

LIQUIDS PIPELINE INDUSTRY
**ANNUAL
REPORT**

PIPELINE SAFETY MANAGEMENT SYSTEM



Pipeline SMS
GROUP

2016

PIPELINE SAFETY REGULATORS ENCOURAGE PIPELINE SMS

“PHMSA fully supports the implementation of pipeline safety management systems. We all agree that the goal is zero accidents, yet low probability, high consequence events continue to happen. Just responding to the latest incident is not the optimal strategy going forward. We need to diligently work to prevent the next accident. This is where pipeline SMS come into play; to apply a methodical, systematic approach to pipeline safety.”

ALAN MAYBERRY

Associate Administrator for Pipeline Safety
U.S. Pipeline and Hazardous Materials Safety Administration

“I am confident the adoption of Pipeline Safety Management Systems by the nation’s pipeline operators will result in long-term improvements in the safety and reliability of the country’s pipeline transportation systems. I believe short-term improvements will also be achieved, namely from organizational changes resulting from enhanced recognition of the importance of positive safety cultures.”

STEVE ALLEN

Director of Pipeline Safety
Indiana Utility Regulatory Commission

PIPELINE SMS GROUP

Pipeline SMS is an effort of the American Petroleum Institute and Association of Oil Pipe Lines to educate stakeholders and enhance safe pipeline operations through the implementation and use of pipeline safety management systems. Every U.S. company operating a pipeline in the United States is eligible to participate in the Pipeline SMS Group.

AMERICAN PETROLEUM INSTITUTE (API)

API is the only national trade association representing all facets of the oil and natural gas industry, which supports 9.8 million U.S. jobs and 8 percent of the U.S. economy. API’s more than 625 members include large integrated companies, as well as exploration and production, refining, marketing, pipeline, and marine businesses, and service and supply firms. They provide most of the nation’s energy and are backed by a growing grassroots movement of more than 30 million Americans.

ASSOCIATION OF OIL PIPE LINES (AOPL)

AOPL represents liquids pipeline owners and operators transporting crude oil, petroleum products like gasoline, diesel, jet fuel, and home heating oil and industrial products like propane and ethane.

OUR IMPLEMENTATION BEGINS

2016 was an exciting year for liquids pipeline operators and pipeline safety improvement. The pipeline industry concluded two years of hard work developing a new way to manage pipeline safety efforts holistically and comprehensively. The result was industry-wide guidance for applying safety management systems (SMS) — a management tool used in the aviation, nuclear, and refining sectors — to pipeline operations. In 2016, individual pipeline companies embraced this new effort by formally agreeing to follow the new Pipeline SMS guidance and begin the journey of implementation.

This report is the first annual review of the liquids pipeline industry's efforts to implement API Recommended Practice (RP) 1173 for Pipeline Safety Management Systems (SMS). RP 1173 is a framework document for operators to develop or adjust their own company-specific SMS programs. Some operators have used a SMS for many years while others have a variety of safety programs, but they are not managed comprehensively. Other operators have not previously used a SMS for pipelines.

For every company participating in this effort, 2016 was a year of embracing a new challenge. Early in the year, companies started formally committing to implementing RP 1173. The industry-wide team of company volunteers helping pipeline operators implement RP 1173, which I lead, issued several tools to educate participants on the benefits of SMS for pipelines. Company personnel attended industry-sponsored workshops on the different elements of RP 1173 and how to implement its requirements. Companies started comparing their safety programs to API RP 1173 and assessing gaps. 2016 closed with pipeline operators developing action plans for closing gaps and recording early successes.

I am extremely proud of all the work shown by pipeline operators and our industry-wide implementation support team. We are embracing something that is hard, but ultimately will take pipeline safety to a new level. This is a multi-year journey to implement something so comprehensive into our complex pipeline operations while operating safely. I hope you will see in this report that we are off to a great start and are already seeing benefits to pipeline safety.

One of my favorite phrases regarding the Pipeline SMS implementation is “It’s a journey, not a destination.” Let’s all keep this in mind as we work to implement a SMS for pipelines in our companies.



