

NTSB Recommendations from Silver Spring, MD Incident



Pennsylvania Public Utility
Commission

September 10, 2020



Incident

An explosion and fire occurred on August 10, 2016 at 11:51 pm EST at an apartment complex located in Silver Spring, Maryland



Before



Incident

14 units in the apartment building partially collapsed due to a natural gas-fueled explosion and fire



Incident

7 residents died

65 residents were transported to the hospital

3 firefighters were transported and released from the hospital



A Quick Synopsis of the Cause

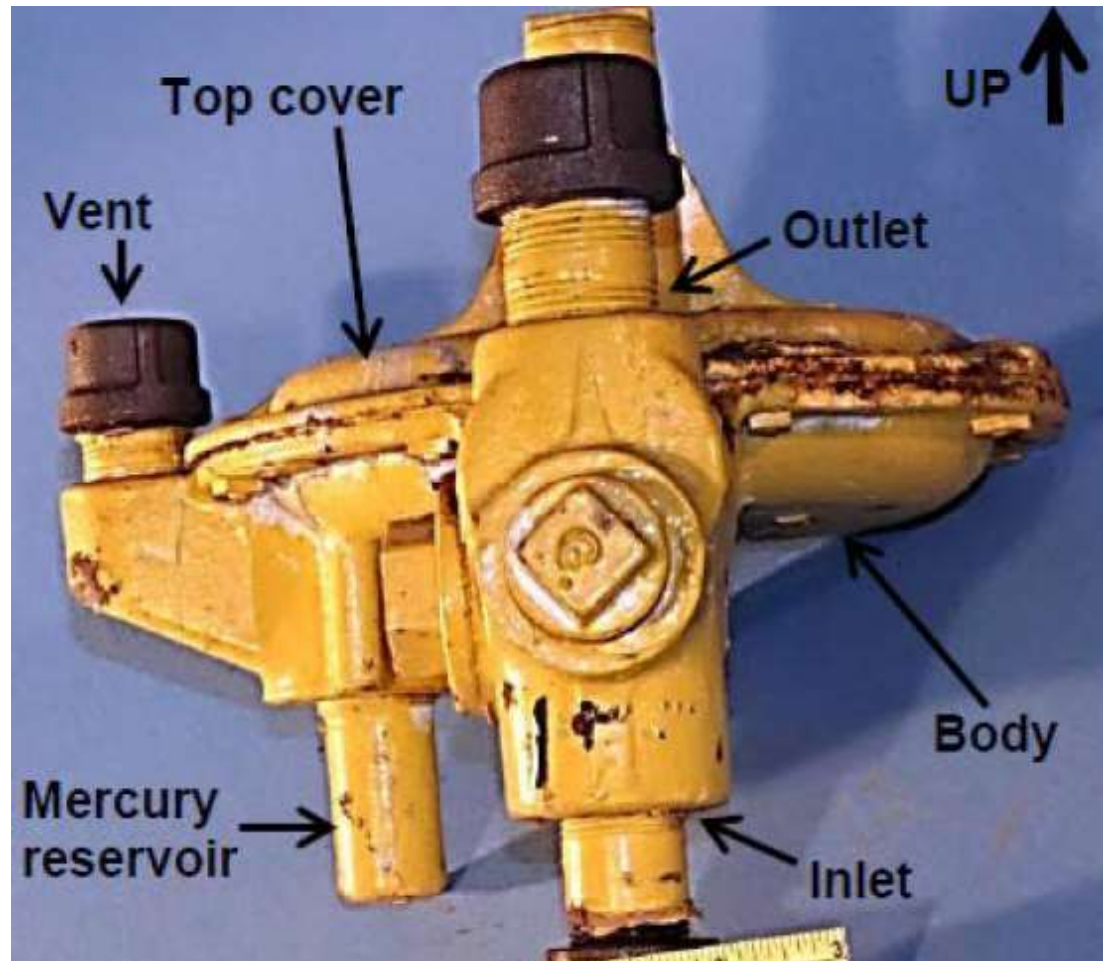
The failure of an indoor mercury service regulator with an unconnected vent line that allowed natural gas into the meter room where it accumulated and ignited from an unknown ignition source.



