

# Valve Installation and Minimum Rupture Detection Standards

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EFFECTIVE DATE OCTOBER 5, 2022



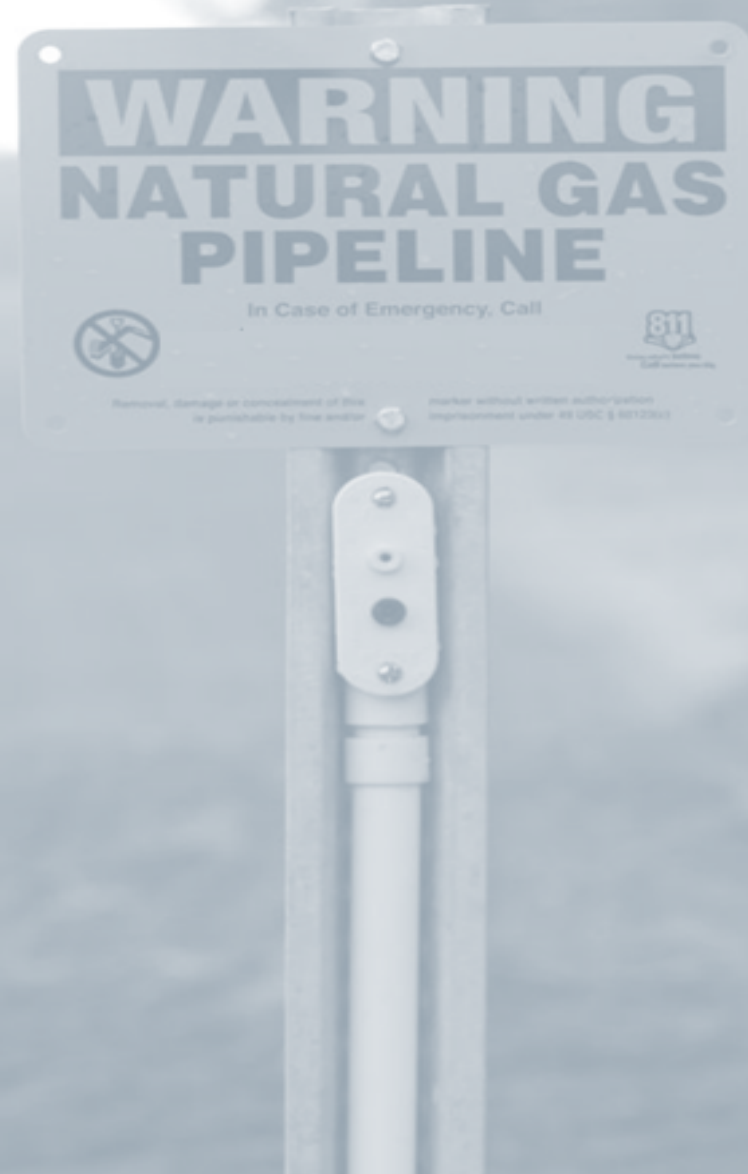
# Tyler L. Dean

Transportation Specialist, Instructor

PHMSA TQ

(405) 627-6752

[tyler.dean@dot.gov](mailto:tyler.dean@dot.gov)



## Why did this Rulemaking Occur?

# Edison, NJ – March 24, 1994

1 person died\*

Destroyed 8 buildings

1,500 Residents Displaced

\$25 Million in Damages

2½ Hours



## Marshall, MI – July 25, 2010

19,000 BBL (800,000 gallons) of  
Crude Oil

\$1 Billion in Property and  
Environmental Damage

18 hours from Initial Alarm



## San Bruno, CA – September 9, 2010

8 people killed

51 injured

Destroys 38 homes

Damaged 70 homes

47 MMCF of Gas

95 Minutes



# PIPES Act of 2011

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## **§60102(n) – Purpose and General Authority, Automatic and Remote-Controlled Shut-off Valves for New Transmission Pipelines**

(1) IN GENERAL-....the Secretary, if appropriate, shall require by regulation the use of automatic or remote-controlled shut-off valves, or equivalent technology, ...on transmission pipeline facilities constructed or entirely replaced after the date on which the Secretary issues the final rule containing such requirement.

# PIPES Act of 2011

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## **§60102(n) – Purpose and General Authority, Automatic and Remote-Controlled Shut-off Valves for New Transmission Pipelines**

### (2) HIGH-CONSEQUENCE AREA STUDY-

(A) STUDY- .... conduct a study on the ability of transmission pipeline facility operators to respond to a hazardous liquid or gas release from a pipeline segment located in a high-consequence area.

