



Kansas Corporation Commission Annual Seminar

October 28-29, 2014



Infrastructure
Development
Energy
Pipeline





RP 1173 Pipeline Safety Management Systems

Curtis G. "Skip" Blake



Infrastructure
Development
Energy
Pipeline

Safety Management can be defined as:

... the reduction of risk to a level that is as low as is reasonably practicable.

Safety Culture

Safety culture is a reflection of "the attitudes, beliefs, perceptions and values that employees share in relation to safety".



"I think we need to take another look at your risk management strategy..."



Why Should I Care

- Energy Industry has had several high profile incidents

Operational Errors

Relaxed safety systems requirements

Friction between owners, operators and contractors

Unusual operations

Media hype

Public perception



Deepwell Horizon Offshore 2010



2010 Same Year

Explosions and spills across the United States



Marshall, MN July 25, 2010



Marcellus Drilling Rig June 7, 2010



PG&E San Bruno

Contributing factors from the aspect of pipeline materials, installation and operation came together in a perfect storm which were further complicated by issues of training, quality control, poor internal and external communications, Lack of understanding, threat recognition and oversight



September 9, 2010



NTSB Reports Major Incidents

Home > Accident Investigations > Reports > Pipeline

PIPELINE ACCIDENT REPORTS

The NTSB issues an accident report following the investigation. These reports are available online for reports issued since 1996, with older reports coming online soon.

The reports listing is sortable by the event date, report date, city, and state. Click on any of those headings to sort the data.

« ‹ 1 2 3 4 5 6 7 › »

Title	Event date	Report date	City	State	NTSB #	NTIS #		
Preliminary Report: Pipeline explosion and fire	3/12/2014	3/31/2014	Manhattan, New York City	NY			 PDF	
Columbia Gas Transmission Corporation Pipeline Rupture	12/11/2012	2/19/2014 Revised 3/11/2014	Sissonville	WV	PAR-14-01		 PDF	Summary
Large Crude Oil Spill from Damaged Enbridge Energy Pipeline	9/7/2010	9/30/2013	Romeoville	IL	PAB-13-03		 PDF	Summary
Enterprise Products Natural Gas Pipeline Excavation Damage, Rupture, and Fire	6/7/2010	9/9/2013	Cleburne	TX	PAB-13-02		 PDF	Summary
Rupture of Florida Gas Transmission Pipeline and Release of Natural Gas	5/4/2009	8/13/2013	Palm City	FL	PAB-13-01		 PDF	Full Text
Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release	7/25/2010	7/10/2012	Marshall	MI	PAR-12-01	PB2012-916501	 PDF	Summary
Pacific Gas and Electric Company Natural Gas Transmission Pipeline Rupture and Fire	9/9/2010	8/30/2011	San Bruno	CA	PAR-11-01	PB2011-916501	 PDF	Summary
Explosion, Release, and Ignition of Natural Gas	12/24/2008	5/18/2010	Rancho Cordova	CA	PAB-10-01		 PDF	Full Text

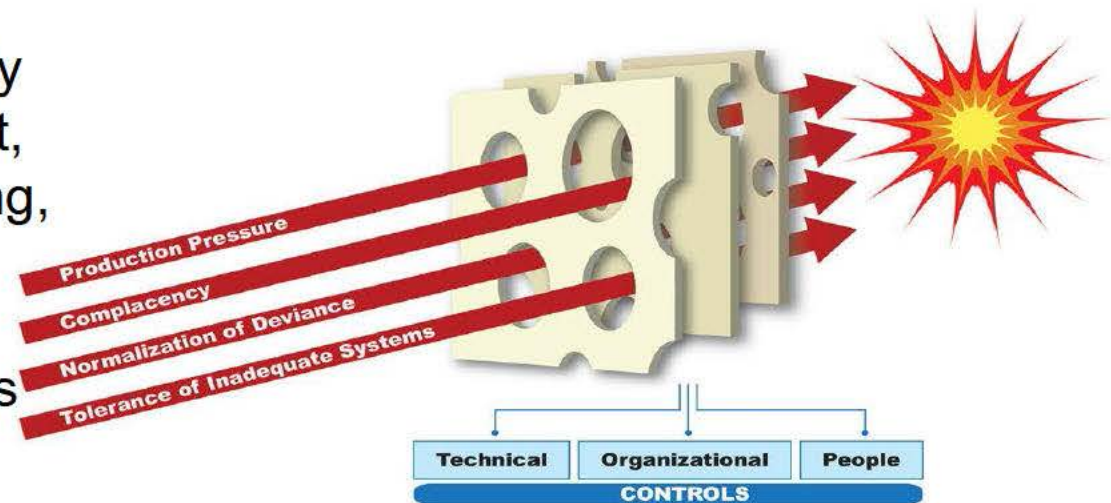


James Reason's Accident Model

- “Swiss Cheese”

- Major accidents happen when all the layers holes line up.

The layers of cheese represent the protective safety culture layers of management, supervision, reporting, learning, training, system design, protective equipment and devices, rules and procedures and Divine intervention that would prevent a catastrophic loss.

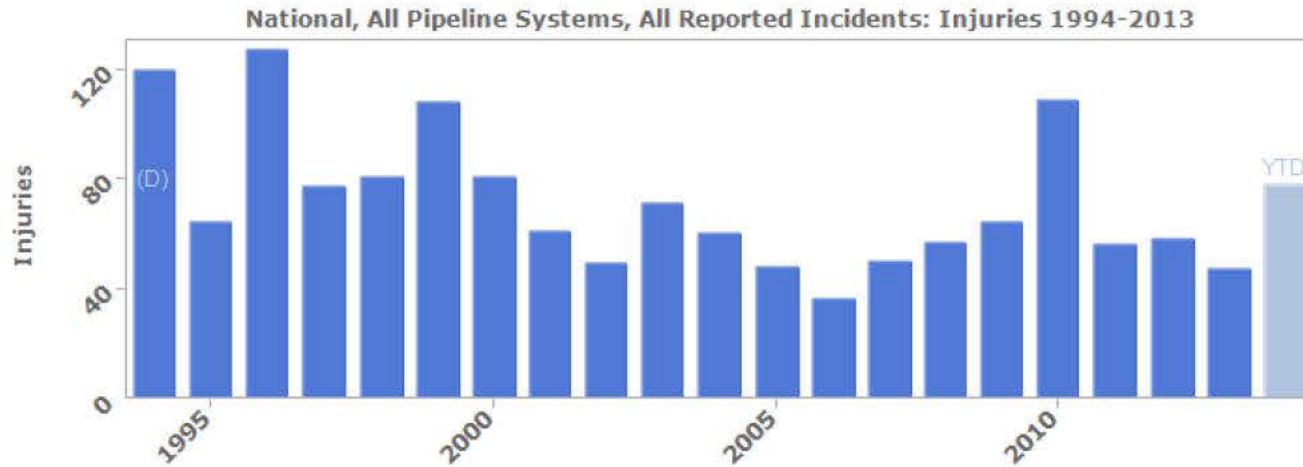


Reason, J. (1997). *Managing the risks of organizational accidents*. Burlington, VT: Ashgate Publishing Company.