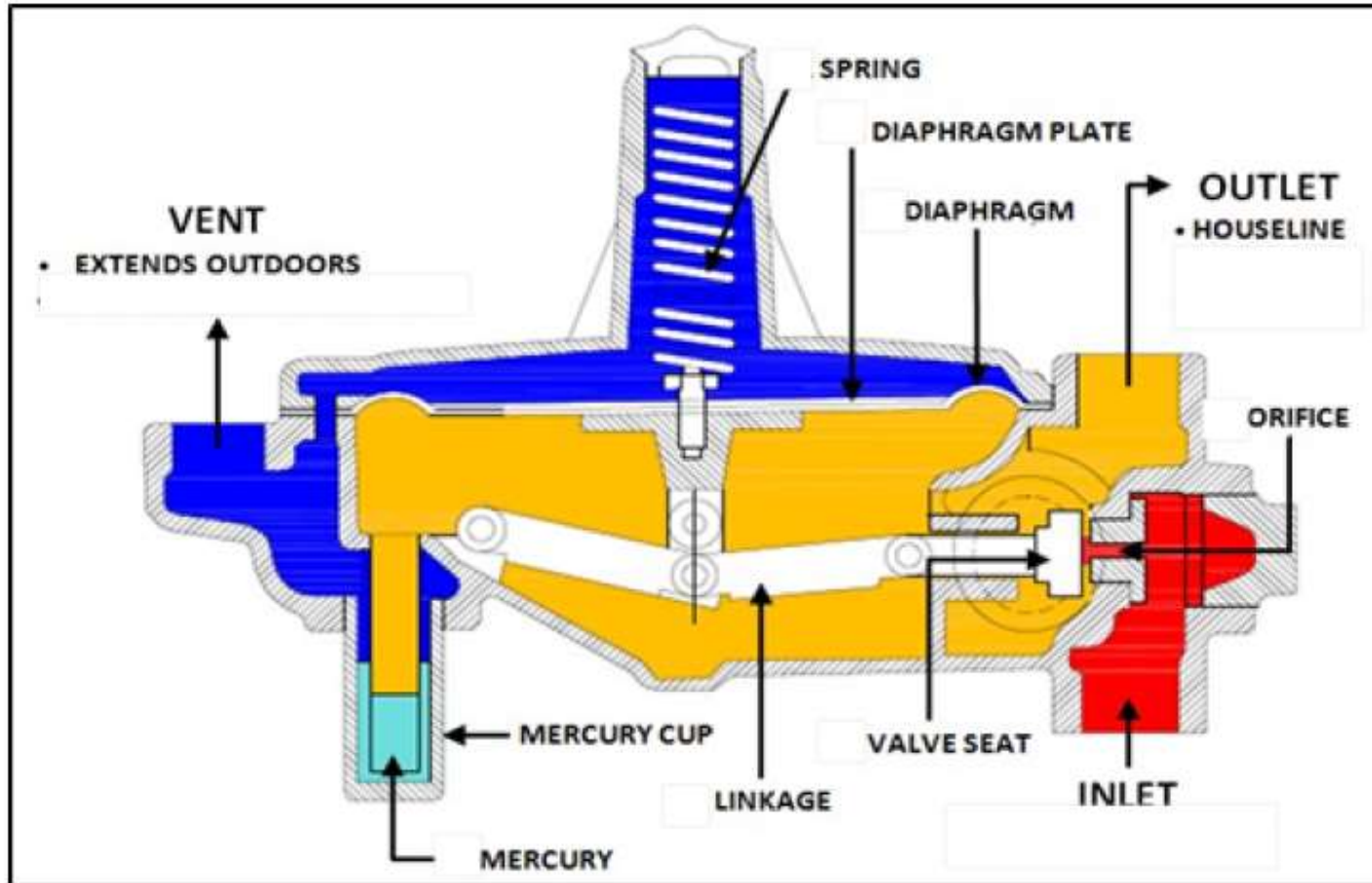
What is a Mercury Regulator?



