Pipeline Safety Management Systems (SMS)

ANSI/API RP 1173

First Edition, July 2015

October 2024

API RP 1173

PHMSA's response to the NTSB Recommendations from Marshall Michigan oil spill

Safety Culture

SAFETY CULTURE

is defined by DOT as the shared values, actions, and behaviors that demonstrate a commitment to safety over competing goals and demands.

PHMSA Safety Initiative Goals

Continue to pursue and foster non-regulatory approaches to effect continuous improvement in safety, such as Safety Management Systems, Safety Culture, and incentivizing regulated entities to move beyond mere compliance with regulations by adopting and institutionalizing voluntary, meaningful, comprehensive programs that will advance safety.

Overview API RP 1173

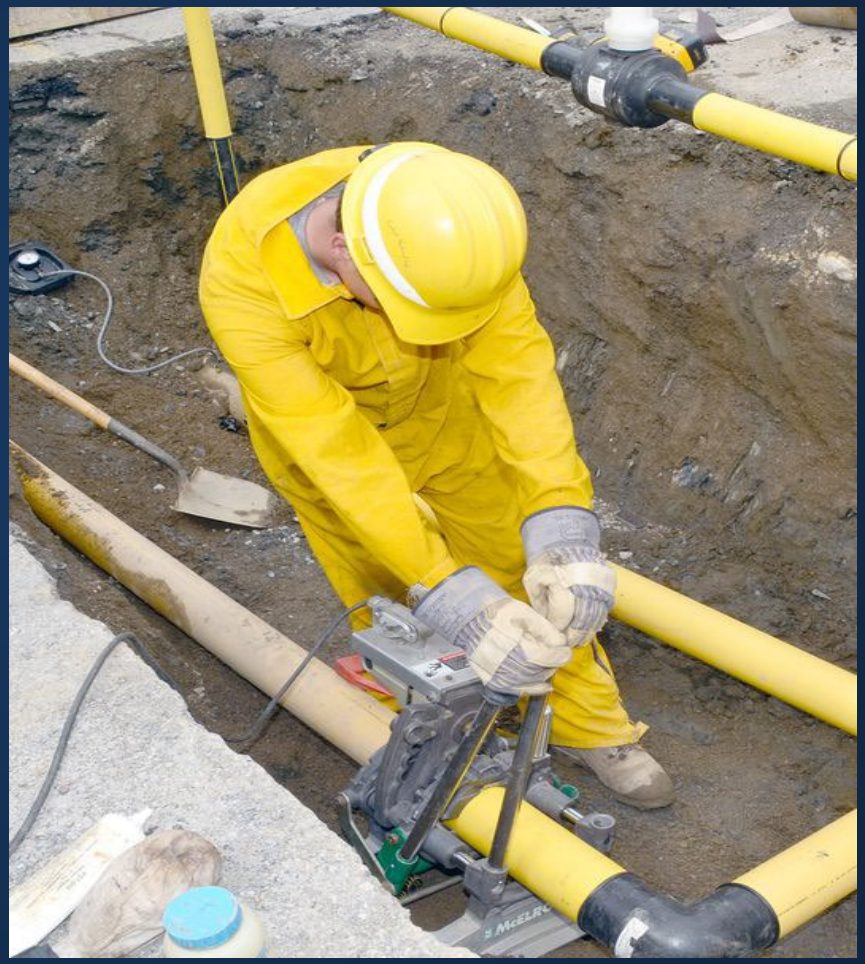
- Focuses on continuous Pipeline Safety Improvement
- Provides a framework to build on
- Allows flexibility for unique operations and environments

Overview API RP 1173

"**Plan – Do - Check – Act**" Continuous Improvement Model

Adds Dimensions to Integrity Management

- Safety Culture Elements
- Emphasis on the Vital Check-Act Elements



CONTINUAL IMPROVEMENT
Establish objectives
Develop plans, processes and practices
Outline roles and responsibilities
Execute against plans, processes and practices
Document
Engage stakeholders
Review results
Evaluate performance
Determine effectiveness
Management Review
Plan
Do
Check
Act
Applied throughout the Pipeline Lifecycle
Design & Construction
Operations & Maintenance
Retirement

Strong Safety Culture

Commitment to safety

Communication

Personal responsibility

Continuous education

Safety Consciousness

Prioritization of Safety

Mutual Trust

Fairness and Consistency

Safety training availability

NTSB Recommendations for a SMS

- Proactively Address Safety Issues.
- Document Safety Procedures With Adherence to Procedures by Personnel.
- Treat Errors as System Deficiencies - Not to Punish / Intimidate Employees.
- Require Senior Company Management to Commit to Operational Safety.