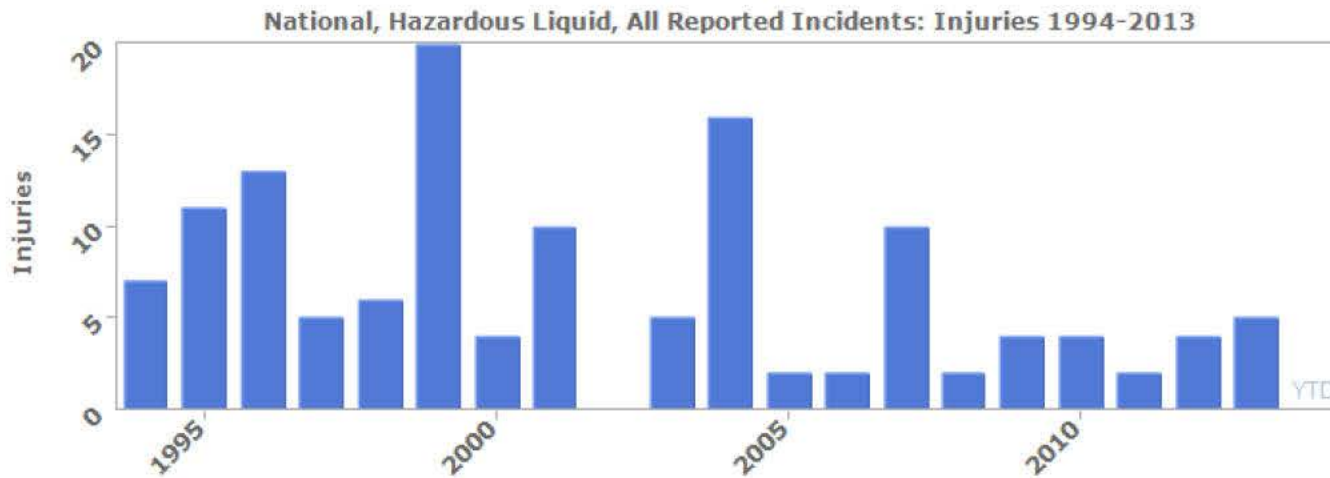


All Gas & Liquid Incidents Injuries

Gas & Liquid



Liquids

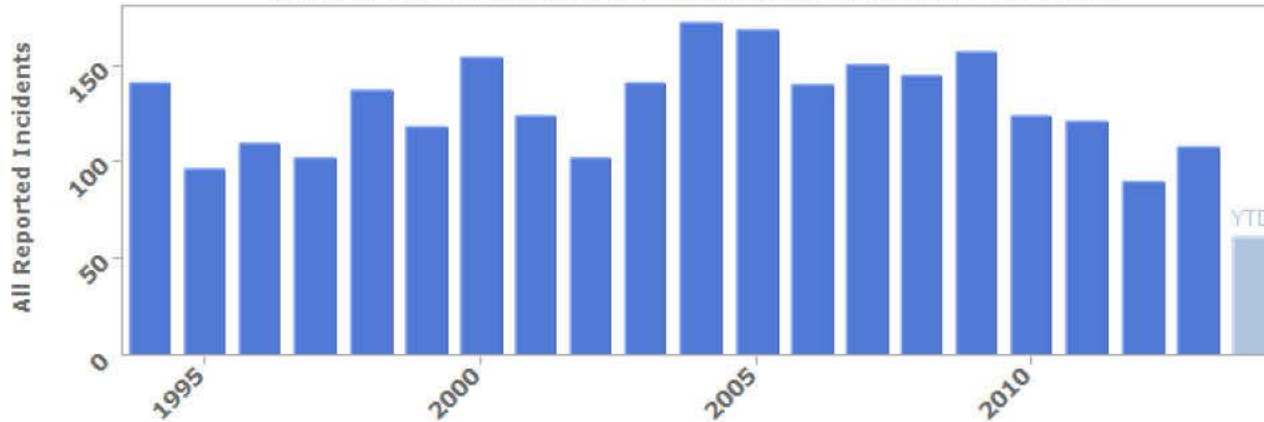


Source: PHMSA Significant Incidents Files, Sept 3, 2014



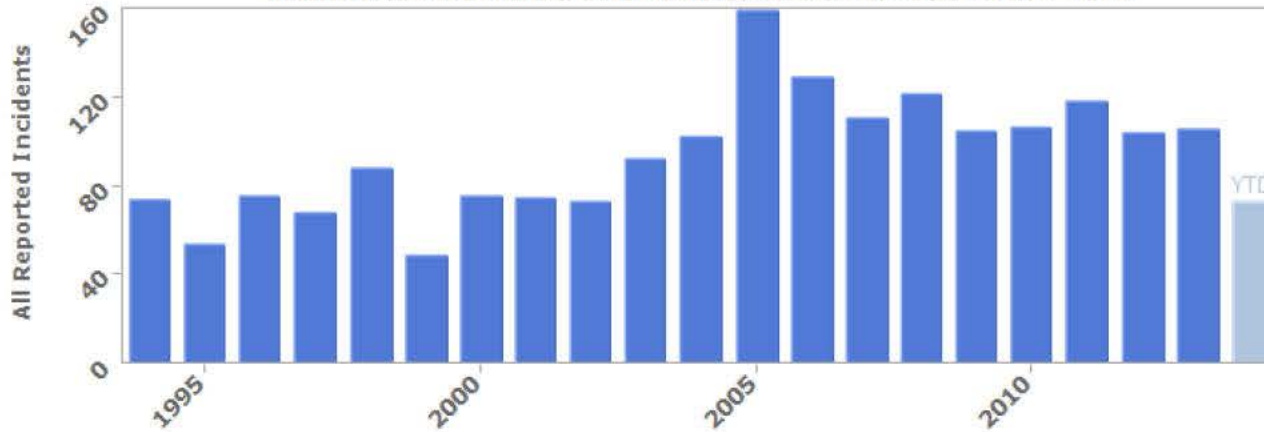
Gas Distribution Vs. Transmission

National, Gas Distribution, All Reported Incidents: Count 1994-2013



Source: PHMSA Significant Incidents Files, Sept 3, 2014

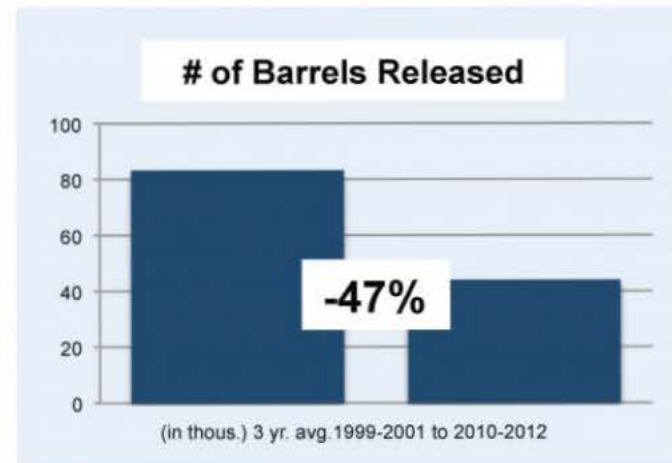
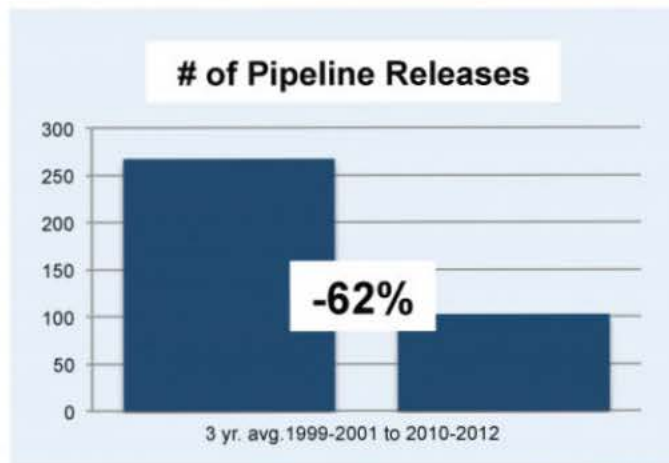
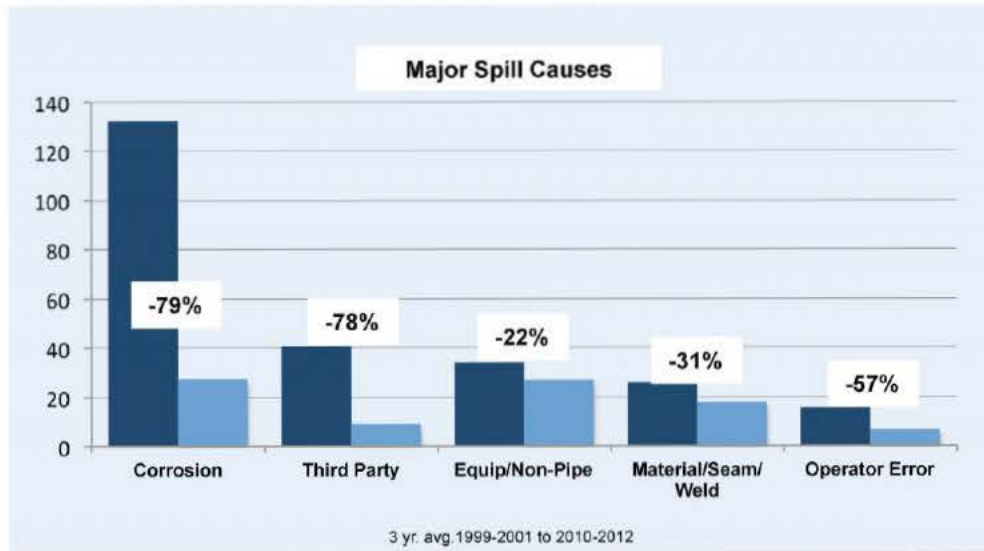
National, Gas Transmission, All Reported Incidents: Count 1994-2013



Source: PHMSA Significant Incidents Files, Sept 3, 2014



AOPL Significant Improvements



Perceived SMS Faults

- Insufficiencies in leadership,
- An acceptance of deviation,
- Complacency,
- A lack of communication,
- Little or no training on new procedures
- Little or no understanding of the law, company policy, good engineering practice and material selection.

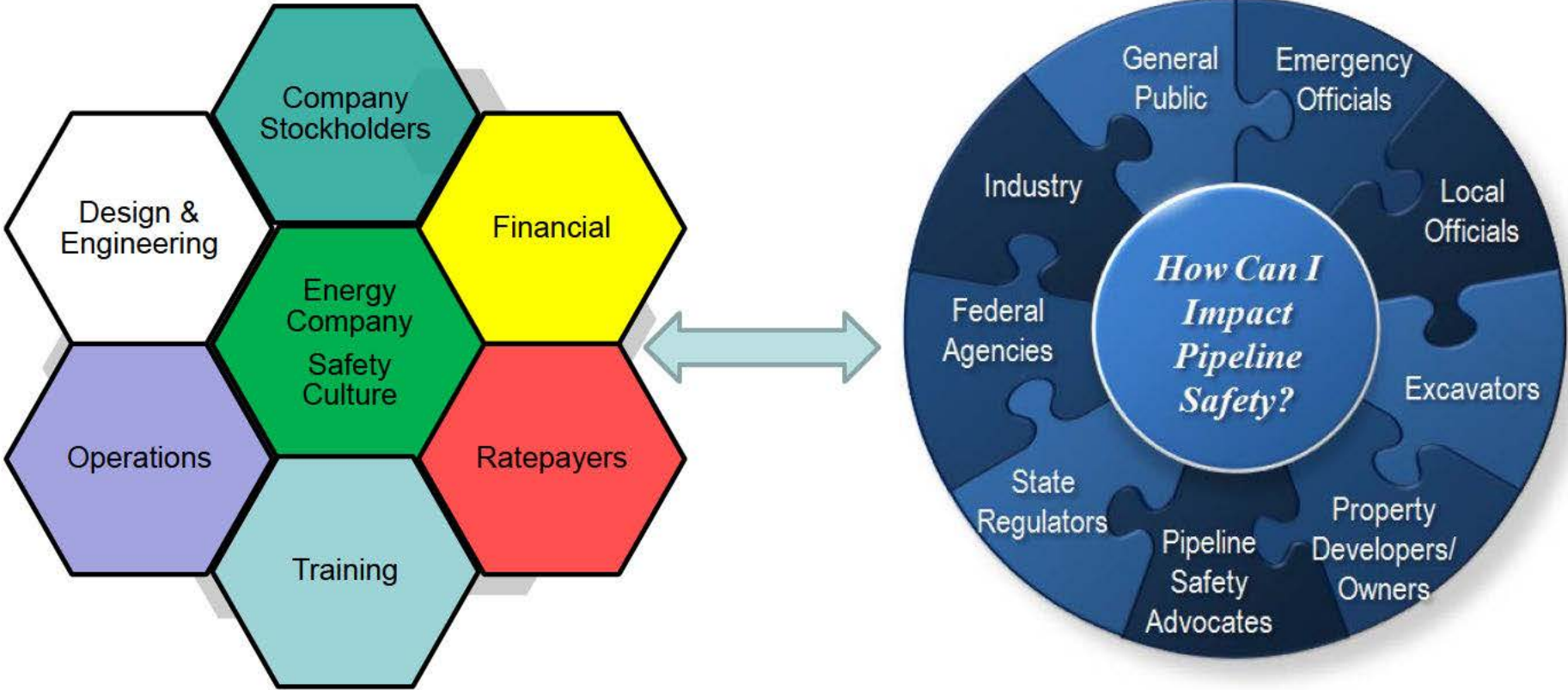


Accountability

- Stakeholders are demanding accountability
 - Leadership
 - Stockholders
 - Employees
 - Customers
 - Congressional
 - Public at large
 - Regulatory agencies
 - Industry related groups affected by fallout



Stakeholder Relationships



Logic Of Investing In A PSMS

Reasons and drivers for adopting such a system:

- Ethical – we have a moral obligation to deliver our product without injury to our own employees, ratepayers, stockholders, the environment and general public
- Legal – In a court of law we are bound by the regulatory system we are governed by
- Financial – Accidents cost way more than that what we invest in safety systems



- Meaningful metrics in IM
 - NTSB recommendation to PHMSA to develop
 - On July 10, 2014 issued:
Guidance¹ for Strengthening Pipeline Safety Through Rigorous Program Evaluation and Meaningful Metrics
 - Note: This document is to provide guidance describing methods to evaluate and measure IM program effectiveness.
 - This document is not a regulation and creates no new legal obligations.



