03

HOW TO IMPLEMENT A PIPELINE SMS

An Introductory Guide with Implementation Suggestions and S trategies

Pipeline SMS

Your guide to implementation.

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CHAPTER ONE

BEGINNING THE JOURNEY...

Pipeline SMS implementation is a journey, not a destination.

INTRODUCTION AND BACKGROUND

A Pipeline Safety Management System (Pipeline SMS) helps operators comprehensively understand, manage and continuously improve their safety efforts. API Recommended Practice (RP) 1173 is a framework pipeline operators can use to review an existing Pipeline SMS or develop and implement a new Pipeline SMS. API RP 1173 was developed jointly by pipeline operators, federal and state pipeline regulators, and expert members of the public to help pipeline operators gain the benefits of a safety management system. It is designed to be scalable to organizations of any size, scope and sophistication and is flexible to account for existing management systems within an organization.

This is the third of three introductory booklets to API RP 1173. **Booklet 1: Why a Pipeline SMS will benefit Pipeline Safety** explains the background and value of API RP 1173 to the Pipeline industry. **Booklet 2: What is a Pipeline SMS?** provides more details on the ten essential elements that are required by API RP 1173. **Booklet 3: How to Implement a Pipeline SMS** includes guidance on how to build and execute an implementation plan for API RP 1173.

This Booklet is not a prescriptive guide to implementation, but a collection of suggestions for an operator to consider as it undertakes implementation of a Pipeline SMS. All operators are encouraged to review this guide for any value they may find. Operators with an existing Pipeline SMS, or who have already designed their implementation strategy, may review this Booklet for any supplemental benefit. Operators starting the Pipeline SMS implementation journey from the beginning will find the greatest use for descriptions of implementation steps, barriers to success and opportunities to leverage.

Pipeline SMS implementation is a priority for operators.

INDUSTRY-WIDE IMPLEMENTATION SUPPORT

Implementation of API RP 1173 Pipeline SMS is a top priority for the pipeline industry. The entire pipeline industry supported development of API RP 1173 and is now mobilizing to encourage and assist its implementation by individual pipeline operators. The liquids pipeline industry plan for Pipeline SMS support includes:

Phase 1: Introduction – Regular industry-wide communication and outreach through awareness events, commitment opportunity and introductory booklets – 2015 & 2016

Phase 2: Tools & Workshops – Development of guidance for the gap analysis process with specific task list, peer-to-peer sharing framework and an assessment tool, along with interactive workshops for practitioners - 2016

Phase 3: Verification Process – Internal, peer-to-peer and third-party options for evaluation of Pipeline SMS implementation and safety performance improvement – 2017 and beyond

API RP 1173 materials and implementation support tools are available at www.pipelinesms.org.

Pipeline SMS is applicable to all.

PIPELINE SMS SCALABILITY, FLEXIBILITY AND MATURITY

API RP 1173 is scalable to pipeline operators of all sizes and levels of sophistication regardless of range of facilities, geographical scope or number of workers.

API RP 1173 also applies to pipeline operators regardless of their current SMS experience. Operators with their own comprehensive SMS can compare themselves to API RP 1173, while those with multiple established SMS can use the RP to integrate and enhance those efforts. Operators with no formal SMS can use the API RP 1173 to establish their own Pipeline SMS.

Regardless of the level of experience with SMS, operators can improve the sophistication, or maturity, of their Pipeline SMS. As an operator's Pipeline SMS matures, it moves towards a fully-integrated, holistic management system, where everyone understands risk, and problems with the potential for incidents are identified and removed from processes and equipment.

An organization's maturity level is not as important as the steps they choose to follow and the progress they make in order to improve their maturity over time.

No one-size-fits-all for pipeline SMS implementation.

IMPLEMENTATION APPROACHES

There is no one size fits all approach to implementing a Pipeline SMS. The implementation suggestions within this booklet are not meant as a prescriptive direction, but instead as a set of considerations to help operators beginning their implementation journey or to enhance and augment existing safety management programs. This implementation guide attempts to identify potential implementation barriers and opportunities for each of the API RP 1173 elements. Operators are encouraged to develop their own implementation program customized to the scale and SMS experience of their company.

Before beginning a Pipeline SMS implementation or improvement project, operators should ensure:

- Top management are actively engaged and supportive
- Managers, supervisors and other impacted stakeholders are identified and involved
- The requirements of the RP as they apply to the operator are clearly understood; this may require re-visiting and re-reading the RP several times
- Internal appraisal and self-reflection on areas for improvement are performed


Pipeline SMS necessitates a strong safety culture.

SAFETY CULTURE DRIVES PIPELINE SMS IMPLEMENTATION SUCCESS

Many aspects of a strong safety culture are necessary for successful implementation of a Pipeline SMS. Collaboration in a strong safety culture enables comprehensive action in a Pipeline SMS. A non-punitive reporting culture enables understanding of risks and improvement opportunities sought through a Pipeline SMS.

Safety culture is a combination of:

Values – what the organization believes
Attitudes – an-open minded approach to always allow asking 'is it safe?'
Practices – established methods that are consistently applied across the organization
Behaviors – how employees should perform their duties and what leaders should both do and reward

Organizations with a positive safety culture are characterized by:

- A shared vision of respect for risk and safety
- A consistent, integrated approach to collaboration across all business functions
- A positive attitude towards 'going beyond compliance', rather than 'just meeting the minimum'
- A feeling of collective responsibility for pubic safety, employee and contractor safety, and protection of the environment
- A non-punitive reporting culture encouraging employees to identify and act upon unsafe situations

Employees, contractors and management acting within a strong safety culture, parallels the entire organization acting under a Pipeline SMS.

02

CHAPTER TWO

IMPLEMENTATION BASICS

IMPLEMENTATION OVERVIEW

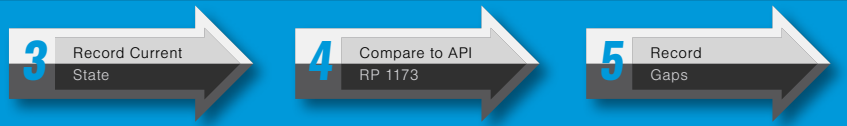
The comprehensive nature of a Pipeline SMS and API RP 1173 will also require a comprehensive implementation effort. Organizations with established project standards can plan their implementation as normal, while organizations that lack such standards can use the ideas in this ten step guide as a starting point for their implementation plan.

