Leak Survey for Local Gas Distribution Companies

Presented to:
The Washington State Citizens Committee on Pipeline Safety

Prepared by Jody Morehouse
March 2013
Objectives

• Overview of Avista’s gas distribution system

• Overview of Regulations on Leaks

• Overview of Avista’s Leak Survey Program
Avista’s Gas Service

- Combined Gas & Electric Distribution Company
- 320,000 gas customers
- 12,600 miles of gas pipeline
  - 8,600 miles PE aged 1968-current
  - 4,000 miles steel, aged 1931-current
- No cast iron
- 112 miles of transmission
  - 73 miles in WA
  - 54 miles in OR
Leak Surveying Rules

Minimum Pipeline Safety Regulations 49CFR 192.723
Distribution System leakage Surveys

PURPOSE: To establish periodic leakage survey frequencies

Survey Categories:
- Annual Surveys – Business Districts
- 5 Year Surveys
- Special Surveys
Annual Surveys

- **Business District:** An area where the public congregates or where the buildings are primarily used for financial, commercial, industrial, religious, educational, health, or recreational purposes.

  - Frequency: *Once each calendar year not to exceed 15 months.*

  - Specific Considerations:
    - High Occupancy Buildings
    - Pipeline operating at 250 psig +
    - Transmission pipelines (may require higher frequencies)
5 Year and Special Leak Surveys

- **5 Year Leak Surveys:** Residential areas are surveyed 20% per year so that the entire system is surveyed in a 5-year period not to exceed 63 months.

- **Special Leak Surveys:** Leak surveys for one-time projects where damage may have occurred, special situations, or for specific programs.
  - Prior to paving or resurfacing of roads
  - In construction areas of other underground structures
  - Unstable soil areas
  - After earthquakes, flood, and fires
  - Early vintage PE pipe locations (annually)
  - During uprate procedures
Leak Detection Instrumentation

- **Flame Ionization Detector (FI):** Very sensitive instrument measuring in parts per million (ppm). It detects the presence of methane gas by measuring the ions produced in a hydrogen flame when gas is burned.
Leak Detection Instrumentation

- **Combustible Gas Indicator (CGI):** A thermal filament is heated, the combustible gases burn on the filament, and the changes in the temperature on the filament are converted into a % gas in air reading (0 to 100% gas in air).

- **Explosive Limits:** Gas is combustible in gas-air mixtures from 5 to 15% gas in air concentrations.
  - 5% gas in air is the Lower Explosive Limit or LEL
  - A CGI can detect % gas in air reading, or a % LEL reading. % LEL refers the level of gas between 0 and 4% gas in air. A 20% LEL reading is equivalent to 1% gas in air reading.
Leak Detection Instrumentation

- Remote Methane Leak Detector (RMLD): This instrument utilizes a laser that passes through the plume of methane and measures the amount of light absorbed by the methane which is measured by spectroscopy.

- Bubble Leak Tests: Applying soapy water to exposed pipe. This method is used as a supplement to the other leak detection methods.
Maps

Annual Survey

ALL THIS PIPE MUST BE SURVEYED. DO NOT DELETE OR ADD ANY SALMON COLORED PIPE THAT HAS ALREADY BEEN IDENTIFIED BY AVISTA.

Within the Annual Survey Avista will be performing a Special Survey of Altadale Main pipe, which will appear with a salmon color.
Survey and Pin Pointing of Leaks

Once the presence of gas is detected underground with an FI unit, the ground is bar holed (punctured with a rod) and a CGI is utilized to determine the classification of the leak based on the % LEL or % gas in air.
Leak Classifications

• **Grade 1 Leaks**: Any leak that represents an existing or probable hazard to persons or property. It requires immediate repair or prompt continuous action until the conditions are no longer a hazard.

• **Grade 2 Leaks**: Any leak that is recognized as being non-hazardous at the time of detection, but that justifies scheduled repair based on probable future hazard. Repaired within 1 year, but must be reevaluated in 6 months.

• **Grade 3 Leaks**: Any leak that is non-hazardous at the time of detection and can reasonably be expected to remain non-hazardous. Reevaluated once per year until fixed or reclassified.