CASE STUDY

ALIGNMENT SERVICES OF NORTH AMERICA, INC.

Precision Machine Alignment Using Laser Tracker Technology and Large-Volume Metrology Software

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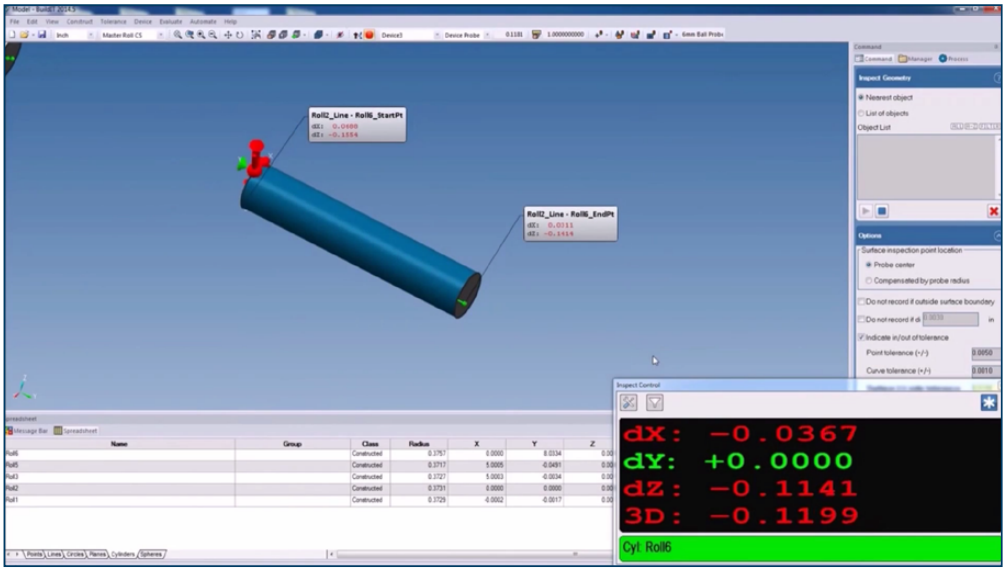
ASNA Overcomes Shop-Floor Challenges



BuildIT Software and FARO® Vantage^{S} Laser Tracker

When Alignment Services of North America (ASNA) began using laser trackers and 3D inspection software, they and their customers began to discover how much more they could do with a 3D survey compared to precision optics.

"I've been with ASNA since April of 2014. We serve the paper industry and have offices in New Hampshire and Mississippi," says Bill Dodd, ASNA tech and veteran 3D measurement technician. "Most of our work revolves around part replacement, new installation alignment, and catastrophic failure. If failure is due to an alignment issue, we need to correct it as soon as possible and get these guys back up and running because it can be thousands upon thousands of dollars lost while that machine is down. Up until recently, we did all this optically with a theodolite and scales and precision levels. This was the industry standard for a long time."

> *"… we thrive on customer satisfaction and we're not going to leave … anyplace unless they're happy. The FARO Vantage Laser Tracker and BuildIt software help us to be more effective in doing that. We are not only retaining customers, but gaining new ones, specifically because of this technology. Our customer base is growing because of this powerful, combined solution."*
>
> ***Bill Dodd***
> *Alignment Services of North America*

Old-School Technology

A theodolite is a precision optical instrument, in use since the 16th century, that measures angles in the horizontal and vertical planes. Over the second half of the 20th century, advances in optics technology and manufacturing quality made the theodolite the de facto tool of choice for aligning large machine rolls, gears, and motors—until the emergence of 3D laser tracker technology over the past few decades.

"One transit (theodolite) must be set up on a reference line, then you have to collimate to a second transit to read the part, whether roll, machine, or surface. The third instrument is your precision level to measure the levelness of the part," explains Dodd. "Too often there are line-of-sight issues because the transit must be parallel to the part. It becomes a challenge when you can't physically get to the spot where you need to be or the lighting is too poor to see. Spatial restrictions can mean multiple instrument moves to get all the necessary measurements."New tools are needed for the technicians tasked with alignment/survey duties to overcome the inherent limitations of optics.