NTSB Recommendations for a SMS

- Identify Personnel Responsible for Safety Initiatives and Oversight.
- Implement Non-punitive Methods for Employees to Report Safety Hazards.
- Continuously Identify and Address Risks for Safety-critical Aspects of Operations.
- Regularly Evaluating (or Auditing) Operations to Identify and Address Risk.

RP 1173 Management System Elements

1) Leadership and Management Commitment.

2) Stakeholder Engagement.

3) Risk Management.

4) Operational Controls.

5) Incident Investigation, Evaluation and Lessons Learned.

RP 1173 Management System Elements

6) Safety Assurance.

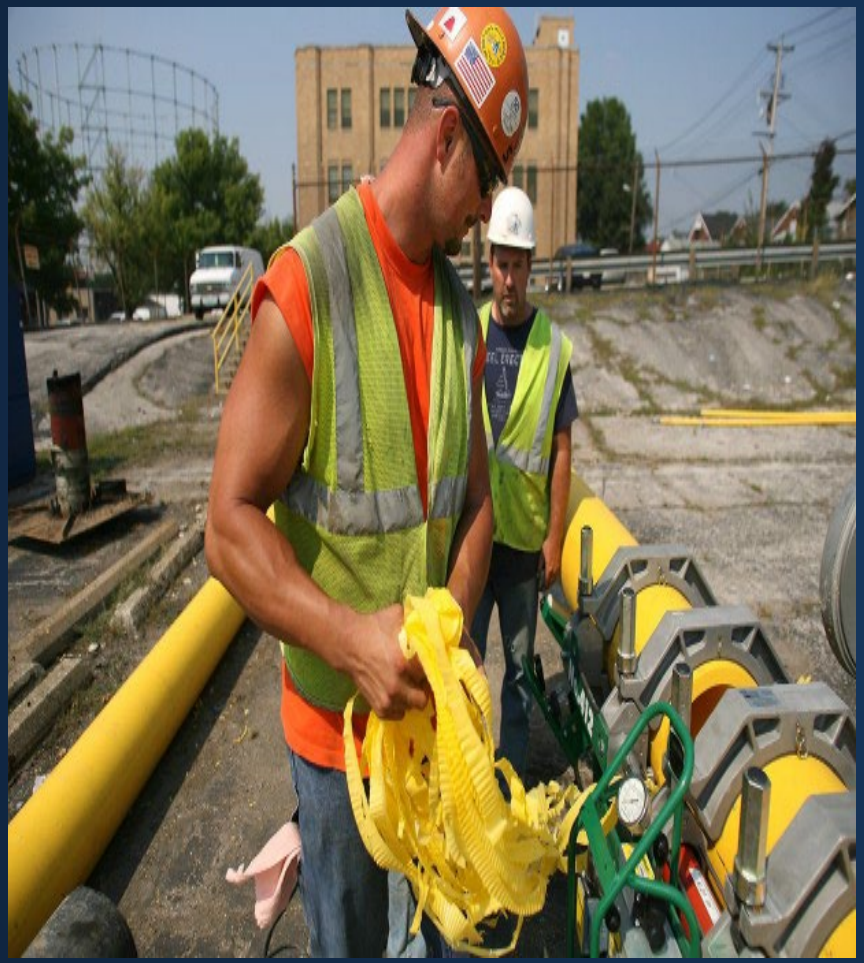
7) Management Review and Continuous Improvement.

8) Emergency Preparedness and Response.

9) Competence, Awareness and Training.

10) Documentation and Record Keeping.

Management Systems



- What not How.
- Continuous Improvement.
  - Allows for Balancing Resources for Implementation with Time.

1) Leadership and Management Commitment

- Leader Involvement Is Essential.
- All Levels of Leadership Are Involved:
  - **Top Management.**
  - **Management.**
  - **Employees.**

How Leadership and Management Commitment Advances Safety:

- Leadership Has More Visible Role in Demonstrating the Safety Culture.
  - Evaluate the PSMS Maturity to Set Specific Goals in Areas of Concern, Checks Actual Progress Against Targets.
  - Assess & Develop Safety Culture; Safety Incentives
- Brings Rigor to Asset Protection / Safety.
  - Preparing All Levels of Employees to Recognize and Respond to Risks.
  - Learns from Past Incidents and Operates With What Could Go Wrong.