Shawn Lyon
Team Leader, API-AOPL Pipeline SMS Implementation Team
Vice President of Operations, Marathon Pipe Line LLC

WHAT IS PIPELINE SMS?

A safety management system is a systematic approach to managing safety, including the structures, policies and procedures an organization uses to direct and control its activities.

Our modern industrial world is complex. Many interrelated activities are needed to develop a resource, manufacture a product, or operate a facility or machine. Managing the safety of a complex process requires coordinated actions to address multiple, dynamic activities and circumstances. Simple management oversight focused on a single activity or process may not be enough to account for all the variables contributing to safe operations. A SMS helps operators comprehensively understand, manage, and continually improve their safety efforts.

SMS users also gain better information on the safety of their systems, learn where they can improve safety and measure progress toward improved safety performance. SMS bring a consistent, formal structure to safety management ensuring operators incorporate learnings from industry trends, incident findings and recommendations, regulatory notices and advisories, internal audits and evaluations or changes in operations into their Plan-Do-Check-Act improvement cycles.

For these reasons, the U.S. National Transportation Safety Board (NTSB) recommended the pipeline industry develop a SMS for pipelines. In 2015, pipeline operators, together with PHMSA, state and local pipeline safety regulators for and expert members of the public, finalized a framework the Pipeline SMS in the form of API RP 1173. The liquids pipeline industry immediately turned to promoting industry-wide implementation of a SMS for pipelines for all pipeline operators.



BENEFITS OF PIPELINE SMS

Safety

Pipeline SMS will help pipeline operators continually and comprehensively track and **improve their pipeline safety performance.**

Flexibility

The Pipeline SMS framework of API RP 1173 provides the **flexibility for operators to apply to their specific circumstances.**

- In cases where a pipeline operator is already operating under its own SMS, API RP 1173 serves as a basis of comparison and review between the pipeline industry's recommended practice and the operator's current system.
- Other operators may have some individually established safety systems but no comprehensive SMS. For them, the framework of this RP provides a means to integrate and add to those efforts resulting in a more comprehensive SMS.
- For those operators without a formal SMS, adoption of API RP 1173 is a starting point to build their own SMS for pipelines.