(B) CONSIDERATIONS- ....shall consider the swiftness of leak detection and pipeline shutdown capabilities, the location of the nearest response personnel, and the costs, risks, and benefits of installing automatic and remote-controlled shut-off valves.



# What Part 192 code sections changed?

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## The following is a list of new or amended code sections:

- §192.3 – Definitions
- §192.18 – How to notify PHMSA
- §192.179 – Transmission line valves
- §192.610 – Change in class location: Change in valve spacing**
- §192.615 – Emergency Plans
- §192.617 – Investigation of Failures and incidents
- §192.634 – Transmission lines: Onshore valve shut-off for rupture mitigation**
- §192.635 – Notification of potential rupture**
- §192.636 – Transmission lines: Response to a rupture; capabilities of rupture-mitigation valves (RMVs) or alternative equivalent technologies**
- §192.745 – Valve Maintenance: Transmission lines
- §192.935 – What additional preventive and mitigative measures must an operator take?

## §192.3 – Definitions

Entirely replaced onshore transmission pipeline segment

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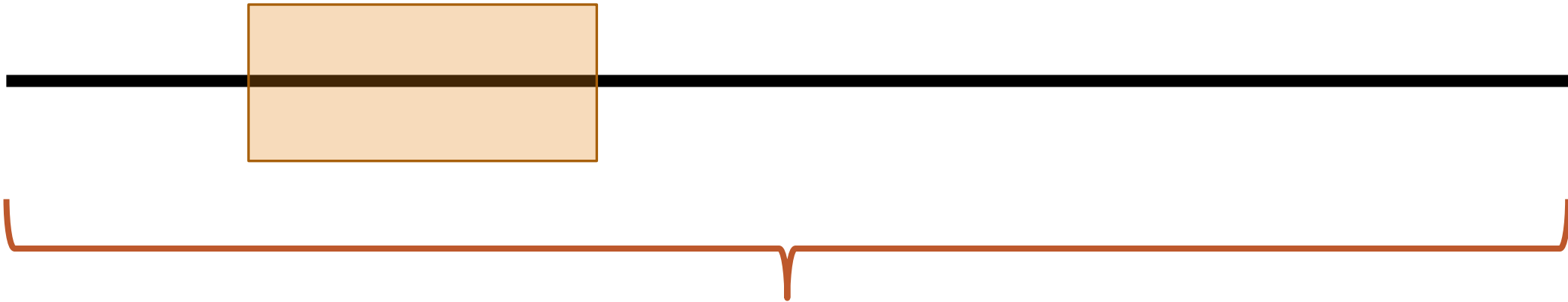
**Entirely replaced onshore transmission pipeline segment means**, for the purposes of §192.179 and §192.634, where 2 or more miles, in the aggregate, of onshore transmission pipeline have been replaced within any 5 contiguous miles of pipeline within any 24-month period.

# Definitions

Entirely replaced onshore transmission pipeline segment

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**June 2023  
Replaced 1.5 Miles**

