PIPELINE SAFETY MANAGEMENT SYSTEMS

Pipeline SMS

2019 Annual Report
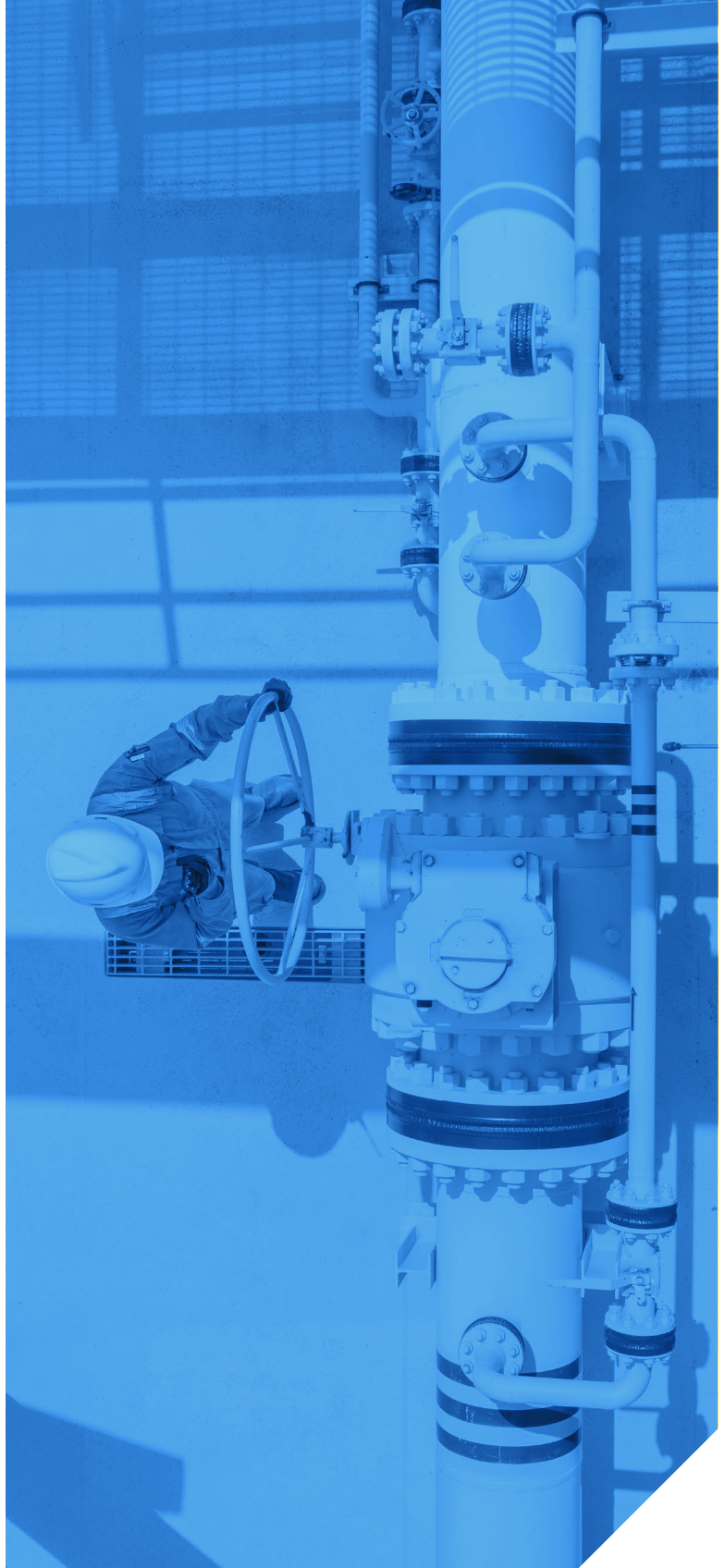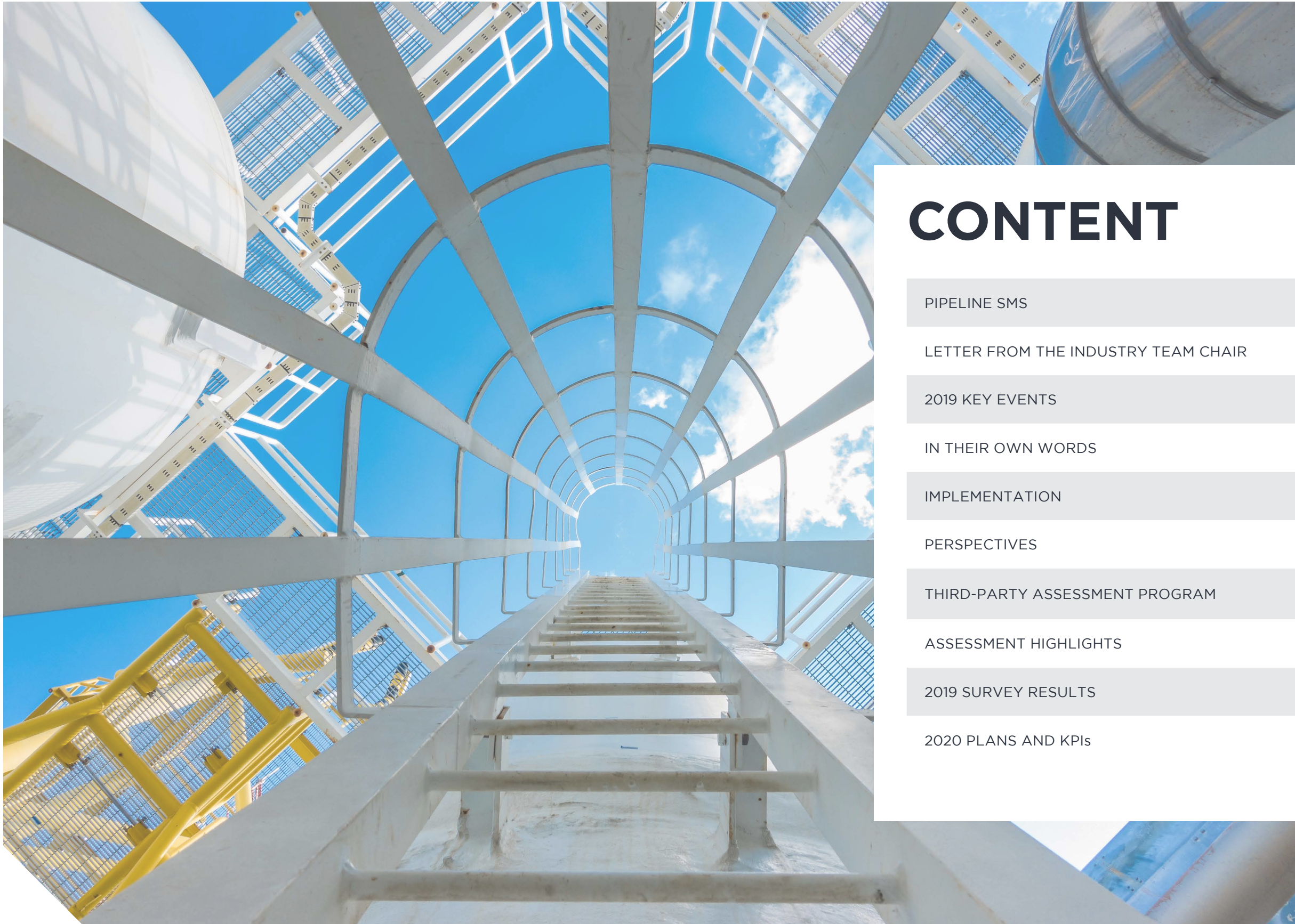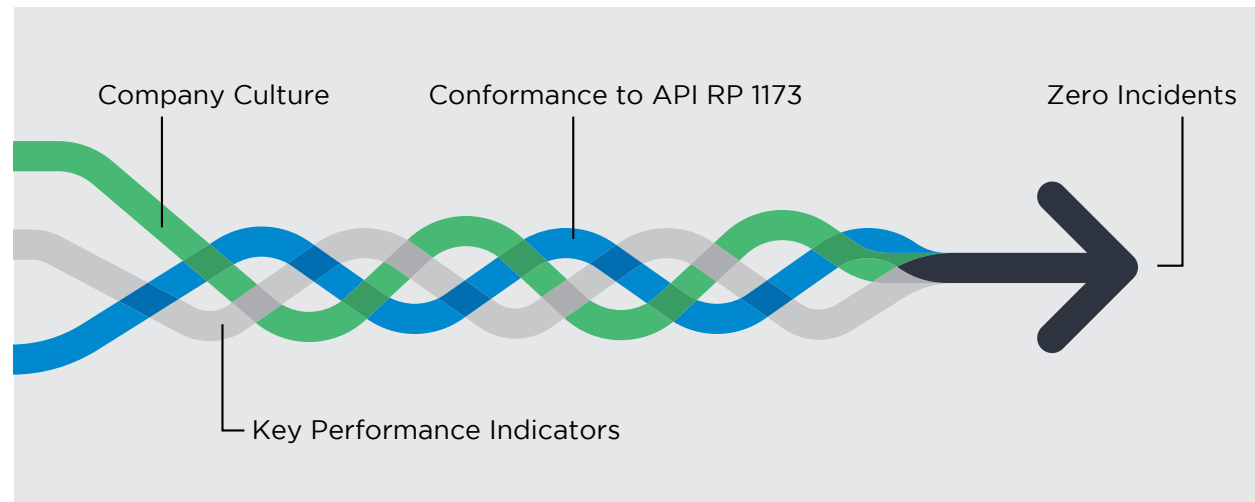
Pipeline SMS

