



Case Study

Bespoke Slim-Fit Header System for Mechanical Heater Cleaning

Introduction

During a planned turnaround, Interro was challenged to mechanically clean a multi-pass convection bank heater that had never been cleaned before. Due to the heater design, conventional pigging methods were not feasible, requiring a tailored engineering solution to enable safe and effective mechanical cleaning of individual passes.

Scope of Work

We were responsible for the engineering, design, fabrication, and on-site execution of a bespoke slim-fit heater header system. The scope included detailed measurements, preparation of construction drawings, manufacturing of custom diverters and pig stoppers, and mechanical cleaning of all heater passes during the turnaround.

Pipeline Details

- Application: Multi-pass convection bank heater
- Heater configuration: 16 passes combined into 8 inlet and outlet headers
- Cleaning method: Mechanical pigging
- Challenge: Extremely tight tolerances between header ID and tube ID

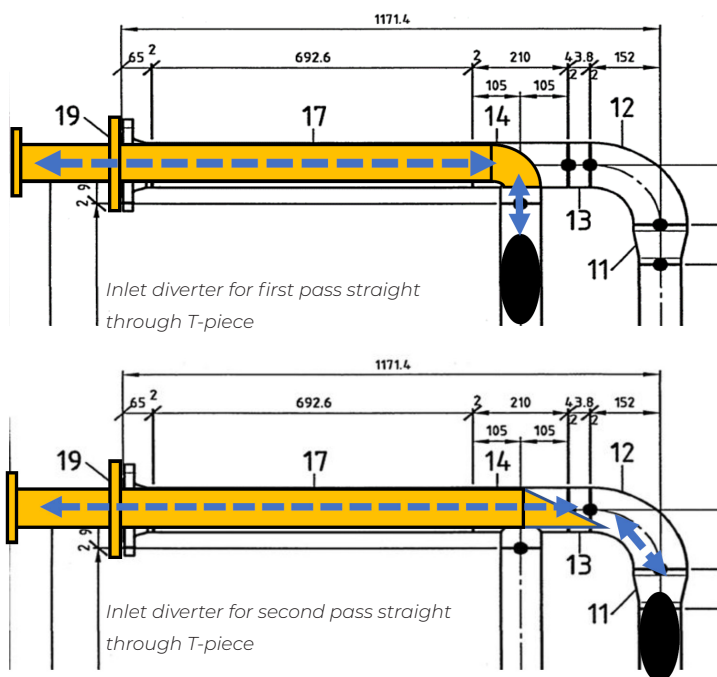


The Challenge

The heater was designed with a multi-pass header configuration in which two passes were combined into a single inlet and outlet using T-piece headers. With very limited tolerance between the header internal diameter and the tube internal diameter, standard off-the-shelf snorkel header systems were not suitable. As a result, the convection bank was previously considered “unpiggable,” and an alternative approach was required to enable mechanical cleaning without extensive modifications or additional resources.

The Solution

Intero developed a bespoke slim-fit header system specifically tailored to the heater geometry. Following concept agreement, a site visit was carried out to measure each header accurately, allowing detailed construction drawings to be prepared for every diverter. Custom inlet diverters were designed to allow foam and stud pigs to be introduced into individual passes, while pig stoppers were selected for the outlet side to reduce the number of special components required. The outlet diverters could be rotated by 180 degrees to switch between passes, significantly reducing changeover time. The complete system was installed and operated by Intero’s de-coking crew without the need for additional scaffolding or third-party support.



The Result

- Successful mechanical cleaning of all 16 heater passes
- Completion of cleaning activities within the original turnaround schedule
- No safety incidents or delays during execution
- Elimination of the need for additional scaffolding and specialist crews
- Heater successfully cleaned despite previously being considered unpiggable

Advantages

- Turnkey project support from engineering through execution
- Bespoke slim-fit design enabling cleaning of challenging heaters configurations
- Single project management team and dedicated Intero de-coking crew
- Reduced manpower requirements compared to conventional header systems
- Cost savings through in-house design and fabrication
- Reduced transport and environmental impact by consolidating equipment
- Flexible, innovative approach tailored to site-specific constraints



Outlet pig stopper first pass



Outlet pig stopper second pass