



Using Laser Trackers to Increase Revenue and Reduce Risk In the Industrial Sector

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Iconic Shipyard Continues Modernization with 3D Measurement Technology



Although more than 140 years old, Colonna's Shipyard Inc. has not stood still with respect to modernization. Colonna's has made the capital investments necessary to improve efficiency and productivity – and those investments are paying off.

During the late 1990s, Steel America (SA), a division of Colonna's, branched off to meet market demands for industrial plant expansions and other onshore fabrication projects.

According to Chris Hartwig, SA operations manager, "Steel America has three basic components: fabrication, in-shop machining, and onsite machining. We fulfill lots of custom, high-tolerance jobs. Some projects are so large that the finished product must be sent by barge to the customer. The machining side services multiple, long-term government contracts for heavy marine-shaft work. We also service industrial markets dealing with super-sized shafts such as those used in hydroelectric dams."

Improvement Challenges

"A two-year ROI analysis showed that the investment in tracker technology versus the cost of outsourcing was pennies on the dollar."

Chris Hartwig,
Operations Manager,
Steel America

Like its parent company, SA is known for continuous improvement, which means a commitment to regularly improve its workflow, throughput, and profitability. In the complex world of marine repair and fabrication, measurement and modeling capabilities can mean the difference between sinking, swimming, or succeeding. As SA developed further capabilities and certifications to meet the market demand in sectors such as marine infrastructure, power generation, industrial plants, oil and gas components, and civil structures, the management team realized that it needed to upgrade the company's manual, time-consuming, and error-prone measurement processes.



3D Measurement Solutions

To maximize the capability of its state-of-the-art fabrication and machining facility, SA incorporated the Vantage Laser Tracker from FARO® Technologies, the world's most trusted source for 3D measurement and imaging solutions.

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With 525 ft (160 m) of spherical working volume, the FARO Vantage has reinvented high-accuracy, large-volume measurement. The Vantage provides tremendous value in a complete laser tracking solution that offers extreme portability, supreme accuracy, and shop-floor durability. “Originally, we looked at the tracker as a time-saving investment,” says Hartwig. “We always say, ‘If it takes a lot of people, it takes a lot of time.’” Not to mention that as more people are involved, more risk is introduced.

“We use the tracker extensively in machining,” Hartwig continues. “A lot of tolerances these days have gotten really tough. Those shafts have to be plus-or-minus two to three thousandths of an inch runout and diameter.” SA’s machine shop boasts lathes, boring mills, shapers, and planers capable of handling shafts up to 95 ft long with a 144 in. swing, and weighing up to 200 tons.

“With the accuracy of the Vantage tracker, we can perform all the inspections, map projects completely, and store the data in a file,” says Hartwig. “When we do design builds, we almost always have to provide digital files.”

SA enhances the capabilities of the Vantage by pairing it with software such as AutoCad® (from Autodesk in San Rafael, California) or SolidWorks® (from Dassault Systemes of Waltham, Massachusetts).

Even though some of SA’s customers require third-party verification, they use the Vantage tracker for in-house verification before inviting a third party. “If a part fails a third-party inspection and they have to return to recheck... well, they’re not cheap,” quips Hartwig.

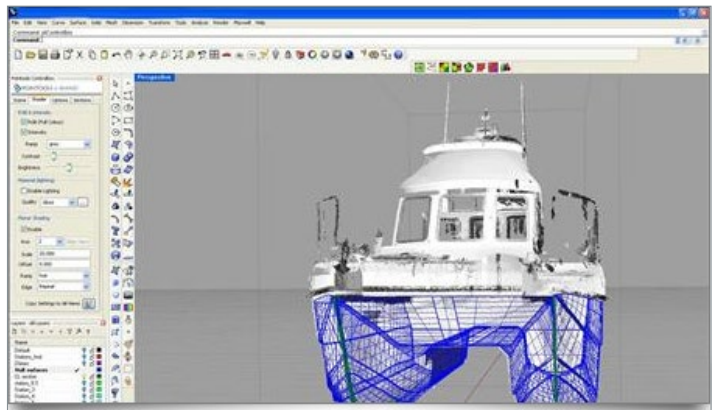
The nature of SA’s clients means that much of their work involves extremely large and unwieldy projects. Some are more than 1,000 tons and require modular construction. Fitting multi-ton components together is a dicey business, and trial-and-error is not an optimal choice.