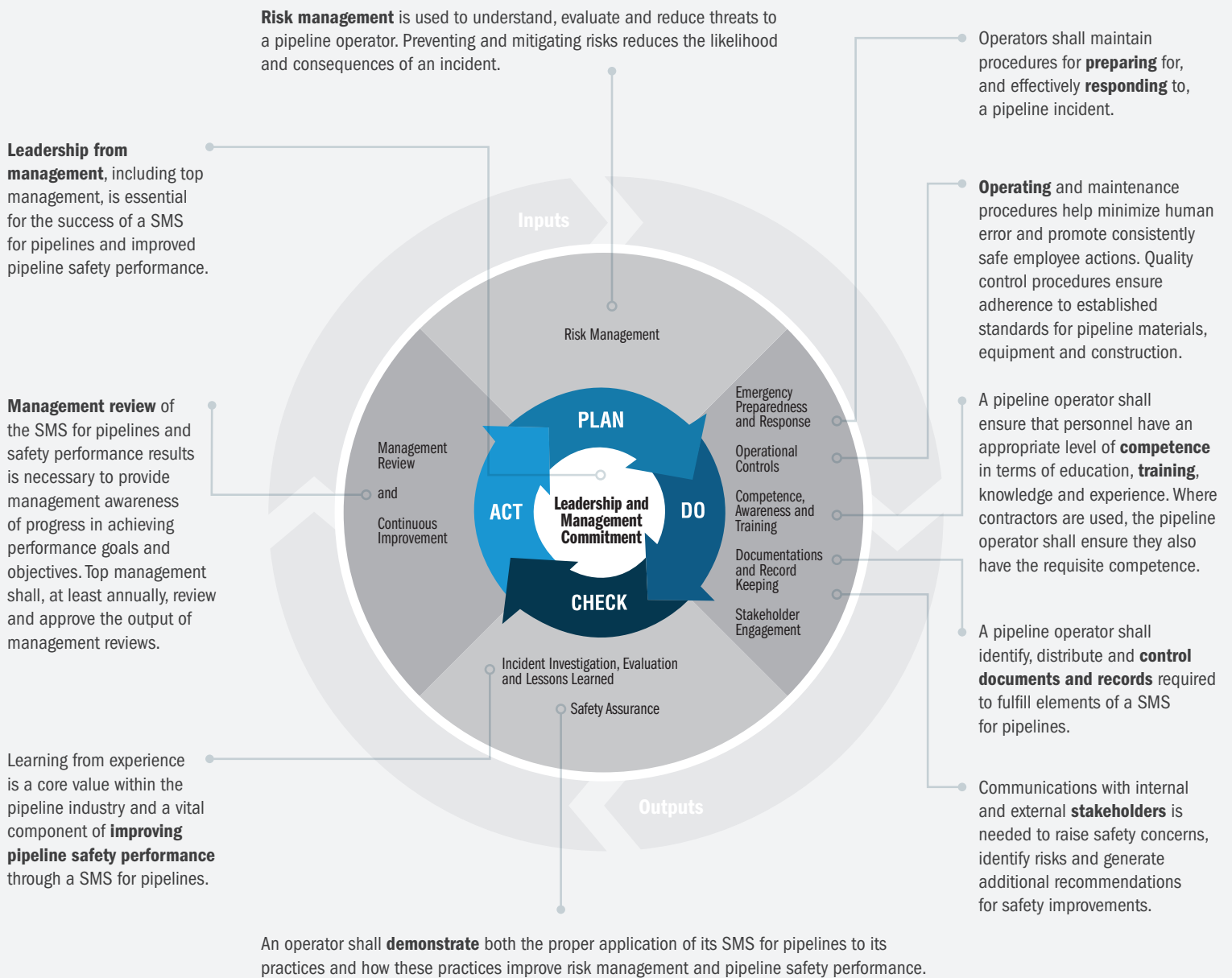
Scalability

The Pipeline SMS framework of API RP 1173 is also **scalable for pipeline operators of varying size and scope.**

- The ten essential elements comprising the framework apply to organizations of any size and sophistication and do not require the same implementation process.
- The level of detail in each operator's SMS for pipelines should be appropriate for the size of their operations and the risk to the public and environment.

AT THE CORE: PLAN-DO-CHECK-ACT

The Plan-Do-Check-Act (PDCA) cycle is central to every SMS including the Pipeline SMS. The cycle encourages creating strategies and plans, executing those strategies and plans in line with guidelines, checking those actions for quality and outcome and using those results to adjust the next generation of plans. This cycle is *iterative* and is *repeated regularly* to achieve continuous pipeline safety improvement.





COMMITMENT

Leadership from management, including top management, is essential for the success of a SMS for pipelines and improved safety performance. Employees will understand that safety is valued if they see management in the constant practice of acting on recommendations, assessments and evaluations, improving plans and processes, and allocating resources to address safety findings and improvements.

PIPELINE SMS GROUP

To encourage Leadership and Management Commitment, the first element of API RP 1173, and to visibly demonstrate that commitment, API and AOPL developed a formal commitment process:

- Every U.S. Company operating a pipeline in the United States is eligible to participate in the Pipeline SMS Group.
- Pipeline operators who have committed in writing to implementing API RP 1173 and participate in the Pipeline SMS Group may display the Pipeline SMS logo.
- Group members will be able to readily exchange ideas, information and lessons learned about implementing Pipeline SMS.



Small-size pipeline operator

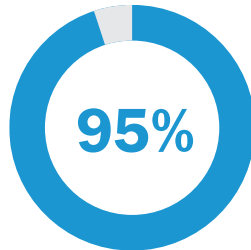
“Our company has a single management system for our environment, health and safety program. Pipeline SMS will be more comprehensive and we expect implementation will have a big impact on our process safety culture.”