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CONTENT

PIPELINE SMS

After publication of the API Recommended Practice (RP) 1173, *Pipeline Safety Management Systems (Pipeline SMS)*, in 2015, the pipeline industry began efforts to promote adoption of the RP among operating companies. This included the creation of materials to promote awareness about the RP, workshops, webinars, and presentations to discuss the RP, and the development of various tools to assist operators in their implementation efforts. Many operators committed to pursue implementation and began their implementation journey to improve their overall pipeline safety performance.

Company Culture

Conformance to API RP 1173

Zero Incidents

Key Performance Indicators

LETTER FROM THE PIPELINE SMS INDUSTRY TEAM CHAIR

I still remember the first time I heard the term "Pipeline SMS" and wondered what this would mean for our industry. The past five years have been the start of an evolution for Pipeline Safety as we continue to strive for zero incidents. As you'll see in this Annual Report, we're seeing steady progress with the implementation of Pipeline SMS across the industry.

More and more company leaders are committing to implementing PSMS. The rate at which companies are performing gap assessments continues to rise and, more importantly, companies are implementing measures to address their identified gaps. This year, we've seen a tremendous increase in sharing of lessons learned across the industry as we become more and more comfortable sharing and learning from each other.

Pipeline SMS is key in developing a strong safety culture and we're seeing an increase in companies that are assessing safety culture and implementing changes to drive results. While there are still some barriers to entry, the Pipeline SMS Industry Team is focused on breaking down these barriers to ensure we are aligned across the industry on the expectation for implementation.

The industry team's focus remains the same: increase industry participation, ensure proactive stakeholder engagement, provide ongoing support for operator journeys, and ensure proper governance and oversight for the Recommended Practice.