PROJECT INITIATION

TASKS TO INITIATE THE PROJECT MAY INCLUDE

- Naming the project sponsor
- Confirming the scope
- Securing an implementation budget
- Verifying the skills required
- Designing the team roles
- Hiring \ engaging the team

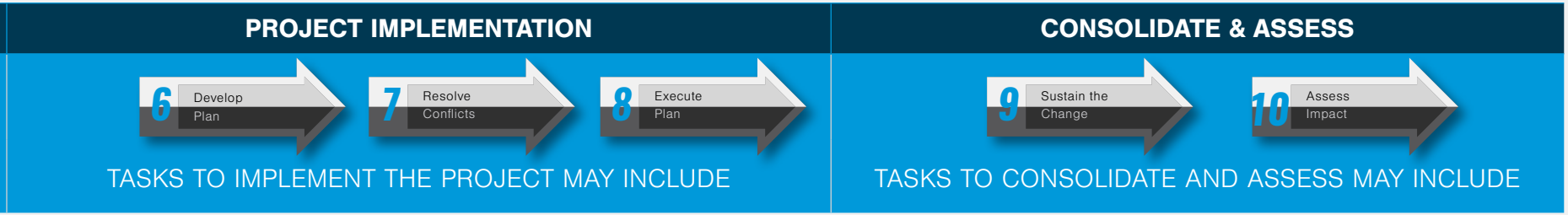
PERFORM GAP ANALYSIS



TASKS TO ANALYZE GAPS MAY INCLUDE

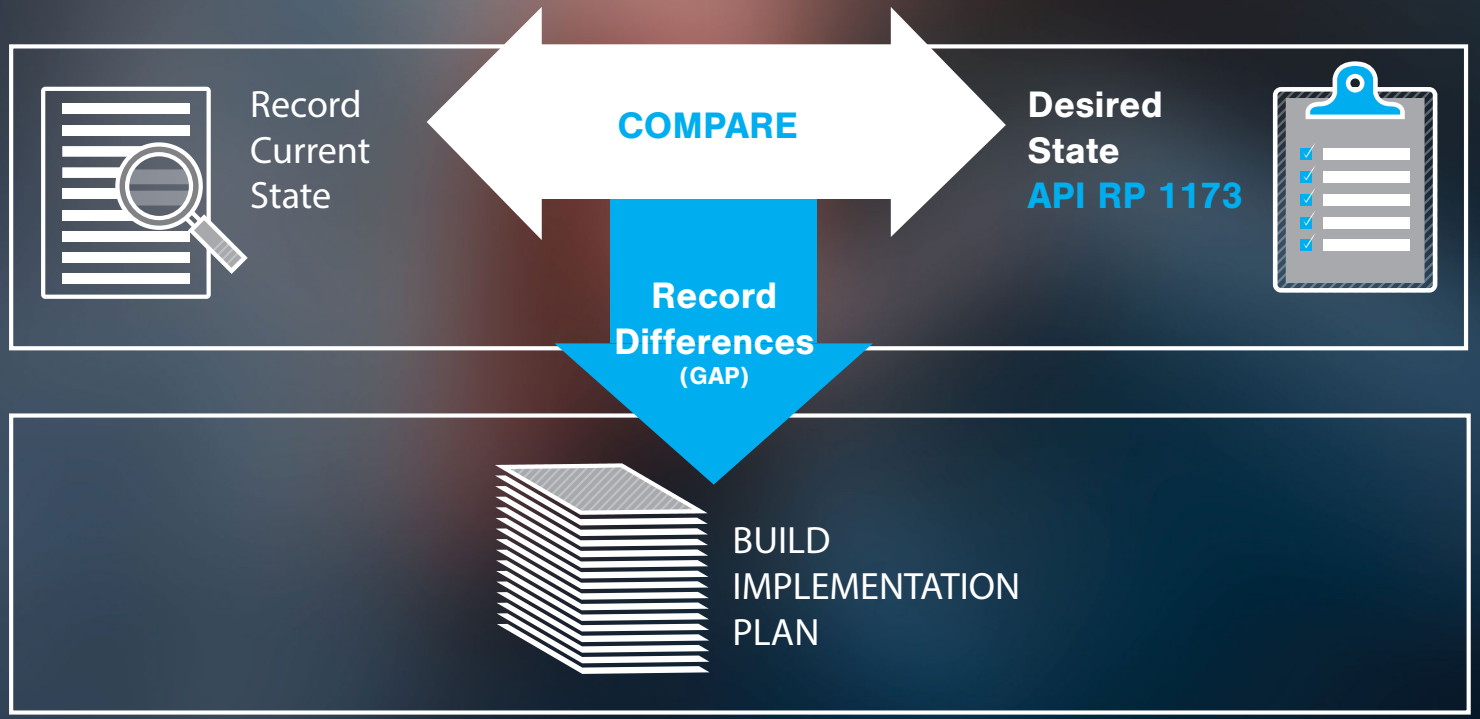
- Understanding the existing current state
- Understanding the maturity of the existing SMS
- Understanding the SMS future plans
- Translating API RP 1173 to the existing SMS
- Determining overlaps and misalignments
- Assessing both coverage and quality
- Identifying API RP 1173 aspects not in the SMS
- Confirming each gap
- Documenting each gap

Implementation activities will span across a pipeline operator's organizational units, across its different functions, and include its many different types of personnel. This effort will require buy-in from all levels of the organization, a detailed plan and everyone's awareness of how they fit into implementation and its success.