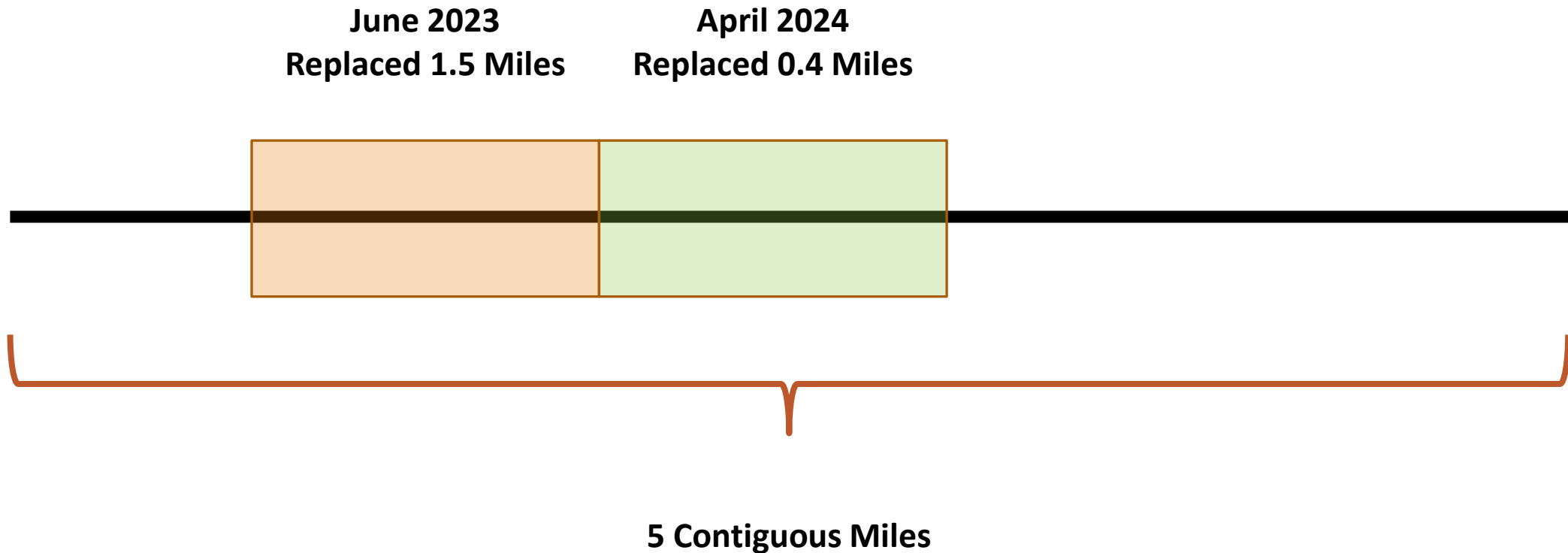


**5 Contiguous Miles**

# Definitions

Entirely replaced onshore transmission pipeline segment

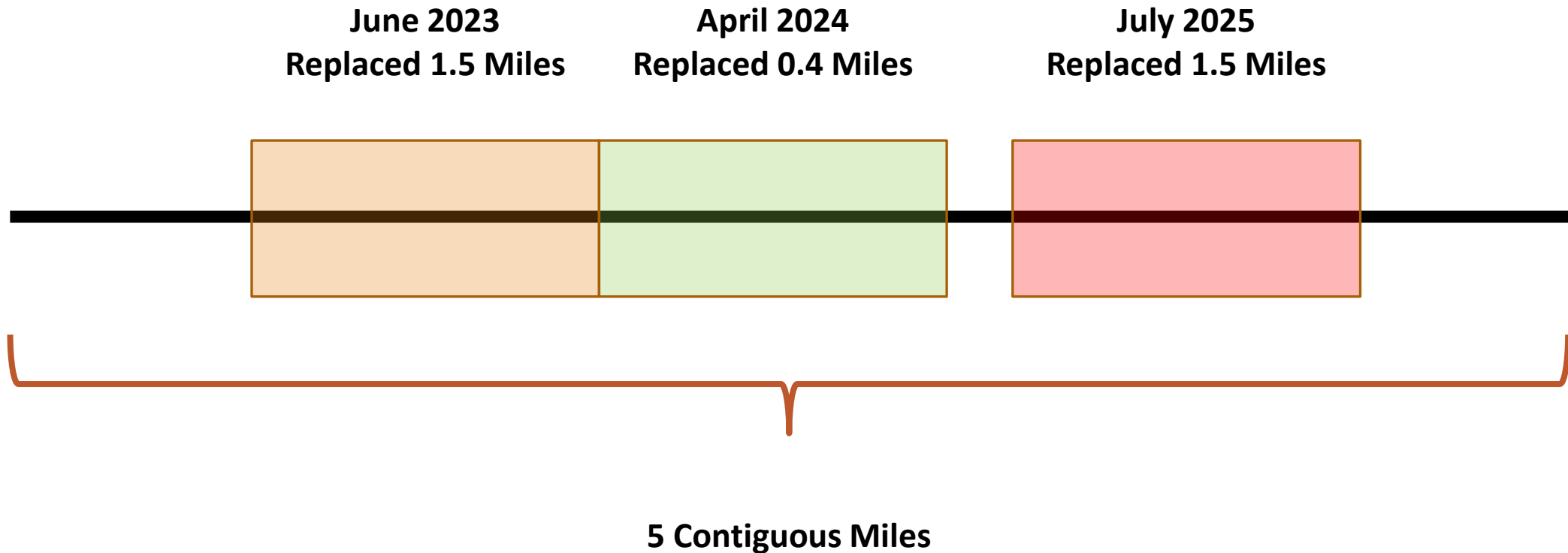
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# Definitions

