Steam Trap Station Visual Testing Method

One Of Three Ways To Test Steam Trap Stations

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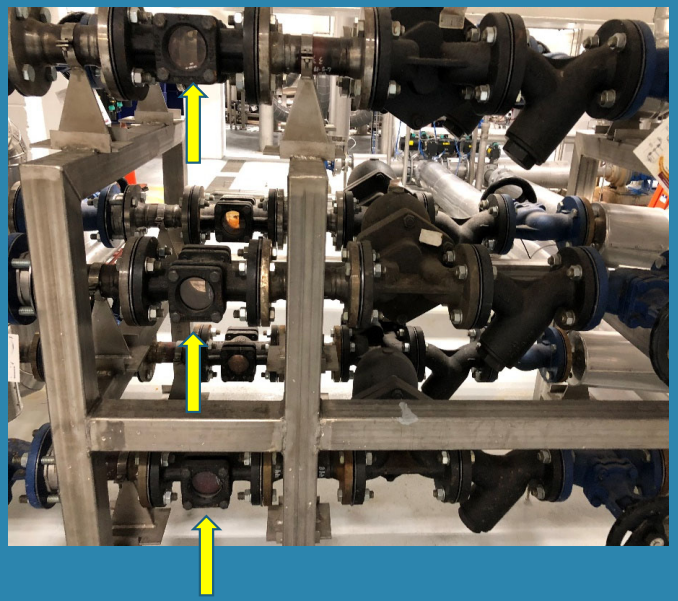
Steam Trap Visual Testing Method



One of the three ways to test steam trap stations

- Visual
- Temperature
- High Frequency Ultrasound

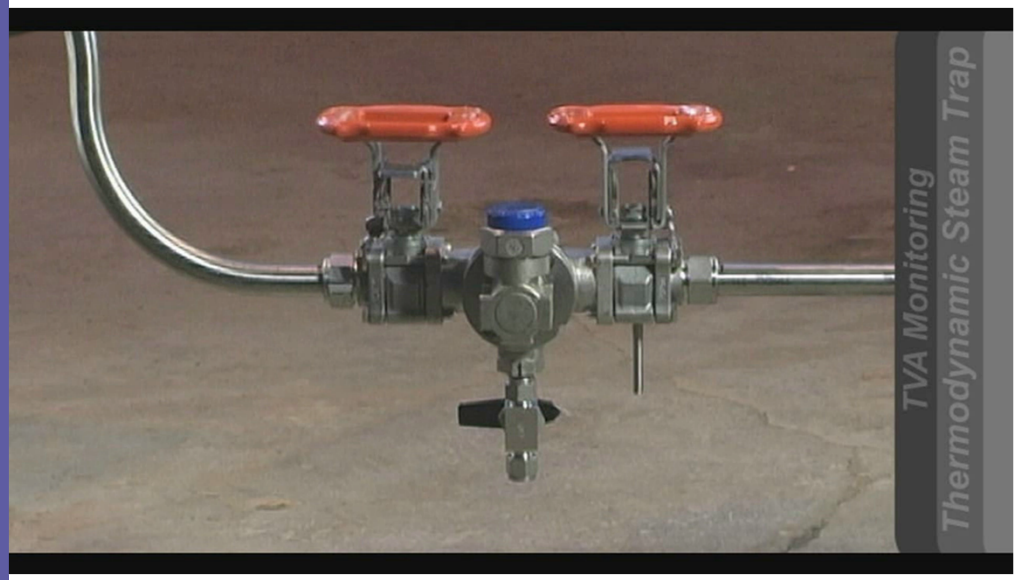
- Fast/easy method
- Anyone with a little training can accomplish testing steam traps
- Negatives;
  - Higher initial installation cost

Why Test Steam Trap?

- Today's steam trap stations
  - need be reliable (15 years or longer
  - proper operation
- Any steam trap station assessment shall have no more than a 3% failure rate

