



# Safety Management Systems in Pipeline Operations

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U.S. Department of Transportation  
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Safety Administration

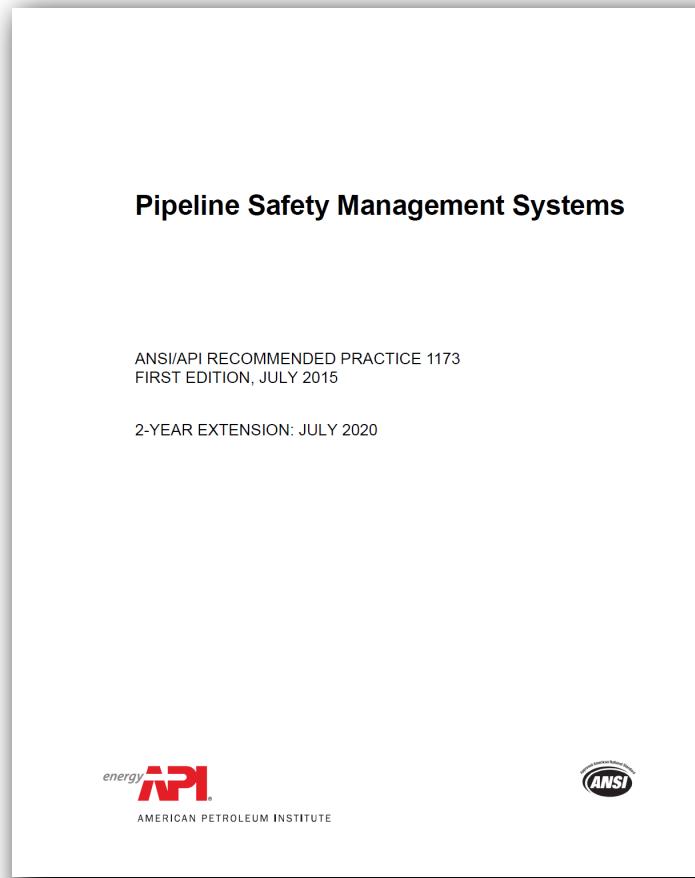
PHMSA: Your Safety is Our Mission

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# Pipeline Safety Management System

- In 2015, the pipeline industry completed the development of a framework for Pipeline Safety Management System (Pipeline SMS) designed specifically for pipeline operators.



# Pipeline Safety Management System

- API RP 1173 is the culmination of a two-year effort by pipeline operators, state and federal regulators, and other engaged stakeholders collaborating to advance to the goal of zero incidents.



# PSMS Objectives

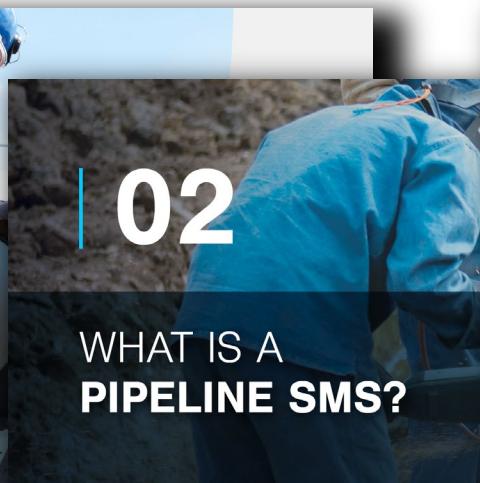
- Be proactive.
- Document procedures and require strict adherence.
- Treat operator errors as system deficiencies and not as reasons to punish and intimidate.
- Require senior company management to commit.



