



Safety Management Systems in Pipeline Operations

Bryan Lethcoe, Director, SW Region, Office of Pipeline Safety



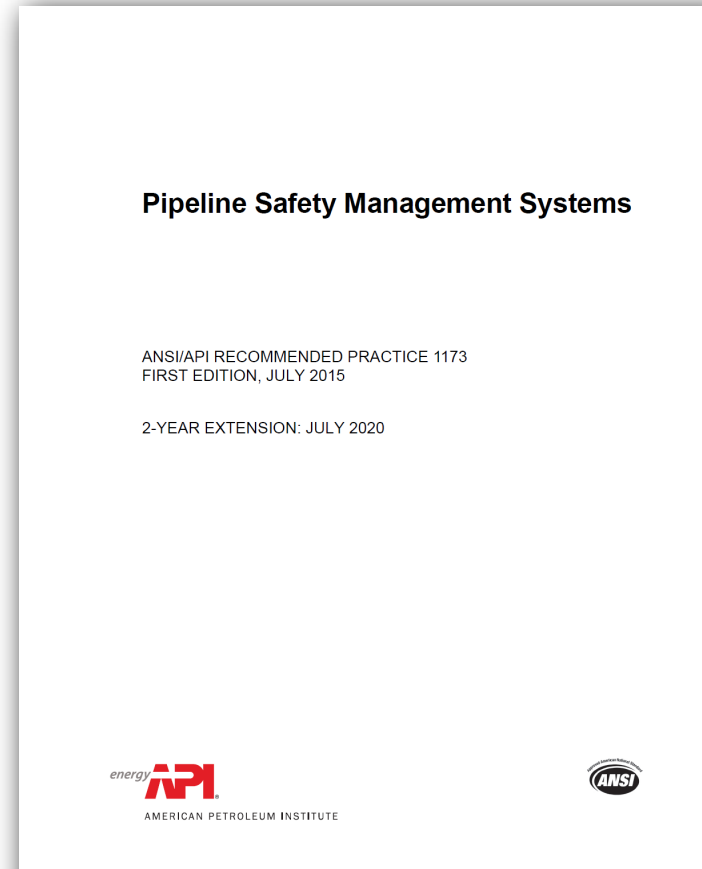
U.S. Department of Transportation
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Pipeline Safety Management System

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



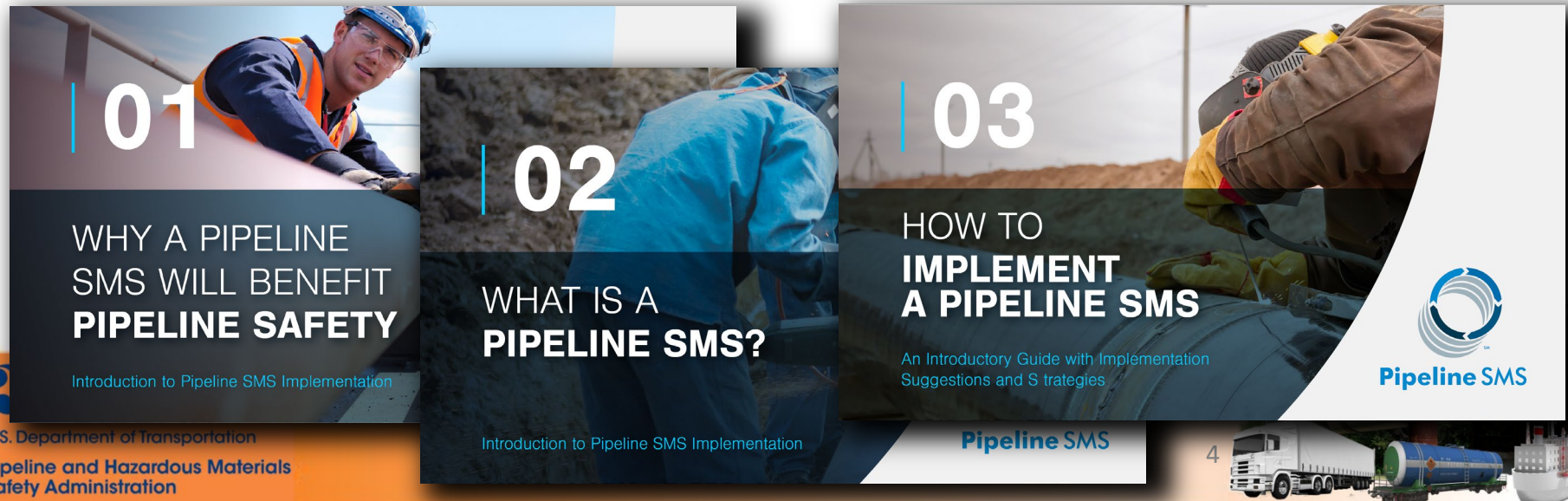
Pipeline Safety Management System

- 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.