- Prioritizing and selecting the gaps to close
- Developing plans to close the key gaps
- Confirming costs, resources, schedules
- Resolving organizational conflicts and impacts
- Resolving schedule conflicts that overload staff
- Escalation to Management as required
- Managing the progress of the plan
- Raising \ resolving risks to the project
- Reporting on-going progress to the sponsor(s)

- Establishing the support team
- Tracking \ publishing progress
- Identifying \ addressing resistance
- Reviewing results against the plan
- Measuring impact of new approaches
- Evaluating if plan goals are met


Record
Current
State
COMPARE
Desired
State
API RP 1173
Record
Differences
(GAP)
BUILD
IMPLEMENTATION
PLAN

GAP ANALYSIS

A key step in implementing API RP 1173 is assessing the gap between the operator's current state and the Pipeline SMS elements of the RP. An operator's management system need not explicitly list the specific ten elements of API RP 1173. An operator will perform a gap analysis to determine whether all of the elements of API RP 1173 are reflected [in some form or fashion] in its processes and procedures and own management system. Gaps only exist if a requirement of API RP 1173 is not reflected somewhere within an operator's management system.

To perform a gap analysis:

- Understand the specific components and obligations of API RP 1173
- Associate (or map) current operator practices and procedures to the components and obligations of API RP 1173
- Analyze where operator practices and procedures, alone or in combination, translate to API RP 1173 elements
- Identify where API RP 1173 components and obligations are unmet by current operator practices and procedures. These represent gaps the implementation plan can consider prioritizing and addressing at appropriate time
- Assess the quality of current operator practices and procedures in comparison to the components and obligations of API RP 1173 to determine opportunities to improve safety management and pipeline safety performance


Everyone helps to achieve
a successful pipeline SMS.

KEYS TO A SUCCESSFUL IMPLEMENTATION

Successful implementation of a Pipeline SMS requires buy-in from all levels of the organization, a detailed plan and everyone's awareness of how they fit into implementation and its success. Top Management sets the tone for an organization and their engagement throughout the implementation plan can prevent barriers to success from emerging.

- Senior leaders need to participate actively and visibly throughout the implementation program. When leaders demonstrate their commitment in both words and actions, employees recognize the importance and priority of the program. Leaders need to build and sustain a coalition of their direct reports who will support the program and tackle the obstacles which arise

- Managers and employees must understand why the program is being implemented and how the program impacts each of them. Leaders need to build awareness and support for their program and visibly communicate the benefits for each employee

- Three parallel tracks of activity, planned and executed in alignment, may help to successfully implement a Pipeline SMS:
    - A Leadership track that ensures implementation, resolves conflicts as they arise and champions the change
    - A Management track that identifies and manages potential implementation impacts such as cost, disruption, resistance and conflicts, and helps participants through the implementation process
    - A Project track that develops and executes an implementation work plan

CHAPTER THREE

03 IMPLEMENTATION OF PIPELINE SMS ELEMENTS

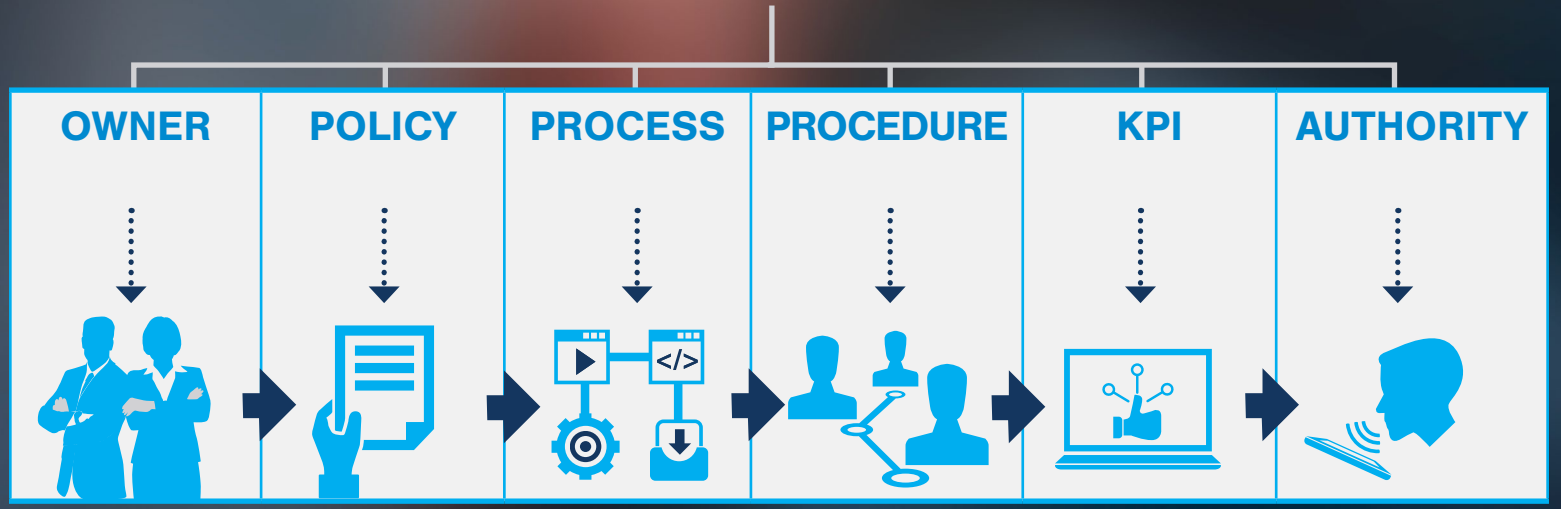
Design an appropriate implementation approach.

IMPLEMENTATION FUNDAMENTALS

As described earlier, this Booklet is not a prescriptive guide to implementation, but a collection of suggestions for an operator to consider as it undertakes implementation of a Pipeline SMS. All operators are encouraged to review this guide for any value they may find. Operators with an existing Pipeline SMS, or which have already designed their implementation strategy, may review this Booklet for any supplemental benefit. Operators starting the Pipeline SMS implementation journey from the beginning will find the greatest use for descriptions of implementation steps, barriers to success and opportunities to leverage.

The following pages of this chapter break down each element of API RP 1173, its purpose and involved stakeholders. Element specific pages also describe potential barriers to success and possible opportunities to leverage when implementing the element. The intent of API RP 1173 to provide a framework that is both scalable and flexible remains just as applicable to the implementation phase. The barriers and opportunities discussed in this chapter are good things for all companies to consider. However, some suggestions in this chapter may not be applicable to all operators, especially those smaller in size or those with established programs utilizing different approaches. In all cases, operators are encouraged to implement API RP 1173 in a way that makes the most sense for their own company, its size, resources and history with safety management systems.