Mercury Regulators

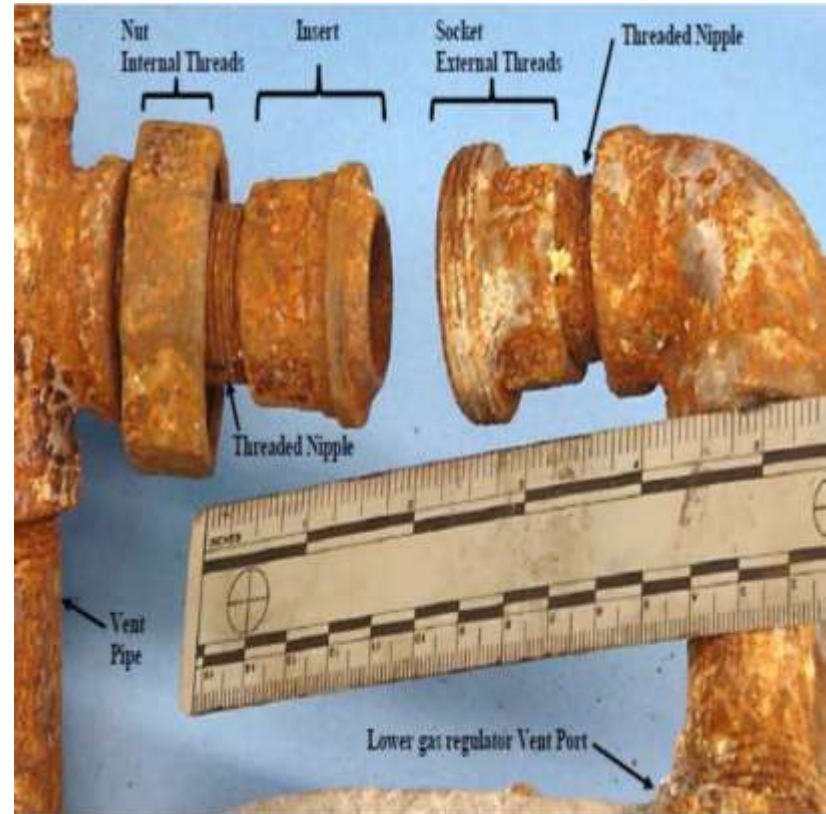


Mercury Regulator Cutaway



Incident Cause

The actual photo of the unthreaded union.



Enforcement Implications

- **Subpart D – Design of Pipeline Components**
- **Subpart H – Customer Meters, Service Regulators, and Service Lines**
- **Subpart I – Requirements for Corrosion Control**
- **Subpart M – Maintenance**
- **Subpart P – Distribution Pipeline Integrity Management (DIMP)**



49 CFR 192

192.199(d)(e)(f) Design of Relief

192.353(a)(b)(c) M&R Location

192.355(b)(1)(2) M&R Protection

192.357(d) M&R Installation

192.481 Atmospheric Corrosion

192.723 Leak Survey



192.199 Requirements for design of relief and limiting devices

(d) Have support made of noncombustible material;

(e) Have discharge stacks, vents, or outlet ports designed to prevent accumulation of water, ice, or snow, located where gas can be discharged into the atmosphere without undue hazard;

(f) Be designed and installed so that the size of the openings, pipe, and fittings located between the system to be protected and the pressure relieving device, and the size of the vent line, are adequate to prevent hammering of the valve and to prevent impairment of relief capacity;



192.353 (a)(b)(c) Customer meters and regulators: Location

Requires each service regulator to be located in a readily accessible location, protected from corrosion and other damage, and that if service regulators are installed in a building they must be located as near as practical to the service line entrance to the building.



**Location
192.353 (a)
Gas service
regulators
must be
installed in
readily
accessible
location.**



Location

192.353 (c)

