



Case Study

Integrated Turnaround Support: Heater Decoking, Reactor Cooldown & Nitrogen Purging

Introduction

During a planned turnaround, Intero was selected to support a refinery in Romania with a combination of critical services, including heater decoking and inspection, reactor cooldown, and nitrogen purging.

The project was executed within a highly constrained schedule, requiring seamless coordination between multiple activities and contractors. In addition to the planned scope, Intero was requested to provide additional support during execution, demonstrating flexibility and rapid response capabilities.

Pipeline / Asset Details

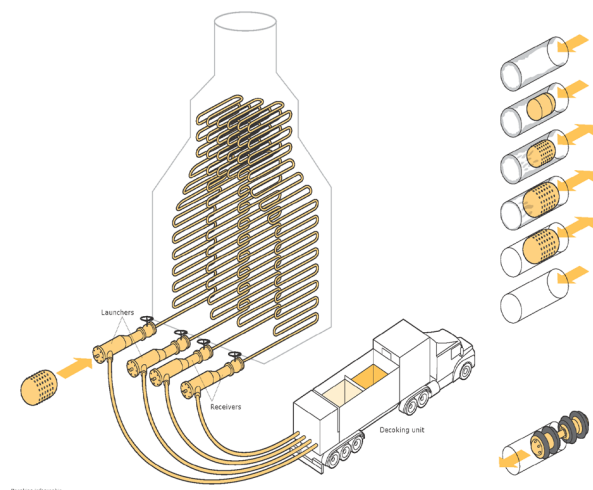
- Application: Refinery heaters and reactor systems
- Services: Heater decoking & inspection, reactor cooldown, nitrogen purging
- Scale: 5 furnaces, 1 reactor
- Execution: Parallel operations with multiple units and crews
- Nitrogen supply: Approx. 500,000 Nm³

Scope of Work

We were responsible for the full execution of multiple turnaround services, including planning, logistics, and on-site delivery.

The scope included parallel decoking and inspection of heaters, execution of a large-scale reactor cooldown using nitrogen, and later an unplanned reactor purging operation to restore safe access conditions.

All activities were performed within tight time constraints and fully aligned with the refinery's broader turnaround schedule.



The Challenge

The turnaround was characterized by an extremely tight schedule, with limited time windows allocated for each service. Multiple heaters required simultaneous decoking, while one unit was undergoing extensive overhaul.

Executing parallel operations required mobilizing four decoking units and a crew of approximately 25 personnel, while maintaining efficiency and safety. Inspection results were required within 24 hours to support critical maintenance decisions.

For the reactor cooldown, a large volume of nitrogen had to be supplied and managed within a defined execution window. Following demobilization, an unexpected issue arose when elevated LEL levels prevented safe access to a reactor, requiring immediate additional support.

The Solution

Intero implemented an integrated execution strategy, enabling parallel decoking and inspection of multiple heaters while coordinating closely with other contractors on site.

For the reactor cooldown, detailed planning ensured reliable nitrogen logistics and delivery within the required timeframe, with parameters aligned to support subsequent operations.

When additional purging support was requested, Intero responded immediately by remobilizing equipment and personnel, restoring safe LEL conditions in the reactor.

Additional Insights

During the decoking process, solid deposits were identified inside radiant tubes of one heater. This finding was reported to the client, triggering further investigation due to potential risks to downstream equipment such as pumps.

Intero's real-time operational insights during daily turnaround meetings were highly valued and contributed to improved coordination of overall maintenance activities.

The Result

- All heater decoking and inspection activities completed within the planned turnaround schedule
- Inspection reports delivered within 24 hours, enabling timely maintenance decisions
- Reactor cooldown executed according to predefined parameters, supporting downstream activities
- Reactor LEL reduced to safe levels, allowing immediate access for catalyst crews
- Avoidance of an estimated multi-day delay to the turnaround schedule
- Strong client satisfaction and continued collaboration interest

Advantages

- Integrated service execution across multiple disciplines
- Ability to perform parallel operations under tight deadlines
- Rapid response and flexibility to accommodate unplanned scope
- In-house nitrogen supply and logistics management
- Reduced downtime and optimized turnaround efficiency
- Dedicated project team ensuring clear communication and coordination