NTSB 2012 Recommended Action

- SMSs continuously identify, address, and monitor threats to the safety of company operations by doing the following:
 1. Proactively address safety issues before they become incidents/accidents.
 2. Document safety procedures and requiring strict adherence to the procedures by safety personnel.
 3. Treat operator errors as system deficiencies and not as reasons to punish and intimidate operators.
 4. Require senior company management to commit to operational safety.
 5. Identify personnel responsible for safety initiatives and oversight.
 6. Implement a non-punitive method for employees to report safety hazards.
 7. Continuously identify and address risks in all safety-critical aspects of operations.
 8. Provide safety assurance by regularly evaluating (or auditing) operations and contractors to identify and address risks.

3-PHMSA_Web_Conference_API-1173_Opening_-_Path_Forward_-_RM.pdf

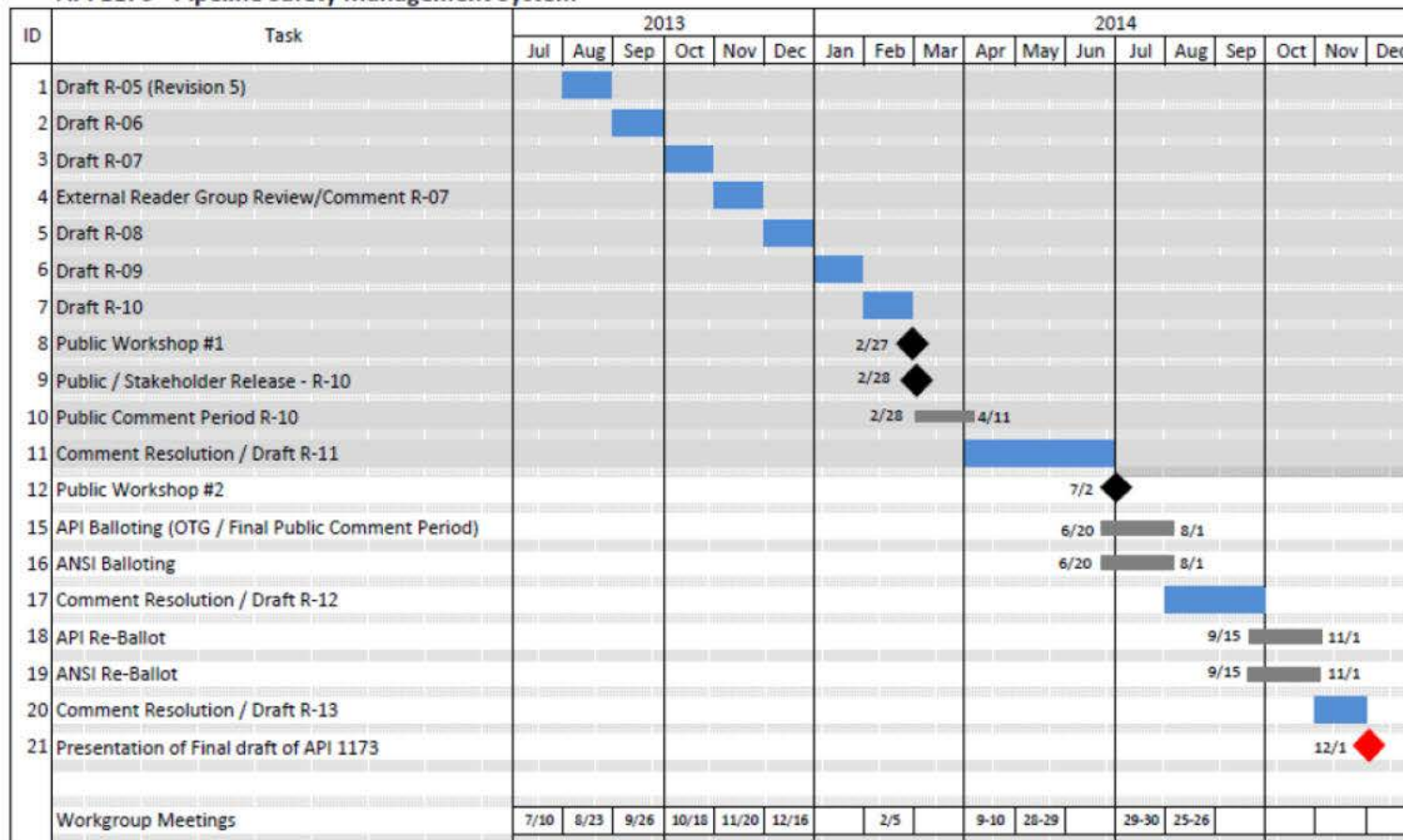


API Publication Timeline

NTSB Report – Marshall, MI – July 10, 2012 - API Workshop on Management Systems – October 4, 2012 - Initial Meeting of SMS Development Team Members – December 18, 2012

Revision 6.0: June 30, 2014

API 1173 - Pipeline Safety Management System

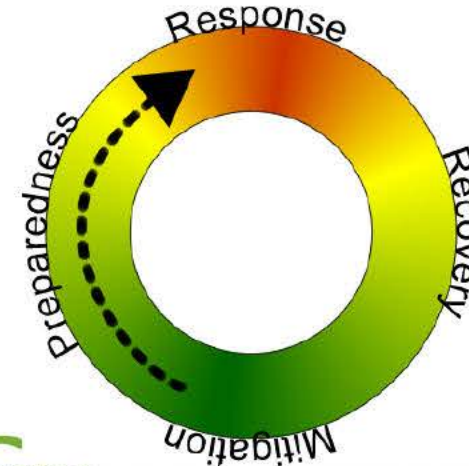


What A PSMS Should Look Like

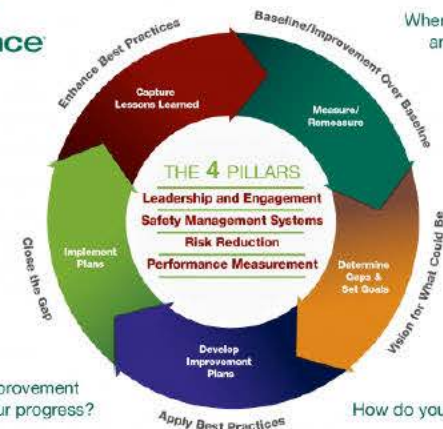
- RP1173 Defines what constitutes such a procedure
- Simplified
 - Plan,
 - Do,
 - Check,
 - Act



© Can Stock Photo - csp16142911



journey to
safety
excellence



Where are you now –
and where do you
want to be?

How do you
manage your improvement
and measure your progress?

How do you move forward?