Thank you for your support of Pipeline SMS as we continue our industry journey to zero incidents!

ANGELA KOLAR

Vice President and Chief Risk Officer, Colonial Pipeline Company

Chair, Pipeline SMS Industry Team

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2019 KEY EVENTS

IN 2019

All segments of the pipeline industry demonstrated progress on their journey of Pipeline SMS implementation. Operators worked strategically around four key focus areas:

Increase Industry Participation

Increase External Engagement

Support Operator Journey

Provide Oversight & Governance

KEY EVENTS INCLUDED:

TRAININGS AND EDUCATION

Engaged nearly 350 people in SMS Training and Education

- **May 21** Webinar for Beginners on the SMS journey
- **June 4** Webinar for Advanced SMS Practitioners
- **December 4-5** Pipeline SMS Elements Workshop
- **Completed** and published RP 1173 eLearning available to all operators

STAKEHOLDER OUTREACH AND ENGAGEMENT

- SMS presentation at AGA's Management Systems Conference in March
- Pipeline SMS panel with operators at various implementation stages during API Pipeline Conference
- SMS presentation at AGA and DCA Utility Contractor Workshop
- SMS presentation at Banff Pipeline Workshop
- Engagement with Alan Mayberry, Associate Administrator for Pipeline Safety, PHMSA during October SMS meetings
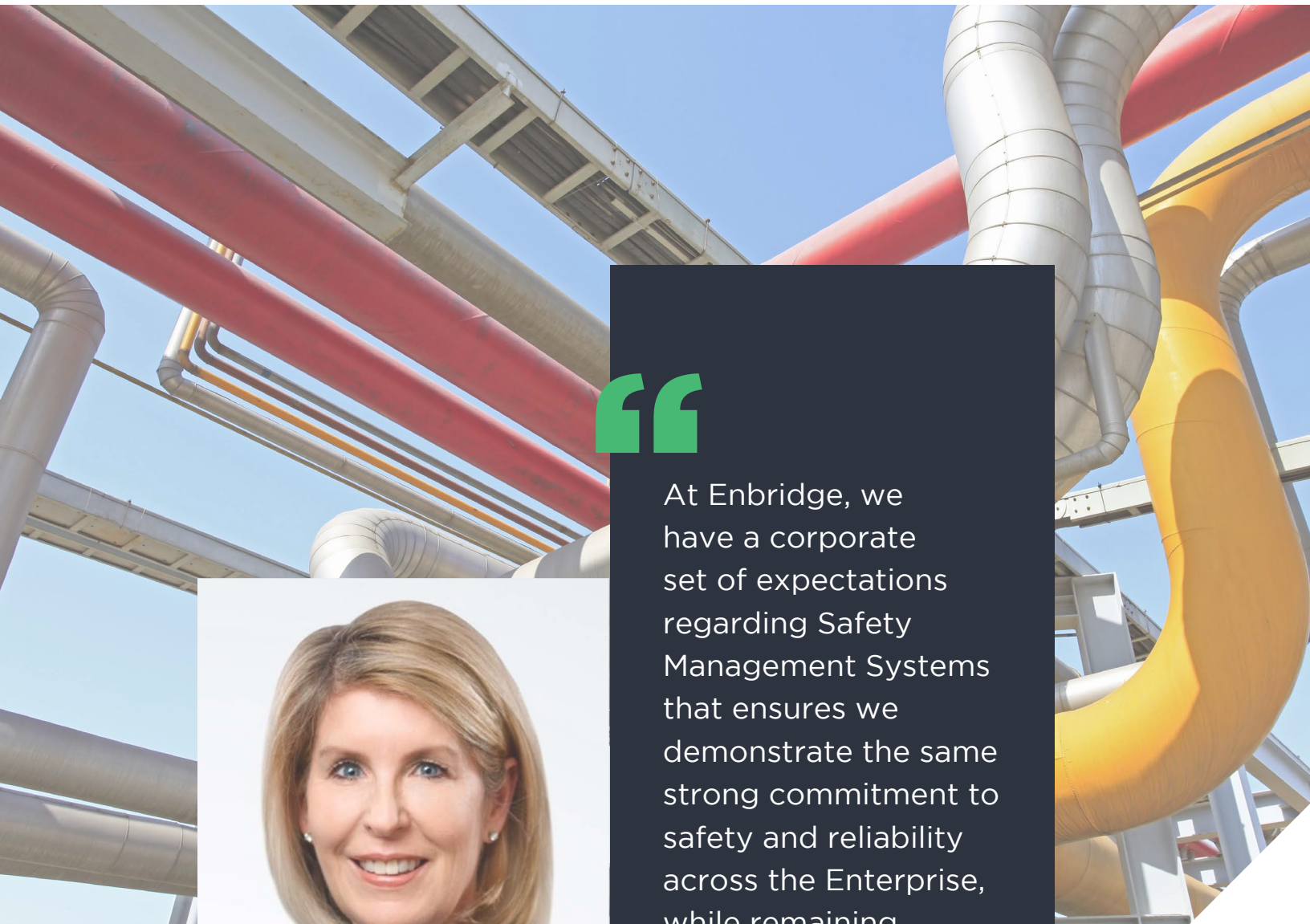
INDUSTRY PARTICIPATION

- 2019 Annual Survey with record completion rate and representing majority of pipeline industry
- Identified barriers to implementation that the united industry team will work to overcome
- INGAA/CEPA conducted their triennial safety culture survey with gas transmission operators and trended against previous cycles

GOVERNANCE AND OVERSIGHT

- Completion of API Third-Party Assessment program
- Pilots with two liquid operators, roll out with large distribution operator
- Continually improving program through operator experiences and feedback

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> At Enbridge, we have a corporate set of expectations regarding Safety Management Systems that ensures we demonstrate the same strong commitment to safety and reliability across the Enterprise, while remaining compliant with specific regulatory requirements."

