



Quantapoint Case Study

Fluor Beats Budget and Timeline With Improved On Site Safety Using Quantapoint

Laser Scanning Used To Quickly Capture Dimensional Data in Harsh Environment

Situation

Fluor Corporation is one of the world's largest publicly owned engineering, procurement, construction, and maintenance service organizations. Fluor is also consistently rated as one of the world's safest contractors. Its primary objective is to develop, execute, and maintain complex engineering and construction projects on schedule, within budget and with excellence. Fluor was selected to implement a nitrogen oxide (NO_x) and highly reactive volatile organic compound (HRVOC) reduction program for a major gulf coast refinery in Texas. The project involved modifying approximately 17 tightly spaced process heaters and 3 carbon monoxide boilers to comply with Texas Commission for Environmental Quality Clean Air regulations. The project required both the replacement of the older burners and the addition of new fuel gas piping along with the new ultra low NO_x burners.

Challenge

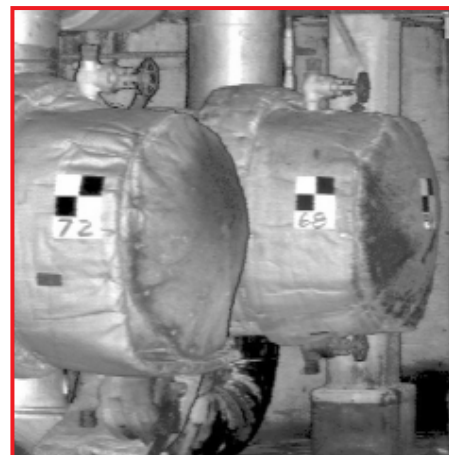
The project faced two major challenges. First, the space under each furnace and around each boiler was extremely tight and congested with support columns, platforms, inlet air ducting, fuel gas piping, instruments and utilities, making it very difficult to access. Second, there was a lack of accurate and current as-built documentation on which to base the design. For these reasons it was determined that traditional surveying techniques and similar technologies would not suffice.

Solution

Due to the congestion and proximity of the heaters to one other, Fluor decided to use laser scanning. According to Vince Griffin, Project Manager for Fluor, "We started looking at how close the quarters were on these heaters and how hot and noisy it would be to send people under the operating furnaces and that's when we contacted Quantapoint. We selected Quantapoint to perform laser scanning because of their significant refining experience." Quantapoint rapidly captured high-resolution dimensional data in the difficult to reach areas around the perimeter of and beneath each process heater and boiler, providing complete and accurate as-built laser documentation.

"In the end, Quantapoint enabled us to save 75-80% of the time our design personnel would have had to spend in the operating units by using as-built laser documentation instead of relying on traditional data collection methods."

*Vince Griffin
Project Manager, Fluor*



Results

Through the use of Quantapoint as-built laser documentation, Fluor was able to complete the project with virtually zero field rework and optimized scheduling from fewer man-hours being required in engineering and reduced outage time during construction. This allowed the construction work on each of the furnaces to be completed three (3) days earlier than scheduled. The advantages were also apparent in the accuracy of fit-up, improved design review capabilities, less physical survey time and improved safety exposure by the engineering team – all of which contributed to a lower project cost.

“Quantapoint allowed us to spend less time in hazardous conditions, less time interfering with the on-going plant operations and more time in the design office. In the end, Quantapoint enabled us to save 75-80% of the time we would have spent in the operating units by using as-built laser documentation instead of relying on traditional data collection methods,” added Griffin.

Overall, design and construction goals were met in record time, with the various benefits achieved being summarized by category below.

- ❖ Overall
 - Project came in ahead of schedule and under budget with an excellent safety record.
- ❖ Reduced Cost
 - The number of construction man-hours decreased as the project was completed in a reduced period of time with essentially no rework.
 - Quantapoint data enabled Fluor to utilize 3D Intergraph PDS design tool economically on a retrofit project in process units where no 3D model existed.
- ❖ Optimized Schedule
 - Significantly reduced the time required for creating, validating and marking up existing drawings by ensuring drawings issued to construction matched what is actually in the field.
 - Using a 3D Intergraph PDS design model allowed Fluor to electronically transfer the design to multiple engineering offices for around the clock design progress to comply with a compressed engineering schedule.
- ❖ Increased Quality
 - Engineered new burner configurations that would better fit into the existing facilities.
 - Significantly reduced re-work from cutting and refitting and helped ensure a clash-free design.
 - Provided operations the ability to participate in virtual 3D reviews of the new facilities for operability and maintainability before the drawings were issued to construction.
- ❖ Improved Safety
 - Minimized the need to place workers inside a hazardous, congested work area during operations.

In short, according to Griffin and Fluor, “if you can't find the drawings, and there is limited access to the units, Quantapoint as-built laser documentation saves time and money and becomes an integral necessity to doing the job right. Quantapoint provided the design team daily access to a digitized version of the equipment to be modified on the user's desktops, without requiring personal protective equipment or permits”. For Fluor and Quantapoint, it could be said they boldly went where few workers have gone before.