SIEMENS
Ingenuity for life

Zero Tolerance for Pipeline Downtime

Ensuring maximum performance and minimum total cost of ownership throughout the pipeline lifecycle

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"If a pipeline is adequately maintained and inspected, age is not an issue."— *Deborah Hersman, U.S. National Transportation Safety Board Chair, 2013*

Picture the scenario. From a central production site in the upstream oil and gas market, there are vast quantities of dual oil and natural gas pipelines stretching thousands of miles long in all directions across North America. Along the length of the pipelines are various points spanning the full oil and gas supply chain—from intermediate pumping stations to storage facilities, Power Equipment Centers, power and compression stations, LNG terminals, oil refineries, and more. All of which need to be secured to ensure the complete integrity and existence of the pipeline.

But what happens when existing pipeline infrastructure is insufficient to meet the needs of globally developing energy production?

While industry debate remains on the safety of oil and gas transportation in the U.S.—pipeline transportation versus rail delivery of crude oil versus ground transportation—one constant remains.

Implementation of pipeline technologies to ensure 24/7 monitoring and analysis is required to maintain and ensure the integrity of your pipeline. Luckily, industry mindset around pipeline operations continues to shift from a reactive approach toward proactive, preventive maintenance.

Understanding pipeline needs

Pipeline corrosion and wear-and-tear, at-maximum capacity operation, natural disasters, intentional damage in the form of cyberattacks on industrial control systems used in pipeline operation —there are different categories of risk that continue to threaten pipeline operation today.

We understand that the safe operation of your pipeline is of critical importance to you. Our mission-critical expertise backed by a complete solutions and services portfolio is designed to help you maintain your pipelines with ultimate dependability and operational integrity for superior manageability, safety, reliability and efficiency.

Pipeline painpoints can include:

- Retirement of decaying pipelines that are 50+ years in age
- 100% pipeline uptime for 24/7 oil and gas supply
- Maintaining aging pipeline systems equals higher maintenance and operating costs
- Transformational risks related to new pipeline development
- Public opposition to pipeline development due to negative environmental impacts
- Compliance with stringent inspections, industry regulations and standards to ensure the 24/7 integrity of each pipeline

How are you maintaining safe pipeline operations?

To address safety risks, pipeline threats and related security breaches, Siemens Siveillance™ Suite of advanced software solutions can enhance situational awareness around your pipeline to improve operation and continuity for these critical infrastructure sites. It uses open and flexible architecture to integrate multiple safety, security, and facility management systems, such as Computer Assisted Dispatch, Geographical Information Systems (GIS), access control, video surveillance, fire alarm and communication systems into a common platform. Increasing effectiveness while minimizing errors, the intuitive graphical user interface displays information including location, actual position of resources and instructional security protocols based on your organizational set up, policies, and processes.

Safety regulations instruct midstream companies to take all necessary precautions to monitor and prevent possible fire occurrences at the numerous compressor stations, pump stations and other areas that stretch along the length of a pipeline.

Siemens Desigo Fire Safety is a complete fire protection system custom-built according to your safety and budget needs. Simple panel operation with easy access to all functions ensures quick, reliable detection of fire, smoke, and carbon monoxide.

The unique detector technology of Desigo sets the standard when it comes to reliable detection, fast notification, and quick response to provide:

- Redundant sensors which increase the reliability of the detectors
- Forward\backward light scattering technology to ensure enhanced sensitivity to actual fires
- No False Alarm Guarantee as a result of detectors equipped with Advanced Signal Analysis (ASAtechnology™)

To address your preventive maintenance needs for pipeline, it is important to understand the maintenance history to assess its remaining lifespan, or how likely that pipeline is to fail. This is the first step of Siemens' Digital Services to turn that data into actionable insight. Starting this conversation enables our experts to define the right mix of preventive and predictive maintenance programs for your pipeline based on the criticality and risk of failure for all major pieces of equipment. Our innovative approach provides a strategic maintenance program, one unique to your facility. It enables you to best allocate your resources and achieve a higher level of reliability at a lower cost.

Achievable results

- Reduce/prevent single point of failure
- Full redundancy
- Enhanced situational awareness
- Streamlined operations and faster response coordination

Half of the nation's 2.5 million miles of pipeline carrying oil, gas and hazardous liquids are more than 50 years old.

By the Numbers

53% The amount of total global capital expense (CAPEX) spending by decade's end which North America and the Former Soviet Union are expected to account for, as a result of 12.9% expected growth in pipeline length in the global oil and gas transmission pipeline industry by 2020.[1]

58% The Americas' market share of the global crude oil pipelines market in 2015—followed by EMEA with around 29% and the APAC with approximately 13%.[2]

$183-$282B

Amount of pipeline investment (including both transmission and gathering lines and compression and pumping) through 2035, with a midpoint CAPEX of $232 billion—driven primarily by natural gas development.[3]

90% The approximate amount of transmission pipeline expenditure for the pipeline itself, with the remainder being spent on compression and pumping.[4]

1 Billion

Expected population increase of Sub-Saharan Africa by 2050 will drive global energy demand. Currently, this region produces the same amount of energy as Belgium for approximately 960 million more people.[5]

For more information, visit **usa.siemens.com/bt-oilandgas**

References

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2. "Global Crude Oil Pipelines Market 2016-2020," Technavio, Sept. 2016
3. "North American Midstream Infrastructure Through 2035: Leaning into the Headwinds," ICF International, April 2016
4. "North American Midstream Infrastructure Through 2035: Leaning into the Headwinds," ICF International, April 2016
5. "Pipeline to Power," U.S. Chamber of Commerce, July 2015

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