ELEMENT COMPONENTS



ELEMENT BREAKDOWN

Understanding the components of an element frames the focus for implementation. Consider these components when implementing elements:

Owner – An identified person within the organization who is accountable for the element content.

Policy – Every element should be aligned to a policy that describes the requirements that define expectations and the behaviors required for success.

Process – An element has at least one process describing the activity to be performed to meet required policy and the organizational roles responsible for carrying out the activity should be described. Large elements may have multiple processes to fully cover the scope of activities.

Procedure – Each process requires a set of written procedures or work instructions for each employee role. These written work procedures\instructions form the basis of competence training to ensure that employees understand how to perform their work.

Key Performance Indicators (KPIs) – How will the performance of the element be measured in order to determine if it is 'fit-for-purpose' or 'drives improvements'? Each element requires a combination of leading and lagging indicators so that organizational performance can be monitored, tracked and enable continuous improvement. Reports of such KPIs form the basis of management and leadership reporting that takes place during management review activities.

Authority – Within each element, certain key decisions will be made, such as 'Which is the best risk mitigation strategy?' employees need to understand their decision-making authority.

IMPLEMENTING LEADERSHIP AND MANAGEMENT COMMITMENT

Purpose – Implementing a management system, with API RP 1173, is a cross-organizational initiative requiring Top Management commitment and involvement. Developing and resourcing implementation plans and communicating widely across the organization will establish the Pipeline SMS initiative as a serious business requirement and not something that can be viewed as 'optional'.

Involved Stakeholders - Top Management, Identified Leader(s), Management, Supervisors

Barriers to Success

- Lack of communications
- Lack of prioritization of objective
- Lack of Top Management accountability

Opportunities to Leverage

- Coffee talks, Employee meetings, Team meetings, Management by walking around
- Hiring \ promoting employees who demonstrate positive safety culture reinforces the implementation
- Visibly reward the desired behaviors

QUESTIONS TO ASK YOURSELF

Does your Leadership team demonstrate the behaviors you are asking of your employees?

Does your resource commitment to the initiative (budget, people) match your messaging?

Do you have a communication plan that involves every Leader, every Manager and every Supervisor?

FACTORS FOR SUCCESS

Key Message Leaders should deliver – Pipeline SMS - it's how you should perform your job

Repeated communications – key messages need to be repeated 5 – 7 times for lasting impact

"Walk the talk" - employees follow the example of their Leaders

IMPLEMENTING STAKEHOLDER ENGAGEMENT

Purpose – Stakeholders for Pipeline SMS are both internal and external. External stakeholders may include Customers, Regulators, Investors, the Public and the wider Business environment. Internal stakeholders extend from the Board through every organizational level to every individual employee. All Stakeholders have different expectations of Pipeline Safety and in order to deploy an effective management system all these viewpoints need to be understood, as they represent uncertainty that must be managed. Ensuring a culture of internal and external stakeholder engagement supports proactively passing concerns to a pipeline operator where they can be addressed, promoting an environment of mutual trust.

Involved Stakeholders – Employees, Contractors, the Public, Emergency Responders, Government (Regulators), Board, Customers, Competitors

Barriers to Success

- No defined stakeholder list
- Lack of trust or low trust culture
- Lack of communications and feedback

Opportunities to Leverage

- Leveraging Stakeholders' informal influence networks
- Identify and use preferred sender of communications for every Stakeholder
- Taking advantage of non-traditional communication channels such as internet chat or social media

QUESTIONS TO ASK YOURSELF

How will you fulfill the expectations of each stakeholder group?

How will you report to stakeholders and what data will you make available?

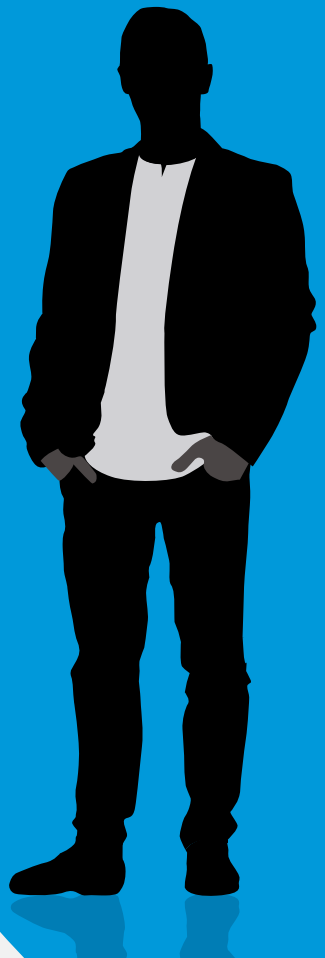
How will you monitor stakeholder expectations in order to detect changes?

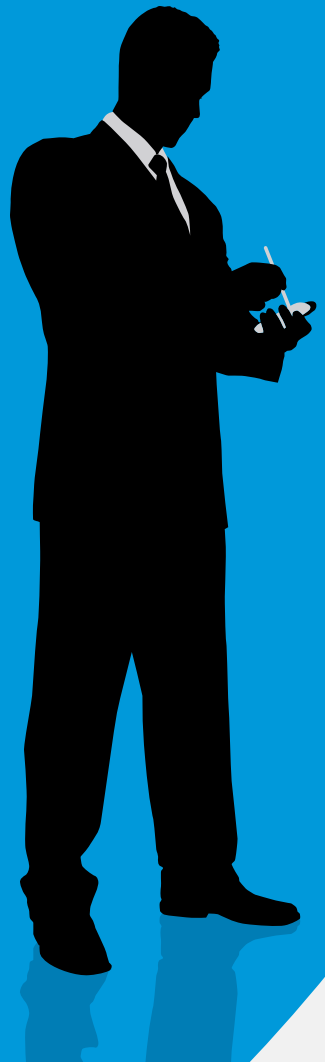
FACTORS FOR SUCCESS

Respect each stakeholder's viewpoint

Listening techniques - 'Why they say that' as well as 'What they actually say'

Understand your stakeholder landscape - Who is most impacted?
Who has most influence? Who is supportive?