**01**

WHY A PIPELINE SMS WILL BENEFIT  
**PIPELINE SAFETY**

Introduction to Pipeline SMS Implementation



**02**

WHAT IS A  
**PIPELINE SMS?**

Introduction to Pipeline SMS Implementation



**03**

HOW TO  
**IMPLEMENT  
A PIPELINE SMS**

An Introductory Guide with Implementation  
Suggestions and Strategies

**Pipeline SMS**

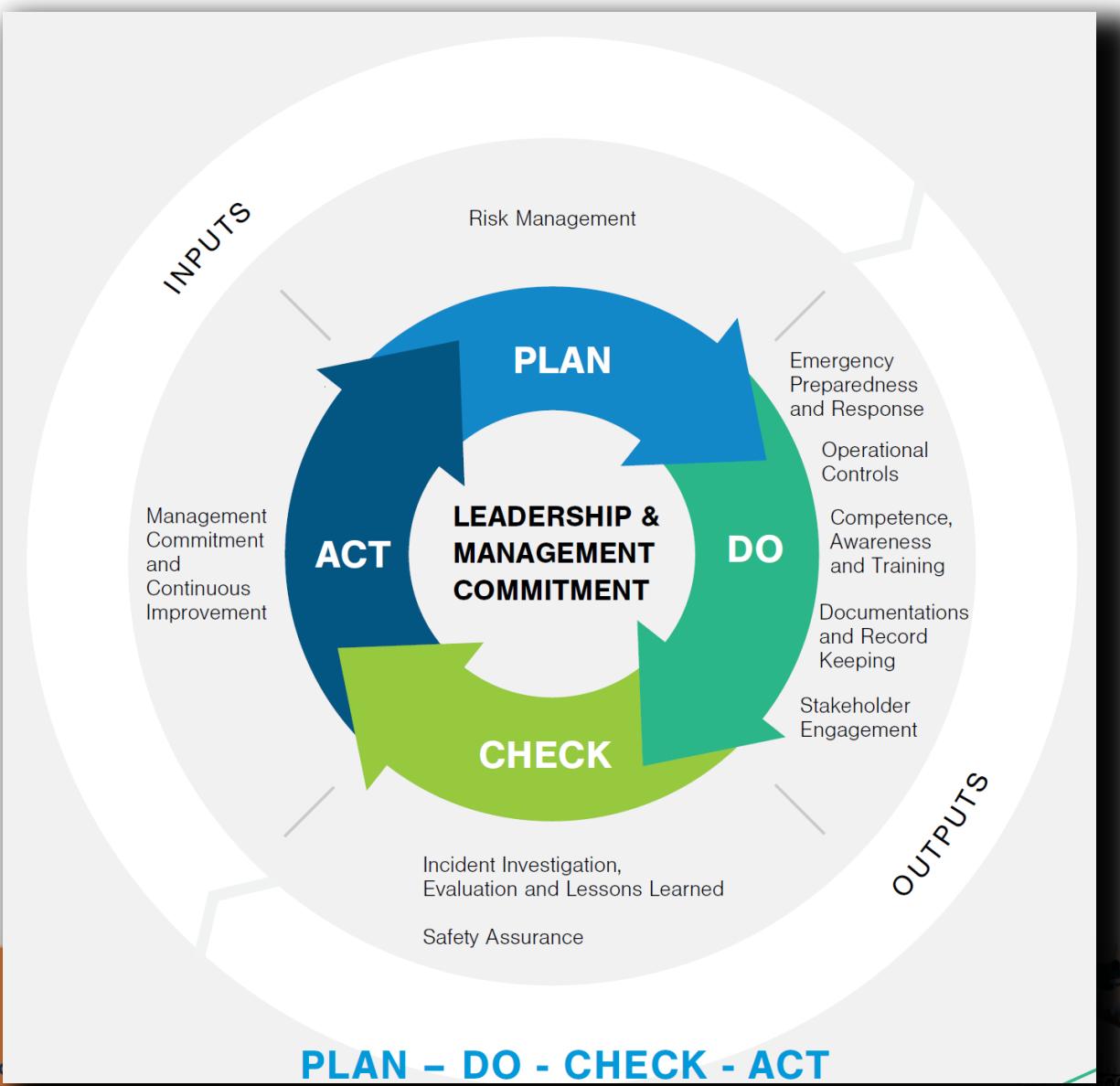


# PSMS Objectives

- Identify personnel responsible for safety initiatives and oversight.
- Implement a non-punitive method for employees to report safety hazards.
- Continuously identify and address risks in all aspects of operations.
- Provide safety assurance by regularly evaluating operations to identify and address risks.



