

Case Study

Custom, slim-fit furnace header system for mechanical cleaning of individual passes of a convection bank

Introduction

The client requested multiple suppliers to devise a solution to clean a multi-pass header type furnace design. This convection bank was not previously mechanically cleaned and cannot be cleaned with conventional pigging methods.

Challenge

The design of this convection bank is challenging due to the fact that each of the two passes are combined in one inlet and outlet on a T-piece type header (16 passes combined into 8 inlets and outlets). There are off-the-shelf snorkel systems available for rent for furnaces equipped with headers, but these are not suitable for this particular set up since the tolerance between the header ID and the tube ID of the passes is very close to each other (100mm and 77.7mm).

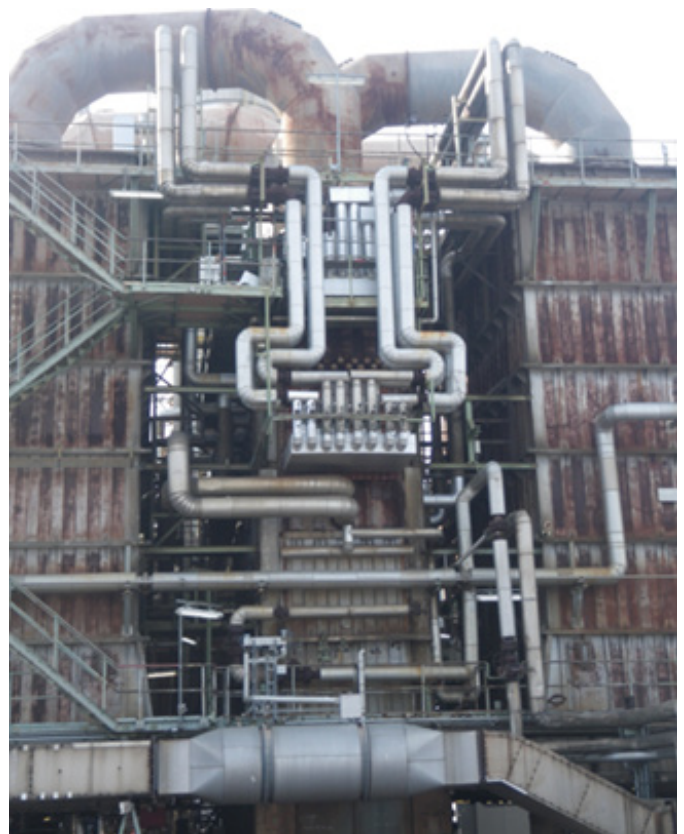
Solution

Intero created a slim-fit design which has been tailor-made for this specific furnace. After the concept agreement, a site visit was conducted to take the measurements of each header and prepare construction drawings for every diverter.

Results and Benefits

All the diverters which are part of the slim-fit header system have been connected to the furnace manifolds by the de-coking crew without the need for additional scaffolding and dedicated crew. This is a major reduction in the requirement of third-party companies and additional resources.

The mechanical cleaning of all 16 passes has been performed within the original timeframe without any delay of safety issues. The slim-fit header system, part of the custom design, is more cost-effective in comparison to off-the-shelf snorkel type header systems (only usable with larger tolerances between header ID and tube ID) in terms of rental cost and the requirement of additional crew members.



Multi-pass header type furnace design

A photograph of a large industrial machine, likely a steam generator or boiler, with numerous vertical tubes and horizontal pipes, situated in a factory setting.

[illegible]

Technical drawing of a mechanical assembly, likely a pump or motor component. The drawing shows a horizontal shaft (17) with a central section (19) and a curved section (12). Dimensions are provided in millimeters (mm): 1171.4 (total length), 692.6 (distance from left end to center of shaft), 210 (distance from center of shaft to right end), 152 (distance from right end to center of shaft), 105 (distance from center of shaft to right end), 105 (distance from right end to center of shaft), 63.8 (distance from center of shaft to right end), 152 (distance from right end to center of shaft), 105 (distance from center of shaft to right end), 105 (distance from right end to center of shaft), 63.8 (distance from center of shaft to right end), 152 (distance from right end to center of shaft). Labels 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100 are present.

Outlet Manifold



- Turnkey project support.
- Innovative solution for challenging furnace design.
- One project management team.
- Hands-on operational crew, Intero de-coking crew capable of mounting and operating the header system.
- Cost savings due to less personnel required, in-house designed and constructed header system.
- Transport costs and environmental impacts reduced as materials required for all scopes can be transported together.
- Clear and close communication with client before and during work scopes to find solutions to changing situations.
- Slim-fit header system which enables cleaning in previously “unpiggable” furnace.
- Flexibility to think and act outside of the box.