CINDY GRAHAM

Director, Safety & Reliability Governance, Enbridge

IN THEIR OWN WORDS

STEVE SQUIBB

Director – Natural Gas Operations, City Utilities of Springfield, MO

"We believe PSMS will take our safety culture to the next level by providing a system that brings all our safety efforts together and focuses on continuous improvement. We are in the early stages of implementation and have struggled with how to take the first steps. APGA has been a great resource by providing webinars and tools to start our PSMS journey. If you don't know where to start, reach out to your industry peers and associations."

ANONYMOUS

Natural Gas Distribution Operator

> The early stages of SMS implementation have already displayed clear benefits to ensuring the safety of our community and the integrity of our system. From the collaboration involved with planning to the MOC process, our organization has witnessed healthy discussion across all areas of operations aimed at mitigating risks associated with all projects. It is evident that as this system grows so will our positive safety culture."

BRIAN KRETZ

Director – Pipeline Safety & Compliance Support, Black Hills Energy

> Since Black Hills Energy committed to the industry-wide initiative of implementing API RP 1173, the power and elegance of the document has revealed itself in its inherent flexibility and scalability. I liken it to existing navigation technology, where the destination is zero pipeline incidents, the RP document is the global positioning satellite network, and the tools provided by Pipeline SMS are the applications used to guide operators to the destination, no matter where they are on the map. This has proven extremely valuable in Black Hills Energy's journey, especially considering the unique challenges we face in having geographically disbursed, highly-rural distribution systems."

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IMPLEMENTATION

OPPORTUNITIES TO OVERCOME IMPLEMENTATION BARRIERS

BARRIERS

Operators are in various stages of their journey, with barriers to implementation including:

- Staff and resources are finite and/or have not yet committed to this effort
- Combining existing internal processes and procedures into written SMS implementation plan
- Competing priorities of executives
- Integrating SMS within an existing mature and effective management system
- Perception that SMS is only for transmission pipeline operators

With these barriers identified, one of the Industry Team's 2020 priorities is developing value-add tools and trainings to help operators recognize the importance of SMS implementation and take the first steps on their critical journey.
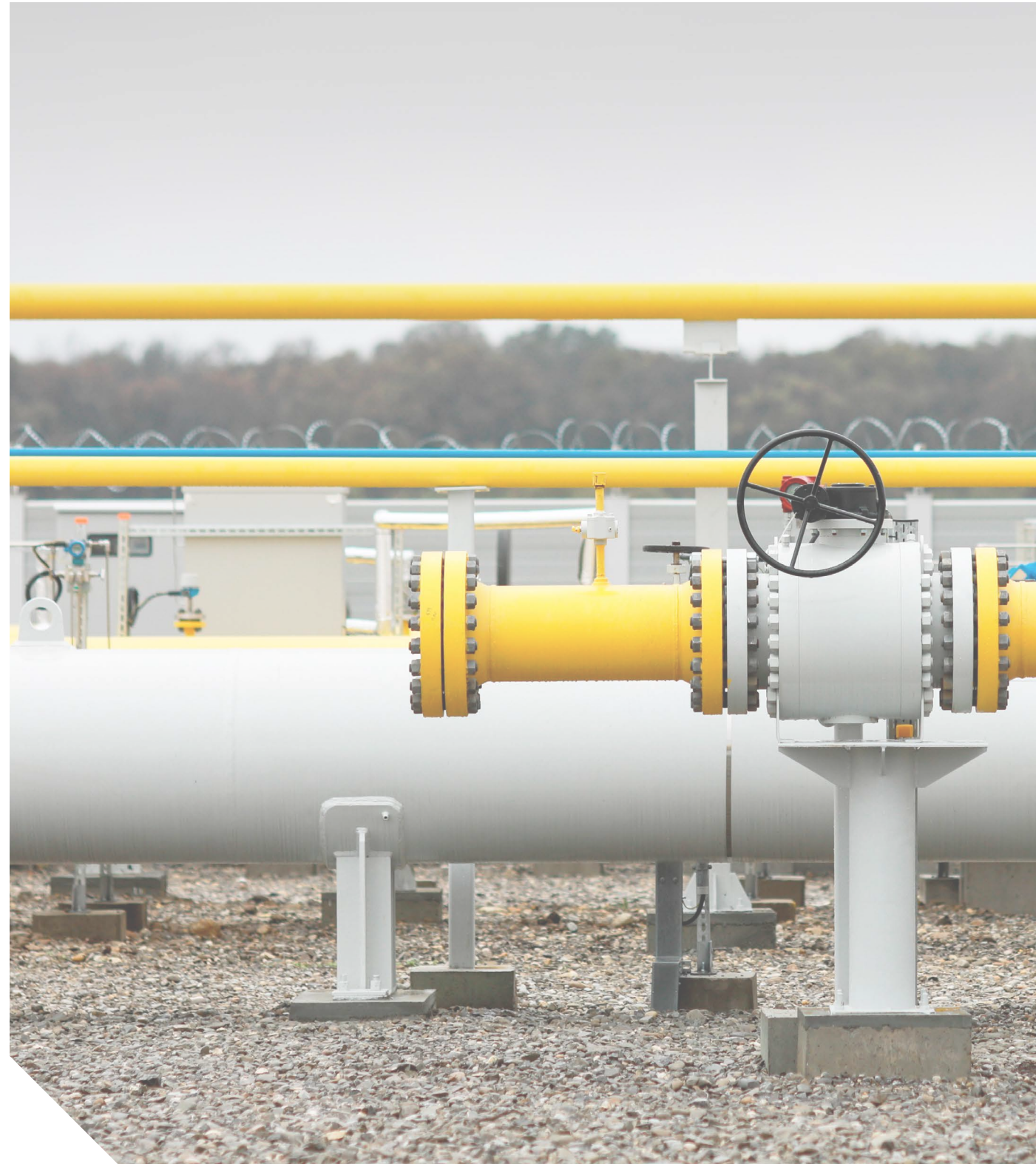
SUCCESSES