# PSMS PDCA Cycle



# PSMS Elements

- Leadership and Management Commitment
- Stakeholder Engagement
- Risk Management
- Operational Controls
- Incident Investigation, Evaluation, and Lessons Learned



# PSMS Elements

- Safety Assurance
- Management Review and Continuous Improvement
- Emergency Preparedness and Response
- Competence, Awareness and Training
- Documentation and Record Keeping



# PSMS Safety Culture

- Implementing Pipeline SMS elements strengthens an organization's safety culture.
- Establishing safety as a core value, and more importantly demonstrating actions which reflect safety as a core value, strengthens the organization's safety culture.

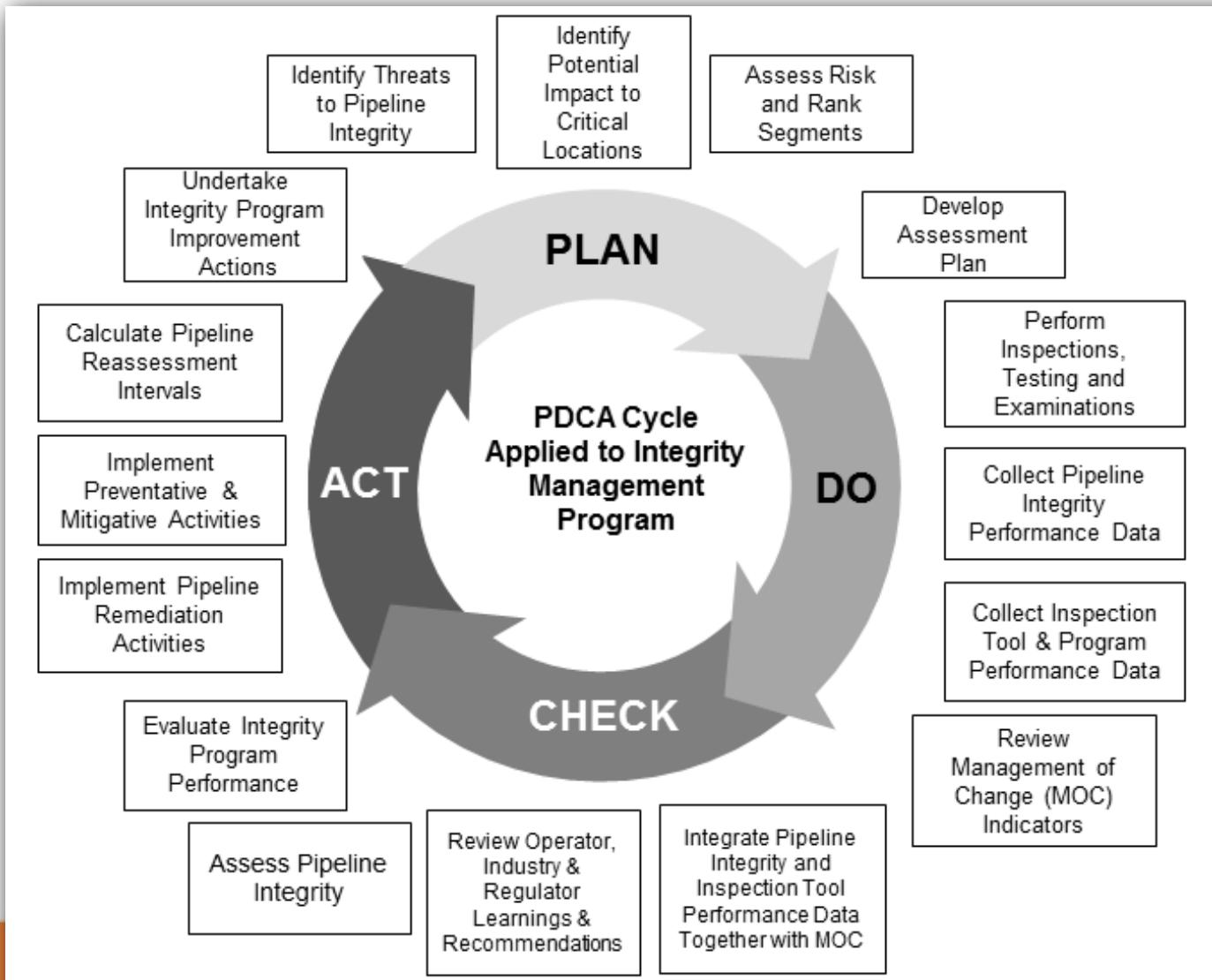


# PSMS Safety Culture

- The Pipeline SMS with each of its discrete elements supports safety culture, and that culture feeds back into the management system in a continuous process.
- The result is a strengthened safety culture and an increasingly mature safety performance improvement focus within the organization.



# Integrity Management Program



# IMP Goals

- Verify existing information and capture unknown information
- Identify threats to the system and ensure the system is functioning as designed
- Continually monitor the condition of the system and identify systemic problems
- Replace or repair identified concerns in order of importance
- Document new information including those found from failure investigations.



# System Knowledge

- What is the pipeline made of?
- How was it constructed?
- How was it protected?
- How was it operated?
- What data is available and what is not?
- How can I capture more information?



# Identify Threats

- What has occurred to the pipeline?
- What might occur to the pipeline?
- What issues has industry identified?
