

# CASE STUDY

## COMPLETE TEMPORARY FLARING & MONITORING SOLUTION

# ZEECO

### SITUATION

In February of 2024, a specialty chemical company in Pasadena, TX, reached out to Zeeco regarding an upcoming fall turnaround. This turnaround would involve taking their flare system and associated instrumentation out of service for around 14 days to perform maintenance. This facility must follow the Refinery Sector Rule (RSR) emissions standards under NESHAP Subpart CC (40CFR §63.670). This rule requires many levels of instrumentation to monitor and record that flares are operating correctly and destroying the emissions being sent to the system. This customer wanted to bring in a temporary combustion and monitoring system that fully complies with the RSR during their turnaround.

### CHALLENGE

Temporary flares are widely used in many industries, including the downstream petrochemical industry, during maintenance turnarounds. A major challenge with using these systems in the petrochemical industry is the instrumentation requirements outlined in RSR, such as:

- Proven pilot verification
- Waste gas flow rate monitoring with flow measurement instrumentation
  - When dealing with temporary piping, the monitor can be difficult to operate with manufacturer L/D requirements of the instrumentation utilized
- Full waste gas speciation
  - This is typically done with gas chromatograph setups
- Air assist monitoring for the flare tip to ensure smokeless combustion
  - This can be done with compressed air or forced air fans
- Data Recording/reporting of environmental data

The facilities themselves also have many challenges with operating a temporary flare during turnaround activities. These include limited personnel and expertise in operating temporary combustion systems, available utilities, and plot space. It can also be difficult for facilities to navigate the regulations within RSR to ensure all components are accounted for during the turnaround.

### SOLUTION

Zeeco's customer began by sending over the process design considerations of their existing flare system so Zeeco could take on all aspects of this project. This included supplying a temporary flare, all instrumentation, all temporary piping, all utilities, including power and instrument air, and all personnel to set up and operate the equipment during the planned shutdown.

The next step was to perform a full job walkdown of the project. Zeeco mobilized its Rentals and Global Field Services teams to visit the job site with the customer. The plant visit gave Zeeco valuable information about the plot space, flare tie-in points, and ensured



Overview of Project Setup.



Interior of Gas Chromatograph Trailer.



Exterior of Gas Chromatograph Trailer.

# CASE STUDY CONT.

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all aspects of the project were covered. After the job-site visit, Zeeco confirmed the project scope and plan with the customer for the upcoming fall turnaround.

During the turnaround, Zeeco supplied several pieces of equipment, controls, and instrumentation to satisfy the customer's needs and RSR requirements. Equipment supplied to the customer included:

- 60' tall hydraulically lifted compressed air assisted flare trailer
  - No cranes were needed to lift the flare system
- Zeeco emissions monitoring trailer with:
  - Full gas chromatograph setup, supplying gas speciation of the waste gas
  - Calorimeter, providing real-time flare gas BTU Value
  - Sample probe and heated sample line for gathering flare gas samples
  - Calibration gas bottles
  - Hydrogen and methane fuel bottles
  - On-board backup generator
  - Zeeco technicians, who recorded and logged all monitoring data
- Waste gas flow meter with pipe spool to fully comply with manufacturer L/D requirements
- Temporary interconnect piping for waste and utilities
- All interconnecting electrical connections
- Temporary generator and air compressor
  - Containment berms were included for the area

In addition to the above equipment, Zeeco deployed its combustion specialist team to set up and fully operate this equipment during the turnaround.

### RESULTS

By bringing in Zeeco to operate the temporary flare system and monitor the flare gas stream, the system was able to maintain above the necessary net heating value dilution (NHVdil) parameter required for refinery flaring. When operating above the required NHVdil number, the flare achieves acceptable destruction removal efficiency levels. Operating at a high efficiency for the duration of the turnaround meant that harmful chemicals were efficiently destroyed and turned into CO<sub>2</sub> and water vapor. Zeeco experts were able to keep the system operating with 100% uptime during the turnaround. This allowed the customer to focus on their maintenance activities, while Zeeco ensured they maintained their operations and remained environmentally compliant during the entire turnaround. Zeeco helped the customer execute a successful project while keeping them environmentally compliant and completing their turnaround on time.



Gas Chromatograph.



Zeeco GTC Rental Yard.