IMPLEMENTING LEADERSHIP AND MANAGEMENT COMMITMENT

Purpose – Risk Management allows organizations to manage uncertainty and maximize value via risk-aware decision-making to mitigate, transfer or accept uncertainty. Effective pipeline safety risk management provides a check against excessive risk-taking and results in resources being allocated to their place of most need. Common tools and processes allow different pipeline safety risks to be compared, contrasted and prioritized.

Involved Stakeholders – Leaders, Top Management, Managers and Supervisors, Operational Employees

Barriers to Success

- Lack of employee understanding and engagement in risk management activities
- Low probability, high consequence risks represent organizational threat and require management attention that can be difficult to secure
- Risk quantification can be viewed as unrealistic by employees, leading to slow adoption

Opportunities to Leverage

- Leverage data, information, operating history from existing risk management programs
- Actively engage employees with first-hand knowledge of the pipeline (operating practices, near-misses)
- Adequately resource risk management efforts to improve both pipeline safety and safety culture

QUESTIONS TO ASK YOURSELF

- How will we quantify pipeline safety risks consistently across the Enterprise?
- How will we train all employees involved in risk management activities?
- Who will own and maintain the pipeline-related asset inventory and associated threats?

FACTORS FOR SUCCESS

- Defining and communicating both risk appetite and risk tolerance
- Quantifying all risks via the same scheme so that risks can be compared
- Consider linking top management compensation to managing pipeline safety risk

IMPLEMENTING OPERATIONAL CONTROLS

Purpose – At any given time a variety of asset life-cycle activities may be underway on a pipeline. Each of these activities interacts with the asset in a manner that has the potential to adversely impact safety. Operational controls ensure the safe execution of work practices by employees and third parties, providing control over construction and installation practices, and the disciplined management of pipeline changes to maintain overall pipeline safety.

Involved Stakeholders – Employees, Contractors, Outsourced Providers, Managers

Barriers to Success

- Complexity (compliance framework, pipeline components, workforce dynamics, acquisitions)
- Balancing priorities in commerical and safety decision-making
- Not understanding the impact of change on process safety objectives or tolerance to risk

Opportunities to Leverage

- Automated tracking of changes affecting operational work procedure documents
- Lifecycle cost models that include safety elements in design/build/operate decisions
- Formal links between change and risk registers to appropriately evaluate process safety impacts

QUESTIONS TO ASK YOURSELF

Can employees stop work if they believe following a procedure creates an unsafe condition?

How do you balance long-term safety vs. short-term production and profitability decisions?

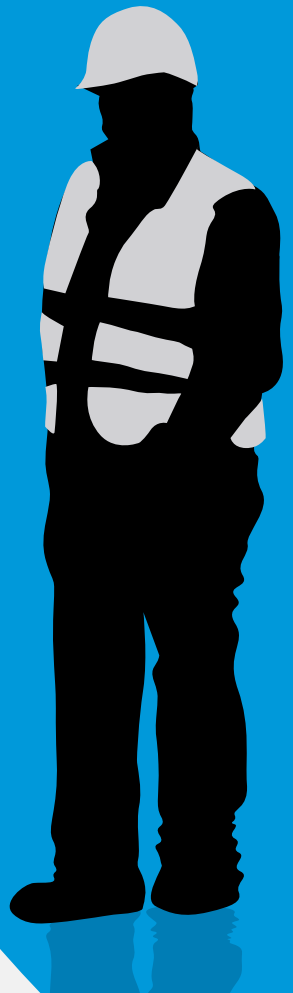
Does your management of change process assess people, process, technology and culture changes for pipeline safety impacts?

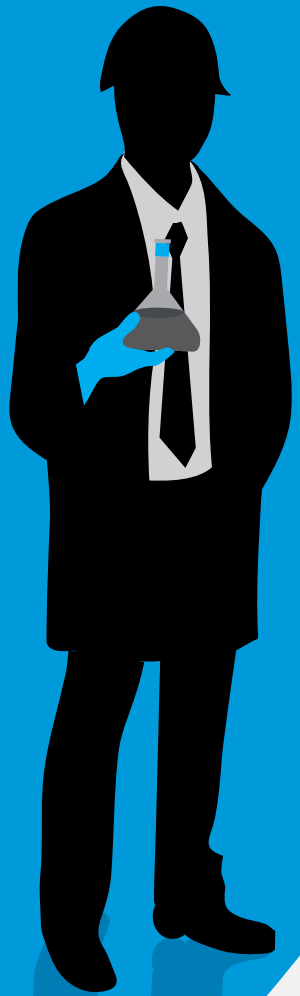
FACTORS FOR SUCCESS

Awareness and compliance with relevant technical standards, legislation requirements and manufacturer requirements

A holistic, ‘whole system view’ that incorporates process safety into all lifecycle decisions

Well-defined alignment between change management and risk management processes





IMPLEMENTING INCIDENT INVESTIGATION, EVALUATION AND LESSONS LEARNED

Purpose – Learning from previous incidents is an important behavior required to drive continuous improvement and the prevention of future incidents. The learning incident need not be a major disaster – it can be the investigation and root cause analysis of an adverse trend of minor failures that will lead to organizational learning and improvement. Regardless of the scale of the incident, it is important to provide a mechanism that protects and empowers employees to perform this function in a consistent manner.

Involved Stakeholders – Subject Matter Experts, Management and Supervisors, Employees, and Contractors

Barriers to Success

- Lack of incident data (non-reporting culture)
- Unmaintained incident trend data resulting in a reactive-only approach
- Fear of reprisal \ discipline \ dismissal

Opportunities to Leverage

- Proactive monitoring of minor incident trends can identify possible increasing safety risk
- Learning from the mistakes of other organizations
- Mobile devices allow easier capture of incident data at the point of occurence

QUESTIONS TO ASK YOURSELF

- What skills and competencies need to be staffed and available to review incidents?
- Do you have a formal decision-making process to guide incident evaluations?
- How will the results of lessons learned be tracked into future improvements?

FACTORS FOR SUCCESS

- Providing processes and policies that encourage reporting of unsafe conditions
- A culture of thinking through ‘worst possible scenario’ outcomes – i.e. the worst can happen
- Establishing a culture of incident reporting and recording – you cannot investigate and evaluate what you don’t know exists

IMPLEMENTING SAFETY ASSURANCE

Purpose – Audit and performance measurement activities assure pipeline operators that safety standards and specifications are adhered to and processes designed to manage risk are in place and effective. Key Performance Indicators (KPIs) should be used to report results from assessments of the adequacy and effectiveness of the Pipeline SMS and the safety culture. Safety assurance also relies on feedback collected from employees on Pipeline SMS performance and risk mitigation practices. Ultimately, management is accountable for developing and executing plans to address identified deficiencies.