- Where are failures occurring?
- What new threats are we finding?
- What about
  - Failure investigations
  - Interactive threats
  - Near misses
  - Employee/contractor errors



# Identify Threats

- Corrosion
- Natural forces
- Excavation damage
- Other outside force damage
- Material or welds
- Equipment failure
- Incorrect operations
- Any other issues that could threaten the integrity of its pipeline.



# Evaluate and Rank Risk

- Risk models
  - Cumulative
  - Probabilistic
  - SME
- Data Accuracy
  - How is data gathered?
  - How is it disseminated?
  - How is data verified?
  - How is stored?
- Does the risk ranking make sense?
- Can threats be deactivated?
- What if I find a new risk?
- What triggers a reevaluation?



# Addressing Risk

- Determine the current condition of the pipeline from existing data and risk analysis
- Measures must include
  - Preventative and Mitigative or Accelerated Actions
- Common Measures
  - Pipe replacement programs
  - Integrity digs
  - Leak management programs
  - Direct and indirect assessments



# Measure, Monitor, Evaluate

- Operators must
  - Develop a program to review their defined performance measures
  - Monitor results of the programs
  - Determine if their P&M measures are effective and if not address shortcomings
  - Gas transmission and Liquid lines must incorporate and spatially correlate new data from assessments with existing information



# Periodic Evaluation and Improvement

- Operators should define
  - How often they will evaluate the program
  - Who will be involved
  - Management that has signed off on program
  - Training requirements if necessary
- Evaluations should include
  - New and old data
  - Effectiveness of programs
  - Goals and shortcomings
  - New industry or vendor information