“We need to know how well these modules are going to fit together before we start moving them around,” says Hartwig. “We might discover we need to trim one or leave a gap in another, and that could end up with 30 guys standing around while we work it out. With the Vantage tracker, we can measure the modules at their connection planes and see exactly what’s up before we start trying to join them together.”



The onsite portion of SA’s work happens outside of its own facility – in other words, on the site of a customer. This presents the extra challenges of an uncontrolled work environment.

“When we’re at a customer’s location, there are no established reference points for measurements, so the FARO Vantage Laser Tracker is a tremendous benefit to our onsite machining program, especially when we’re working with big flanges for stuff like radar and sonar domes,” explains Hartwig. “When an item is put on a lathe at the shop, the lathe already has a two to three thousandths basis, but when we go onto a boat we have nothing.



Onsite we’re still facing the item, checking for flatness, and checking hole and line-bore diameters, but out there, the Vantage tracker levels itself out and even gives us a nice report when we’re done that we can email to our customer.”

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Unintended (but profitable) Results

Any debate over the issue of a “skills gap” has been settled – it’s real – and SA is keenly aware of its effect on the ability to find metrology talent. The quality assurance (QA) and metrology technician bench is not so deep these days. That means good talent is hard to find, but for SA relief comes from a surprising situation.

“We’re finding that our market (manufacturing) is not attracting the younger generation like it used to,” states Hartwig. “People go to college looking for business or finance careers. Apparently they’re not attracted to being down in the shipyard beating on steel.

“We’re seeing, however, that the younger generation is suited to more advanced technology. They are very computer-based, they understand 3D CAD, so it’s more attractive for them. Hand them a micrometer or dial indicator, and they don’t get it; however, put them behind a tracker with onboard programming, and you almost don’t have to tell them anything!”

As SA faces a shortage of QA personnel, FARO’s Laser Tracker technology helps mitigate this predicament by shortening inspection times and attracting new talent.

Fostering Investment Buy-in

Getting management buy-in for any investment is always a challenge; Colonna’s had to navigate the time-honored funding dance at many points in its history. Fortunately, SA has partners already experienced with tracker technology who had helped reassure management that this investment was going to be well worth it.

“The FARO Vantage tracker has truly been a huge improvement for Colonna’s and Steel America. It’s improved our revenue stream and also our capability to market to new customers. In all honesty, it’s had a much bigger impact than we ever imagined.”

**Chris Hartwig, Operations Manager,
Steel America**

“We deal with several companies we consider as ‘mentor customers,’ who had used FARO’s Laser Trackers and were ahead of us in that technology,” says Hartwig. “We asked them about realistic benefits and the true return on investment, and it became evident that this was the next generation of equipment. We were able to produce an ROI for management

and show them actual numbers on how much we spent internally for inspection services – it was astronomical. A two-year ROI analysis showed that the investment in tracker technology versus the cost of outsourcing was pennies on the dollar.



“The other day we had a boat in dry dock with hull damage right above the keel box,” Hartwig recalls. “There was a very large piece of steel plate that had to be cut out and replaced, but the geometry and compound curvature were giving our guys fits.

They sacrificed plenty of steel and spent almost a week trying to make it happen the old-school way before they called me. As it turned out, using the Vantage Tracker’s magnetic base, we had just enough room to put the base and head of the tracker in the keel box to map the damaged hull. They made the cut, used the tracker to measure the cut, and then imported that data into SolidWorks. That made it possible to take the measurements from a three-dimensional view and flatten it. We then cut a piece of steel and bent it according to the CAD file. When we put it up into the hull, it fit perfectly. And that was all done within one day.

“The supervisor involved in that project approached me afterward and thanked me for helping transition them into newer and better technology,” says Hartwig. “We just put another four guys through training on it.”

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Conclusions

The bottom line is that if a technology doesn't help a company make more money, it doesn't make sense. For Colonna's Shipyard and SA, the FARO Vantage Laser Tracker plainly increases throughput. At the end of the day that means more revenue and more profit.

"This is an interesting company," says Hartwig. "We participated in a leadership development program over the last two years. One of the things coming out of that is our leaders have empowered some of the younger people, such as myself, to make decisions like investing in newer technology, and it's starting to pay off. The Vantage tracker has truly been a huge improvement for Colonna's and Steel America. It's improved our revenue stream and also our capability to market to new customers. In all honesty, it's had a much bigger impact than we ever imagined."

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