Involved Stakeholders - Auditors and reviewers, employees, contractors, IT, Management and Supervisors

Barriers to Success

- KPIs incompletely aligned with objectives
- Weak KPIs that drive undesirable behavior
- Culture that does not promote reporting

Opportunities to Leverage

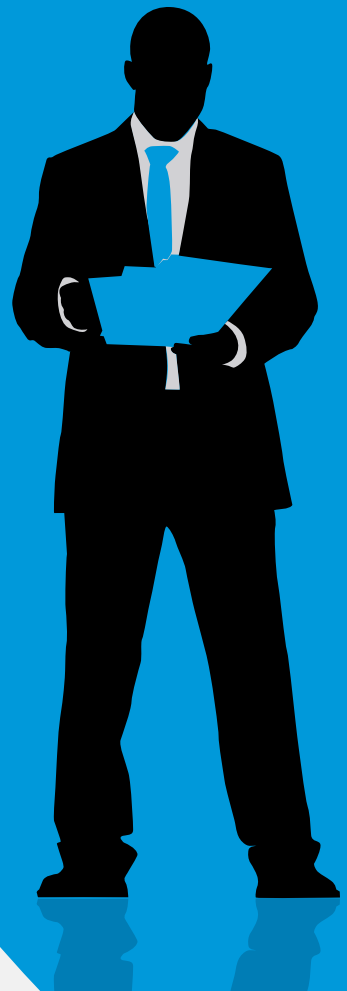
- Benchmarking and sharing of KPI best practices allows self-comparison of safety performance
- Leveraging cross-functional resources for Pipeline SMS corrective improvement plans results in better decisions
- Performing safety culture assessments to encourage a willingness to report unsafe conditions
- Establish good evaluation and audit programs including considering third party audits

QUESTIONS TO ASK YOURSELF

- Do performance metrics drive the behavior of Leaders and Managers and relate to Employees' day-to-day activities?
- Are Managers and Senior Leaders empowered and accountable to correct Pipeline SMS deficiencies?
- What is our attitude towards blame when safety concerns are identified?

FACTORS FOR SUCCESS

- Metrics that monitor both safety culture and the Pipeline SMS
- Seeing deficiencies as opportunities to continuously improve performance
- Maintaining a non-punitive environment so employees, contractors and others involved are comfortable raising pipeline safety concerns



IMPLEMENTING MANAGEMENT REVIEW AND CONTINUOUS IMPROVEMENT

Purpose – Management Review is the process by which Leaders periodically take stock of their safety performance and determine progress in achieving goals and objectives. By evaluating the effectiveness of the Pipeline SMS, the validity of risk management decisions and the overall safety performance can be assessed and corrective actions can be developed to drive further improvements. Such decisions and actions feed into the next iteration of the Pipeline SMS plan to close the PDCA loop, and are the foundation of efforts to continually improve maturity.

Involved Stakeholders - Top Management, Leaders, external stakeholder deliverables (reports, surveys, investigation recommendations, lessons learned)

Barriers to Success

- Incomplete or misaligned performance targets
- A silo view of performance \ corrective actions
- Wide variation in quality of performance data

Opportunities to Leverage

- Balanced scorecard and cascaded goals to develop comprehensive performance targets
- Executive-level sponsorship of Pipeline SMSto ensure alignment across the organization
- Business Intelligence and decision-support technologies to simplify Management Review

QUESTIONS TO ASK YOURSELF

- Do you have a full suite of pipeline safety performance targets appropriate to the level of risk for your operation?
- Do senior leaders and managers have pipeline safety-related performance objectives in their personal performance plans?
- Do you publish your Pipeline SMS performance?

FACTORS FOR SUCCESS

- Comprehensive, holistic performance targets covering systems and behavior, both proactive (leading) and reactive (lagging)
- A published pipeline safety improvement plan for each contributory part of the organization
- Top management and leadership accountability for completion of preventive and corrective actions identified from management reviews, evaluations and audits

IMPLEMENTING INCIDENT INVESTIGATION, EVALUATION AND LESSONS LEARNED

Purpose – In the event of an incident, companies must be prepared with appropriate resources, processes and readily available infrastructure. First responders with adequate and readily available pipeline specific information are better prepared to respond to emergencies. Planning and training for emergencies allows the organization to protect value in difficult circumstances, while meeting the expectations of Regulatory agencies and the Public.

Involved Stakeholders - Response Team, Command Center, IT, Law, Top Management, HR, Supply Chain, Response Contractors, Local Emergency Responders, Government Agencies

Barriers to Success

- Leadership commitment to provide resources for something that 'might never happen'
- Culture of 'it won't happen to us'
- Availability of named personnel for training

Opportunities to Leverage

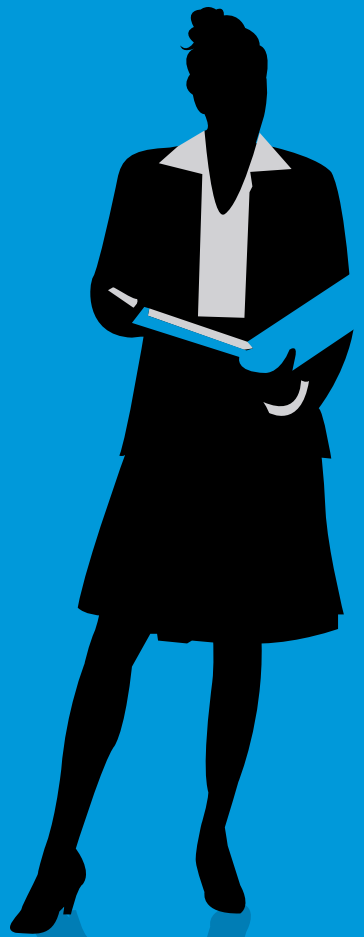
- Conducting table-top exercises with Top Management, Managers and Employees allows safe learning
- Engaging supply chain to implement rapid procurement practices can lead to other savings
- Undertaking joint training and planning exercises with local responders or other operators

QUESTIONS TO ASK YOURSELF

- Do you have sufficient response resources for the locations where you operate?
- When was the last time you tested emergency response processes?
- What emergency situations do you NOT address currently and why?

