



Multiple furnace change outs under 45 days? No problem

ParFab is up for any challenge

Looking back over ParFab's 20 years in business, it is hard not to think about the victories and challenges we have experienced. During the good times and bad, it has always been our mission to provide uncompromising safety and quality, successfully completing every project at a competitive price and to the complete satisfaction of our customers, regardless of the situation. With more than 260 combined years of experience in the refining, petrochemical, syngas and power industries, ParFab's senior leadership has been involved in all aspects of project stages, whether it's engineering, planning, fabrication, construction, turnarounds, shutdowns, maintenance or emergency services. With this wealth of knowledge and experience, we often receive requests pertaining to difficult issues, allowing our team to rise to the occasion, think outside the box and offer solutions to resolve our customers' toughest problems.

Over the years, there have been many projects that stand out where ParFab exceeded its customers' expectations. ParFab has provided solutions to customers' most difficult problems; however, there is one project in particular that stands out as one of the most challenging.

In 2014, ParFab Senior Vice President of Projects J.T. Miller was called on by a customer's lead heater manager to travel to Texas City, Texas, and consult on some ongoing heater efficiency issues. Having been in the refining and petrochemical industry for more than 35 years, Miller is a trusted consultant to plant operators around the world regarding fired heaters, making him an obvious choice to address the customer's issue.

The problem presented was an increasing lack of efficiencies with four furnaces, three of which included Kellogg platform heater continuous catalytic reforming units from the 1970s. The high production cost per gallon of the high-test gasoline was becoming more and more difficult to overcome and needed to be resolved. The initial challenge was two-fold. First, there was a requirement to stay within a desirable cost percentage to replace all four furnaces with new equipment instead of revamping. Second, the entire project, including the demo and erection of all four units, needed to happen within a 45-day scheduled turnaround.

"Now the hard part is talking about replacing a single furnace and erecting the new furnace," Miller said. "Typically, it is about a 12-week project, which does not include taking the old furnace down."

Miller, along with ParFab's senior leadership team, extensively evaluated the situation and presented a strategic plan to the client that included collaboration between ParFab's fabrication, field and customer-dedicated, on-site teams. The methodic strategy included

expanded pre-turnaround planning and logistics; fabricating new components to include furnace modules, arbor coils, harps, manifolds, convection boxes, stack sections and all associated ducting (all shipped to the site); and staging and pre-assembling the furnaces to the fullest extent on-site at the plant in advance of the turnaround. Then, once the turnaround began, ParFab would demo the old furnaces, followed by placing and erecting new units on existing foundations with all required tie-ins.

Nearly six months after the initial walkthrough, the project was finally approved to move forward. "Although this was one of the most challenging projects ParFab's team had performed in terms of logistics and timing, we felt confident in our plan, not to mention we really had to have faith in our team and their expertise to do a project of this magnitude," Miller said.

Shortly after approval to move forward with ParFab's fabrication and constructability plan, the engineering phase began to increase efficiencies for the units. The new design that was selected created its own challenges for our field team, as the existing units were going from individual stacks on each unit to a new ducting system in which all four units would flow in and out through a common 300-foot stack. This new configuration also had to be factored into the turnaround timing and planning stages.

Two years after the original walkthrough with the client and after engineering was finally released, ParFab began fabrication of the furnaces and their components. We collaborated closely with the engineering firm from both fabrication and constructability perspectives to ensure the project stayed on track and to quickly work through any issues that arose from the new stack and ducting design.

A crucial part of the plan was to ensure ParFab's fabrication team was able to fabricate and pre-assemble the furnaces and components to the fullest extent possible. This would limit the amount of outage time for the client while staying within shipping restrictions. Given the timing of the project and physical size of the units, the obvious choice was to ship the units via barge down the McClellan-Kerr Arkansas Navigation System, which is a convenient 7-mile trek from ParFab's Inola, Oklahoma, location.

"Getting it all there is just part of the equation," Miller said. "The units also need to be transported from the channel and go on a short drive to the plant, not to mention the other ongoing construction obstructions."

The units arrived six months in advance of the turnaround as scheduled and were transported to the designated staging and laydown area within the plant. Upon arrival, ParFab's field services teams were ready to spring into action with the installation of ladders,

platforms and all ancillary equipment that typically extend the timeline of the erection process. With the bigger components assembled as much as possible, we began moving new units to the staging area in proximity of the existing units and then finished out what we could.

There are a couple key elements outside the normal pre-assembly phase that positively affected the timing of the project. The area that housed three of the units was in a very confined area, with each unit



Unit being placed in close proximity to live units.



Successful 12-point super-lift ready for placement and fit up.

then stacked one at a time," Miller said. "To demo just one of these units is a really big deal, but we ended up doing all four within that same amount of time. It was not a simple pull and replace."

As previously mentioned, the first unit was fully pre-assembled, while the following units were placed as one large three-section piece that was already assembled. This allowed for time savings on fit up in the field as each unit was placed.

Once the first unit was in place, the additional units seemed to go like clockwork, with each unit dropping in as planned, allowing ParFab's field services team to do what it does best: get to work and get the job done.

Projects like this come along once in a blue moon, and ParFab is willing, able and up to the challenge for the next one.

As intimidating as a project of this scope can be, ParFab rallied and successfully completed the project to the complete satisfaction of the customer, even wrapping up ahead of schedule with time to spare.

"This was absolutely one of the coolest projects I have been involved in throughout my 35-year career," Miller said. "Companies often change out furnaces one at a time, but to get into a unit and dig out that many furnaces and put new ones in within 45 days is quite a feat."

ParFab is successful because we continue to maintain and build dependable partnerships with our customers, employees and subcontractors on every project.

For more information, visit www.parfabusa.com or call (918) 543-6310. ●