Entirely replaced onshore transmission pipeline segment

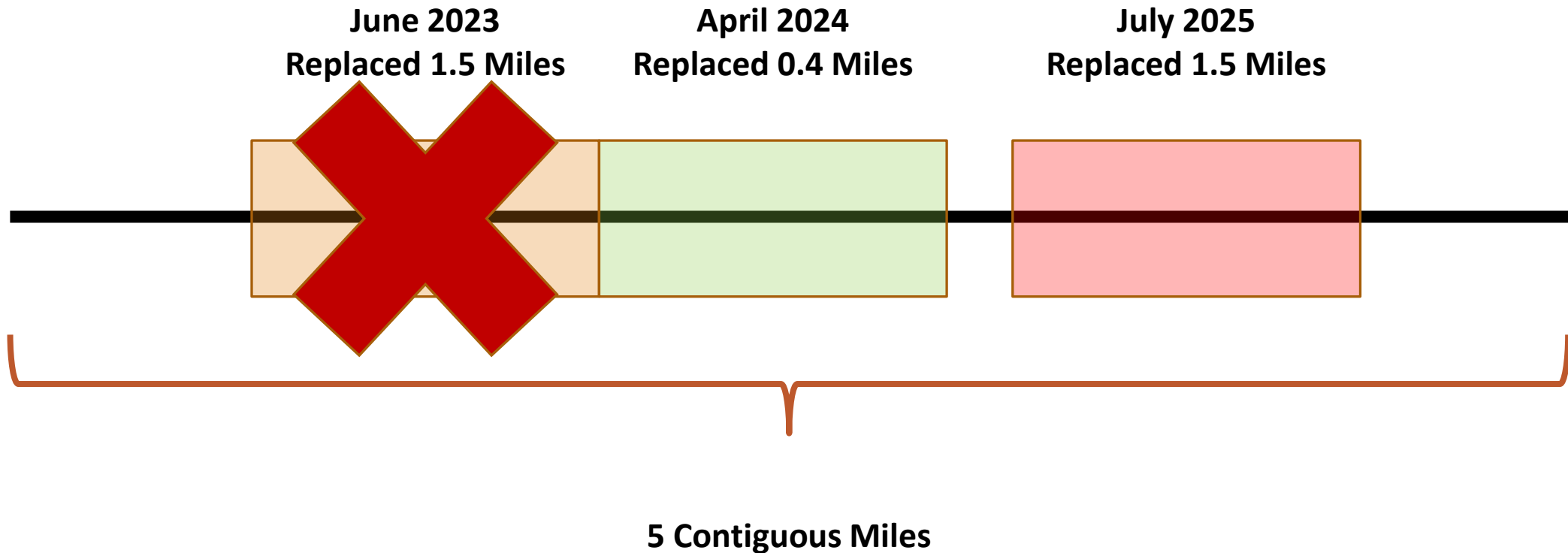
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# Definitions

Entirely replaced onshore transmission pipeline segment

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# Definitions

## Notification of Potential Rupture

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**Notification of potential rupture** means the notification to, or observation by, an operator of indicia identified in §192.635 of a potential unintentional or uncontrolled release of a large volume of gas from a pipeline.

# Definitions

## Rupture-Mitigation Valve (RMV)

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**Rupture-mitigation valve (RMV)** means an automatic shut-off valve (ASV) or a remote-control valve (RCV) that a pipeline operator uses to minimize the volume of gas released from the pipeline and to mitigate the consequences of a rupture.



# §192.179 – Transmission Line Valves

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## For New or Entirely Replaced Transmission Lines

- Constructed after April 10, 2023
- Greater than or Equal to 6”
- Located within an HCA
- Replacement project involves a valve
  - Addition, Replacement, or Removal
- Exemption: Class 1 or Class 2 with a PIR less than 150’

# §192.179 – Transmission Line Valves

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## **Alternative Equivalent Technology**

- Must notify PHMSA (§192.18) (90 Days in Advance)
- Must include a technical and safety evaluation
- Must comply with §192.634 and §192.636

# §192.179 – Transmission Line Valves

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## **Alternative Equivalent Technology – Manual Valve**

Must include a demonstration that installation of RMV as otherwise required would be;

- Economically,
- Technically, or
- Operationally infeasible

Exception: Manual Compressor Station Valve

# §192.179 – Transmission Line Valves

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## Pipe Replacements – Valve Spacing Requirements

The valve spacing requirements of paragraph (a) of this section do not apply to pipe replacements on a pipeline if the distance between each point on the pipeline and the nearest valve does not exceed:

Class Location	Nearest Valve	Total Spacing
Class 1 or Class 2	10 Miles	20 Miles
Class 3	7 ½ Miles	15 Miles
Class 4	4 Miles	8 Miles