2) Stakeholder Engagement

- Stakeholders must be identified and listed, to include contractors and excavators.
- Establish dialog with Stakeholders; it's a 2-way street. May use Public Events, Social Media and Other Methods.
- Sharing Safety Performance Data with those in proximity to the Pipeline Facilities.

How Stakeholder Engagement Advances Safety

- Internal: Focus on Employee Engagement, Involvement and Learning.
- External: Focus on Moving from Awareness to Dialogue to Help Identify and Control Risk and Share Performance.
- Supports Processes to Identify and Resolve Concerns about Transparency on Safety Matters.

3) Risk Management

- Builds upon the Risk Management in IMP
- Risk Identification & Threat Assessment: Ask “What can go wrong?”
- Define “Safe Operating Conditions” for your System (e.g., state MOP/MAOP safe range)
- Review Risk at least Annually (Review to include Top Management)

How Risk Management Advances Safety

- Responsiveness to Employee-identified Risk Builds / Improves the Safety Culture.
- Identification of Operational Risks Above & Beyond Regulatory Requirements
- Preventive & Mitigative measures developed

4) Operational Controls

- Operating Procedures

  All employees have STOP WORK authority if procedure may cause an unsafe condition

- System Integrity

  Apply Quality Control for the Life Cycle of Pipeline.

- Management of Change

  Potential risks must be identified for each change

- Use of Contractors

  Communicate SMS requirements to contractors

How Operational Controls Advance Safety

- Greater Certainty That Activities Are Performed as Expected
- Greater Certainty That There Is an Intentional Commitment to Safety
- Employee Understanding That Following Procedures Is Important
- Employees Can Confidently Stop Work and Identify Unsafe Activities

5) Incident Investigations, Evaluations and Lessons Learned

- Must have procedures for incidents and Near-Misses
- Track Corrective and Preventative Actions
- Communication of the Investigation.
  - Internally (Required)
  - Externally (Recommended)
- Re-evaluate Past Incidents & look for patterns
- Evaluate External Events & learn from them

How Incident Investigations, Evaluation, and Lessons Learned Advances Safety

- Ensures the Right Information Is Gathered from Events.
- Is Used to Improve the Risk Management Process.
- Sharing of Lessons Learned Within the Organization Builds the Safety Culture.
- Uses the Incidents of Others to Prevent Their Occurrence Within the Organization.

6) Safety Assurance

- Audit to determine conformity with the SMS.
- Evaluation of:
  - Risk Management to Assess Effectiveness
  - Safety Culture & SMS Maturity.
- Reporting and Feedback to Employees.
- Establish and Maintain Key Performance Indicators (KPIs)
  - Leading (improvements evident due to SMS)
  - Lagging Indicators (track fatalities, injuries, etc.)

How Safety Assurance Advances Safety

- Validation that Risk Management Is Systematic and Disciplined
- Evaluates the Openness of the Organization and Trust of the Employees in the Organization.
- Enhances Safety Culture.

7) Management Review and Continuous Improvement

- The SMS must be reviewed Annually to determine the extent to which goals and objectives have been met
- Management Review Inputs include:
  - Status of Actions from Last Management Review.
  - Results and Recommendations from Incident Investigations.
  - Results of Audits and Evaluations.
  - Regulatory Changes & Stakeholder Input.
- Management Review Outputs
  - A Summary of the effectiveness of the SMS
  - Opportunities for Improvement and Action Items.
  - Identification of Resources
- Continuous Improvement (evaluation of new technology)
- Top Management must review and approve output Annually

How Management Review Advances Safety

- Defines Opportunities and Obtains Authorization for Continuous Improvement Activities
- Sets Safety as a Priority
- Enhances the Safety Culture

8) Emergency Preparedness & Response

- Must have procedures for responding effectively to emergencies
- Procedures must be accessible and communicated to all employees and contractors
- Use of Unified Command/Incident Command Structure.
- Identification of Safety, Health, and Environmental Protection Processes
- Critiques of Drills for Lessons Learned and Improvements
- Periodic Review and Update of the Plan

How ER Advances Safety

- External Stakeholders Involvement and Feedback
- Being Prepared Leads to Good Safety Culture Characteristics
- Identifies the Resiliency of the Organization and Gives a Realistic Sense of Vulnerability and Therefore Watchfulness

9) Competence, Awareness and Training

- Ensure the appropriate level of competence for personnel involved in the SMS
- Training Provided:
  - Elements of the SMS and the Impact on Their Job Requirements
  - New or Changing Risks and Opportunities to Improve Processes and Procedures
  - Potential Consequences of Failure to Follow Processes or Procedures

How Competency Advances Safety

- Builds Trust and Confidence
- Defines Competencies
- Skill Sets Are Refreshed
- Confidence Is Improved.