- Implementation went faster than anticipated as compared to peers because the company made the SMS implementation a strategic priority and staffed the research, implementation and development of the core elements with a full time employee
- We have integrated 1173 requirements with our OSHA PSM and ISO
- Tools used: AGA Self-Assessment Spreadsheet; ISO 55001/PAS 55 maturity assessment tool and internal SMS maturity assessment tool

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PERSPECTIVES

PERSPECTIVES ON IMPLEMENTING A PIPELINE SMS

Pipeline Industry SMS Workshop, Fort Worth, TX, December 2019

Last December, pipeline operators from across the country gathered in Fort Worth, TX to share their experiences implementing a pipeline safety management system at their company. Participants ranged from large cross-country transmission pipeline companies to small local distribution systems. They came together with the common goal of sharing their stories and learning from each other. The following are reflections of two participants at the Fort Worth workshop. These interviews were edited for brevity and clarity.

JOHN SOENNING
Senior Director of Program Safety, Plains All American Pipeline, LLP

What is a pipeline safety management system (SMS) from your perspective?

I think a safety management system is a systematic way to think about work. To me the best safety management system is when you don't even know it's there. It's just how you do your day to day activities.

What are the benefits of a pipeline SMS?

I think you can see in our own data with Plains how we're improving over time. We have a five-year journey to zero incidents strategy, and we're hitting it consistently year after year. And the only way you can do that is to be very systematic in your approach. By using the safety management system's plan, do, check, act model, if you're not seeing the results you want, you partner with different levels of the organization and investigate to see what you can do differently. You then implement changes from the review process and continue the cycle until you hit your end goal.

How is focusing on PSMS elements like incident investigations and lessons learned making a difference?

I think you can see where we're making a real difference. You can see it through the Operations Management System (Plains' safety management system) field assessments that Plains does. As an example operations personnel a few years ago may not have understood what is entailed with the incident investigation or lessons learned process. By using the plan, do, check, act model to make improvements for a couple of years, now in more recent surveys operations personnel are asking for specific lessons learned types, and they're giving us feedback on what works well for them, what they want to see more of, and things of that nature. So, it's a very collaborative effort.

How did implementing your SMS make your safety efforts more systematic?

Best way to answer is through a real example. One of the things we implemented through our SMS system was a systematic way for operations to report good catches, close calls and incidents. Note that other companies refer to "good catches and close calls" as "hazard identifications and near misses."

The data funnels into Plains' electronic incident management system, and companywide personnel see a daily summary of events that were submitted. Based on the risk associated with each event, the investigation requirements change, such as who is involved, data collected, and time to complete. All events are reviewed by the corporate investigation and operations risk teams and based on trends or high risk events, lessons learned bulletins are written and sent out once a month across the organization. And if an event submitted has something that needs to be immediately shared, the corporate investigation team will send out a safety field alert aimed at specific areas of the organization where the alert applies and that lists specific actions to take.

How important is leadership involvement in implementing a pipeline SMS?

After recommended practice 1173 was published in 2015 Plains executive leadership sent a letter stating that Plains will comply with all of the sub elements listed. And all along the way, leadership has been very supportive in that they recognize SMS is a process and that plan, do, check, act is necessary to continuously improve.

So, as a sub element owner you're allowed to implement a solution. If it doesn't work perfectly then as part of the way a safety management system works, you utilize field feedback to change your approach and continue to drive action. Leadership supports us in our efforts by recognizing that no new work process will be perfect on day one.

One of the things that Plains leadership does is continue to demonstrate support by walking the talk. For example, Plains has a good catch reward program, which recognizes personnel for submitting high quality good catches. When the Executive VP and COO of Plains was visiting the St. James facility, he sought out one of the good catch winners to personally thank him and discuss the value he saw in the submission. Folks hear about this, and it just engages the whole workforce.

How did your company implement SMS?

Plains started out by having a dedicated OMS team partner with the organization to conduct a detailed gap assessment against RP 1173. Sub-element owners were identified and tasked with closing gaps utilizing a phased approach to ensure that the operations field personnel were not overwhelmed by change. Each sub-element owner identified interactions with other sub-elements and defined key milestones.

The OMS team conducts annual field assessments to measure progress against gaps. We've seen the field gap assessment scores improve over time and have utilized field feedback in the plan, do, check, act process to continuously improve. It's been a very positive, collaborative and supportive process.

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What is an example of a change you made in your company as a result of implementing pipeline SMS?

One of the early sub-elements assigned to the safety department was management of change or MOC. At the time, as a company, we were doing MOC's for changes, but we were doing it in different ways across the organization and using different software platforms to house the information.

MOC was the perfect opportunity for using an SMS approach. Utilizing the Plains OMS work process, the right personnel were engaged from each business area and a fit for purpose policy and software solution were implemented to comply with RP 1173 and meet each business area's needs. Having an OMS gatekeeper attuned to field workload allowed us to roll out the new policy and program in a systematic method that reduced impact to the day-to-day business.

What is another example?