**Inside meter
must be not
less than 3
feet from any
source of
ignition.**



**Location
192.353 (c)
Each meter
installed
within a
building must
be located in
a ventilated
place.**



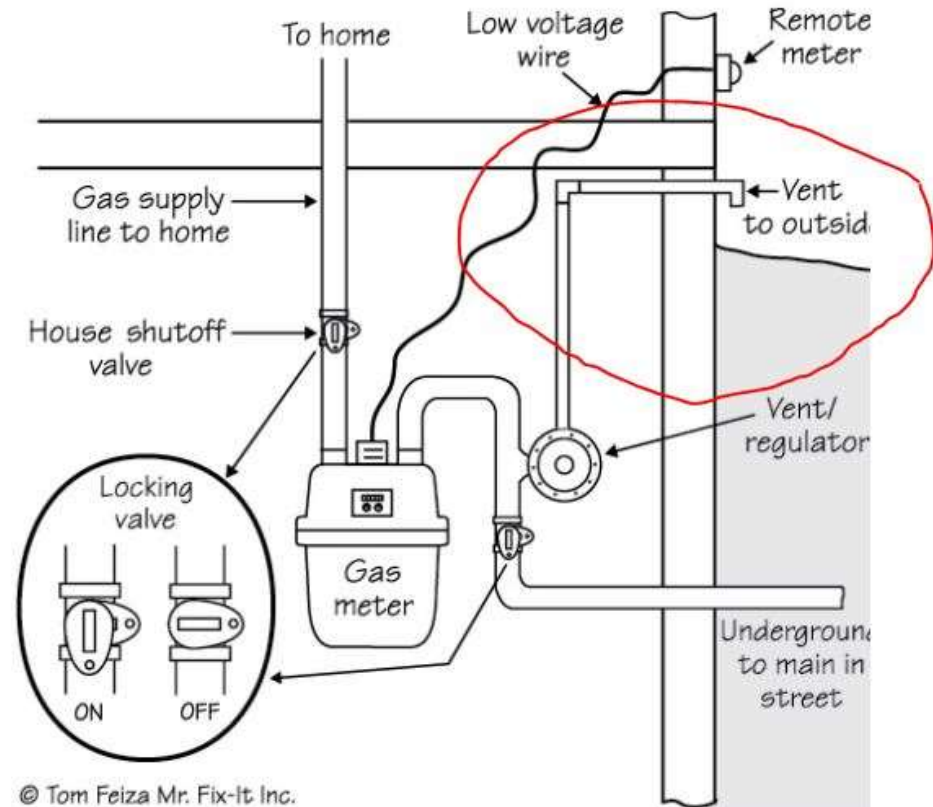
192.355 Customer meters and regulators: Protection from damage.

- (a) Protection from vacuum or back pressure. If the customer's equipment might create either a vacuum or a back pressure, a device must be installed to protect the system.
- (b) *Service regulator vents and relief vents.* Service regulator vents and relief vents must terminate outdoors, and the outdoor terminal must -



Protection 192.355 (b) Service regulator vents and relief vents.

MUST terminate outdoors



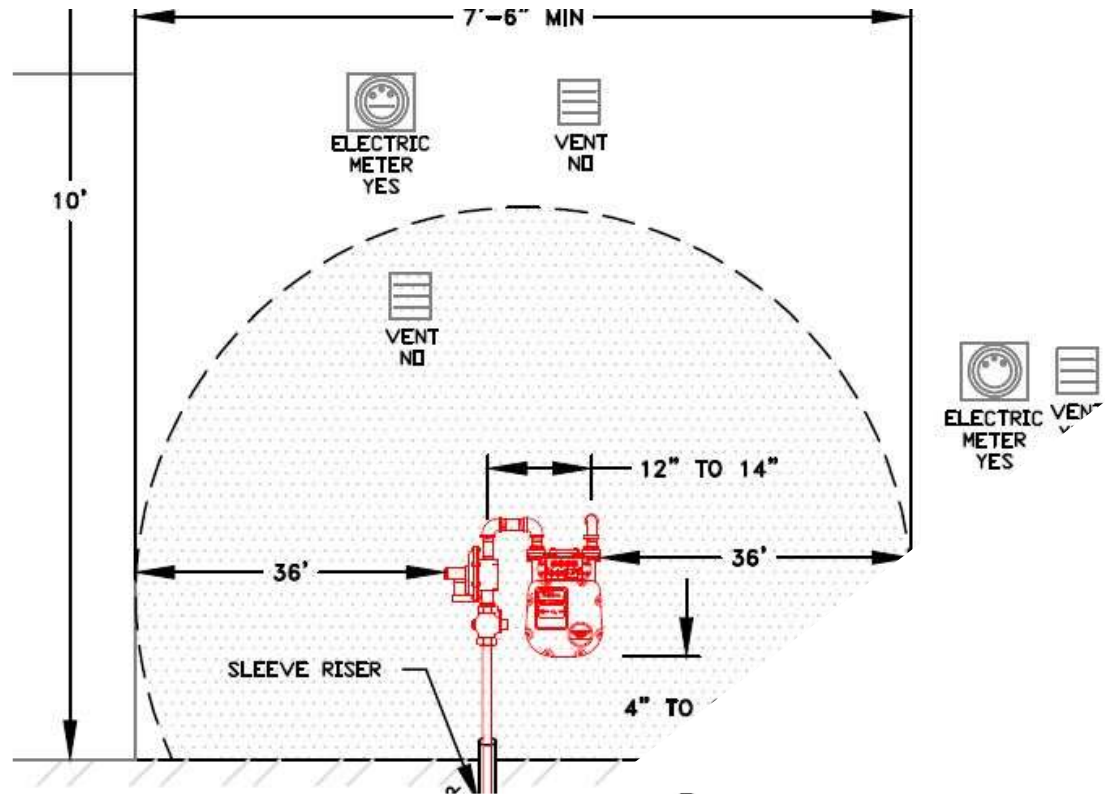
Protection 192.355 (b) (1) MUST

Be rain and
insect
resistant



Protection 192.355 (b) (2) MUST

Be located at a place where gas can escape freely into the atmosphere and away from any opening into the building