FACTORS FOR SUCCESS

- Named individuals who are immediately assigned to Emergency Response activities in the event of an incident
- Pre-prepared response procedure manuals and supporting infrastructure toolkits
- Protocols, plans and infrastructure to maintain clear communications during critical events if normal infrastructure is not available



IMPLEMENTING DOCUMENTATION AND RECORD KEEPING

Purpose – Regulators and external stakeholders have ever-increasing expectations that pipeline operators have appropriate documentation to support their pipeline safety programs. Being able to access the 'right document' for the 'right information' at the 'right time' is a crucial aspect of safety management.

Involved Stakeholders - Law, IT, Records Management, Employees

Barriers to Success

- Inadequate IT Systems
- Manual classification of records is inaccurate and error prone making information retrieval more difficult
- New communication channels – TXT, internet chat, social media challenges traditional recording mechanisms

Opportunities to Leverage

- New automation technologies for document \ record classification and storage can remove human error
- Process definition work can identify when a document becomes a record, removing human decision errors

QUESTIONS TO ASK YOURSELF

- Do employees understand the difference between a document and a record?
- Are all your Policies, Processes and Procedures signed by a current accountable employee?
- Can you demonstrate you have control of custody of a record over its full lifecycle i.e. could it have been altered?

FACTORS FOR SUCCESS

- Disciplined document controls and management procedures facilitate easy and fast information retrieval
- Establish a culture of dating and signing documents – this demonstrates accountability
- Minimize manual handling and processing of records

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CHAPTER FOUR

04 PIPELINE SMS IMPLEMENTATION IN ACTION

Examples of PDCA Cycle

PLAN – DO - CHECK - ACT

PLAN-DO-CHECK-ACT CYCLE

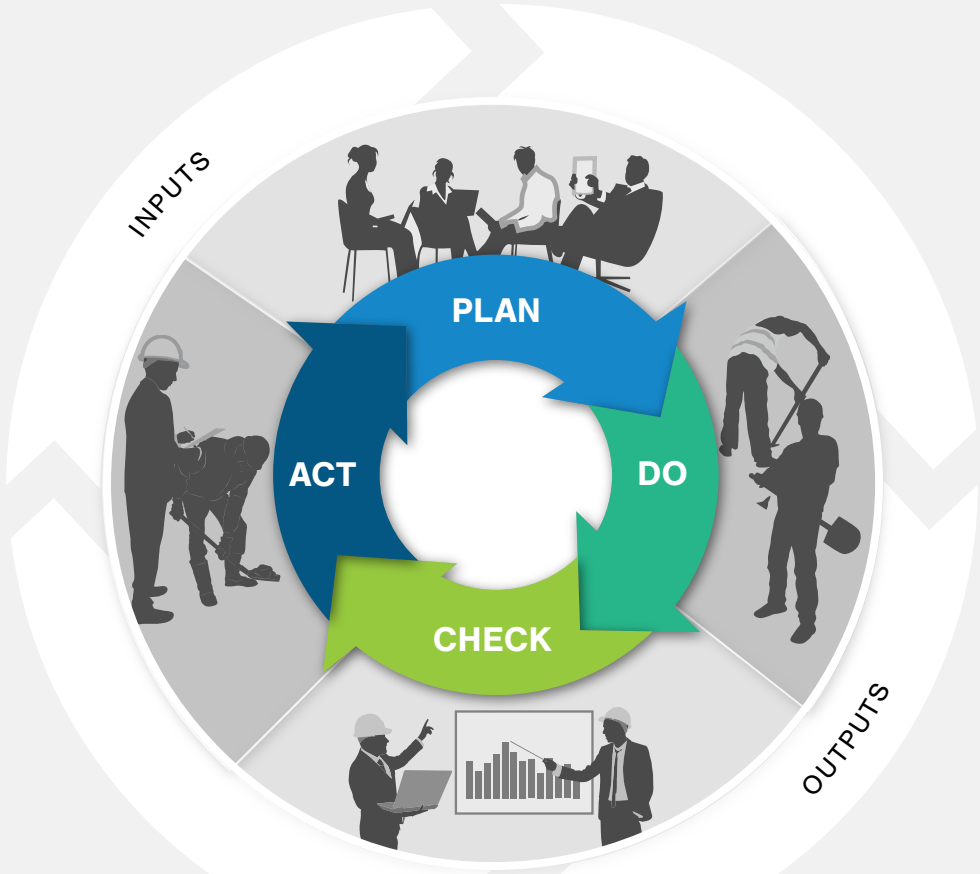
The Plan, Do, Check, Act (PDCA) is central to the Pipeline SMS. It is the iterative approach to creating strategies and plans, executing the plans, checking outcomes and effectiveness, and then adjusting future strategies and plans to repeat the cycle enables continuous pipeline safety improvement. Each phase of the PDCA cycle requires the implementation of enabling functions, which support its operation:

Plan – Implementation results in the delivery of information and the management oversight necessary to develop plans to meet the pipeline operator's goals, objectives and activities.

Do – Implementation results in personnel with the skills and competencies appropriate to their role and the correct procedures to follow in order to execute the plans.

Check – Implementation results in the discipline and maturity of self-assessment, learning from experience and the policies and procedures for undertaking necessary reviews.

Act – Implementation results in management commitment and procedures to incorporate the adjustments necessary to drive continuous improvement.