So, as part of the sub-element safe work practices, one of the things that actually tied in from learnings from our incident investigation sub element was understanding and compliance with our work permits.

Utilizing the SMS approach, safety as the sub-element owner partnered with Plains field based safety committee and asked "how can we make permits more real in the field for the operations people so that every box that they fill out, they understand the purpose, the reason behind it?" Going through this exercise and rigorously reviewing every item filled out on the work permit led to around a 20% change or reduction in the permit required fields. It also led to development of more detailed work permit training. Both of these changes resulted in improved work permit compliance as seen by less findings during incident investigations.

What did you like about the industry-wide pipeline SMS forum?

What's great about this type of event is you have a peer group of companies that are trying to do the same thing. We all have the same end mission in mind, which is around safety and compliance

resulting in improved view of midstream companies by the public.

Hearing other company's ideas, even on things that we've already implemented, allows for input into the plan, do, check, act part of continuous improvement. I've loved hearing what some of the different companies have presented, and there are opportunities to immediately go back and consider how to integrate new ideas.

CINDY GRAHAM
Director of Safety and Reliability Governance, Enbridge

How would you describe SMS?

In my mind, safety management systems relate to pipeline safety - all the things we do collectively to keep our gas or oil in the pipes. It's everything combined and working together, including setting up barriers that help prevent a failure. It also includes how we mitigate or help to reduce the impact in the event of a failure. We target zero incidents while ensuring that we are constantly learning and improving.

What is the level of commitment at your company to implement SMS?

Our level of activity is very high - we've absolutely embraced it. We have commitments at the highest level of our company. In fact, each business unit president is called an accountable officer, and he or she signs off on their management review on an annual basis. So, we have that commitment. We have the programs, the systems, and the overall structure. I think we've got a strong set of systems in place.

How does your SMS let you know your safety performance is improving?

We have just aligned with a new Canadian standard for pipeline system safety measurement: CSA Z260:19 Pipeline System Safety Metrics. This standard has clear criteria to tier any release. It requires the development of leading metrics as well. As leading metrics get incorporated into our programs, they will demonstrate that we're being effective and allow us to continue to improve.

What were your hopes for the SMS forum and what you expected to happen?

I had two things I was hoping to accomplish at this forum. First, I am glad to have had the opportunity to present on management reviews at Enbridge. In my role at the enterprise level, I get to see what each of the business units are doing for their management review. So, this workshop was a chance for me to share my bird's eye view - what I think is the best of the best. Second, I am always keen to learn and take away good ideas and I've already received a couple.

What's an example of a good idea you heard at the forum that you might take?

It's tough to find good metrics - particularly leading ones. One company, I learned, looks at their ratios related to incident reporting. Specifically, the ratio of actual pipeline safety incidents that occur compared to the potential near miss incidents that are being reported. We want to learn from the potential near misses. If we get a lot of those being reported and we're learning from them, ultimately that should help decrease the number of actual incidents. Tracking this metric may help encourage more information on potential occurrences that we can learn from.

How do you see those dynamics of pipeline operators of all shapes and sizes trying to improve and work together?

I'm a big fan of people working together. What I like about the API SMS Industry Team that I'm part of is it is comprised of several pipeline groups all working together. It's comprised of diverse industry groups who all want the same thing, which is to continue to work towards even safer pipelines. So, it makes a lot of sense that we work together – don't duplicate our efforts– and instead, compile our ideas while working together.

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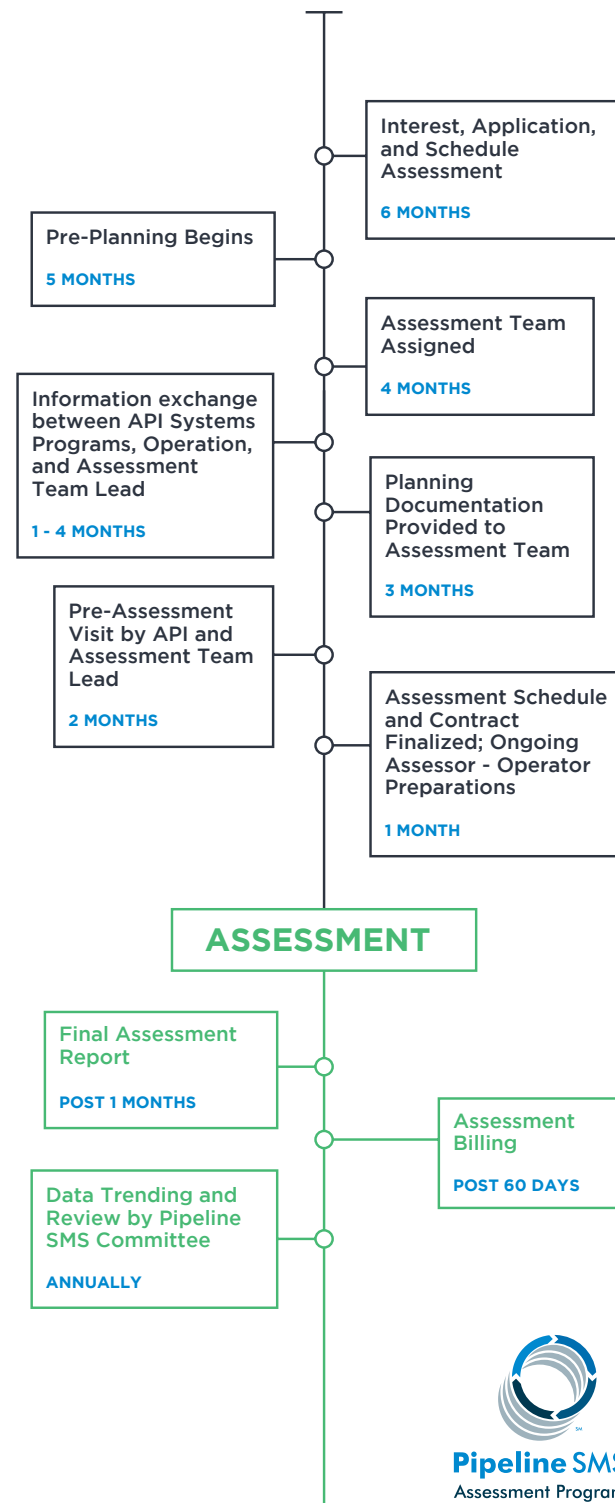
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ASSESSMENT PROCESS OVERVIEW