PSMS RP1173 What Does It Mean

- Pipeline Safety Management System Standard API RP 1173 (Recommended Process)
- Pursuing continuous improvement by making pipelines and operations safer
- A coordinated (also termed holistic) approach to ensure the methods and practices we use to protect our plant, operations and stakeholders which will ultimately reduce avoidable incidents and accidents
- Practiced by the aviation, nuclear and similar high profile industries

Let's ZERO In



**On NO
Accidents**

Ref No. - 0202012

© 2011 SafetyCulture.com - All Rights Reserved



Other Industry Models - DuPont

- DuPont Is A Very High Profile Manufacturer Has 22 elements

RP 1173 has 10 Elements

1. Leadership and Management Commitment
2. Stakeholder Engagement
3. Risk Management
4. Operational Controls
5. Incident Investigation and Evaluation
6. Safety Assurance
7. Management Review and Continuous Improvement
8. Emergency Preparedness and Response
9. Competence, Awareness and Training
10. Documentation and Recordskeeping



Canada's Safety Culture Initiative

- **SAFETY is an overriding value and priority**
- **Everyone is aware of known hazards and vigilant to new threats**
- **Employees feel empowered and recognized for making safe decisions**
- **No one would hesitate to report a safety hazard, the commitment of an error or the introduction of a threat without fear of reprisal or disciplinary action; even the most junior**
- **Everyone works safely with or without people watching**
- **Everyone is continuously learning from their own experiences, and those of others with the goal of advancing safety.**



Canada's National Energy Board

- Safety Culture Drivers
 - Driver #1 – Production Pressure
 - Example
 - I.e.; It's cold delivery pressures are falling
 - We can't do any overtime
 - Driver #2 – Complacency
 - Example
 - Oh it's OK we've exceeded MAOP before
 - It's never been a problem before
 - Driver #3 – Accepting Deviations
 - Example
 - It's been like that since I began working here
 - Driver #4 – Tolerance of Inadequate systems and resources
 - Example
 - Poor communications and inadequate funding of projects



Canada's National Energy Board

- Safety Culture Deterrents

- Deterrent #1 – Leadership committed to doing it safely
 - Example
 - Competent engineering designs, practices and funding
 - Do it right or don't do it
- Deterrent #2 – Vigilance
 - Example
 - Management by walking around and seeing it done properly
 - Ensuring everybody knows the right way to get it done
- Deterrent #3 – Empowerment and Accountability
 - Example
 - You have a duty to make it safe and you are expected to do it
- Deterrent #4 – Resiliency
 - Example
 - Able to resolve difficult situations and adjust resources



Coordinated Industry Approach

- **Oil, Gas, Regulatory Initiative**

- API

- AOPL

- AGA

- APGA

- GPTC

- INGAA

- NAPSR

- PHMSA



Pipeline Safety ExcellenceTM Initiative

- 1) Embrace a joint set of safety principles,
- 2) Undertake continuous industrywide safety improvement efforts,
- 3) Report annually on industrywide pipeline safety performance, and
- 4) Annually assess and pursue high priority pipeline safety initiatives



AOPL/AFT Approach

Safety Excellence Program

- In 2014, the liquid pipeline industry is launching its Pipeline Safety initiative.
- It reflects the shared values and commitment we have to building and operating safe pipelines.
- One of those pipeline safety values is communicating with stakeholders.
- Pipeline operators are committed to sharing publicly the results of industrywide safety performance.
- At its heart, Pipeline Safety Excellence TM is about continuously improving pipeline safety until we reach the ultimate goal of zero incidents.



AOPL & API 2012 Joint Principles

- Zero Incidents
- Organization-Wide Commitment
- A Culture of Safety
- Continuous Improvement
- Learn from Experience
- Safety Systems for Success
- Employ Technology
- Communicate with Stakeholders



INGAA's Approach



INGAA Appendices

VIII. Appendices

Linking Recommendations to Standards and Regulations

Element	B31.8S Standard	CFR 192 and Gas Integrity Management Inspection Manual : Inspection Protocol with Supplemental Guidance, Jan 1, 2008, Rev. 5	Recommendations for Management System

Building Confidence in Pipeline Safety

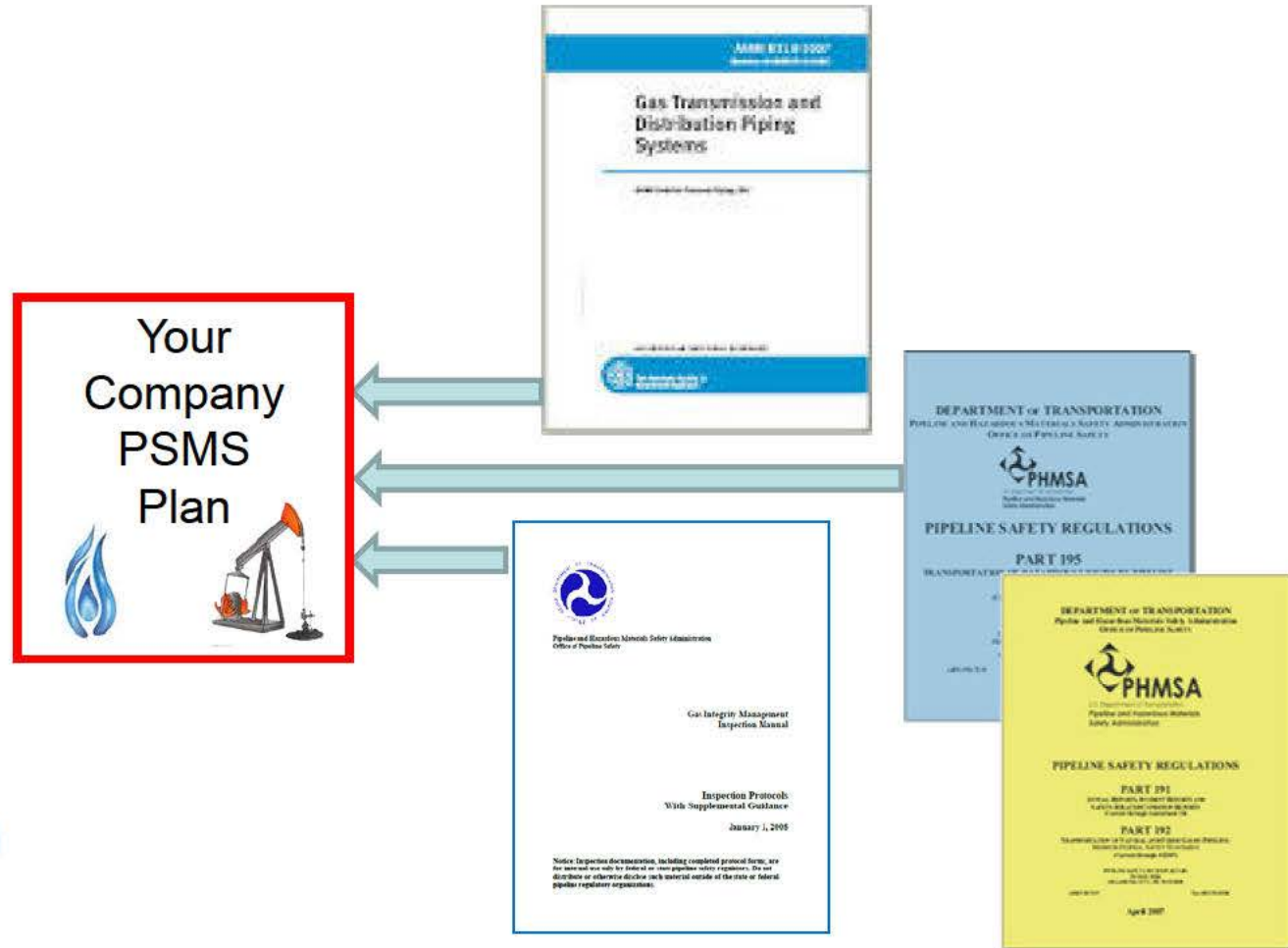
The role of management systems in achieving our goal of zero incidents