10) Documentation and Records

- Must have a document control procedure
- Documents:
  - Are Reviewed and Approved Prior to Use
  - Identify Changes and Revision Status
  - Are Available / Accessible to Those Performing an Activity
- Obsolete Documents are not used
- *"If something is not written down, it doesn't exist."* according to (API RP 1173, Sec. 15.11)

How Documentation Advances Safety

- Ensures procedures are up to date
  - Minimizes confusion
  - Reduces operational errors
  - Ensures all parties have agreed to the best way to do things

- Enables accurate reporting and tracking of data, which is the basis of learning and improvement.

How Do I Get Started?

- Top Management Interest / Commitment
  - This cannot be driven from the bottom up
  - Benefits have to be clear, or commitment will vanish

- Decide how API RP 1173 Integrates with Your Operations
  - Already Using an Industry Recognized Management System?
  - Identify gaps and areas for improvement
  - Develop an implementation plan

How Do I Get Started?

- Decide how API RP 1173 Integrates with Your Operations
  - Already using a management system?
    - Product quality management system (ISO 9001 or 9002).
    - Industry process safety management system (American Chemistry Council – Responsible Care®).
    - Regulatory process safety management system (OSHA PSM, EPA RMP).
    - Environmental management system (ISO 14001).
    - Personal safety management system (OHSAS 18001).
    - Asset Management – Management systems (ISO 55001).

How Do I Get Started?

- Decide how API RP 1173 Integrates with Your Operations
  - Already Using an Industry Recognized Management System?
    - If Yes, Then Implementation of API RP 1173 May Be Quick.
    - Implementation Would be Incorporation of the RP Into the existing Management System with Additions Specific to Pipelines.
    - It Is a Recommended Practice.
    - It Is Designed For and By the Pipeline Industry.
    - Has Strong Support From Industry and PHMSA.

How Do I Get Started?

- Decide how API RP 1173 Integrates with Your Operations

  Compliance Issues:
  - Implementation May Uncover Noncompliance
  - Implementation May Provide the Means for Addressing Noncompliance
  - May Identify Issues Before They Become Noncompliant

How Do I Get Started?

- Decide how API RP 1173 Integrates with Your Operations

  External Stakeholder Issues

  - Have Communication Problems with External Stakeholders?
    - Encourages Open Discussion for Building Relationships and Understanding
  - Can Increase the Stakeholders' Confidence in Your Safe Operation (Transparency)
  - Hopefully, You Can Hear About a Concern Before You Learn About it in the News Media

How Do I Get Started?

Develop a S.M.A.R.T. Action Plan

S - **Specific:** Clear goals, not broad generalities

M - **Measurable**: Progress can be measured

A - **Assigned:** A person, not a team

R - **Realistic:** **R**esources are available and dedicated to the task

T - **Trackable:** Deadlines are assigned, and progress is monitored

How Do I Get Started?

- Train the Organization
  - Specific to the Role.
  - The Results of Gap Analysis
  - The Action Plan to Close the Gaps
  - How it Impacts What They Do
  - Benefits of Implementation
  - ‘What Good (or Conformance) Looks Like’

How Do I Get Started?

- Conduct Your First Management Review to:
  - Adopt the Gap Analysis and Action Plan.
  - Prioritize the Actions.
  - Resource the Actions.
  - Set Performance Measures.

What Actions Should I Do First?

- Concentrate on the Continuous Improvement Elements:
  - Leadership and Management Commitment.
  - Stakeholder Engagement.
  - Safety Assurance.
  - Management Review.
- For:
  - Risk Management.
  - Operational Controls.
  - Audit and Evaluations.

- Address any Noncompliance.

How Will I Know That I Am Finished?

- You Will Never Be Finished
  - Continuous Improvement Process.
  - Look for Possible Improvements and Evaluate Their Impact for Improving the Safety Management System.
    - Required by the standard.
    - At this stage of implementation, the evaluation of possible improvements is the primary task.

Steven W. Kirkland
PHMSA Training & Qualifications
Steven.Kirkland@dot.gov
405-423-1353