

Case Study: Fenceline Monitoring of VOCs



IONICON is the world's leading manufacturer of ultra-sensitive (< 1 pptv) real-time trace gas analyzers based on unique Proton Transfer Reaction - Mass Spectrometry (PTR-MS) and proprietary SRI-MS technology.

The most important features of all systems offer are:

- PPT range detection limit for monitoring VOCs
- Direct real-time analysis without sample preparation
- The entire mass range quantified in split seconds
- Robust engineering quality & field tested performance

Most accurate,
reliable, and
sustainable
Fenceline
Monitoring
solution

Parameters

VOCs

Hydrocarbons

Ketones

Aldehydes

Organic Acids

Esters

Alcohols

Glycols

Glycerols

Ethers

Organic Peroxides

Nitros

Amines

Nitriles (Cynadies)

Carbamates

Amides

Alkyl Halides

Thiols

Organo Phosphates

Dopants AsH₃ PH₃ TEP

Fluoro Compounds C_xN_yF_z, C_xO_yF_z

Sulphur Compounds H₂S, CH₄S,...

many more...



US-EPA Reference



Installed at



Project Description

This project focuses on fence-line monitoring of more than 10 gas parameters at a major industrial facility, ensuring full perimeter coverage and compliance with Royal Commission (RC) regulations. Sampling points are strategically distributed around the 6,000-meter fence line to detect fugitive emissions, including trace-level pollutants, and to provide real-time monitoring data for environmental compliance and operational decision-making. A total of four high-resolution Mass Spectrometers have been installed, each connected to 10 sampling lines, with an average spacing of 150 meters between points. The longest sampling line extends up to 675 meters, demonstrating the system's capability to cover extensive distances without compromising measurement accuracy. All sampling lines are measured individually within a 15-minute cycle, allowing rapid detection of emissions from multiple points while meeting strict RC regulatory requirements. Data from all four analyzer shelters is seamlessly integrated into a centralized Data Acquisition and Handling System (DAHS) located in the plant's EHS office, enabling real-time monitoring, automated reporting, and regulatory compliance verification.

OEM Details: Ionicon, Austria.

Ionicon is a world-renowned manufacturer of high-precision mass spectrometry instruments, capable of detecting gases at ultra-trace levels (up to 10 ppt). Their analyzers are known for reliability, robustness, and high-resolution measurement capabilities suitable for industrial and environmental applications.

Challenges

- **First-of-Its-Kind Multi-Point Sampling:** Implementing a fence-line monitoring system with simultaneous multi-point sampling was a pioneering approach for this facility.
- **High-Resolution Mass Spectrometry:** Deploying mass spectrometers capable of detecting gases at 10 ppt required precise calibration and advanced analytical expertise.
- **Extensive Fence Coverage:** Monitoring a 6,000-meter plant perimeter while maintaining rapid, accurate measurements posed significant engineering and operational challenges.
- **Rapid Sampling Cycle:** Ensuring all sample points were measured within a 15-minute window demanded highly efficient system design, including robust sampling manifolds and data integration.
- **Complex Gas Composition:** Detecting and quantifying difficult-to-measure gases from multiple remote points simultaneously.
- **Project Timeline:** Despite the complexity, the project was originally scheduled for one year, requiring meticulous planning and execution.

Achievement

- **Ahead of Schedule:** The project was completed in 9 months, three months ahead of the original schedule.
- **Regulatory Submission:** Eight months of operational data were successfully submitted to the RC, facilitating timely regulatory approval.
- **Operational Reliability:** Two years of continuous operation have passed without any major issues, demonstrating the robustness and stability of the system.
- **High-Performance Monitoring:** The system operates smoothly and reliably, delivering accurate, high-resolution data for environmental compliance and real-time decision-making.

Classification: Confidential



Saudi Basic Industries Corporation
Engineering & Projects Management
Site Project Department – SHARQ Site

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Date: 04- Sept-2024

To: Petroleum Innovative Technologies company
for Environmental Services (Petrointech)

SUBJECT: Letter of Appreciation to PETROINTECH

We would like to extend our sincere appreciation to **Petroleum Innovative Technologies company for Environmental Services (Petrointech)** for successfully completing the supply, installation, testing, and commissioning of VOC analyzers at Sharq as part of the RC regulatory project.

Petrointech team's dedication and professionalism throughout this project have been exemplary. Despite facing various challenges, Petrointech demonstrated remarkable diligence, expertise, and commitment to delivering high-quality work on time.

We are particularly impressed with the outstanding leadership and coordination shown by Petrointech team members on site. Their technical proficiency and unwavering dedication were crucial in achieving the project's objectives and ensuring compliance with the required standards.

The successful completion of this project is a testament to Petrointech's capabilities and reliability as a trusted partner. Your efforts have significantly contributed to the project's overall success, and we are grateful for the valuable support and service provided by your organization.

Thank you once again for your exceptional work and commitment to excellence."

For more information about the application and also Ionicon's PTR-TOF Mass spectrometer kindly contact the below contact.

Contact Address

Email: dms@petrointech.com

Mobile: +966 50 8772 999