DEMONSTRATING PROGRESS THROUGH CONTINUOUS IMPROVEMENTS

DEBRA PHILLIPS
Senior Vice President for Global Industry Services, API

In 2019, API's Global Industry Services Division worked with pipeline companies to pilot a new safety assessment program using API Recommended Practice 1173 on pipeline safety management systems. These assessments are an important tool to assist operators with measuring progress and maturity on safety systems and identifying excellent practices that can drive industry-wide safety improvements. Working closely with the Pipeline SMS Industry Team and utilizing lessons learned from the 2019 pilots, API formally launched the Pipeline SMS Assessment Program in January 2020 with a staff team and assessor pool to support industry's needs for assessments in 2020 and beyond.

Interest, Application, and Schedule Assessment
6 MONTHS

Pre-Planning Begins
5 MONTHS

Assessment Team Assigned
4 MONTHS

Information exchange between API Systems Programs, Operation, and Assessment Team Lead
1 - 4 MONTHS

Planning Documentation Provided to Assessment Team
3 MONTHS

Pre-Assessment Visit by API and Assessment Team Lead
2 MONTHS

Assessment Schedule and Contract Finalized; Ongoing Assessor - Operator Preparations
1 MONTH

ASSESSMENT

Final Assessment Report
POST 1 MONTHS

Assessment Billing
POST 60 DAYS

Data Trending and Review by Pipeline SMS Committee
ANNUALLY

Pipeline SMS
Assessment Program

ASSESSMENT HIGHLIGHTS

Safety Assurance
Audits and Evaluations
Performance Measures, KPIs

CHECK

ACT

DO

ASSESSMENTS DRIVE CONTINUOUS IMPROVEMENT

PLAN

conEdison, inc.

"Being the first Gas LDC to participate in the API third-party assessment provided us with a great learning experience that can help us improve our PSMS. The preparation we put in working with API and the Assessment Team, made the assessment organized and informative. Our leadership team was pleased with the final product and the thorough, comprehensive approach of the Assessment Team."

MARATHON

"MPL understands the importance and value of partnering with the industry to improve safety performance, thus MPL volunteered to participate in the second Pipeline Safety Management System (PSMS) Pilot Assessment. The assessment team was comprised of experienced professionals who actively engaged with MPL staff and offered points of improvement to our PSMS. Differing from other third-party assessments, the PSMS Assessment offers a consistent approach in evaluating the health and maturity of an operator's PSMS. MPL recognizes the potential of API's PSMS Third-Party Assessment Process and how it can support an operator's implementation and maturing of their Management System."
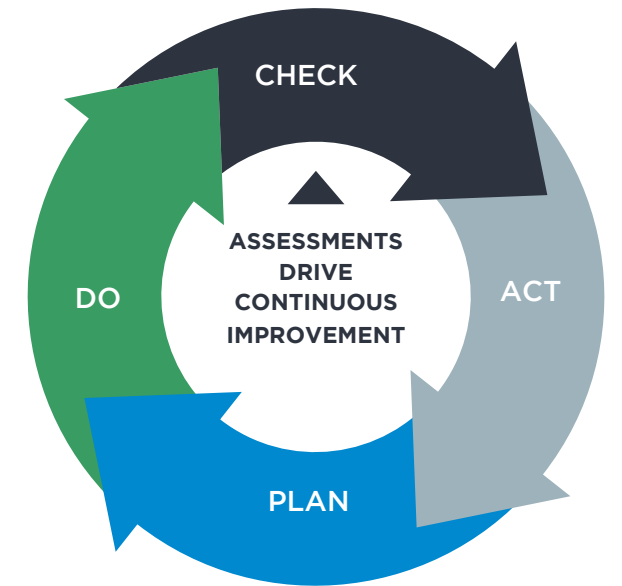
Colonial Pipeline Company

"A third-party assessment process is critical to ensure effectiveness of any management system approach. As the industry continues its journey toward PSMS implementation, Colonial is invested in assuring that the API third party assessment is structured to meet the needs of the industry. Serving as the pilot allowed us the opportunity to provide critical support and feedback in the development of this process.

The Pipeline SMS Assessment allowed us to challenge the assessment team approach to element scores and progress through documentation and interviews which now drives our approach to Safety Assurance internally. The assessment also identified things we already do that we had not considered as being impactful in elements such as Risk Management and Safety Assurance. For Colonial, the assessment gave us some ideas of how to solidify the Management Review processes allowing us to tie together components of the elements we already had in place.

Colonial believes that collaboration and sharing of examples is the best way assessment teams can raise the bar across the industry. Knowledge is meant to be shared and a team like this is in a perfect position to observe, discuss and then suggest areas for improvement with real examples."

Angela Kolar, VP Operations Services & Chief Risk Officer

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2019 SURVEY RESULTS

COMMITMENT TO IMPLEMENTATION

Pipeline operators responded to the Annual Survey in record numbers, representing over 55% of the pipeline industry mileage with nearly 150 submitted responses. The percentage of pipeline miles responding to the Annual Survey has steadily increased in recent years, starting from 7% in 2016; 30% in 2017; 47% in 2018 and 57% last year, showing the industry's commitment to and implementation of Pipeline Safety Management Systems.