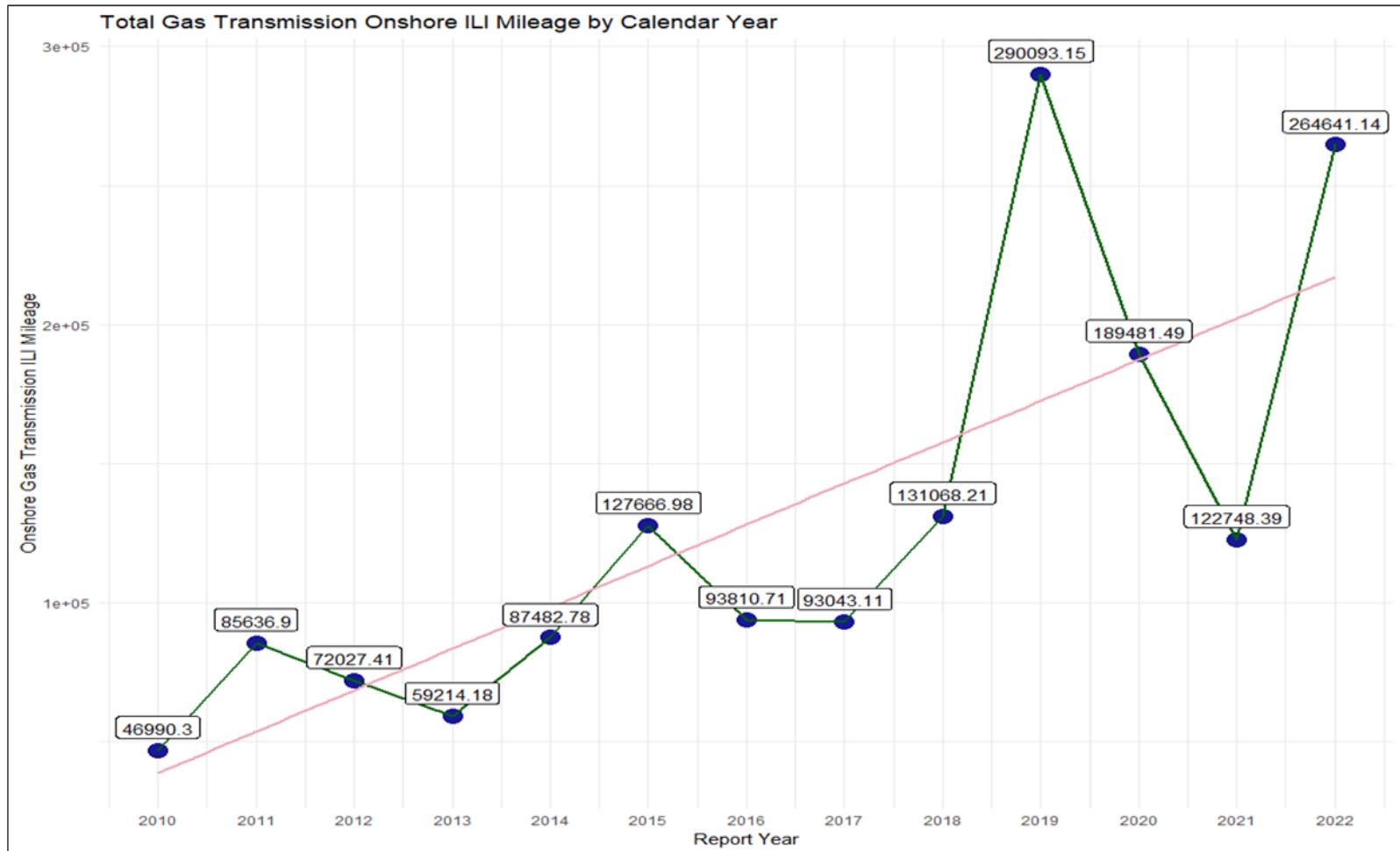


# Periodic Evaluation and Improvement

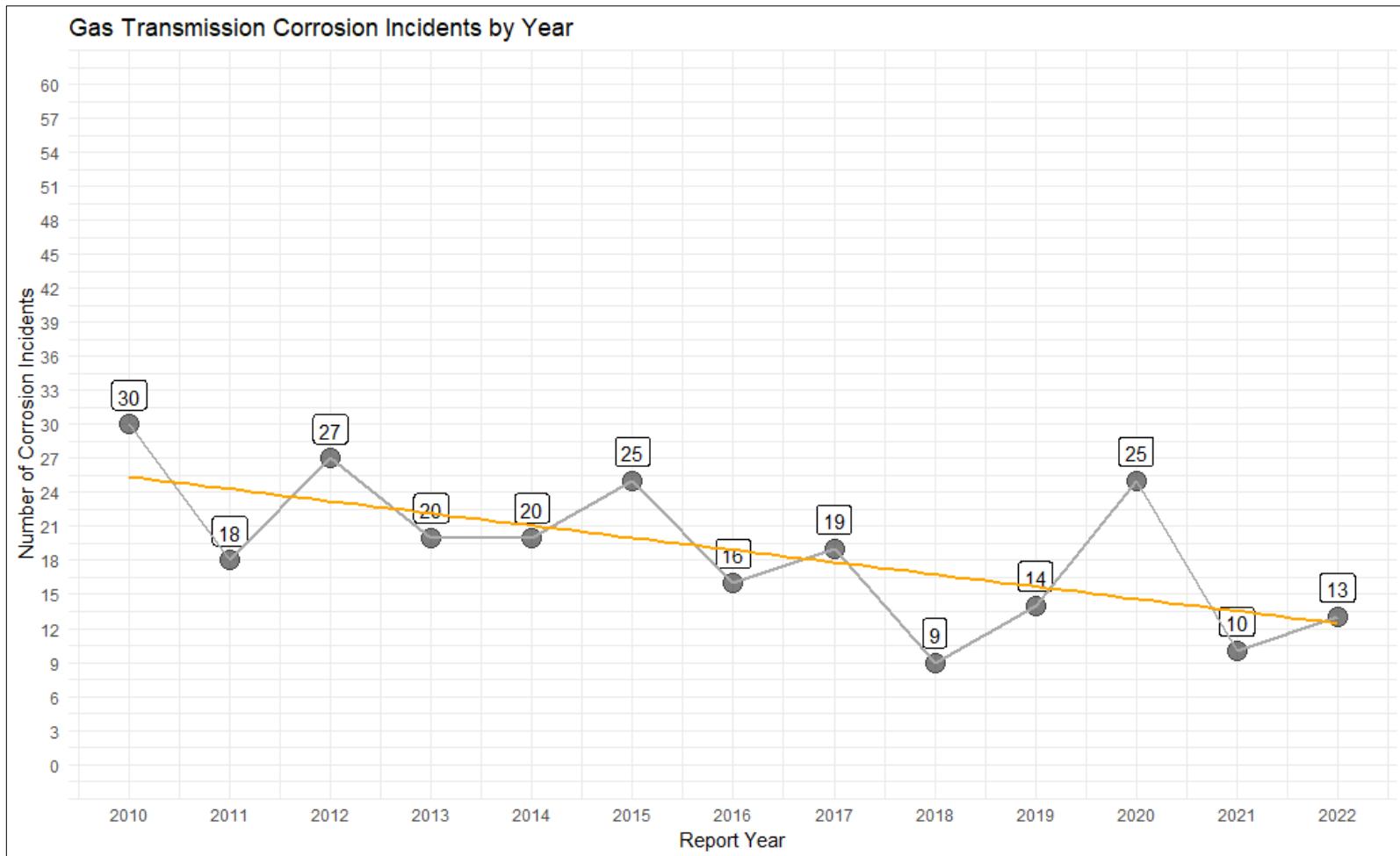
- Keep in mind
  - Bad trends are not always bad things
  - Several risks can be addressed with a single P&M measure
  - Initiatives don't always work the first time
  - Operators don't always take credit for things they do
- Have a discussion with the operator



