</td>
<td>Greater</td>
<td>Lesser</td>
</tr>
<tr>
<td>Impact outside hazard area</td>
<td>Greater</td>
<td>Lesser</td>
</tr>
</tbody>
</table>
Why broadband is safer

- Not masked by other sounds
Why broadband is safer

- Not masked by other sounds or hearing impairment