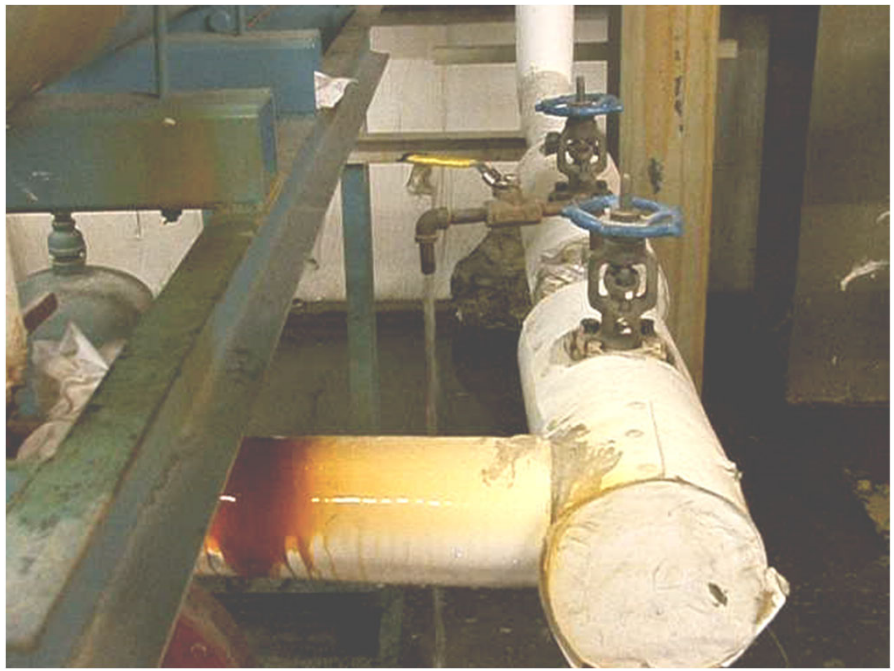
Steam Trap Visual Testing Method

- Two types of steam trap station operation;
  - On/off
    - Inverted bucket
    - Thermostatic
    - Thermodynamic
  - Continuous flow
    - Float and Thermostatic



Steam Trap Visual Testing Method

- Steam trap visual discharge
- Two phase flow
  - Flash steam
  - Condensate



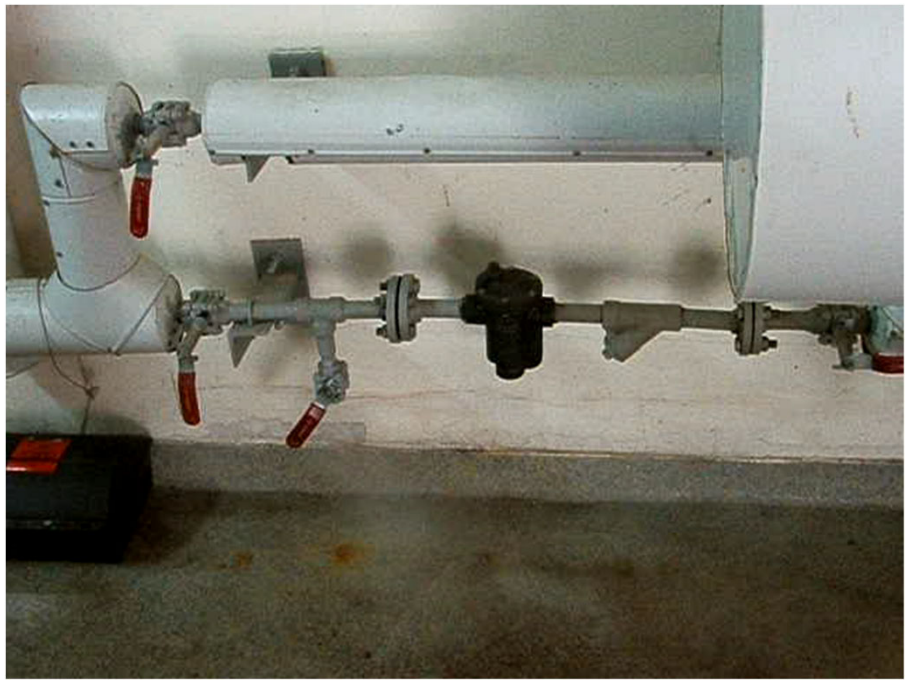
Steam Trap Visual Testing Method

- Steam trap visual discharge
- Thermostatic design
  - On/off operation

Steam Trap Visual Testing Method

- Inverted bucket design
  - On/off operation
  - Off for at least 15 seconds
  - Can stay off for a long period of time

