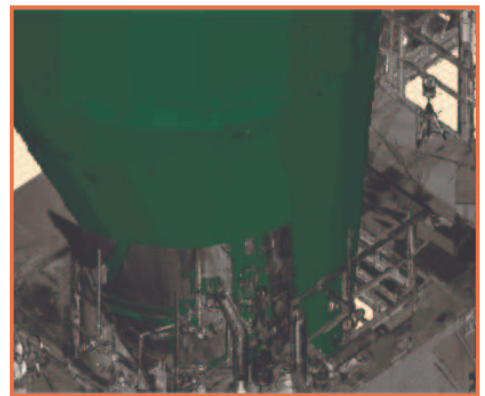
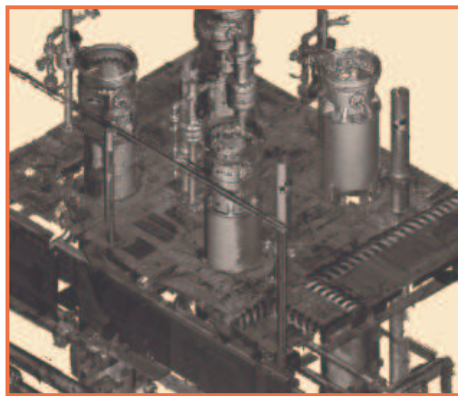
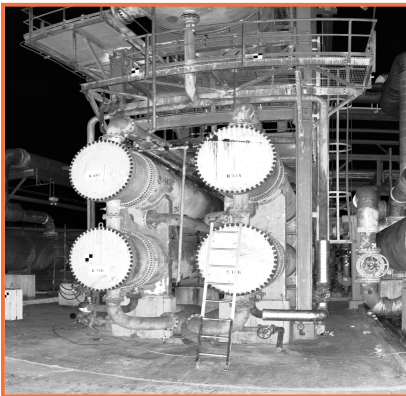


Seven Things Every Project Manager Should Know About Laser Scanning

1. Manage Expectations – Laser Scanning Isn't Magic
 - ❖ Do not ask a service provider to “go scan the plant” and expect to be satisfied with the results.
 - ❖ Work with the service provider before the project to plan the workflow, identify the deliverables and manage the expectations of the project team.
 - ❖ Expect occasional glitches – plants are difficult environments – it is how these situations are handled that define the quality of the provider.
 - ❖ Do not blame technology for the failures of implementation.
2. Educate Yourself to Ensure Success – Understand and Plan
 - ❖ Talk to peers that have had experiences with laser scanning – both good and bad.
 - ❖ Get buy in from your project team and manage the results carefully.
 - ❖ Understand how the as built information is to be used in the design process.
3. You Can't Cheat Physics – No Matter What The Vendor Says
 - ❖ Each vendor has their own set of technical specifications – there are no industry standards.
 - ❖ Any physical condition that causes poor return or with high “background noise”, such as highly reflective or absorptive surfaces or intense direct sunlight, causes a reduction in the “signal-to-noise” ratio and will produce results with greater uncertainty.
 - ❖ Accuracy specifications are given using a known reflectance target at a known range and are averaged quantities.
 - ❖ There is no such thing as a single correct measurement for a specific point, only a measurement with a specified tolerance.
4. Measurement Accuracy – It's The Primary Specification You Need
 - ❖ If you are using laser scanning then specify the measurement accuracy required.
 - ❖ Measurement accuracy is the ability to generate physical dimensions using the laser scan data that are correct to within a stated tolerance. (e.g. length, diameter, location). It combines all technical specifications and work processes into a single number for comparison.
 - ❖ Measurement accuracy should be specified as a plus and minus quantity. A realistic value is +/- 1/4” (6 mm). Be skeptical of accuracy claims that are less than this value.

- ❖ Measurement accuracy implies a spatial resolution of ½ the measurement accuracy (e.g. an accuracy of ¼” requires a resolution of 1/8”).
5. Calibration – It Speaks Volumes About Quality
- ❖ The quality of a provider’s calibration program says a great deal about the delivered data quality.
 - ❖ Without provable calibration, there is no way to ensure accurate data between laser scans.
 - ❖ A strong calibration program will include calibration prior to visiting the site, on site calibration and recollection of any site data that cannot be shown to be in calibration.
 - ❖ An understanding of these issues indicates the industry maturity in the service provider.
6. Results – Proven Results Count For More Than Price
- ❖ A well-executed laser scanning project will have a 10 to 20 times return on investment.
 - ❖ Only about 15% of the delivered value comes from replacing manual labor.
 - ❖ Price should not be the driving factor when picking a vendor.
7. Selecting a Service Provider – Characteristics to Consider
- ❖ Industry experience and good references.
 - ❖ Field crew with industry experience and training for safety and comprehensive scanning in plants.
 - ❖ Data integration work processes to ensure overall accuracy, not just within in each scan.
 - ❖ Guarantee of results – Overall measurement of accuracy and trustworthiness, including recollection of data when necessary.
 - ❖ Software to extract information from data.
 - ❖ Knowledge of how data will be used throughout the work process – not just data collection.
 - ❖ Responsiveness and scalability to support design schedules.
 - ❖ Strong quality assurance program.
 - ❖ Dedicated customer support.



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