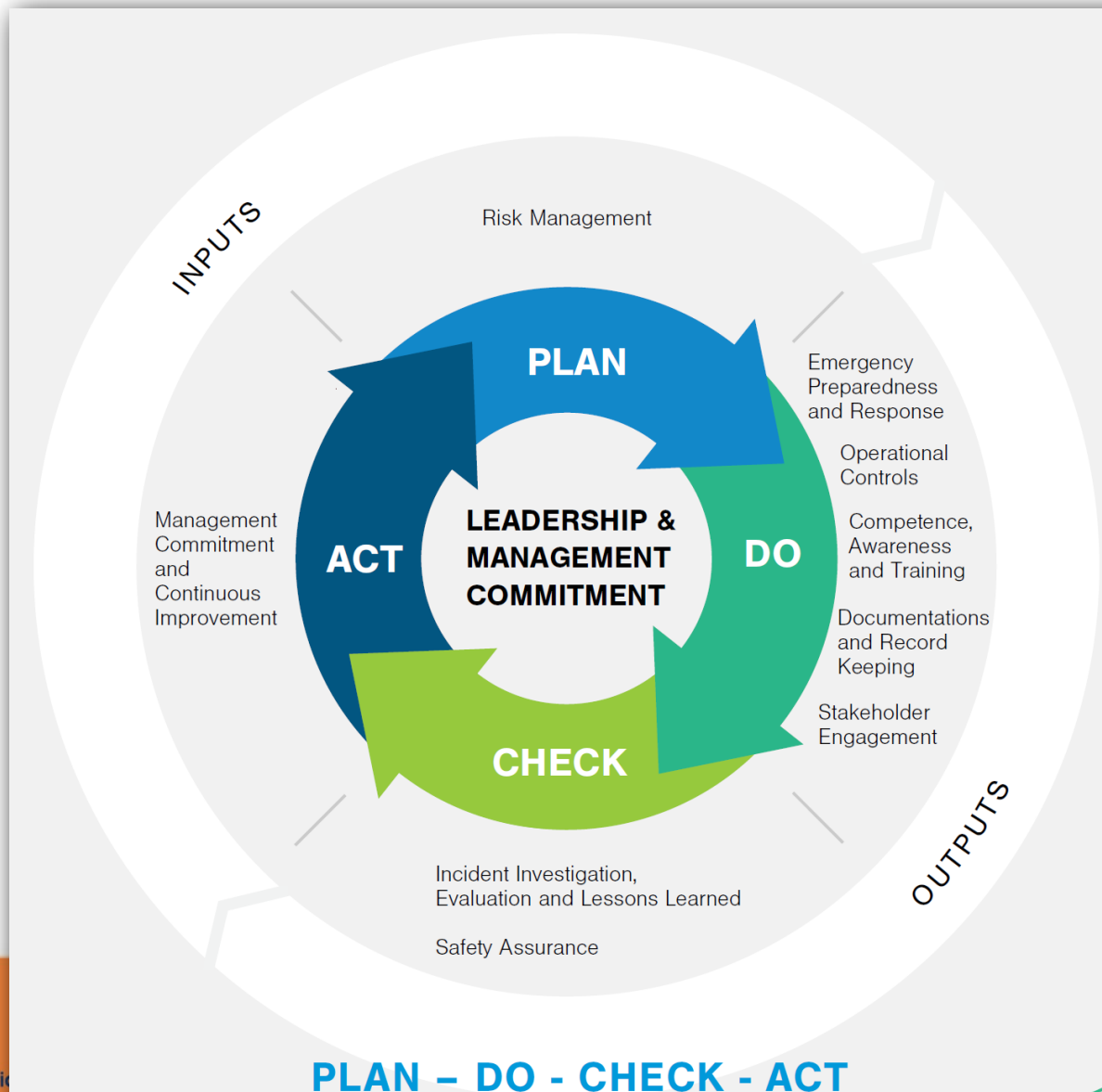


PSMS Objectives

- 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.