  - Proper operation



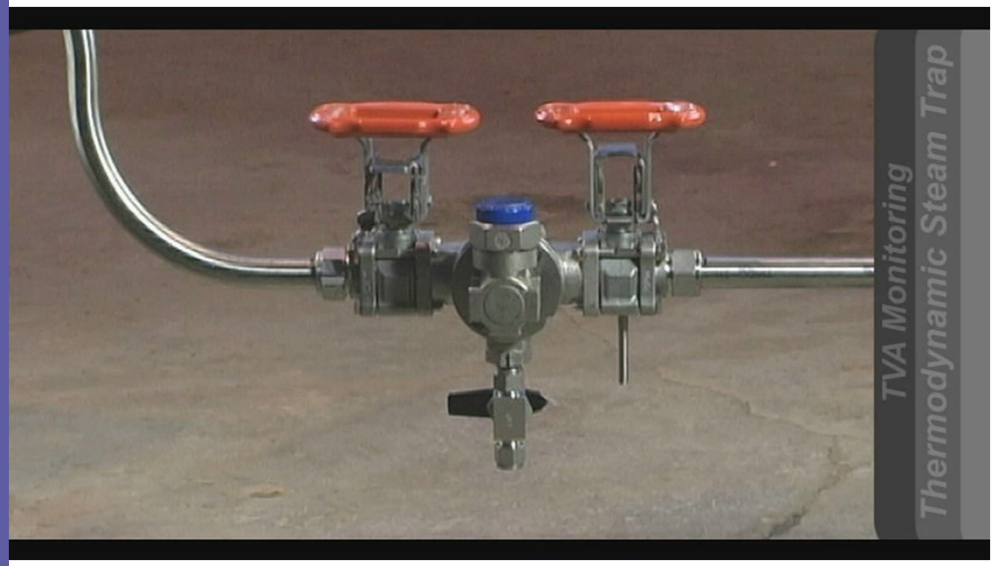
Steam Trap Visual Testing Method

- Inverted bucket design
  - On/off operation
  - No cycling or on/off operation

  - Completely Failed

Steam Trap Visual Testing Method

- Thermodynamic design
  - On/off operation
  - Very fast in it’s operation
  - Working properly



Steam Trap Visual Testing Method

- Thermodynamic design
  - On/off operation
  - Extremely fast cycling
  - Completely Failed – should be in the off position at least 12 seconds or longer

Steam Trap Visual Testing Method

- Thermostatic design
  - On/off operation

Steam Trap Visual Testing Method

- Thermostatic design
  - No on/off operation
  - Completely failed

Steam Trap Visual Testing Method

- Float and Thermostatic Design;
  - Continuous flow operation
  - Proper operation

Steam Trap Visual Testing Method

- Float and Thermostatic Design;
  - Continuous flow operation
  - Completely failed

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SUCCESSFULLY TESTING STEAM TRAPS WITH HIGH-FREQUENCY ULTRASOUND

When using high-frequency ultrasound, the main question is where the sensitivity should be set to conduct the test. If the testing instrument is set to too high a sensitivity, all the steam traps will test as failed; using too low a sensitivity will indicate that all steam traps are operating properly.

The solution is using a field-proven comparison method, which will provide an accurate test on each steam trap. The comparison method uses three or more test points on the steam trap station. Two of the test points are the sensitivity baseline settings on the ultrasound unit, and the third is for testing the steam trap. The comparison method allows the steam trap station assessor to establish a base reading to filter out any competing ultrasounds that can be generated upstream or downstream of the steam trap. Without using the comparison method of testing, it is very difficult to assess the steam trap's performance because the assessor will not know the correct sensitivity setting. Each steam trap will be in slightly different installations and situations in the steam system, so the comparison method is the most accurate method for setting the ultrasound sensitivity.

1. SENSITIVITY SETTINGS FOR A DIGITAL ULTRASOUND

Figure 1: Three Test Points for Baselines and Testing

With the stethoscope module, contact each point on the steam trap station, as shown in Figure 1. The steam and condensate line should have baseline test points that are between 6 and 10" (these estimated values will vary depending on the piping) upstream or downstream of the steam trap that is being tested. More test points can be taken to establish a baseline, but at least two need to be done for each steam trap location.

2. SETTING UP AND USING THE HIGH-FREQUENCY ULTRASOUND UNIT

The ultrasound unit needs to be set at 25 kHz to provide the highest clarity for high-frequency ultrasound generated by steam or condensate passing through an orifice in steam trap.

1. Pull the trigger to turn on the ultrasound unit. If the instrument is within sensitivity range, the decibel (dB) indicator (A in Figure 2) will blink.

Figure 2: Dial Readings on the Ultrasound Unit

Inveno Engineering LLC Our Approach

Partnerships

Short Term Impact

- ✓ Steam System Engineering Assessments
- ✓ Steam System Balancing
- ✓ Steam System Reliability
- ✓ Steam System Engineering Training

Long Term Impact

- ✓ Implementation engineering
- ✓ Project designs, project management,
- ✓ Full engineering support for Steam System changes

Thank You

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