# §192.610 – Change in Class Location: Change in valve spacing

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## **Pipe Replacement to meet MAOP (§192.611, §192.619, §192.620)**

Class Location change occurs after October 5, 2022

<b>Length of Replacement</b>	<b>Replacement Period</b>	<b>Applicable Rule</b>
2 or More Miles / 5 Contiguous Miles	24 Months	§192.610(a)
Less than 2 miles / 5 Contiguous Miles	24 Months	§192.610(b)
Less than 1000' / 1 Contiguous Mile	24 Months	§192.610(c)

# §192.610 – Change in Class Location: Change in valve spacing

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## §192.610(a) – 2 or more miles

- §192.179, §192.634 and §192.635 apply
- Apply to **NEW** Class Location
- Must install RMV (or alternative equivalent technologies)

Must be installed within 24 months of class location change

# §192.610 – Change in Class Location: Change in valve spacing

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## **§192.610(b) – Less than 2 miles**

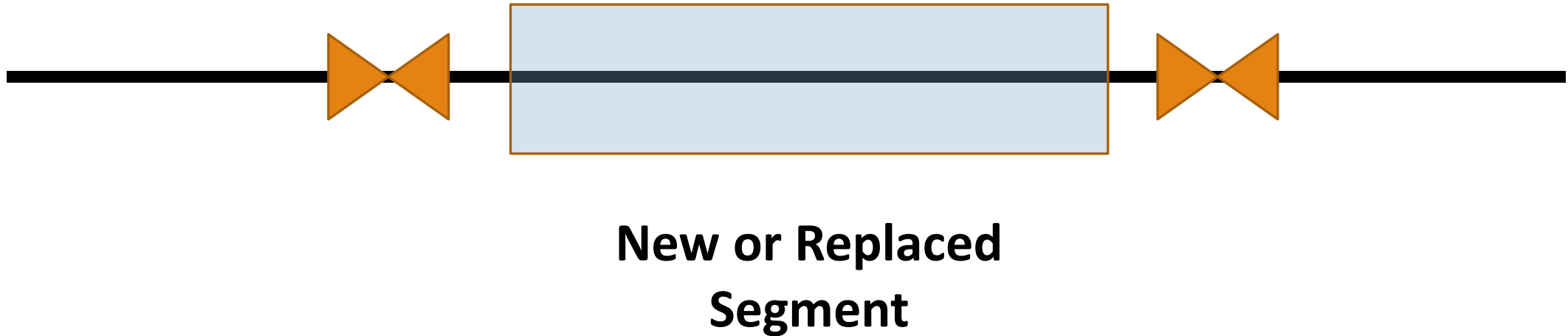
- Comply with Valve Spacing in §192.179(a),  
or
- Install or use existing RMVs or alternative existing technologies
- Must not exceed 20 miles between RMVs
- Must comply with §192.636