Medium-size pipeline operator

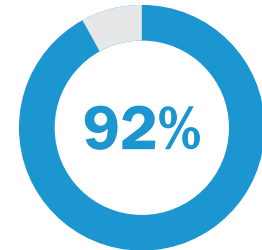
“We have a culture of tracking multiple performance metrics, but we expect Pipeline SMS will help make better, more holistic metrics.”

Large-size pipeline operator

“Before Pipeline SMS, we had ... different management systems RP 1173 will help us combine our efforts into one holistic management system.”



Pipeline companies representing 95% of U.S. liquids pipeline barrel-miles have committed to implementing API RP 1173 and a SMS for pipelines.



As of December 2016, pipeline operators transporting almost 92% of the liquids pipeline industry barrel-miles have membership in the Pipeline SMS Group.

If you would like to commit or join the Pipeline SMS Group, please contact API at www.pipelinesms.org

EARLY WINS & SUCCESS STORIES

Initial API RP 1173 implementation steps are already yielding benefits for pipeline operators. Implementation itself is like the PDCA cycle with a gap tool, gap analysis and gap closure plan.

SMALL, MEDIUM AND LARGE PIPELINE OPERATORS



A **small pipeline operator** was able to begin development of its SMS for pipelines using a third-party contractor to **complete its gap analysis** and **develop a plan for closing those gaps**.



A **medium pipeline operator** has already **completed its assessment of gaps** between API RP 1173 and their current operations. They identified several gaps, **have prioritized them** into four categories and will address them in priority order.



A **large pipeline operator** recognized, after reviewing API RP 1173 and its Plan-Do-Check-Act cycle, that it has opportunities to **strengthen its processes** for making adjustments after management reviews.

INCREASED SAFETY MANAGEMENT



After reviewing API RP 1173, an operator recognized that while it had many mature safety programs in place, they were in **silos with poor coordination and communication** between groups. A SMS for pipelines will **help holistically manage** all their safety efforts.



An operator used the elements of API RP 1173 to evaluate the state of its operations center. The build out of the elements into specific requirements **helped provide a clear picture** of the strengths and weaknesses within the PDCA cycle.



An operator previously shared safety lessons informally across the company. API RP 1173 is **helping the company establish a formal process for safety lesson sharing**.

IMPROVED SAFETY CULTURE



Star certification under OSHA's Voluntary Protection Program formed the basis of an operator's personal safety culture. That operator believes its SMS for pipelines **will improve its process safety culture**.



Through review of API RP 1173, an operator recognized the need to **improve their safety culture by rewarding employees for identifying safety issues**.



A pipeline company has a single management system for its environment, health and safety program. It expects its SMS for pipelines will be **more comprehensive and implementation will have a big impact** on their process safety culture.



RESOURCES

BOOKLETS

In 2016, the liquids pipeline industry undertook a number of activities to support pipeline companies' adoption of API RP 1173 and implementation of Pipeline SMS, including developing **three booklets on why, what, and how:**



WORKSHOPS

In 2016, the liquids pipeline industry hosted two workshops and one webinar to support implementation of Pipeline SMS. Personnel from pipeline operators attended, heard and shared insights on how to develop Pipeline SMS and implement them within their own companies. Visit www.pipelinesms.org for information on 2017 events.

AVG. 95 PARTICIPANTS
WORKSHOPS
AVG. 31 COMPANIES

120 PARTICIPANTS
WEBINAR
70 COMPANIES

WEBSITE

In 2016, the liquids pipeline industry launched a website to communicate Pipeline SMS including commitment information and tools (booklets, gap analysis, presentations, etc.).

www.pipelinesms.org

IMPLEMENTATION TEAM PROGRESS & UPDATE

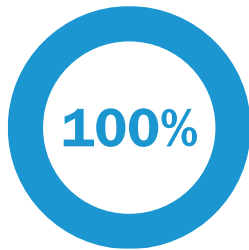
To assist individual pipeline company adoption of API RP 1173 and their own Pipeline SMS, the liquids pipeline industry developed an implementation plan with three phases.



