Getting Ready to Find Problems by Inspection

You can spot many energy-wasting problems with a few tools and your five senses. This document offers some pointers on how to prepare for and carry out an inspection.

In addition to these pointers, familiarize yourself with the Symptom-Diagnosis Tool, which will help you find symptoms and diagnose many of the common problems that waste energy.

When and How Often to Inspect

Ideally, inspection should take place once before the HVAC systems are scheduled to come on in the morning, once while they are operating in normal mode, and once after they are scheduled to shut down. An additional inspection may be needed for after-hours conditions.

As-Built Plans

Obtain the as-built plans and study them before the inspection. If convenient, take them with you. Review them for accuracy. Sometimes the as-built plans are final engineering drawings that were wrongly stamped as as-built.

If the as-built plans are not accurate, you have the following options:

- If the building is still under warranty, ask the contractor for the corrected as-built plans.
- Hire the designer to conduct a field survey and create as-built plans for you.
- Develop as-built plans yourself using CAD software. This is the preferred method because it fosters detailed familiarity with the systems.

You can also get information from the installed sequences of operations programmed in the direct digital control (DDC) system, which are as important as the building plans.

O&M Documents

O&M documents are often too cumbersome to take on the inspection. After the inspection, compare your to the data in the O&M documents. Look for materials such as piping, valves, hangers, and insulation, which are commonly substituted but not documented during construction.

Clothing

Wear appropriate clothing that can get dirty—no loose shirts, ties, or hats. Carry gloves if you will be working with heating water or steam. Wear boots with good traction.

Toolkit

- Rags for clean equipment nameplates
- Infrared temperature sensor
- Multimeter
- Electrical safety gloves
- Tool kit with screwdrivers, pliers, etc.
- Stethoscope
- Insertion thermometer for P&T plugs
- Flashlight

- Earplugs
- Safety glasses
- Camera (The condition or situation you see may not be static.)
- Watch or clock (Many problems can be time-dependent.)
- Tape measure (Learn how to measure using ceiling or floor tiles, light fixtures, and pipe hanger spacing.)
- Walkie-talkie or cell phone (Make sure that your staff knows where you are going and what time you expect to be back.)
- Ladders, as needed

Safety

- Get familiar with all safety regulations in effect onsite.
- Working on the roof can require safety harnesses if you work close to a low parapet.
- Do not alter the operation of any system or equipment while doing the survey. Note unusual conditions for future analysis and correction, if required.
- Immediately report any life-safety concerns to the facility manager.
- Make sure all areas are adequately lit to allow for inspection. (Mechanical rooms are often underlit because pipes and ducts interfere with the lighting layout.)
- Make sure all equipment is easily accessible. (Equipment is less likely to be maintained if it is not easy to get to.)
- Make a mental note of all the tripping hazards and low overheads to avoid injury. (Constantly avoiding hazards can distract you from inspecting properly. Make notes for future protection and identification.)