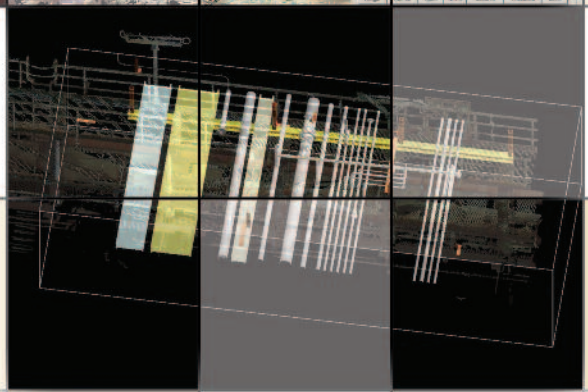
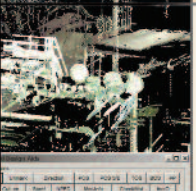
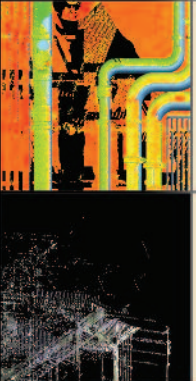
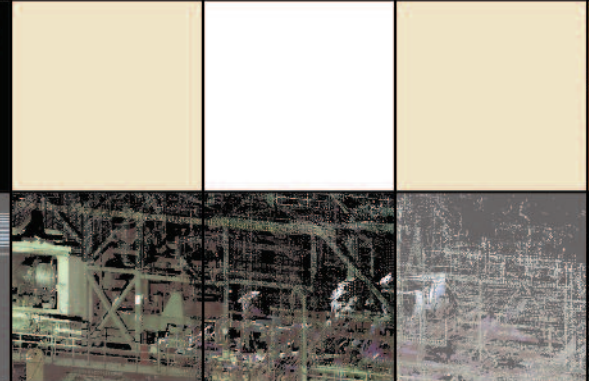
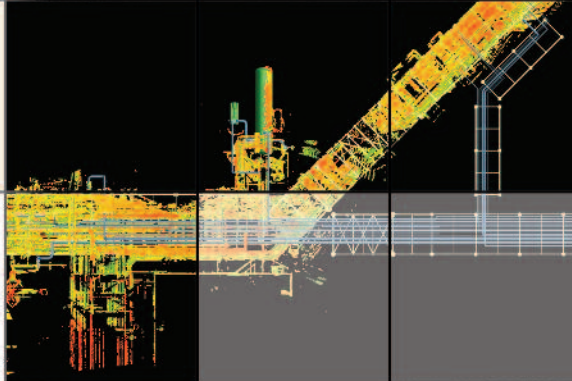
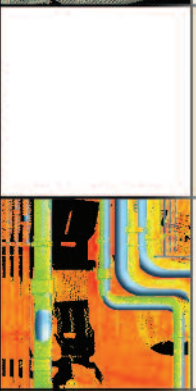
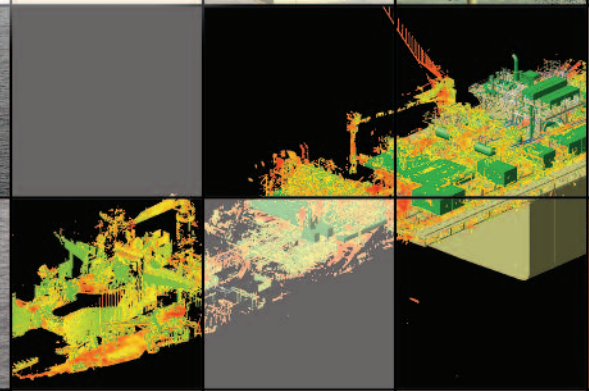
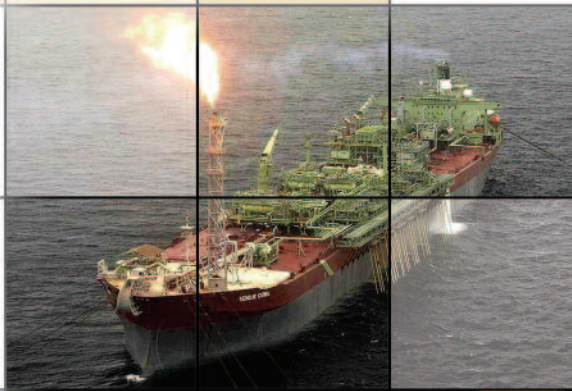
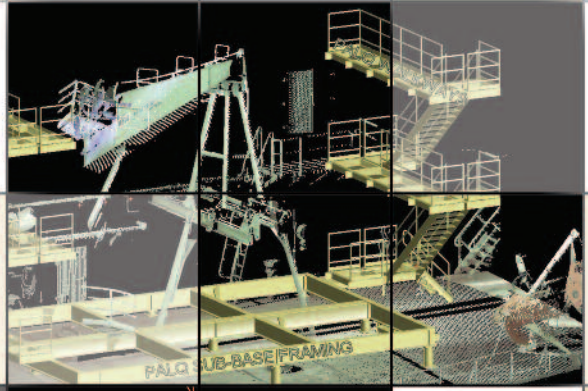