57% Pipeline Mileage Surveyed

68% Gap Assessment Completed

66% Assessing Safety Culture

100% Operators Identified Improvement Opportunities / Gaps from Gap Analysis

- API, AOPL, INGAA, AGA, APGA Members
- Respondents +57% Over 2018
- Pipeline Mileage Surveyed +10% Over 2018

FURTHER INFORMATION

IN 2019, PIPELINE OPERATORS FOCUSED ON THE FOLLOWING ELEMENTS FOR IMPLEMENTATION:

1. Risk Management
2. Leadership & Management Commitment
3. Emergency Preparedness & Response
4. Operational Controls
5. Incident Investigation, Evaluation & Lessons Learned

LAST YEAR, THE MOST CHALLENGING ELEMENTS TO IMPLEMENT WERE:

1. Operational Controls
2. Stakeholder Engagement
3. Documentation & Record Keeping
4. Risk Management
5. Management Review & Continuous Improvement

IMPLEMENTATION TOOLS SUPPORTING THE JOURNEY:

- Ten more companies using the Planning Tool (up to 35% of respondents)
- Twice as many companies using the Implementation Tool (up to 31%)
- Nearly twice as many companies using the Evaluation Tool (up to 27%)
- Twice as many using a Third-Party Assessment (up to 24%)

+47 Leadership Commitment as compared to 2018

+31 Gas Assessments as compared to 2018

58% Yes — First time participation in survey

83% Yes — Operators committed to PSMS implementation

58% On Track — Implementation progress is steady

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2020 PLANS & KEY PERFORMANCE INDICATORS (KPIs)

PLANS & KPIs

API RP 1173 states that, "an effective Pipeline SMS cannot exist without a positive safety culture."

- Voluntary implementation promotes a robust safety culture where employees are encouraged to share potential problems without punitive measures;
  - Safety culture can forecast accident/incident rates and shows how effective an SMS is;
- SMS provides a layered approach to pipeline safety to prevent rare, complex-cause incidents beyond one-size-fits-all regulatory compliance programs;
- API/AOPL are partnering with liquid operators to conduct safety culture surveys this fall, with a plan to sync up with INGAA/CEPA's triennial employee surveys moving forward.

IN 2020

The Industry Team will continue to drive implementation progress through its four focus areas: increase industry participation, ensure proactive external engagement, support operator journeys, and ensure governance and oversight.

Increase External Participation
- Industry Annual Survey
- Industry SMS Annual Awards Development
- "Barrier to Entry" Determination

Ensure Proactive External Engagment
- Ongoing PHMSA Engagement
- Pipeline Safety Advocacy Group Engagement
- Newsletter
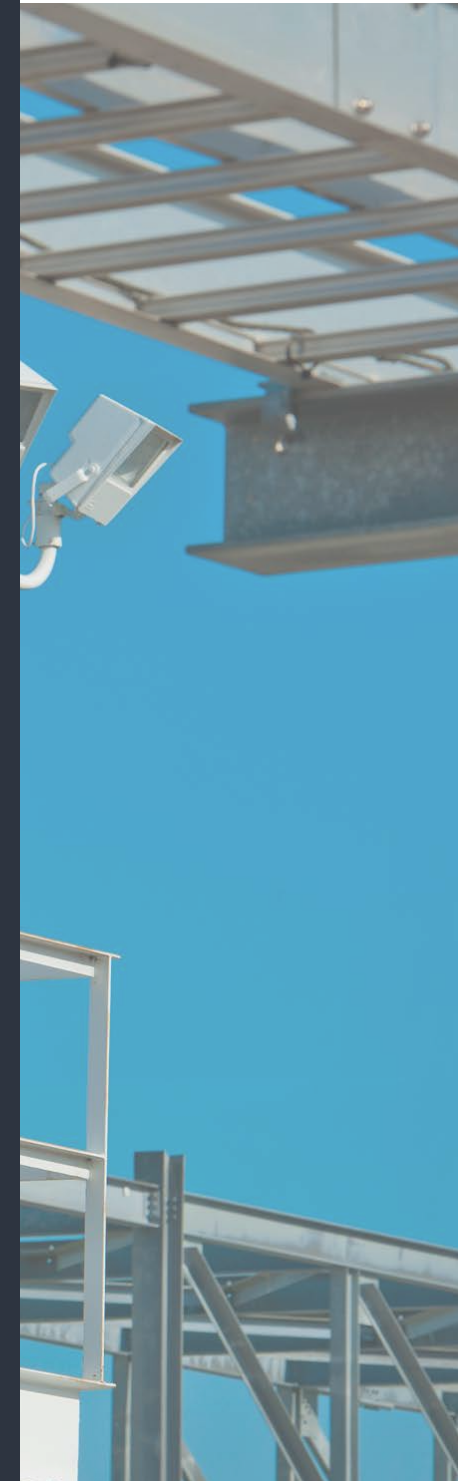- Annual Report
- Web-site
- PHMSA Reauthorization

Provide Governance & Oversight
- Culture Survey for operator use
- Third Party Voluntary Assessment
- Education: Workshops, Webinars

Provide Ongoing Support for Operator Journeys
- Industry Annual Survey
- Industry SMS Annual Awards Development
- "Barrier to Entry" Determination

Pipeline SMS

+1 202-682-8000
200 Massachusetts Avenue NW, Suite 1100
Washington, DC 20001-5571 USA

www.PipelineSMS.org