Quantapoint Case Study

O'Neal Engineering Achieves Significant Results for Pulp and Paper Manufacturer with Help from Quantapoint

Enables Precision for Shop Fabrication and Piping Tie-Ins and PDMS Integration

Situation

O'Neal, Inc. is a full-service planning, design and construction firm that serves the pharmaceutical, biotechnology, chemical, general manufacturing, automotive, pulp and paper, specialty fibers and plastics industries headquartered in Greenville, S.C. In late 2003, O'Neal began working with a major pulp and paper manufacturer on a project to eliminate contamination of a fine paper process in a machine that became operational in 1998. The existing screens weren't suitable for removing plastic contamination from the process. O'Neal's scope of work was to install three new screens and associated new piping for this machine. New screens had to be installed in the approximate location of the original screens. The largest of these pressure vessels was 8 feet in diameter and 12 feet tall with 32-inch stainless steel pipes. The system capacity was 35,000 gallons of stock per minute.

Challenge

Scheduling was one of two major challenges for O'Neal: the company had only two days for shutdown and installation of the new equipment while O'Neal team members had to work in congested conditions while the existing paper machine continued production. Accuracy was the other major challenge. O'Neal needed to address changes and upgrades to an area on the ground floor of the customer's facility that measured approximately 75 feet by 75 feet (5,625 square feet) and an area on the first floor measuring approximately 25 feet by 25 feet (625 square feet). O'Neal also had to capture and factor in features that had the potential to interfere with new installations such as the finish floor elevation, walls, ceiling, piping and equipment, miscellaneous and structural steel, electrical equipment and other features.

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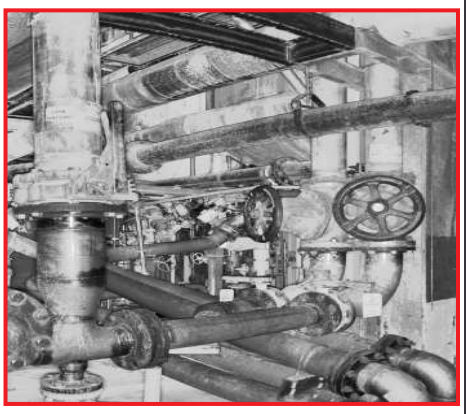
>
> *John Blasdale*
> *Project Administrator, O'Neal*



Solution

To provide accurate as-built documentation and measurement information, O'Neal contacted Quantapoint Inc. of Pittsburgh, Penn., a leading provider of as-built documentation using integrated laser scanning. Quantapoint's as-built laser documentation™ is a "turnkey" solution that combines hardware, software, data processing and delivery. Quantapoint rapidly collects, registers and verifies billions of highly accurate measurements to provide a consistent and up-to-date "digitized building" of as-built laser documentation – without purchasing costly hardware, error-prone data handoff or time-consuming remodeling. Quantapoint team members mobilized and completed field work with two

people working 10 hours per day for 3 days. They scanned 348 targets over 21,000 square feet. Quantapoint then processed and delivered dimensional data in 9 business days.

Quantapoint delivered the as-built laser documentation via an external hard drive. The data package included the registered network to integrate data collected by Quantapoint, control files to organize the data, a plot plan to access the data, photo-realistic two-dimensional laser scan data, interactive three-dimensional laser models and PRISM 3D software for managing, sharing and extracting dimensional information from the data. Quantapoint also provided O'Neal with Quality Assurance Reports that included calibration summaries for Quantapoint laser scanners, a printed copy of the survey summary, an overall network quality report and visual browser notebooks that included hard copies of all images for ease of viewing and sharing data with various project team members.

Results

O'Neal realized several major results and benefits relative to as-built laser documentation, field work and impact on the overall project. Field fabrication was accomplished for most piping, but shop fabrication was required for 32-inch stainless steel piping, which had to be precision cut to fit. O'Neal was able to complete 30 piping tie-ins without error, including two highly critical field welds to RA28 specification for 32-inch piping. Moreover, laser scanning helped to eliminate three 32-inch pipe welds that would have required 12 hours per weld. Additionally, PRISM 3D was used to import and clash 3D CAD models against the 3D laser models to identify and eliminate potential interferences during design. Overall results for the project include:

- **Reduced costs** resulting from quickly capturing as built dimensions, eliminating rework and field changes, and less down time.
- **Optimized schedules** through reducing time spent collecting data, improving design efficiency, enabling pre-fabrication of components that minimized construction durations. Quantapoint saved O'Neal from having 4 team members in the field for 5 business days, working 8 hours per day.
- **Enhanced quality** due to greater accuracy and precision that improved designs. O'Neal also improved pipe routing and improved steel fit up around existing components.
- **Improved safety** by exposing fewer people to hazardous conditions during as-build data collection and reducing the number of field trips required. Because engineering teams are not in a working plan environment every day, they are subjected to more risks.

Lessons Learned

O'Neal provided Quantapoint with only one data point which hampered alignment between the 3D cad model and 3D laser model. O'Neal plans to scan shop-fabricated components in the future to ensure that tolerances have been met in the fabrication stage. Additionally, O'Neal project team members Jim Maxey and John Blasdale recommend that other engineering team members remember to scan not only existing facilities and equipment, but also new equipment that will be installed to ensure accurate placement and fit during the design and installation phases of projects.