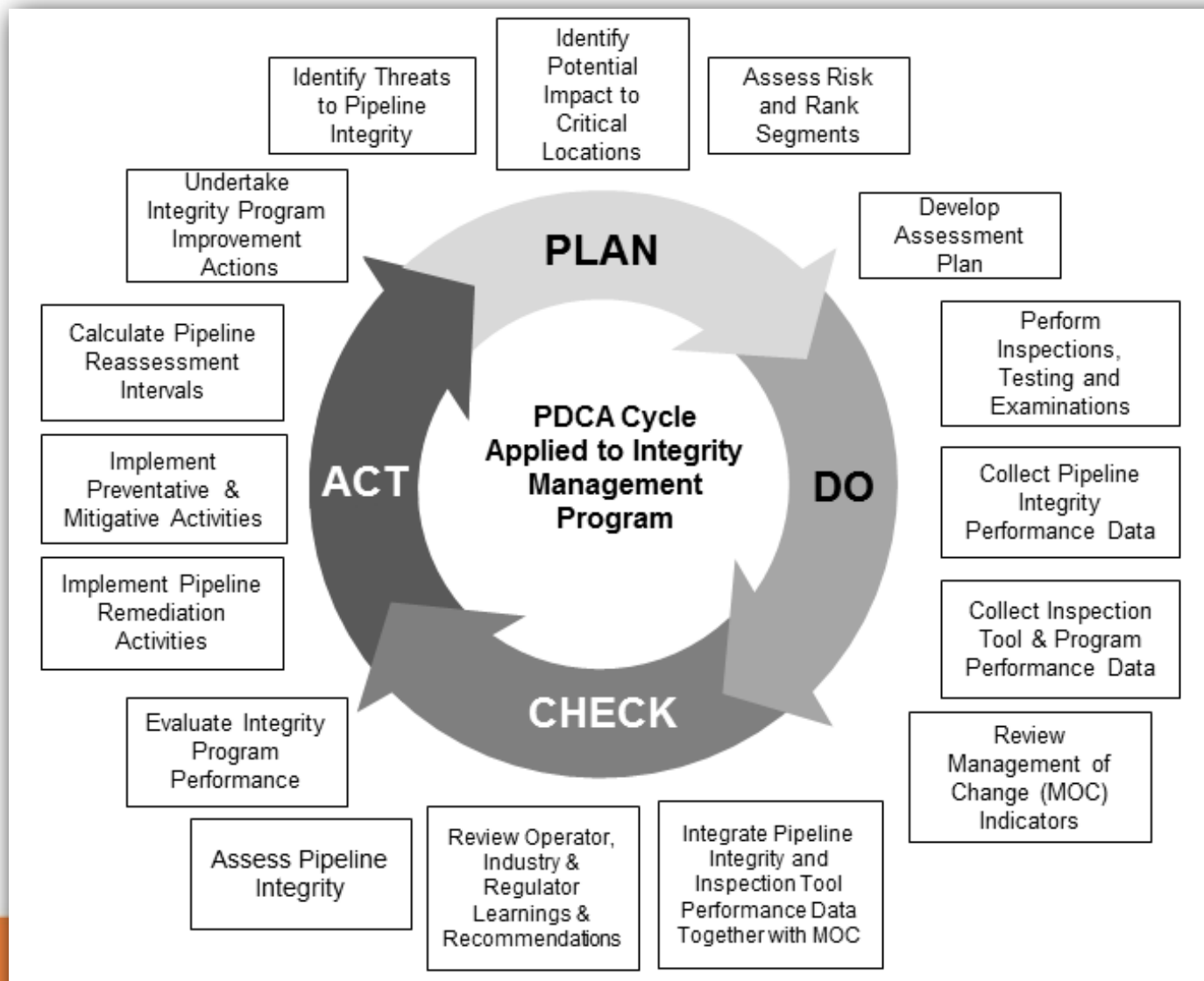


PSMS Safety Culture

- 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.



