

Sensory Cues ...

Utilizing sight, sound, touch and smell as indicators of mechanical equipment maintenance needs.
By Mark Strahan



When you or your building engineer walk through a building, **be aware of what may have changed**. Try to stay alert for things that are not as you remember them previously. If you see, hear, feel or smell something that has changed, your mechanical or electrical equipment may be politely asking for attention. It's always a good idea to investigate a change that may indicate a problem is developing.

The two senses that may come to your mind first are sight and sound, but touch and smell can also be important cues to impending mechanical failure.

One area where touch is extremely useful is for sensing vibration. An increase or sometimes even a decrease in vibration levels is an important indicator that something has changed. If you know the source of the vibration and are already aware there may be a fluctuation in the intensity of it due to normal equipment operation it may be safe to ignore it. If not the source should be investigated.

Vibration sources that are particularly important to investigate come from rotating pieces of equipment like pumps, fans and blowers. When these types of equipment have vibration levels that changed from the last time you were around them find out why. Not doing so could result in costly repairs or even catastrophic failure. The following experiences readily come to mind as examples.

While surveying a building with a potential customer, we noted the closed circuit cooling tower blower was producing a significant level of vibration (sound and touch). We turned off the electrical disconnect to the blower motor temporarily to investigate the source of vibration. We found a plastic garbage bag had entered the blower housing and become lodged in the blower wheel. Because the blower wheel was not evenly loaded it was creating excessive vibration. After removing the bag from the blower wheel the vibration levels returned to normal. If we had not taken corrective measures, the bearings or the blower wheel may have failed resulting in a very costly repair.

Another story relates to vibration that could be felt in the first floor restroom of a multi-story building. Little sound could be heard on the first floor, but the vibration could be felt. The offending piece of mechanical equipment was the condenser water pump on the roof. When the pump shaft coupling was replaced the vibration levels returned to acceptable levels.

The table below indicates a few changes you might notice that could merit additional investigation, unless you already know their source and have determined it is not a potential concern.

| <u>Sight</u> | <u>Sound</u> | <u>Touch</u> | <u>Smell</u> |
|--------------------------|--------------|--------------------------|--------------------|
| Change in appearance | Hissing | Overheated surfaces | Hot or burning |
| Missing or loose items | Dripping | Abnormally cold surfaces | Dank, Moldy, Stale |
| Corrosion or scaling | Grinding | Vibration | Natural gas odor |
| Discoloration | Screeching | Hot or cold rooms | Solvent odor |
| Wet or oily surfaces | Scraping | Electrical shock | Decay |
| Leaking fluids | Rumbling | | Other strong odors |
| Ice on exterior of pipes | Banging | | |
| | Rattling | | |

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