Laser Trackers to the Rescue

"Our company's co-owner, Chuck Williams, is very in touch with the customers and he could see what the market was doing (with laser tracker technology)," says Dodd. "Chuck is very methodical when it comes to researching something, and he doesn't buy something on a whim. Trackers were an investment that he looked at as, 'Is it justifiable, will it pay for itself, and does it make sense for ASNA to invest in this technology?' ASNA did invest and we've seen how much customers like it. We know how accurate, reliable, and effective they are."

The tracker that ASNA chose is the FARO® Vantage Laser Tracker from FARO Technologies, the world's most trusted source for 3D measurement and imaging solutions. With 160 m (525 ft) of spherical working volume, the 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 great shop floor durability.

ASNA's 3D Metrology team utilizes extremely accurate, portable coordinate measuring machines.

"With the Vantage, we can survey multiple parts without moving the instrument. Not only does it provide the nominal data, which is the squareness and levelness of the part, but we can compare multiple parts to each other to see if there is a trend developing," reveals Dodd. "Especially with new construction, these heavyweight machines tend to actually sink into the floor. So, one trend we see is the machine leaning over to one side. Another trend is a developing misalignment between parts like motors, gears, bearings, and rolls. Because we can capture measurements from multiple parts at once with the Vantage, we can determine if there's misalignment between parts, wear of a particular part, or if the whole darn thing is leaning over."

Entire roller systems sinking into the floor is definitely bad, but misaligned parts are no small thing either – misalignment is going to cause premature wear and possibly catastrophic failure. No matter what industry you are in, machine failure due to misalignment and resulting wear is going to be expensive at the very least; at worst, employees could be injured or even killed.

"Another thing that reveals trends is the capability to track measurement over time," says Dodd. "We can set up an equipment nest, or in survey terms, a monument where we affix a tracker mount to a fixed structure that doesn't move and come back periodically to compare current data to past data and see where trends are developing.

"This is where the Vantage and BuildIT software come in and make everything so much easier. We've gone from using three instruments to just using the Vantage. We're getting information faster and we're getting 3D data. With the Tracker and BuildIT, things have become so much easier, better, and more efficient."

New tools = New Techniques and Benefits

To maximize the capability of their FARO Tracker, ASNA chose BuildIT 3D metrology software.

"We invited all the leading software providers to demo their programs and we went through each one extensively," says Dodd. "They were all really good programs, but BuildIT seemed like the best fit for our primary use."

BuildIT Desktop is a CAD-to-part inspection software that enables quick and easy dimensional verification of manufactured parts and assemblies for tool building, assembly, alignment, process automation, reverse engineering, and quality control. BuildIT's advanced analysis and reporting capabilities combine measurement data to produce detailed graphical and textual reports that are used to quickly identify manufacturing and production trends. With both numerical and graphical feedback of real-time deviations, BuildIT allows users to position parts with micrometer accuracy for high-precision assembly and alignment applications.

"With the FARO Vantage we're able to take a 3D measurement of an entire segment of a machine, and the BuildIT software then allows us to relate everything we do to whatever point of reference or part the customer wants us to," explains Dodd. "They may want to know where everything is, in terms of height, length, and elevation, relative to roller A. We're able to do that much more efficiently and in a timely manner now. It almost seems like the FARO Tracker and BuildIT software were tailor-made for our industry.

"Our customers can look at the computer screens and see the data as we are gathering it. This ends up being more than just the tracker and the software – it translates to the customer trusting us more. We're providing way more information than they anticipated. We'll kinda see their eyebrows raise and a little light bulb go on above their heads. With the graphics of the BuildIT program, they're able to see the data in such

a way that they are able to understand what's going on with their machines. We're able to provide so much more critical information in less time, and our customer has the information right away. With optics, you have to collect your data, compose your data, apply some math to the data, and draw it all out by hand before it's ever useful for the customer. Now BuildIT does it right there for you."