Must comply within 24 months of class location change

# §192.634 – Transmission Lines: Onshore Valve shut-off for rupture mitigation

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## Shut-off segment

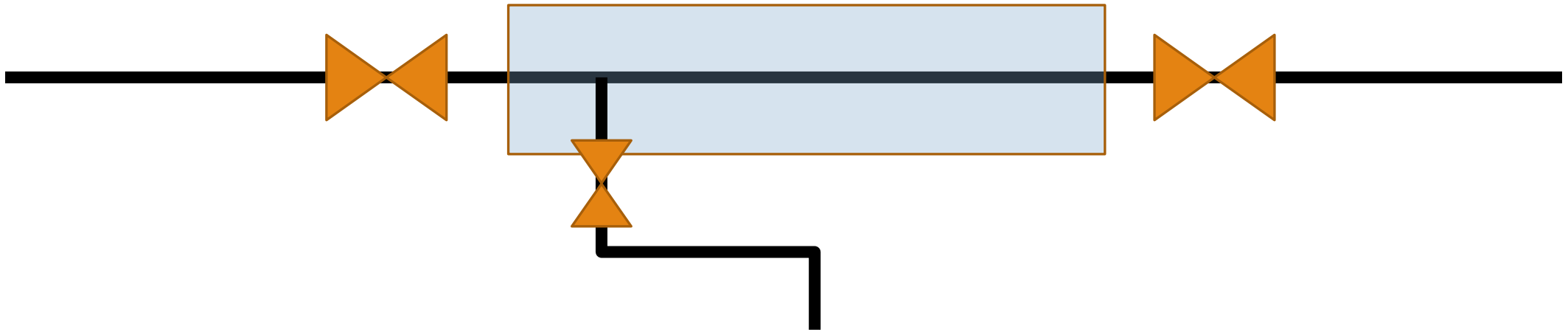




# §192.634 – Transmission Lines: Onshore Valve shut-off for rupture mitigation

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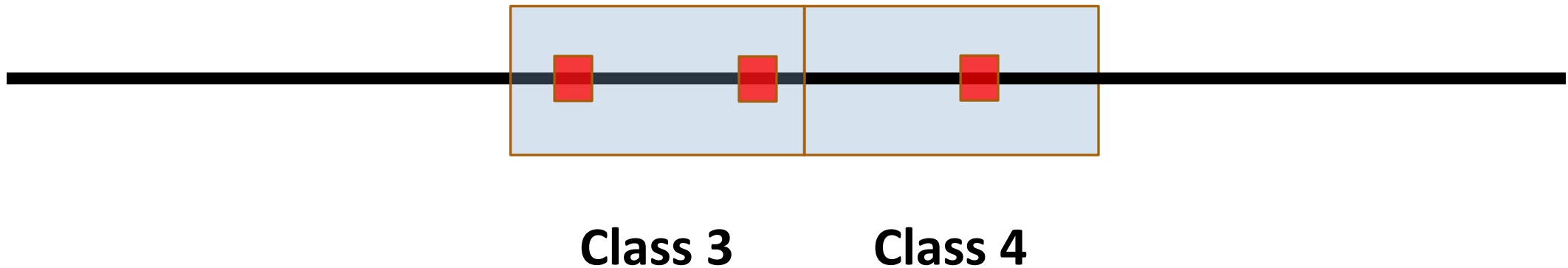
## Shut-off segment (Lateral/Crossover)



# §192.634 – Transmission Lines: Onshore Valve shut-off for rupture mitigation

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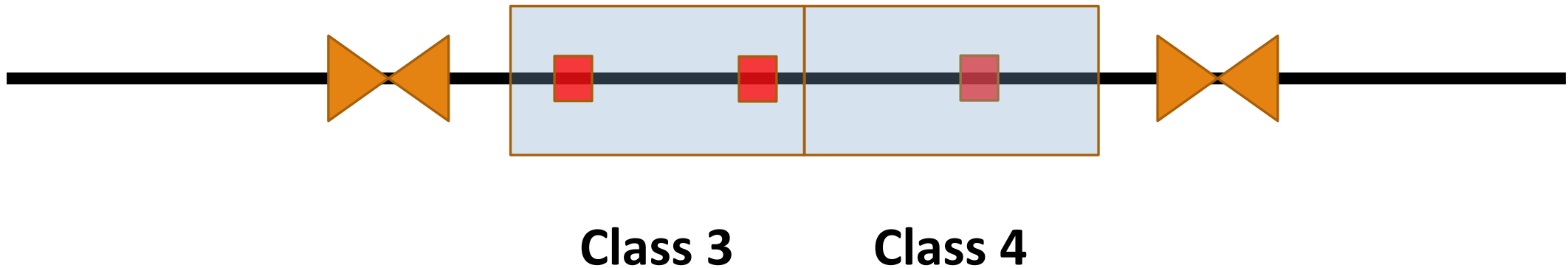
## Shut-off segment (Multiple Criteria)



# §192.634 – Transmission Lines: Onshore Valve shut-off for rupture mitigation

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## Shut-off segment (Multiple Criteria)



# §192.634 – Transmission Lines: Onshore Valve shut-off for rupture mitigation

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## **Laterals**

RMV's or Alternative Equivalent Technologies can be installed at points other than mainline receipt or delivery points if the length of the lateral does not contribute more than 5% of Total Shut-Off Segments gas volume. (Calculated as Max Flow at Operating Pressure)

# §192.634 – Transmission Lines: Onshore Valve shut-off for rupture mitigation

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## **Laterals (Check valves)**

Laterals less than or equal to 12”, check valves can be used as an alternative equivalent technology.

