

Modernizing Refinery Emissions Monitoring Systems

A Case Study



A U.S. refinery faced challenges in upgrading its outdated CEMS infrastructure due to corporate directives against suppliers with environmentally-focused business strategies. Through collaborative efforts and innovative solutions, it overcame these challenges, leading to improved efficiency, compliance, and customer satisfaction.

Measurement made easy

Executive Summary

The refining industry in the U.S. is undergoing significant shifts in response to environmental concerns and corporate sustainability initiatives. As refineries seek to adapt to these changes, there arises a need to modernize critical systems, such as Continuous Emissions Monitoring Systems (CEMS), to meet evolving regulatory standards and operational demands. This case study discusses a situation where a refinery, located in the vicinity of Houston, faced challenges in upgrading its outdated CEMS infrastructure due to corporate directives against suppliers with environmentally focused business strategies. Through collaborative efforts and innovative solutions, the refinery successfully overcame these challenges, leading to improved efficiency, compliance, and customer satisfaction.

Introduction

Refineries play a crucial role in processing crude oil into various petroleum products essential for modern life. However, they also emit pollutants that can impact the environment and public health. Regulatory bodies impose stringent standards on emissions monitoring and control, requiring refineries to deploy robust CEMS to track and mitigate emissions effectively. pipelines, and distributing finished products through pipelines and refinery docks into ships and barges.

The case study discussed herein focuses on a refinery, geographically situated approximately 90 miles east of Houston, Texas. This refinery, though strategically located, faced hurdles in upgrading its aging CEMS infrastructure. Corporate directives constrained its ability to collaborate with suppliers embracing “green” business strategies, complicating efforts to modernize emissions monitoring systems.

Challenges Faced

The refinery's existing CEMS infrastructure comprised 18 obsolete analyzers and Syscon boards, posing reliability and compliance risks. However, procurement restrictions stemming from corporate sustainability initiatives hindered efforts to replace these outdated systems with environmentally conscious solutions. This conundrum presented a significant challenge, compounded by the refinery's insistence on an aggressive delivery schedule.

Proposed Solution

In response to the challenges posed, ABB, a leading provider of industrial automation and digital solutions, conducted a comprehensive Life Cycle Assessment (LCA) Site Survey in July 2022. Leveraging data gathered from the survey, ABB proposed targeted upgrades to the refinery's obsolete CEMS analyzers. Rather than advocating for complete system replacements, ABB offered individual Component Gas Analyzer (CGA) modules as a viable alternative. This collaborative approach, coupled with strategic engagement with channel partners, facilitated the acceptance of ABB's solution by the refinery.

Benefits Realized

By embracing ABB's tailored approach, the refinery unlocked several benefits. Firstly, the utilization of CGA replacement modules addressed the immediate need for system upgrades while aligning with corporate procurement directives. Additionally, ABB's provision of upgraded Syscon boards and onsite training bolstered the refinery's operational efficiency and compliance capabilities.

Moreover, ABB's commitment to delivering on an aggressive schedule further enhanced customer satisfaction. Despite the complexities involved,

ABB's factory and service teams ensured timely deliveries and installations, exceeding customer expectations. Consequently, the refinery expressed satisfaction with ABB's support, signaling a willingness to extend the partnership to other sites across the United States.

Conclusion

The case study exemplifies the challenges and opportunities associated with modernizing emissions monitoring systems in the refining industry. By adopting a collaborative and innovative approach, ABB successfully addressed the unique constraints faced by the refinery, delivering tangible benefits in terms of compliance, efficiency, and customer satisfaction. As refineries navigate an increasingly complex regulatory landscape, partnerships with solution providers like ABB offer a pathway to sustainable and resilient operations.

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