Customers can see visually what is being explained verbally. The Vantage coupled with BuildIT make data timely and configurable so that customers and ASNA are co-creating new questions about their machines as systems and new ways to use the technology to provide answers.

"You may have a customer that wants to know a measurement from point A to point B and what's the status of a certain part. Then distance from point C back to point A – after we are done with our scan," explains Dodd." With so much information immediately available, we are able to do that. With the click of the mouse and a few key strokes we can see reference points as relative to each other rather than to gravity; no need to recalibrate or set up in a different spot.

"The more we use it, the more our customers see the benefit. They are beginning to ask questions that we would not have been able to answer before. With BuildIT, it's just the click of a mouse to change reference points or even provide diagonal measurements. We're no longer bound by horizontal and vertical limitations. Not only can show parts' relation to each other, we can even provide data on parts themselves. We can tell not only if a roll is squared and level, but if it has a flat spot. We couldn't do that before. And it can all be done either right away as relevant information dictates, or later as new questions come up. Once the scan or survey is done, all the information is there."

The flexibility of the BuildIT software is a bonus for all interested parties. “Where reporting is concerned, we’re dealing with various kinds of people; front-line supervisors who are mainly interested in whether things are level and square, skewed, or maybe just broken,” says Dodd. “Then there’s the engineers who really want the 3D data. With BuildIT we can export those data files in various formats; an IGS file, a STEP file, or a TSV file for Excel if they want to chart the data for themselves. In fact, we can even provide screen shots. We can leave all that information with the customer right away. On top of that, BuildIT offers a free downloadable viewer for companies to look at the survey data we provide.”

Supporting the Team

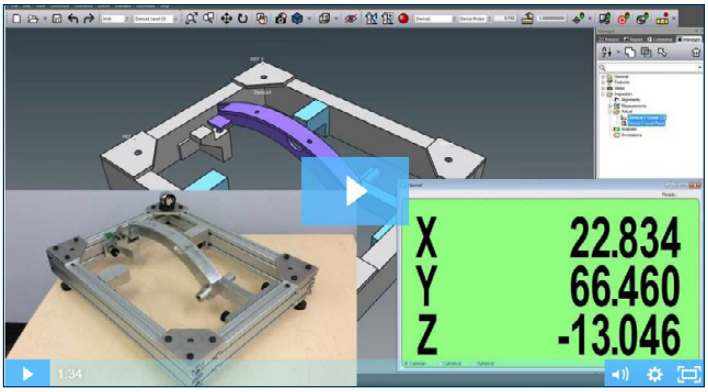
With this level of three dimensional technology comes a need for training and support in order to realize its full potential.

“I interacted with FARO a lot back when I worked in the ship building industry,” explains Dodd. “FARO application engineers came out to us more than once and provided extensive training. They were also very accessible, we could always get in contact with someone for questions and advice.

“BuildIT is just exceptional with customer support, too. When you call some vendors it’s automated or you feel like you can’t get to talk to anybody; BuildIT is just the opposite. We’re on a first-name basis and they actually call on us to see if we’re happy. Any suggestions we give them to make the software more effective, they’re keen to hear it. BuildIT sent training personnel to us and gave us courses on using the software. The program itself is great and their support is even better.”

The Payoff

“The more we use this and the more we expose the usage with customers, the more we’re experiencing an increased demand for it,” says Dodd. “People are looking to reinvest in their businesses. Currently we’re looking at expanding and maybe opening an office out West to meet that demand. Even though we’re a smaller company, we’ve always prided ourselves on delivering highly accurate measurement data and customer satisfaction. I know it sounds like a commercial, but we thrive on customer satisfaction and we’re not going to leave a machine or a mill or anyplace unless they’re happy. The FARO Vantage Laser Tracker and BuildIt software help us to be more effective in doing that. We are not only retaining customers, but gaining new ones, specifically because of this technology. Our customer base is growing because of othis powerful, combined solution.”



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