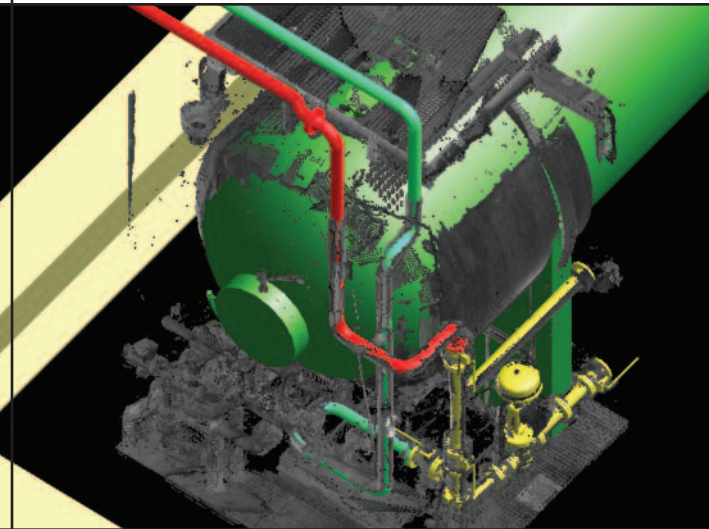
Laser Scanning

*Adding Power to
Project Design*



Experience the Mustang Difference

The use of 3-D laser scanning technology is one of the latest and most powerful tools to assist in project design. Mustang has expanded its Laser Scanning capability, investing in cutting edge camera technology and software and increasing its in-house training of designers to be specialized in data interpretation. Our designers have over 30+ years of energy industry design experience, and a combined total of over 14 years in laser scanning. Our highly skilled team can interpret the scan data quickly, detect critical information, and help our client make better decisions for improving the project's bottom line.



Your Laser Scanning Project Starts Here

Mustang's Laser Scanning provides a 360-degree data capture within an x, y, and z axis for a three dimensional view of a facility. These accurate 3-D models can then be transferred into all major CAD design software packages, including AutoCAD, 3D, PDMS and PDS, to instantly bring the picture of the facility to a desktop anywhere in the world. Some project types include:

- Offshore facilities (Deepwater/shallow water)
- Floating production facilities
- Natural gas processing plants
- Petrochemical and chemical facilities
- Marine loading and offloading terminals
- Water and wastewater facilities
- Utilities and infrastructure
- Pipeline compressor, pump and metering stations

Applications

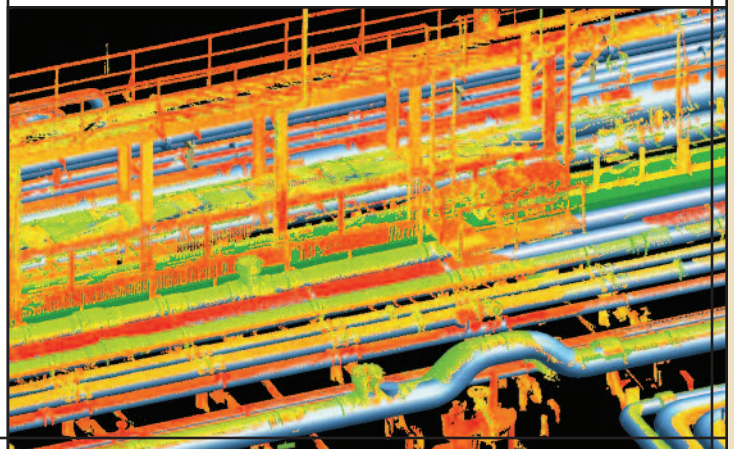
Laser Scanning can be used in a wide variety of applications, including:

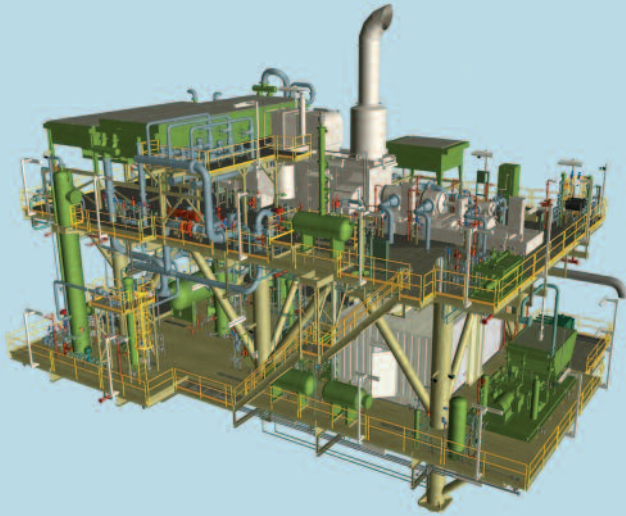
- Expansions
- Retrofits
- Constructability reviews
- Unit revamps
- Facility relocations
- Piping repair and re-routing
- Material or facility inspection
- Field accident investigation

Benefits

Laser Scanning has many advantages over traditional survey and field measurements:

- Transfers facility immediately back to desktop
- Improves field accuracy
- Improves safety by eliminating the need for scaffolding and harnesses
- Minimizes number of site visits
- Reduces costs
- Sends electronic data anywhere
- Automatically detects clashes
- Reduces the number of required drawings
- Shortens project cycle time
- Reduces facility down time
- Measures elevated equipment from ground level
- Can be used on a facility in motion
- Does not require ambient light





Error Detection – West Africa

Scope:

- Establish as-built configuration for addition of new 750-ton gas compression and injection module
- Five year-old FPSO in water depth of 2,200 feet

Results:

- Survey of four pre-installed stabbing points on vessel's topsides
- Scans revealed one stabbing point deviated one-inch from drawing

Cost/Time Savings:

- Scans completed on time and under budget
- Detection of error = cost savings of approximately \$1 million

Platform Survey – Gulf of Mexico

Scope:

- Blast remediation study for major operator on 13 year old, eight-pile fixed platform in water depth of 1,300 feet
- Survey of potentially hazardous scenarios in topsides area

Results:

- Confirmed that facilities afforded operating personnel and equipment maximum safety
- 95% of facility scanned: 216 total scans that verified measurements

Cost/Time Savings:

- Six days and three person crew vs. 6–10 months and 7–10 technicians (manual measurement)
- Scans placed into design model one day after scan portion of project completed

Erroneous Drawings – Gulf of Mexico

Scope:

- Replacement of six living quarters modules on SPAR
- Existing drawings contained 18" discrepancy compared to actual dimensions

Results:

- 29 scan positions on three deck levels
- Data captured discrepancy in one corner of platform adjoining living quarters

Cost/Time Savings:

- Two-person Mustang crew completed job in less than seven hours vs. one week with two draftsmen (traditional method)
- Unparalleled accuracy

Tight Piping – West Texas

Scope:

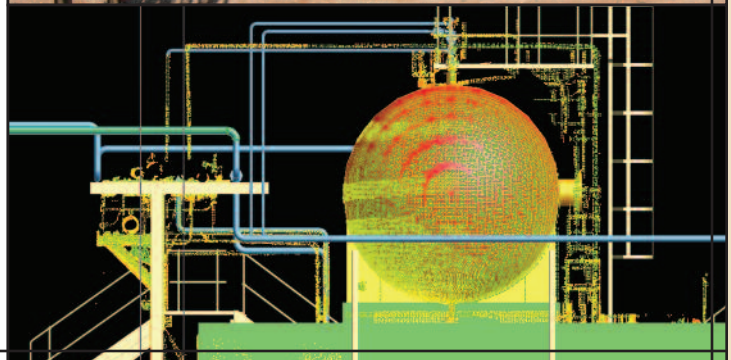
- Identified tie-in points and potential clash points for new piping runs
- 50 tie-in points, 20-inch heavy wall piping

Results:

- Data prevented piping clashes in tight places
- Intricate piping runs were designed in the shortest distance

Cost/Time Savings:

- Essential amount of pipe procured early in project
- Prevented long lead times



The word Mustang conveys energy, vitality and full-spiritedness. That image accurately describes Mustang's people.

Mustang has established a worldwide reputation for quality engineering design, construction and project management and inspection services. Our focus encompasses upstream oil and gas, midstream projects, process plants, pipeline, automation and control, and industrial and manufacturing. Our professionals are fully backed by a hands-on management team, a solid support staff and cutting edge systems.

Our philosophy is simple – deliver the highest quality, highest value project on time, within budget and with no surprises. That's our goal, backed by Mustang energy and innovation.

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Mustang Vision

***Our quest is to embody a culture that inspires
super-motivated people to make heroes of Clients,
Partners, Vendors and Mustangers!***



People Oriented...Project Driven®



Houston • London • Perth • Mumbai • Kuala Lumpur

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