An INGAA IMCI White Paper
October 2012



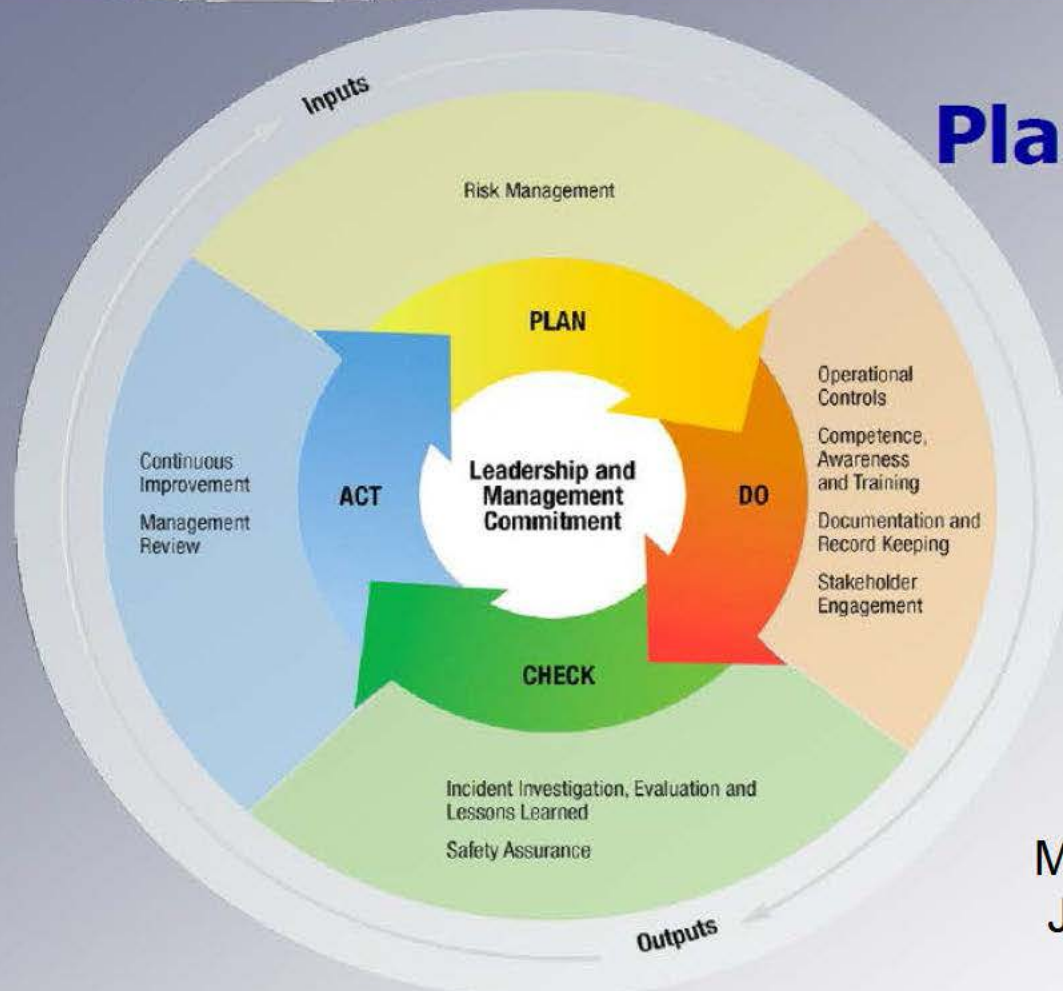
INGAA Regulatory Approach

- Begin with B31.8s
- Integrate CFR 192 and Gas Integrity Management Inspection Manual : Inspection Protocol with Supplemental Guidance, Jan 1, 2008, Rev. 5



PHMSA July 2, 2014 Guidance

Plan, Do, Check, Act



Meeting Roll Out RP 1173
July 02, 2014 Alexandria, VA

Continuous Improvement is the Goal

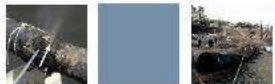
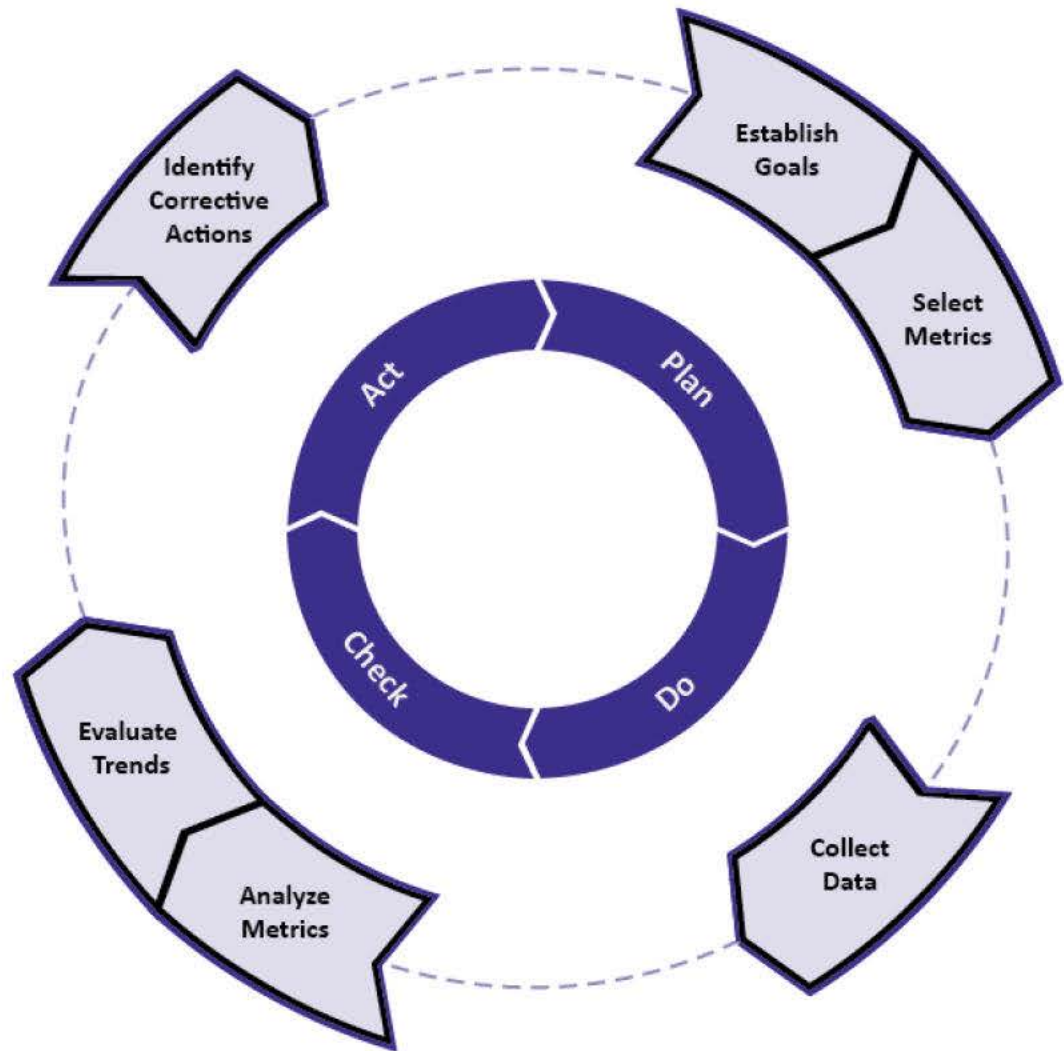