Protection 192.355 (b) (3) Vents either service regulators or reliefs, **MUST**

(3) Be protected
from damage
caused by
submergence in
areas where
flooding may
occur



192.357 Customer meters and regulators: Installation.

(a) Each meter and each regulator must be installed so as to minimize anticipated stresses upon the connecting piping and the meter.

(b) When close all-thread nipples are used, the wall thickness remaining after the threads are cut must meet the minimum wall thickness requirements of this part.

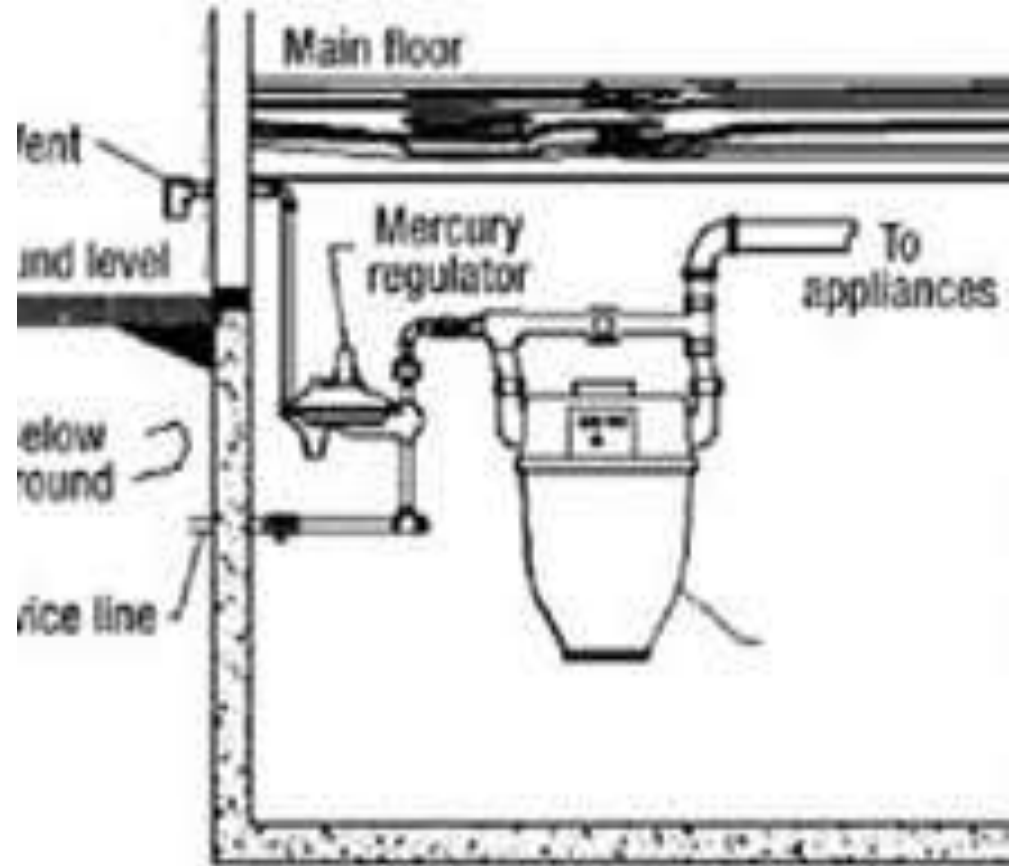
(c) Connections made of lead or other easily damaged material may not be used in the installation of meters or regulators.

(d) Each regulator that might release gas in its operation must be **vented** to the **outside** atmosphere.