DEMONSTRATING PROGRESS

Individual pipeline companies are starting from different points depending upon their past experience with Pipeline SMS. Implementing a SMS for pipelines program in conformance with API RP 1173 will be a multi- year process. In 2016, the liquids pipeline industry developed initial progress metrics. The goal in 2016 was to measure the first steps of implementation. The API SMS Group then surveyed members to measure progress.

FIRST YEAR'S PROGRESS

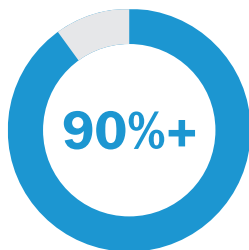


ESTABLISHING LEADERSHIP

Has senior management demonstrated tangible commitment to implementation of a SMS for pipelines, through assignment of personnel and allocation of appropriate funds?

Results

Every surveyed API SMS Group member answered yes, and has dedicated funds and personnel to implementation of a SMS for pipelines.

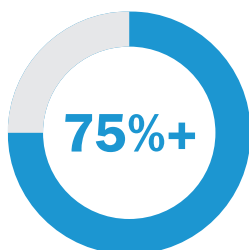


DETERMING GAPS

Has your company performed a gap assessment of your existing programs versus RP 1173 requirements?

Results

More than 90% of surveyed API SMS Group members answered yes, indicating that the company had done an internal review to determine how well their existing programs, procedures and systems aligned with the requirements of the RP. Most used the industry-developed gap assessment tool.



TAKING INITIAL ACTION TO ADDRESS GAPS

Has your company taken initial steps or developed plans to address gaps?

Results

More than 75% of surveyed Group members answered yes. The few that did not explained that they were developing their gap closure plan, but it was not complete at the time of the survey.

IT IS IMPORTANT FOR PIPELINE OPERATORS PERFORMING EVALUATIONS TO **ASSESS MANAGEMENT EFFECTIVENESS AND PIPELINE SAFETY PERFORMANCE IMPROVEMENT PROGRESS.**

MOVING FORWARD

IT'S A JOURNEY, NOT A DESTINATION

The development and implementation of a SMS for pipelines is a long-term endeavor which will span several years. It is a journey, not a destination. No matter an organization's level of experience with SMS, growth and maturity of the system is always possible. The important measures are committing to implement a SMS for pipelines and then over time improving SMS for pipelines maturity and safety performance. Once effective, a SMS minimizes risk and maximizes value for organizations.

FLEXIBLE AND SCALABLE

API RP 1173 is scalable and flexible to accommodate all types and sizes of pipe systems and operating companies. There is no expectation that pipeline operators will develop identical SMSs, nor that they will approach development and implementation in the same manner, nor on the same timeframe. Each company will move at its own pace, and in its own way, while moving the entire industry forward.

WHAT GETS MEASURED GETS DONE

Industry metrics – To better evaluate industry-wide improvements, the liquids pipeline industry is collecting various metrics from Pipeline SMS Group Members. This information will be utilized to evaluate and measure performance improvements across the liquids pipeline industry with the adoption of Pipeline SMS over the long-term. It is important to note that any safety performance information that is shared will be treated as confidential and will be blinded in any related publications.

Operator metrics – Pipeline SMS is intended to provide operators the tools they need to continuously and comprehensively track and improve their safety performance. A pipeline operator should establish and maintain a procedure to identify and measure Key Performance Indicators (KPIs), such as effectiveness of risk management and Pipeline SMS adequacy.

KPIs should consist of measures that demonstrate risk-reduction completion or improvement of elements and their supporting processes and procedures.

RESOURCES

In 2017, the liquids pipeline industry will host additional industry-wide workshops for operators to exchange experiences. The workshops will provide an opportunity for operators to learn how companies overcame hurdles and dealt with challenges in the implementation of a SMS for pipelines. In 2017, the industry will also deploy additional measures of API RP 1173 conformance along with more detailed auditing tools.

THE GOAL OF PIPELINE SMS IS TO **ENHANCE RISK MANAGEMENT AND ENABLE CONTINUOUS IMPROVEMENT IN PIPELINE SAFETY PERFORMANCE.**



Pipeline SMS
GROUP

www.pipelinesms.org



www.api.org



www.aopl.org