Not subject to §192.636

Must be inspected, operated, and remediated per §192.745

Must notify PHMSA per §192.18/ §192.179

# §192.634 – Transmission Lines: Onshore Valve shut-off for rupture mitigation

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## **Crossovers (Manual Valves)**

Manual Valves as an alternative equivalent technology can be used in lieu of RMV if:

- Locked and closed during normal operations
- Develop and Implement operating procedures
- Document the valves are closed and locked (lock-out/tag-out)
- Notify PHMSA per §192.18 and §192.179

# §192.634 – Transmission Lines: Onshore Valve shut-off for rupture mitigation

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## **§192.634(c) – Manual Operation**

Must develop and implement operating procedures that;

- Designate and Locate nearby personnel
- Account for response and action times
- Must be done in 30 minutes of rupture identification (§192.636)

# §192.635 – Notification of Potential Rupture

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## **Who must the operator consider as sources of rupture notification or observation?**

- Operator (i.e. Control Room Operator)
- Field Personnel
- Nearby Pipeline Personnel (or other utility worker)
- Local First Responders
- Public Authorities
- Public



# §192.635 – Notification of Potential Rupture

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## **What indications must an operator consider?**

Unanticipated or Unexplained

- Pressure Loss
- Flow Rate Change
- Pressure Change
- Equipment Function or Instrumentation Indication
- Release of Large Volume of Gas
- Fire or Explosion (immediate vicinity)

# §192.635 – Notification of Potential Rupture

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## **When does a notification occur?**

A notification of potential rupture occurs when an operator first receives notice of or observes an event specified in §192.635(a)

# §192.636 – Response to a rupture and capabilities of RMV

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## **When must a valve be fully closed after rupture identification?**

- Rupture Mitigation Valves must be **Fully Closed** within 30 Minutes
- Left Open IF detrimental to Public Safety
  - Established in Operating Procedures
  - Notified PHMSA (§192.18)
  - Coordinated with Local Emergency Responders
  - Procedures to determine if left open (environmental factors included)
  - Communication Plan with Local Emergency Responders

# §192.636 – Response to a rupture and capabilities of RMV

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## **Valve Monitoring and Operation Capabilities**

Must be capable of monitoring or controlled as follows:

- Operated during normal, abnormal and emergency conditions
- Monitored for Status
  - Position and Upstream/Downstream Pressures
  - ASV/Manual – Monitor pressure or flow between RMV
- Back-up power to SCADA or Communications System

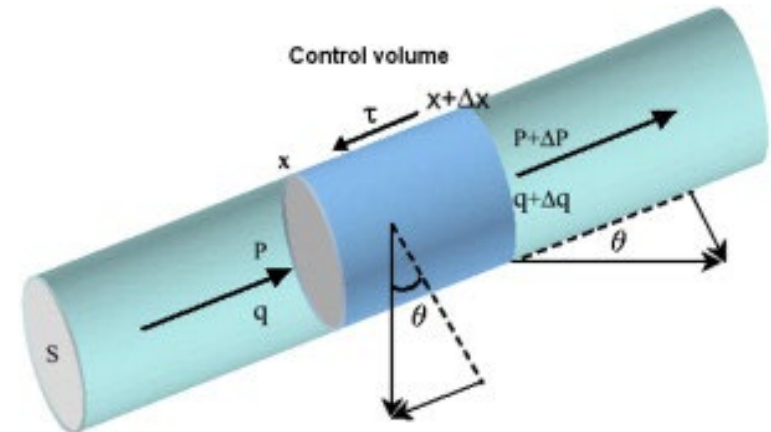
# §192.636 – Response to a rupture and capabilities of RMV

## Flow Modeling for Automatic Shutoff Valves

Flow Modeling for the Shut-Off Segment, including laterals, so that the valves will close within 30 minutes.

Must Include:

- Anticipated Maximum, Normal or other flow volumes
- Operating Conditions (15 Month)
- Between RMV or Looped System



# §192.636 – Response to a rupture and capabilities of RMV

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## **Non-HCA Manual Valves – Class 1**

If a request pursuant to §192.18 and §192.179 for manual valves, the operator can also request an exemption from §192.636(b)

*(30 Minute time to closure)*

# §192.745 – Valve Maintenance: Transmission lines

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Must conduct Point-to-Point Verification per §192.631 (c) & (d)

## Alternative Equivalent Technology

- 30 Minute Drill – Validation (Full Closure)
- Random Selection AEV in lieu of RMV (25% Drill)
- Revise Response Efforts (30 Minute Failure)
- Lessons Learned
- Does not apply to §192.636(g)

# §192.745 – Valve Maintenance: Transmission lines

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## Remedial Measures

Repair / Replace within 12 months and

Designate alternative valve withing 7 Calendar Days

Document and Confirm ASV Shut-in pressures annually  
(not to exceed 15 months)



# §192.935 – What additional preventive and mitigative measures must an operator take?

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Risk Analysis for gas releases and protection against ruptures

If a RMV is determined to be an efficient means of adding protection to HCA in event of gas release, must install RMV

Periodic Evaluations

Risk Analysis per §192.935(c) must be reviewed by the operator and certified by a senior executive of the company. Must occur once per calendar year, not to exceed 15 months.