Installation 192.357 (d)

Requires
regulators that
might release
gas to be
vented to the
outside
atmosphere



192.481 Atmospheric corrosion control: Monitoring.

(a) Each operator must inspect each pipeline or portion of pipeline that is exposed to the atmosphere for evidence of atmospheric corrosion, as follows:

Onshore - At least once every 3 calendar years, but with intervals not exceeding 39 months

(b) During inspections, the operator must give particular attention to pipe at soil-to-air interfaces, under thermal insulation, under disbonded coatings, at pipe supports, in splash zones, at deck penetrations, and in spans over water.

(c) If atmospheric corrosion is found during an inspection, the operator must provide protection against the corrosion as required by § 192.479.



192.481 Atmospheric corrosion control:

Monitoring.

Perform Every 3 years, Not To Exceed 39 months for inside and outside piping up to the outlet of the meter



192.723 Distribution systems: Leakage surveys.

- a) Each operator of a distribution system shall conduct periodic leakage surveys in accordance with this section.
- (b) The type and scope of the leakage control program must be determined by the nature of the operations and the local conditions, but it must meet the following minimum requirements:
- (1) A leakage survey with leak detector equipment must be conducted in business districts, including tests of the atmosphere in gas, electric, telephone, sewer, and water system manholes, at cracks in pavement and sidewalks, and at other locations providing an opportunity for finding gas leaks, at intervals not exceeding 15 months, but at least once each calendar year.
- (2) A leakage survey with leak detector equipment must be conducted outside business districts as frequently as necessary, but at least once every 5 calendar years at intervals not exceeding 63 months. However, for cathodically unprotected distribution lines subject to § 192.465(e) on which electrical surveys for corrosion are impractical, a leakage survey must be conducted at least once every 3 calendar years at intervals not exceeding 39 months.



192.723 Distribution systems: Leakage surveys.

- **Detector mandatory**
- **Required** for inside and outside piping up to the outlet of the gas meter.
- **Business districts – 1 year, not to exceed 15 months**
- **Outside business districts**
- **5 years** not exceeding 63 months for plastic and cathodically protected lines;
- **unprotected distribution lines every 3 years** not exceeding 39 months.



While doing those surveys...

For Inside meter and regulators why not:

- perform required atmospheric corrosion inspections (192.481)
- perform visual inspections of the meter and regulator which includes the interior and exterior vent piping



Enforcement Implications - DIMP

- **192.1007(a) – Knowledge:** Do you know the location, type, maintenance, and leak call history of ALL your system’s inside meter sets? *Can you demonstrate this to an inspector?*
- **192.1007(b) – Identify Threats:** “An operator must consider reasonably available information to identify existing and potential threats. Sources of data may include, but are not limited to, **incident** and leak history, corrosion control records, continuing surveillance records, patrolling records, maintenance history...”
- **NOTE:** It’s not just *YOUR* system’s incident history! NRC 1155909 (Silver Spring) has put the entire gas distribution industry on notice with respect to indoor meter sets as a system integrity risk.