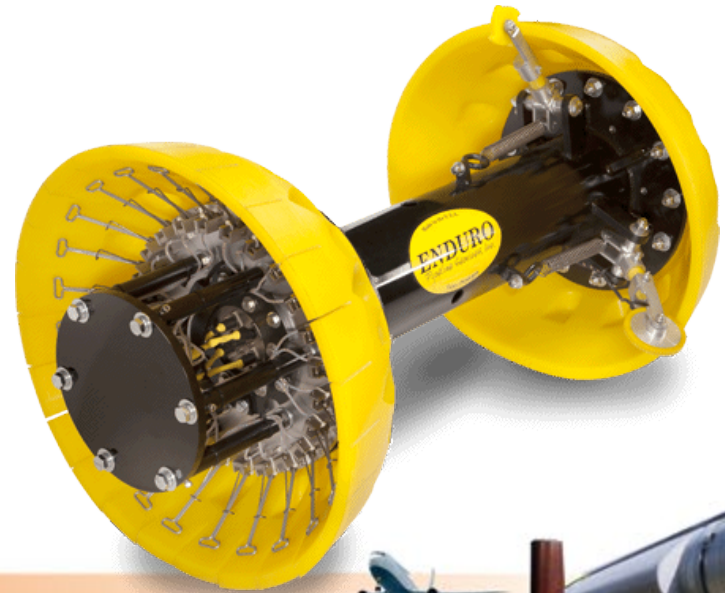
Evaluate and Rank Risk

- 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

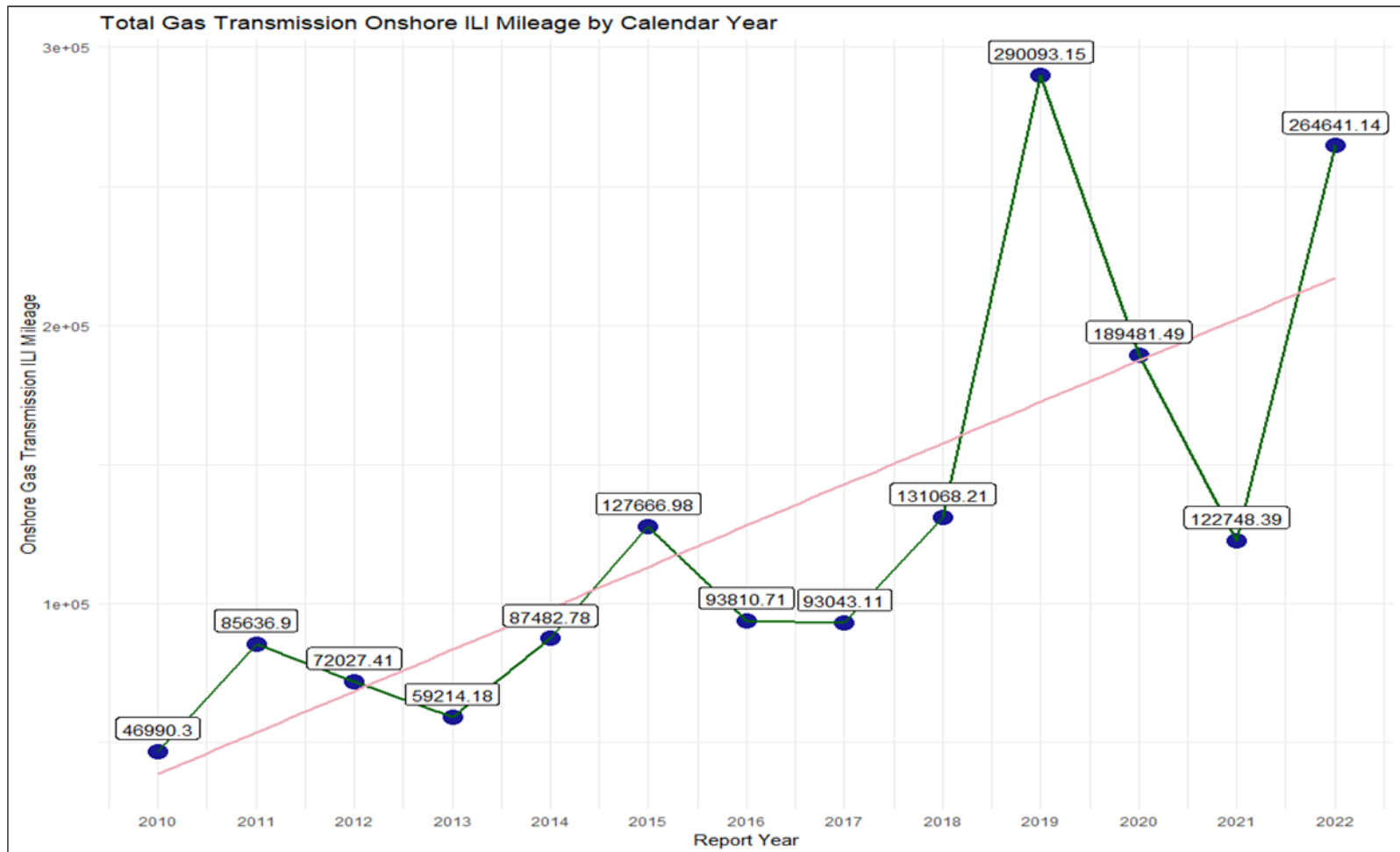


Periodic Evaluation and Improvement

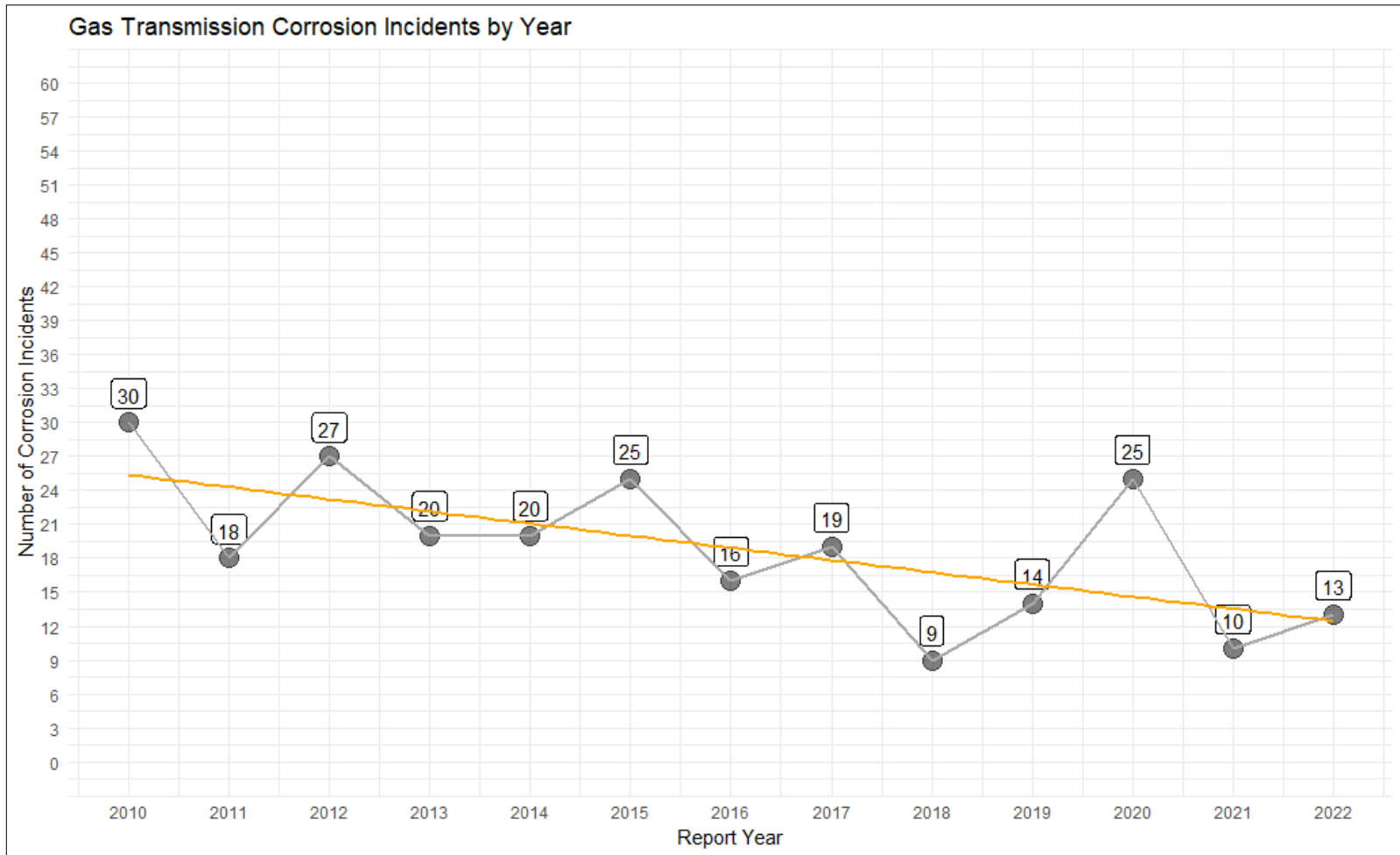
- Keep in mind
 - Bad trends are not always bad things
 - Several risks can be addressed with a single P&M measure
 - Initiatives don't always work the first time
 - Operators don't always take credit for things they do
- Have a discussion with the operator