Guidance Manual July 10, 2014

Guidance for Strengthening Pipeline Safety Through Rigorous Program Evaluation and Meaningful Metrics

Or

How to comply with:
49CFR195 Liquids
49CFR192 Gas Xmsn
49CFR 192 Gas Dist.
ADB-2012-10 (12/5/2012)



RP1173 10 Essential Elements

1. Leadership and Management Commitment
2. Stakeholder Engagement
3. Risk Management
4. Operational Controls
5. Incident Investigation
6. Safety Assurance
7. Management Review
8. Emergency Preparedness and Response
9. Competence, Awareness and Training
10. Documentation and Recordskeeping



PHMSA API Development Model

Plan – Assess The Exposure

Do – Develop an E-Plan with:

1. Operational Controls
2. Establishes competence
3. Provide training
4. Document plans and required goal metrics
5. Engage stakeholders

Internal

Employees, Owners

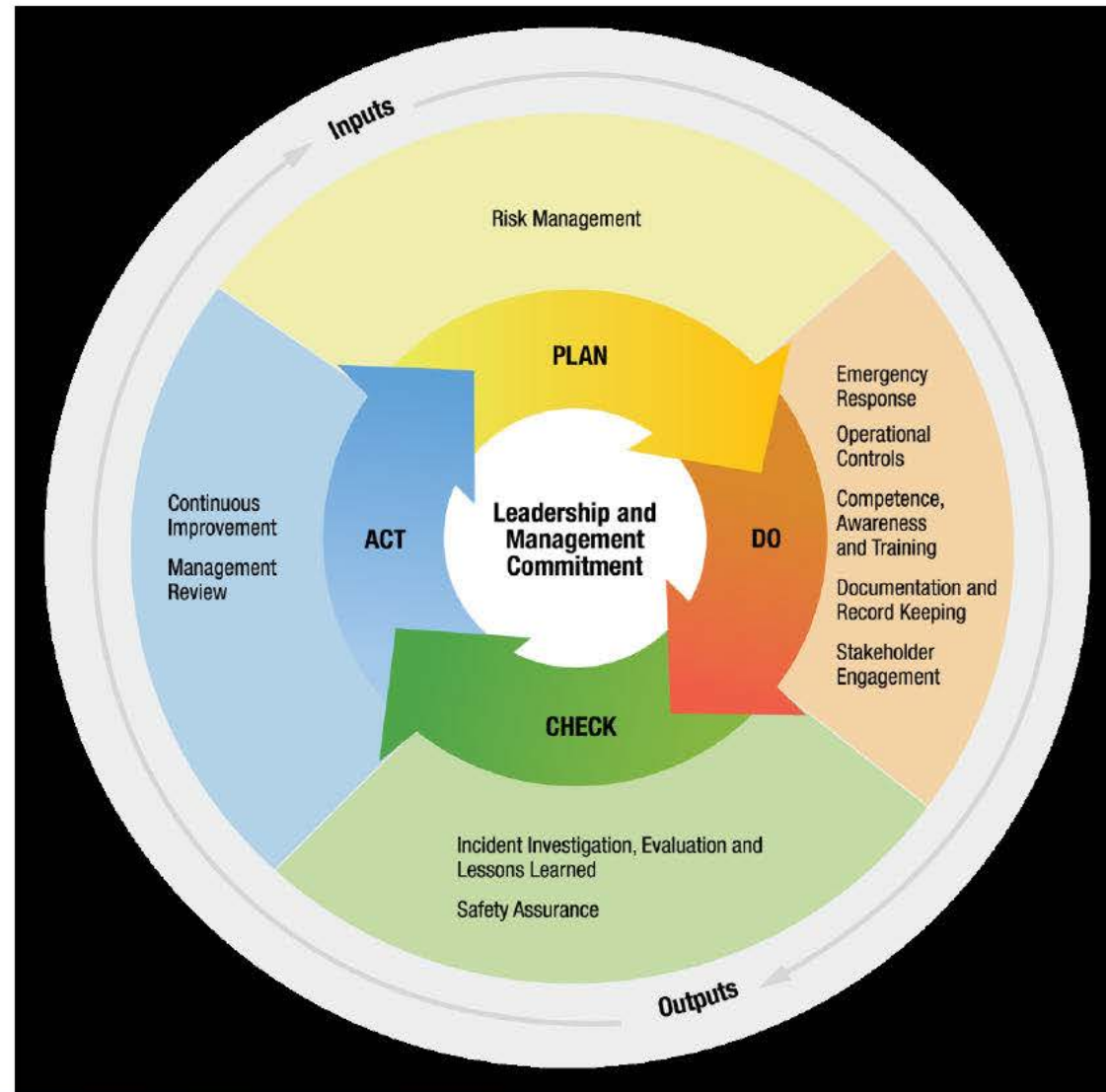
External

Public, Regulatory &

E Responders

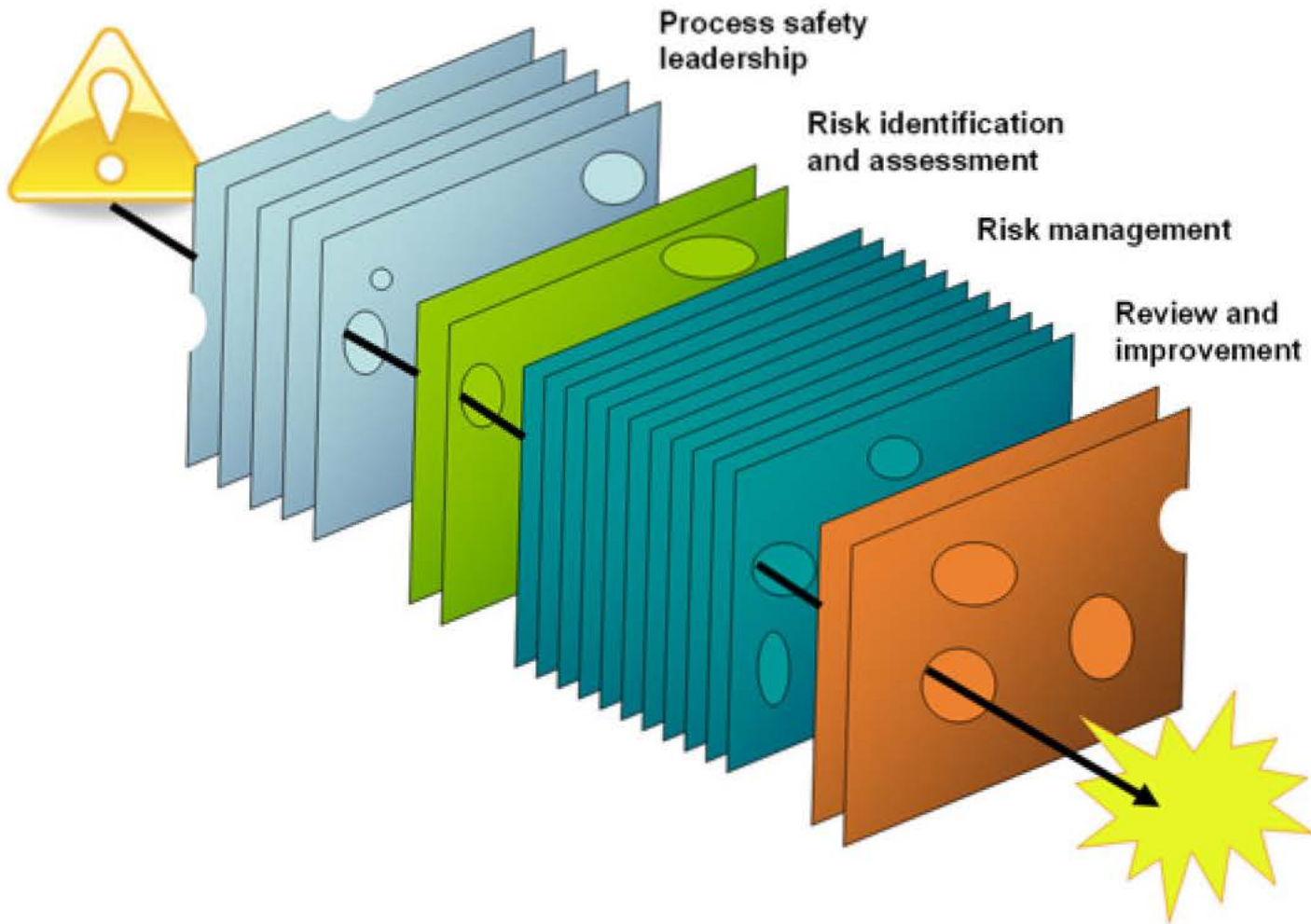
Check – Investigate, Evaluate

Act – Change For The Sake Of
Continuous Improvement



Conclusion

Achieving SMS Success



Then came the bomb

- Hello! Distribution operators



July 10, 2014 Distribution Affected

- Up to this point 192 & 195 Reference
 - Guidance¹ For Strengthening Pipeline Safety Through Rigorous Program Evaluation and Meaningful Metrics
 - This document is to provide guidance describing methods to evaluate and measure IM program effectiveness.
- This document is **NOT** a regulation and creates no new legal obligations



#1 Element - Leadership

- **What must leadership do to make this work ?**
 - Accountability For Resource Allocation
 - Shall Be Assigned To An Executive with Responsible Authority
 - Top Management to 1st line supervisor must make resources available to build a safety culture
 - Time Money Manpower 13 Points of Guidance / Direction
 - Top Management to 1st line supervisor must be committed to the elements and lead by example
 - No Ignoring the principles of the anticipated safety culture
 - Provide goals and accountability for what is expected
 - Build a dialogue and promote openness without retribution for reporting errors omissions or personal inadvertent mistakes
 - Provide feedback on progress and be flexible to change things that aren't working



#2 Stakeholder Engagement

- PSMS Plan Shall Provide A Methodology For Two Way Communication and Engagement With:
 - Internal Stakeholders
 - All Owners, Employees, Contractors and Suppliers
 - External Stakeholders
 - Regulatory, Public, Abutters, Responders, other public agencies
- PSMS Plan Shall Provide Designated Personnel
 - To Interact & Describe the Goals, Methods and Organization of the Safety Management System
 - Those Persons Who Will Receive and Distribute Necessary Operating Communications



RP 1162 External Stakeholders

- Inform Abutters, Public, Emergency Responders, Public Agencies, Excavators and Other Affected Parties
 - **195.440 and 192.616**
 - Good Guideline Follow PHMSA Form 21 Public Awareness Program Effectiveness Inspection, July 21, 2011, Rev 0
- Pipeline Safety
 - Damage Prevention
 - Emergency Response
 - Emergency Contacts
 - General Pipeline Awareness
- Measuring effectiveness
 - Need to How we are doing getting The Word out to our Stakeholders
 - **PAPERS** the Public Awareness Program Effectiveness Research Survey (PAPERS),



Risk Management

- Murphy's Law Assessment Of The System
 - The bigger the length and complexity of the system the greater the risk of individual type failures.