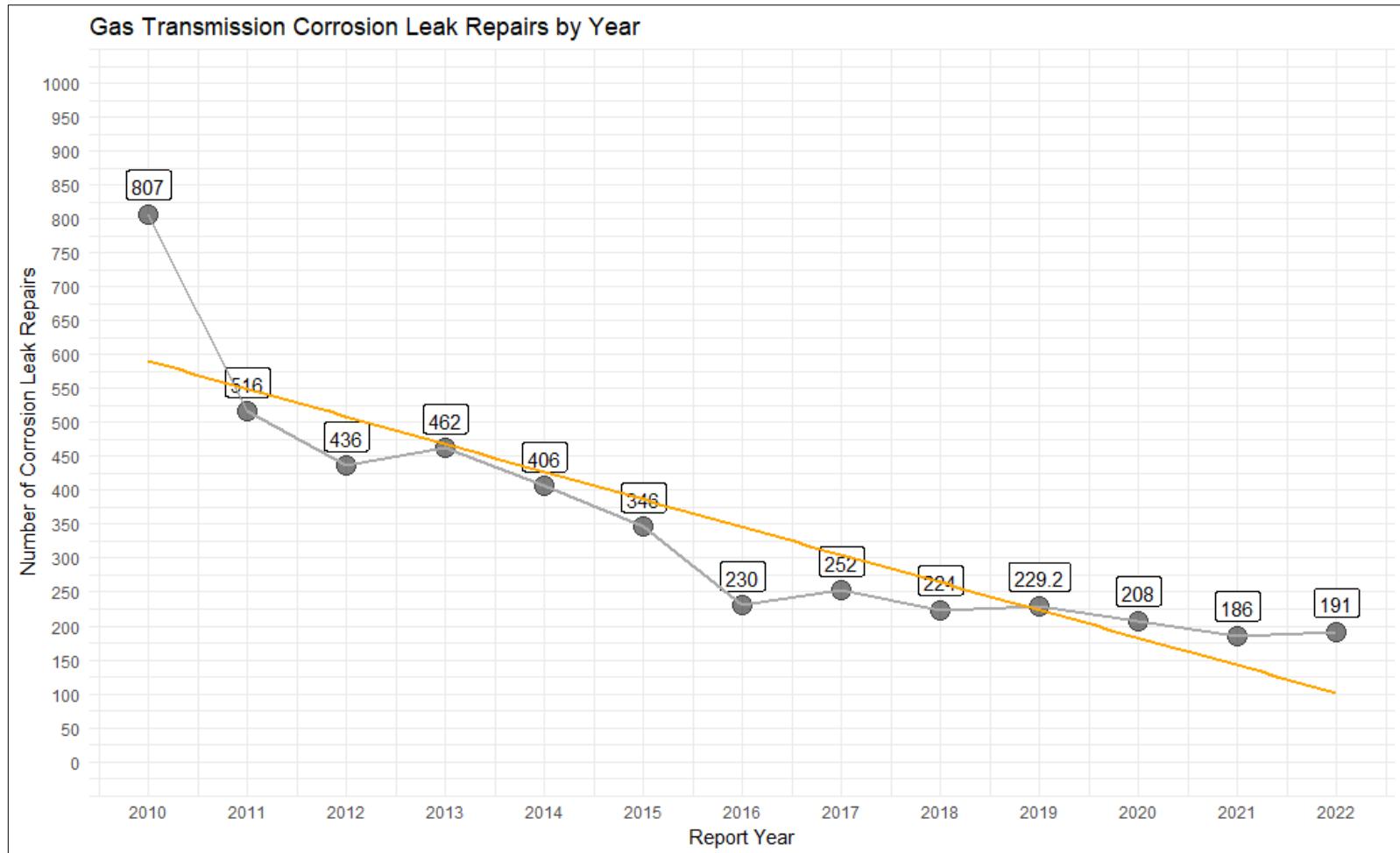
# Effectiveness of IMP



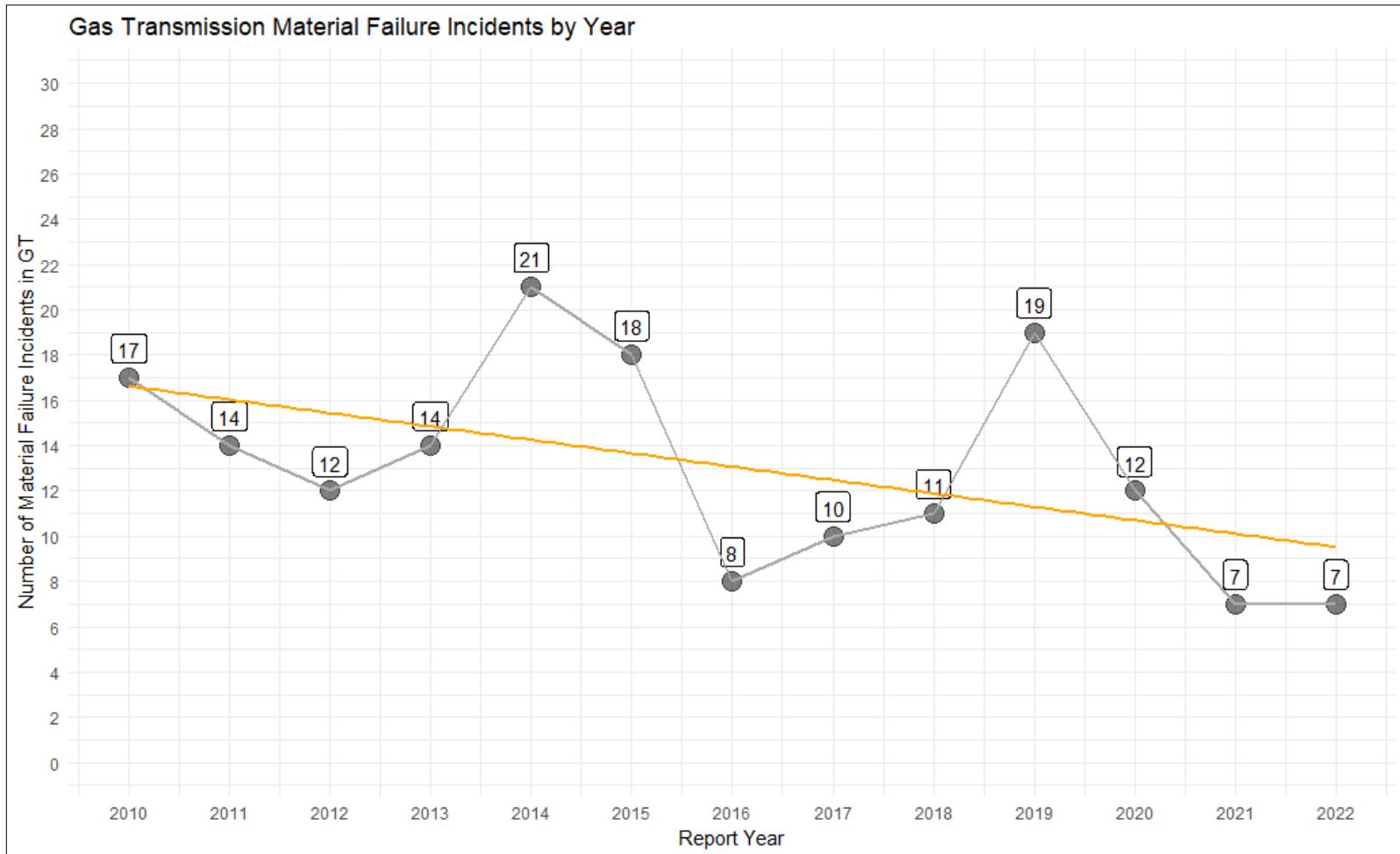
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# Effectiveness of IMP



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# Questions?