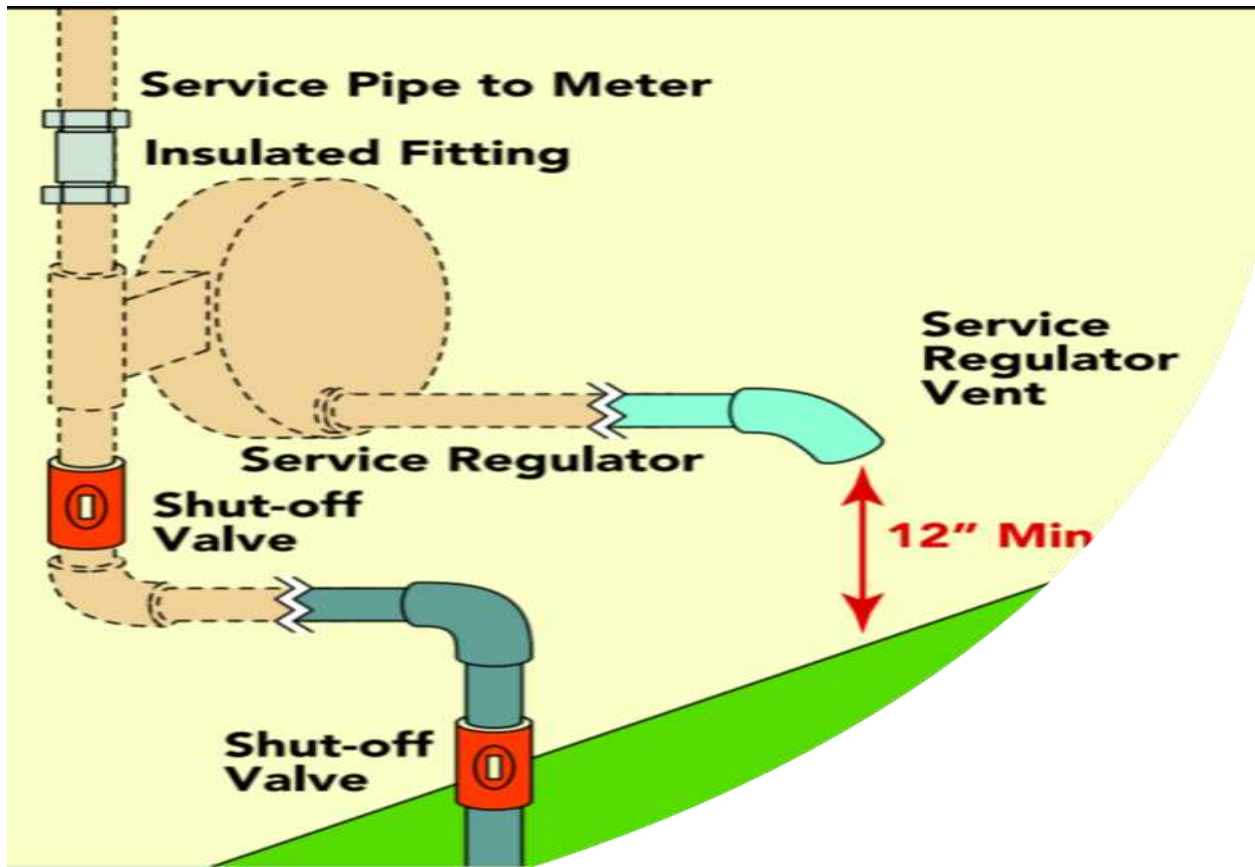


Enforcement Implications – DIMP (cont.)

- **192.1007(d) – Identify and Implement Measures to Address Risks:**
 - Address the possible need for specific measures to address sub-categories of inside meter set risks, e.g., meter types, multi-unit buildings, special venting issues, etc.
 - Special/Accelerated AC & Continuing Surveillance Patrols
 - Vent testing/Replacement/Move out Programs
 - “Red tag” and shut-in as an explicitly considered option to remove risk
 - Others?
- **192.1007(f) – Periodic Evaluation and Improvement: “An operator must re-evaluate threats and risks...”. If you haven’t re-evaluated your DIM program with respect to Silver Spring and other incidents – WHY NOT?**



Considerations when installing and inspecting inside service regulators



And now Sunil Patel...



NTSB Recommendations

To PHMSA

- Require that all new service regulators be installed outside occupied structures
- Require existing interior service regulators be relocated outside occupied structures whenever the gas service line, meter, or regulator is replaced. In addition, multifamily structures should be prioritized over single-family dwellings.



NTSB Recommendations

To MD, VA, DC

- Replace mercury service regulators

To Washington Gas

- Replace Mercury Regulators
- Revise procedures and field forms to require technicians to verify the integrity of vent lines



Make Sure All Piping Inside a Structure is Connected



In Pennsylvania

- **§ 59.33. Safety.**

(a) Responsibility. Each public utility shall at all times use every reasonable effort to properly warn and protect the public from danger, and shall exercise reasonable care to reduce the hazards to which employees, customers and others may be subjected to by reason of its equipment and facilities.



In Pennsylvania

§ 59.18. Meter, regulator and service line location.

(a) *General requirements for meter and regulator location.*

(1) Unless otherwise allowed or required in this section, meters and regulators must be located outside and aboveground.

(8) Meters and service regulators may not be installed in the following locations:

(i) Beneath or in front of windows or other building openings that may directly obstruct emergency fire exits.

(ii) Under interior stairways.

(iii) Under exterior stairways, unless an alternate means of egress exists and the meter and service regulator are installed in a well-vented location under stairs constructed of noncombustible material.

(iv) A crawl space.

(v) Near building air intakes under local or State building codes.

(vi) In contact with soil or other potentially corrosive materials.



