Pepper Maintenance®
The Hottest Name in Reliability!

Edward LaPreze, CMRT
Level II Thermographer
Category II Vibration Analyst
Certified in Precision Alignment / Balancing
SMRP Member

♦ 2017 IAOM Western District Fall Meeting
Ultrasound

- Our ears hear from 20Hz to 20kHz
- Ultrasonic is over 20kHz
- Equipment converts the ultrasonic sounds to a range we can hear
- Noisy environments do not interfere with ultrasonics
The Sound Spectrum

- Low bass notes (20Hz)
- Animals and chemistry (20kHz)
- Medical and destructive (2MHz)
- Diagnostic and NDE (200MHz)

Infrasound → Acoustic → Ultrasound

- Infrasound: below 20 Hz
- Acoustic: 20 Hz to 20,000 Hz
- Ultrasound: over 20,000 Hz

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Benefits of Using Ultrasonics?

- Electrical - Mechanical
  - Detect problems without interrupting service or production
  - Improve efficiency – usage and product movement
  - Increase life of equipment
  - Reduce utility costs
Different Uses for Ultrasound

- Leak Detection - compressed air systems, blowers, liquid movement
  - Anything with a pressure differential
- Lubrication
  - Motors
- Electrical faults
  - Corona – Only above 1000v
  - Arcing
  - Tracking
- Steam Trap Operation
- Excellent compliment to other technologies
### Air Loss → Cost $

#### Just one air leak?

<table>
<thead>
<tr>
<th>Diameter of air leak</th>
<th>CFM of air lost at 100 psig</th>
<th>x 8 = Annual cost at $0.18 per 1,000 cu. ft. *</th>
<th>Annual cost at $0.32 per 1,000 cu. ft. *</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/32&quot;</td>
<td>1.62</td>
<td>$777.60</td>
<td>$91</td>
</tr>
<tr>
<td>1/16&quot;</td>
<td>6.49</td>
<td>3,115.20</td>
<td>$205</td>
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<td>1/8&quot;</td>
<td>26</td>
<td>12,480.00</td>
<td>$820</td>
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<td>1/4&quot;</td>
<td>104</td>
<td>49,920.00</td>
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<td>3/8&quot;</td>
<td>234</td>
<td>112,320.00</td>
<td>$7,379</td>
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<td>1/2&quot;</td>
<td>415</td>
<td>199,200.00</td>
<td>$13,087</td>
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<td>3/4&quot;</td>
<td>934</td>
<td>448,320.00</td>
<td>$29,455</td>
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</table>

*Source: UE Systems*
Steam Loss ➔ Cost $$$

Steam loss is higher

<table>
<thead>
<tr>
<th>Leak</th>
<th>lb/hr</th>
<th>Loss / Day</th>
<th>Loss / day</th>
<th>Loss /</th>
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<tbody>
<tr>
<td>1/32</td>
<td>3.3</td>
<td>79.2</td>
<td>$4</td>
<td>$1,445</td>
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<tr>
<td>1/16</td>
<td>13.2</td>
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<tr>
<td>1/4</td>
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<td>1267.2</td>
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<td>1980</td>
<td>$99</td>
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<td>5064</td>
<td>$253</td>
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</table>

Source: UE Systems
Blowers

Efficiency Loss

- Loss of product volume flow
- Increase air needs
- Line product plugs
  - ½ air hose in a blower line
Ultrasound compliments other Technologies
Conclusion

- Performing ultrasound inspections saves $$
- Increases product movement efficiency
- Ensures proper lubrication
- Improves bearing fault detection
Questions?

Thank You!

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