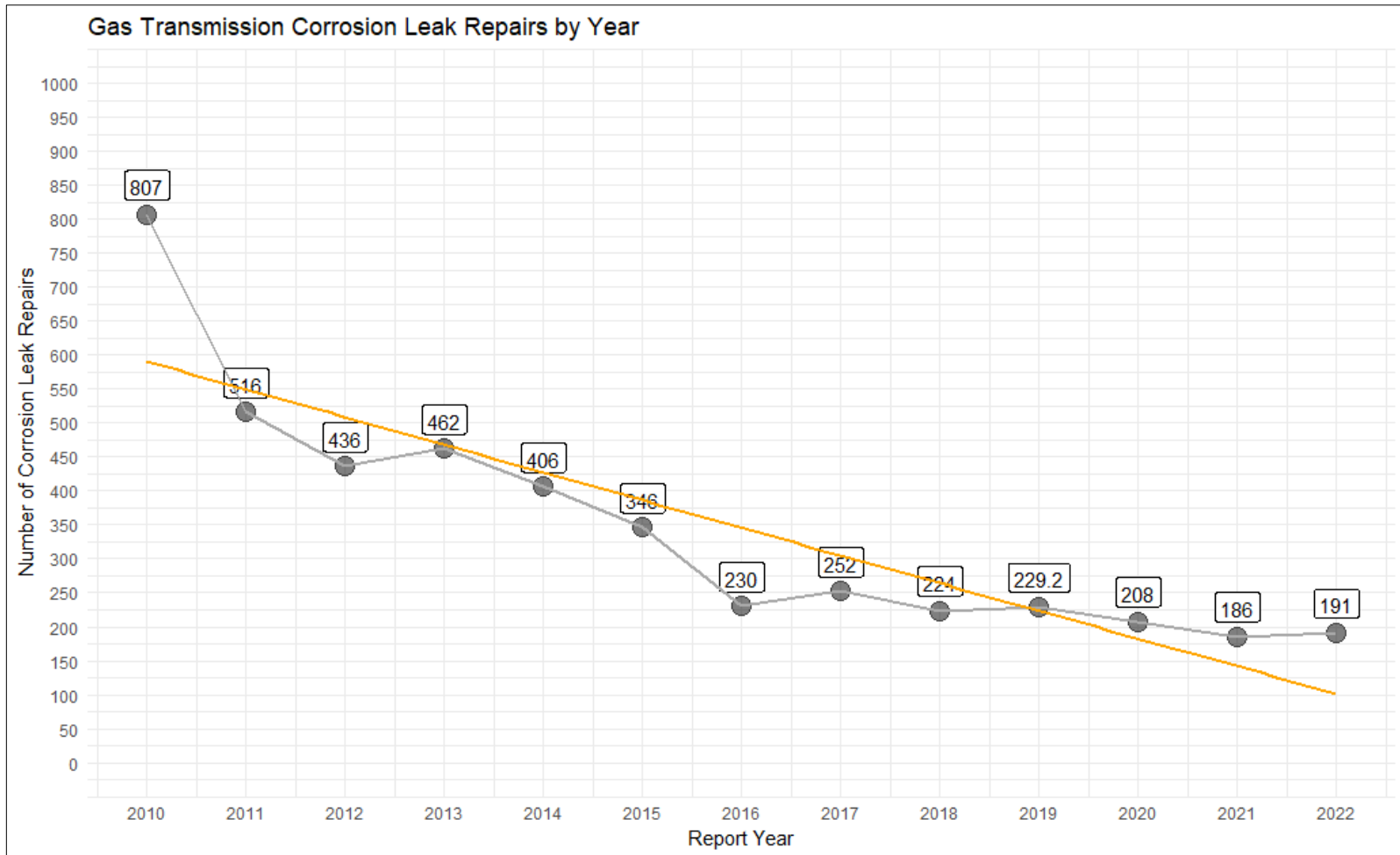
Effectiveness of IMP



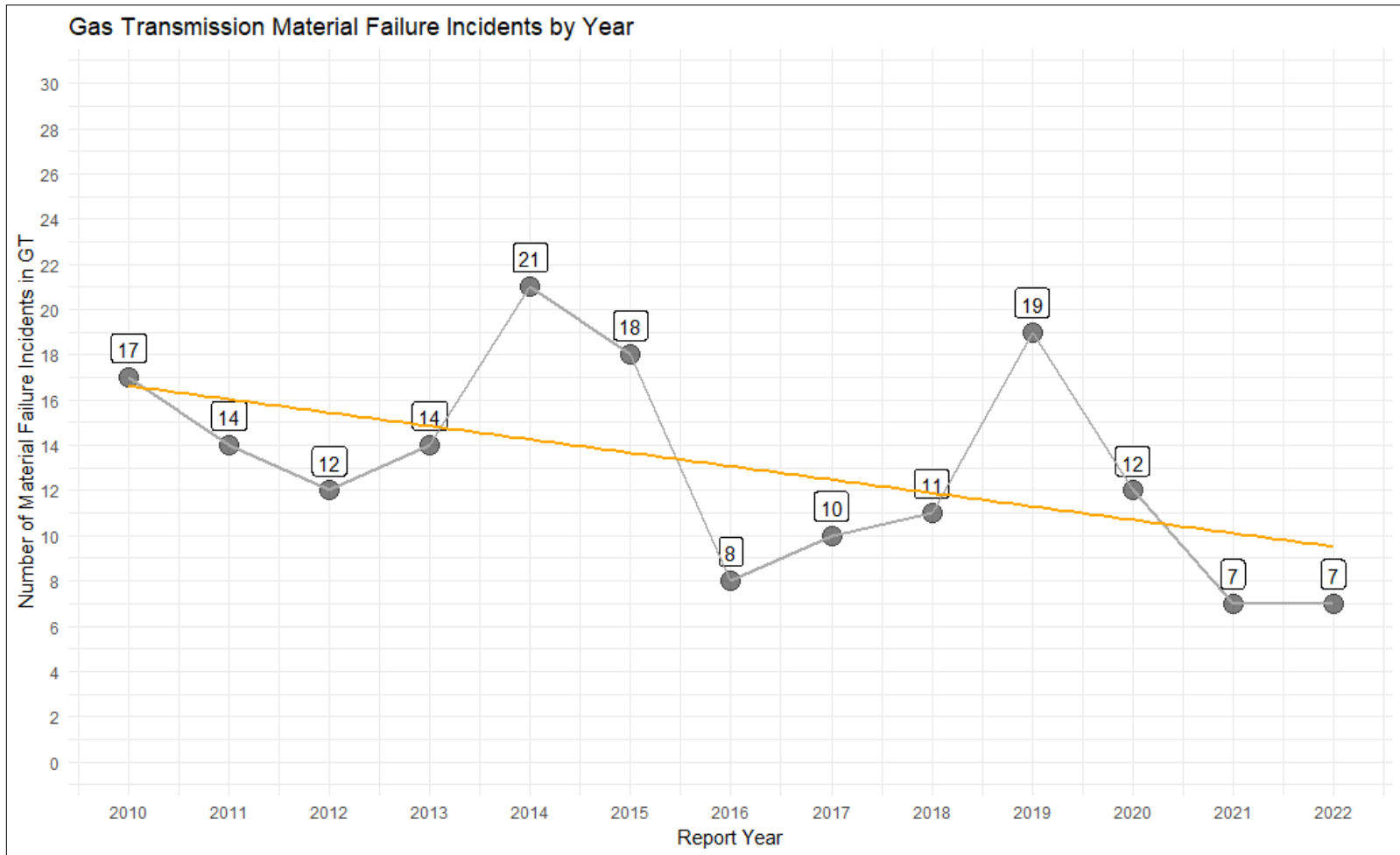
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Questions?



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