In Pennsylvania

§ 59.18. Meter, regulator and service line location. (continued)

(8) Meters and service regulators may not be installed in the following locations:

- (i) Beneath or in front of windows or other building openings that may directly obstruct emergency fire exits.
- (ii) Under interior stairways.
- (iii) Under exterior stairways, unless an alternate means of egress exists and the meter and service regulator are installed in a well-vented location under stairs constructed of noncombustible material.
- (iv) A crawl space.
- (v) Near building air intakes under local or State building codes.
- (vi) In contact with soil or other potentially corrosive materials.



In Pennsylvania

§ 59.18. Meter, regulator and service line location. (continued)

(g) Application of regulation.

- (1) Beginning September 13, 2014, utilities shall comply with this section for new meter, regulator and service line installations in new locations.
- (2) Beginning September 13, 2014, utilities shall comply with this section when replacing existing meters, regulators and service line facilities.

(3) By September 13, 2034, utilities shall complete replacement of existing facilities in compliance with this section or incorporate the requirements of this section in a distribution integrity management plan, whichever occurs first



FL-3-20 Overview

**Total Number of Operators
Responded to FL-3-20 Request**

36

Total Number of Inside Meters

843757

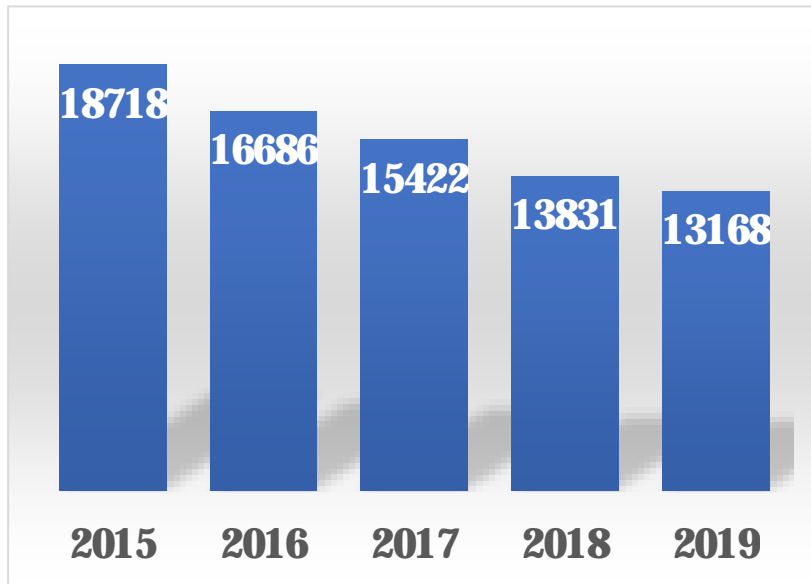
**Total Number of Inside
Mercury Regulators**

13168

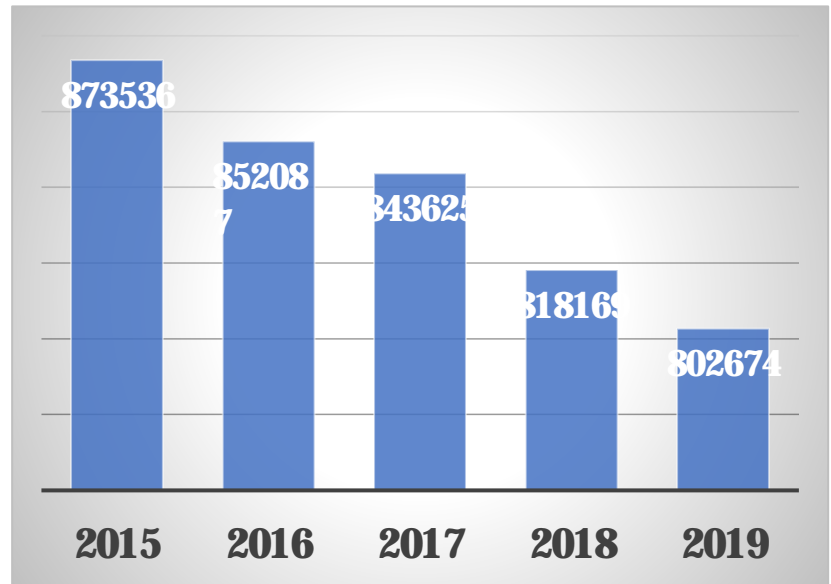


FL-3-20 Large Operators of PA

Total Number Of Mercury Service Regulators On Inside Meters



Total Number of Inside Meters



The Pennsylvania Public Utility Commission

Thank you for your attention!

