

Securing the Lifelines of Energy: Enhancing Safety in America's Aging Midstream Oil and Gas Infrastructure

The midstream sector in the oil and gas industry plays a crucial role, handling the gathering, processing, transportation, and storage of hydrocarbons. However, this sector is currently confronting notable safety challenges, primarily due to its reliance on aging infrastructure. The exploration herein will take aim at the concerning state of safety seen in America's aging midstream infrastructure today, highlighting risks connecting facilities, pipelines, etc. while posing strategies that can be employed to enhance safety in this space.

Aging infrastructure in the midstream sphere poses great risk - namely accidents, leaks, and costly failures. The Pipeline and Hazardous Materials Safety Administration (PHMSA) reported material, weld, and equipment failure were the leading causes of incidents in pipelines from the years 1999 to 2018 (PHMSA, 2019). What this showcases is the vulnerability of outdated pipelines and facilities, which usually are more susceptible to corrosion, fatigue, and other forms of degradation. The ramifications of these failures are not only detrimental to the environment, but also pose significant risks to public safety and the industry's reputation.

The financial implications of aging infrastructure safety issues are substantial. According to the American Society of Civil Engineers (ASCE), the U.S. will need to invest \$1.1 trillion in its pipeline infrastructure over the next two decades to maintain safety and meet increasing demand (ASCE, 2021). This figure underscores the urgent need for investment in infrastructure upgrades and maintenance.

Corporate structure plays a pivotal role in addressing safety challenges. Companies in the midstream sector must prioritize safety in their operations and maintenance programs. This requires a shift in corporate culture to place safety above financial and operational goals. A study by Deloitte (2020) suggests that companies with a strong safety culture have fewer incidents and are more profitable in the long run, as they avoid costly accidents and regulatory fines.

The industry is diligently developing solutions to quell the safety issues associated with aging midstream infrastructure. A particularly promising direction is the adoption of cutting-edge monitoring technologies, such as smart sensors and real-time data analytics. These tools are capable of identifying early warning signs of pipeline deterioration. This early detection and diagnosis is crucial as it allows for proactive [as opposed to reactive] maintenance, potentially averting disastrous failures (IEEE, 2019). However, the benefits of these technologies extend well beyond safety enhancement; they also bring about more efficient maintenance scheduling and help in cutting down operational costs.

Regulatory frameworks also play a crucial role in ensuring the safety of midstream infrastructure. The implementation of stringent safety standards and regular inspections by

government agencies like PHMSA are crucial. However, regulatory efforts must evolve to keep pace with technological advancements and changing industry dynamics. The Interstate Natural Gas Association of America (INGAA) advocates for regulations that promote the adoption of new technologies and best practices in pipeline safety (INGAA, 2021).

Raising public and governmental awareness is essential for enhancing safety in the midstream oil and gas sector. When there's a transparent flow of information between industry stakeholders, regulatory bodies, and the public, it can undoubtedly lead to better decision-making and fosters an environment where the necessary investments in infrastructure upgrades are more readily supported. Transparency is key.

A 2018 Harvard Business Review study revealed that energy sector companies that display transparency about their operations and safety measures saw a 30% increase in public trust (Harvard Business Review, 2018), underlining the continuing importance of transparency in industries impacting the environment and public health. With an increase in trust, particularly in the energy sector, there is a clear increase in public support and acceptance, smoother regulatory interactions, greater investor confidence, effective crisis management, etc. Further, companies with high levels of public trust are better equipped to navigate the complexities of regulatory compliance, community relations, and market dynamics, which are vital for company continued success and long-term growth.

In closing, it's clear that bolstering safety in the aging networks of the midstream oil and gas infrastructure is a challenge with many layers, requiring a collaborative push from all corners of the industry, including regulatory bodies and the community at large. To make headway, a series of strategic moves are necessary: substantial investments to refurbish and maintain aging systems, a cultural revolution within companies to put safety at the forefront, the integration of state-of-the-art surveillance technologies, and a dynamic evolution in the regulatory landscape. These steps are the cornerstone for diminishing the hazards that come with dated infrastructure. By following through with these actions, the midstream sector is well-positioned to guarantee not just the safe and efficient flow of hydrocarbons but also to uphold its responsibility towards public welfare and environmental preservation.

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References

ASCE's 2021 American Infrastructure Report Card: GPA: C-. ASCE's 2021 Infrastructure Report Card |. 2021, September 15. <https://www.infrastructurereportcard.org/>

Deloitte Us: Audit, Consulting, advisory, and Tax Services. Deloitte United States. (n.d.). <https://www2.deloitte.com/>

Harvard Business Review. (HBR). 2018. <https://hbr.org/>

Interstate Natural Gas Association of America (INGAA). 2021, August 31. <https://www.ingaa.org/>

Pipeline incident 20 year trends. (PHMSA). 2019. <https://www.phmsa.dot.gov/data-and-statistics/pipeline/pipeline-incident-20-year-trends>

The world's largest technical professional organization dedicated to advancing technology for the benefit of humanity. (IEEE). 2019. <https://www.ieee.org/>