Also occurs within 3 months of an incident or SRC

# §192.617 – Investigation of failures and incidents

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## Post-failure and incident procedures

Each operator must establish and follow procedures for investigating and analyzing **failures and incidents** as defined in § 191.3, including sending the failed pipe, component, or equipment for laboratory testing or examination, where appropriate, for the purpose of determining the causes and contributing factor(s) of the failure or incident and minimizing the possibility of a recurrence.

**APPLIES TO ALL OPERATORS**

# §192.617 – Investigation of failures and incidents

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## **Post-failure and incident lessons learned**

Each operator must develop, implement, and incorporate lessons learned from a post-failure or incident review into its written procedures, including personnel training and qualification programs, and design, construction, testing, maintenance, operations, and emergency procedure manuals and specifications.

**APPLIES TO ALL OPERATORS**

# §192.617 – Investigation of failures and incidents

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## **Analysis of Rupture and Valve Shut-offs**

If an incident involves the closure of a rupture-mitigation valve (RMV) or the closure of alternative equivalent technology, the operator of the pipeline must also conduct a post-incident analysis of all of the factors that may have impacted the release volume and the consequences of the incident and identify and implement operations and maintenance measures to prevent or minimize the consequences of a future incident.

**APPLIES TO TRANSMISSION ONLY**

# §192.617 – Investigation of failures and incidents

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## **Rupture post-failure and incident summary**

The operator must complete a summary of the post-failure or incident review within 90 days of the incident

If the investigation is pending, conduct quarterly status reviews until the investigation is complete and a final post-incident summary is prepared.

Must be reviewed, dated and signed by the appropriate Senior Executive Officer

All investigation and analysis documents and records of lessons learned must be kept for the applicable life of the pipeline

**APPLIES TO TRANSMISSION ONLY**

# §192.615 – Emergency Plans

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## **Communication with Emergency Responders and Officials**

Establishing and maintaining adequate means of communication with the appropriate public safety answering point (911) or appropriate emergency coordinating agencies.

**APPLIES TO ALL OPERATORS**

# §192.615 – Emergency Plans

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## **Actions to take in Emergency**

Taking necessary actions, including but not limited to, emergency shutdown, valve shut-off, or pressure reduction, in any section of the operator's pipeline system, to minimize hazards of released gas to life, property, or the environment.

**APPLIES TO ALL OPERATORS**

# §192.615 – Emergency Plans

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## **Emergency Response**

Notifying the appropriate public safety answering point available for the location of the pipeline of gas pipeline emergencies to coordinate and share information to determine the location of the emergency (Planned Responses and Actual Responses).

**APPLIES TO ALL OPERATORS**



# §192.615 – Emergency Plans

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## Rupture

The operator must immediately and directly notify the appropriate public safety answering point or other coordinating agency for the communities and jurisdictions in which the pipeline is located after receiving a notification of potential rupture, as defined in Sec. 192.3, to coordinate and share information to determine the location of any release, **regardless of whether the segment is subject to the requirements of Sec. 192.179, Sec. 192.634, or Sec. 192.636.**

# §192.615 – Emergency Plans

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## Control Room Actions

Actions required to be taken by a controller during an emergency in accordance with the operator's emergency plans and requirements set forth in §192.631, §192.634, and §192.636.

**APPLIES TO ALL OPERATORS (Except §192.634 and §192.636)**

# §192.615 – Emergency Plans

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## Rupture Identification

Each operator must develop written rupture identification procedures to evaluate and identify whether a notification of potential rupture, as defined in Sec. 192.3, is an actual rupture event or a non-rupture event. **APPLIES TO ALL OPERATORS**

For operators installing valves in accordance with Sec. 192.179(e), Sec. 192.179(f), or that are subject to the requirements in Sec. 192.634, those **procedures must provide for rupture identification as soon as practicable.**

# §192.615 – Emergency Plans

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## **Establish and Maintain Liaison with Emergency Responders and Officials**

Each operator must establish and maintain liaison with the appropriate public safety answering point (i.e., 9–1–1 emergency call center) where direct access to a 9–1–1 emergency call center is available from the location of the pipeline, as well as fire, police, and other public officials

**APPLIES TO ALL OPERATORS**

# Anyone have a friend who owns a pipeline?

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