 - Break it down into components, materials, & product composition.
 - Determine failure modes and frequencies. (Likelihood and consequences)
 - Go after the most human interactive catastrophic scenarios first
 - Protect Life first and property second
 - Threats and hazards are more than just pipeline components
 - Organizational Attitude – “Nothing ever happens here,” We’re too small”
 - Culture with no sense of responsibility, inclusion or empowerment
 - Lack of system knowledge and operating principles
 - Disgruntled or complacent employees, contractors, irate abutters and customers, Product supply, Environmental, Terrorism, public lack of confidence,
 - Lack of Financial and resource support
 - Lack of oversight, sharing of knowledge and failing to learn from others mistakes



Operational Controls

- O & M Plan
 - Define how your system will be constructed, maintained and operated - and stick to it! Conduct annual reviews
 - Ensure that as components, procedures and processes change, everyone gets training (MOC)
 - Temporary, infrequent or unusual operations need to be supervised closely. Tailgates prior performing any work. Especially hot taps, purging and pressure testing.
- E-Plan
 - Test the response system to make sure it works. Consider distances, environmental, civil disruption and vandalism, supply curtailments and equipment resource sharing consortiums. Learn from others incidents.
 - Police, fire and first responder liaison is important prior to incidents
- MOC's
 - A process of documenting and defining change risks and responsibility



API 1173 para. 8.5

- Use of contractors
 - The use of contractors or outsourcing operating functions must be documented in the PSMS
 - Designate who is responsible for the contractor – Internal/External
 - Contractor must adopt and perform to the principles
 - Contractors must have safety orientation and training in policies
 - Contractors must be evaluated (Inspection)
 - Contractors must be aware of and communicate risks
 - Contractors must participate in MOC process and procedure



Operational Control-Stop Order

- If you see something; Say something
 - Any person on the job site that recognizes a discrepancy, impending failure or hazardous situation is obligated and encouraged to communicate his perspective.
 - The spirit of this premise is to be able to bring all employees into the process without fear of ridicule or repercussions.
 - This includes the most junior of positions to the most senior of executives.
- No safety question gets left unresolved



Incident Investigation

- Secure the incident scene,
- Protect people and the environment,
- Maintain and recover important evidence and testimony.



Safety Assurance

- Audit your programs
 - Did you meet your goals
 - Do your employees know the program and expected results
 - Analyze your collected data
 - Performance evaluations



Management Review & Continuous Improvement

- Management signs off on yearly audit
 - Based on goal progress make adjustments and sets new or continuing prioritys



Emergency Preparedness and Response

- Ensure that all materials, training and resources are available to meet anticipated possible scenarios
 - Sister Industry company contacts
 - Suppliers
 - Contractor capabilities



Competence, Awareness and Training

- Operator Qualification
 - Technically competent
 - Safety, CPR, First Aid formalized programs
 - Awareness by experience



Documentation and Recordskeeping

- If it isn't on paper it never happened
 - Meaningful