PLAN – DO - CHECK - ACT

PDCA APPLIED TO INTEGRITY MANAGEMENT

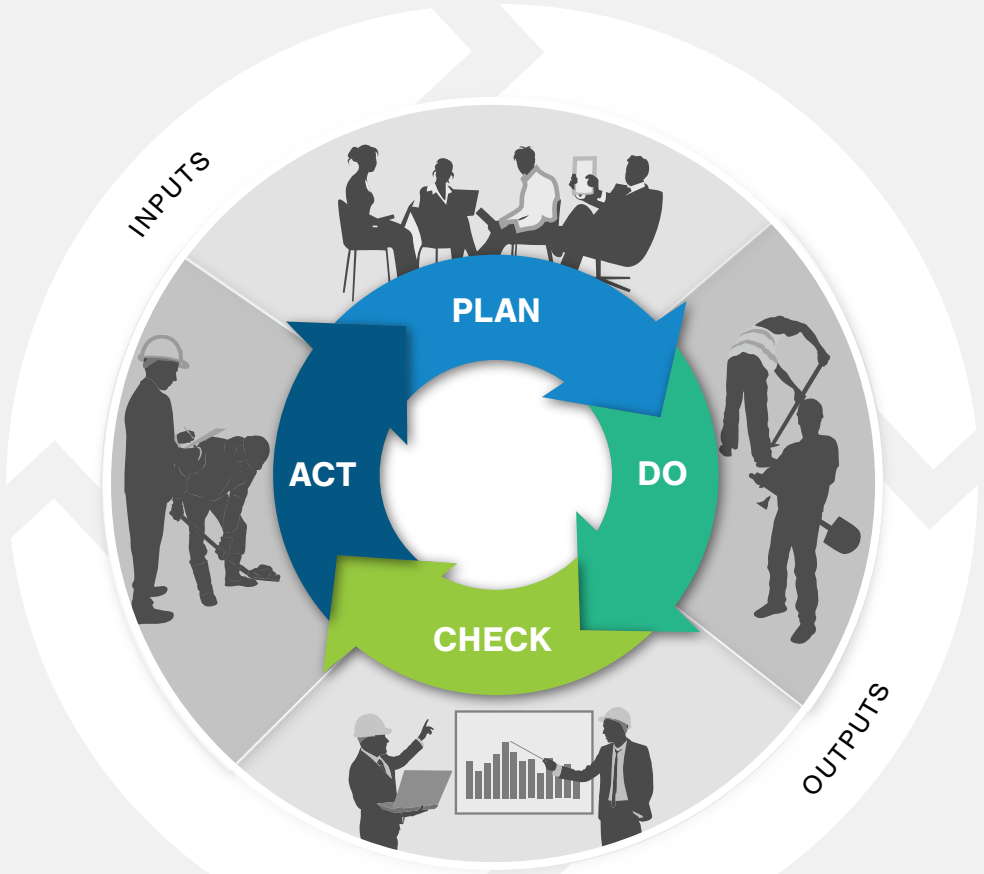
Implementation of a Pipeline SMS and the PDCA cycle will benefit many different functions and activities across a pipeline organization. Fully embracing opportunities to learn from experience and make continuous improvement reflected in the PDCA cycle can greatly benefit the annual planning and reassessment cycles of a pipeline integrity management program.

Plan – Incorporate improvement recommendations or advisories, “act” results from last pdca cycle.
– Incorporate line operational history, ili capability changes, management of changes issues.
– Select inline inspection tool (ili).

Do – Collect and integrate threat data
– Conduct ILI tool runs
– Analyze ILI tool run results
– Perform verification digs
– Conduct repair digs

Check – Review ILI tool performance.
– Compare dig results to ILI results .

Act – Revise ILI tool capability knowledge.
– Set new ILI reassessment cycle.
– Inform risk assessments.
– Evaluate program, organizational performance.



PLAN – DO - CHECK - ACT

PDCA REFLECTED IN MANAGEMENT REVIEW

Each phase of the PDCA cycle is reflected in robust implementation of the Management Review and Continuous Improvement element of API RP 1173. Plan and Do phases of the PDCA cycle are natural steps for producing information inputting into reviews and producing review output decisions and action items. Check and Act activities will also enable adjustments to improve the quality and effectiveness of the reviews and increase the performance improvements spurred by management reviews

Plan – Identify internal and external stakeholders involved in preparing for Review.
– Schedule development of input requirements (KPIs, Risk Reviews, Evaluations etc.) and review dates.

Do – Conduct management review of status and results from input requirements.
– Produce any management review decisions and actions, changes to required resources and improvements to processes and procedures.

Check – Check the process for producing the management review inputs for completeness and timeliness.
– Determine the extent to which management review outputs were implemented.

Act –Make adjustments as necessary to improve production and gathering of management review input requirements.
– Make adjustments as necessary to improve implementation of management review decisions and actions.


Raise Safety Performance
to benefit All.

CONCLUSION

API RP 1173 is an important initiative for the pipeline industry and effective implementation will raise safety performance to the benefit of operators and the wider public and environment.

For successful implementation it is important to remember:

- Visible and active leadership is critical for success – your Leaders must be part of the implementation
- The implementation of Pipeline SMS never stops, it is a continuing improvement activity whereby maturity increases with each implementation cycle
- Once effective, Pipeline SMS minimize risk and maximize value for the organization
- Regulator and public expectation – formal documentation and records management helps demonstrate your company's management systems reflect the requirements of API RP 1173

Implementation Resources are Available.

TOOLS TO SUPPORT OPERATORS

Website – http://www.pipelinesms.org

Booklet 3 – http://bit.ly/PSMSBookThree

Implementation spreadsheet – http://bit.ly/RP1173Speadsheet

Peer to Peer Tool – http://bit.ly/RP1173Sharing

MORE TOOLS TO SUPPORT OPERATORS

In Booklet 1, the reader will learn:

- Why a Pipeline SMS will help improve pipeline safety
- Background information on the development of API RP 1173
- How Safety Management Systems have helped other industries
- The ways Pipeline SMS enhances safety culture
- The intention for Pipeline SMS to be used by operators of all sizes and experiences
- The role of a leader in Pipeline SMS

Booklet 1 – http://bit.ly/PSMSBookOne

MORE TOOLS TO SUPPORT OPERATORS

In Booklet 2, the reader will learn:

- Descriptions of the 10 Pipeline SMS elements and their importance to improved pipeline safety performance
- How the Plan-Do-Check-Act (PDCA) cycle is critical to implementing the 10 Pipeline SMS elements
- Details on the flexibility and scalability of the elements
- Ways each element strengthens an organization's safety culture

Booklet 2 – http://bit.ly/PSMSBookTwo

Pipeline SMS

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