Equipment Validation Through Scanning

Project Team members: Austal USA, Fincantieri Marinette Marine, DotProduct, SSIUSA

Concept/Idea

Issue:
Received equipment that does not match form/fit expected by engineering is disruptive and costly to deal with.

Proposed Solution(s):
Provide an inexpensive and intuitive 3D scanner to receiving personnel to scan equipment as it is delivered and compare the scan to the expected 3D model provided by engineering. Mismatches can be identified directly on the handheld scanner and flagged for action before it gets warehoused or delivered to production.

Benefits/Justification

Benefits of the project
- Identify mismatched equipment items (for form/fit) before being fully received and warehoused (or delivered to production)
- Lower cost due to disruptions of engineering personnel to very component suitability.
- Lower cost due to improper components delivered all the way through production

Project Approach

High level Statement of Work
- Identify receiving processes and candidate equipment
- Provide and train 3D scanning hardware and processes
- Provide data exchange process from 3D models to scanner
- Scan, test, report

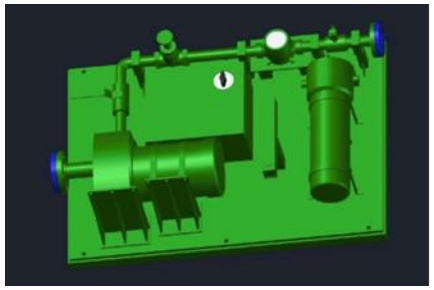
Metric(s) of Success (ROI)
- Receiving personnel trained in use of 3D scanner
- Successful test of scanning candidate items and matching to 3D model
- Implementation processes

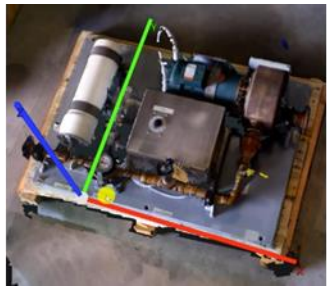
Cost/Images/Relevant Information

https://www.dotproduct3d.com/

SHIP CONSTRUCTOR

ENTERPRISE PLATFORM





The Problem

Shipyards and Maintenance, Repair & Overhaul facilities specializing in sustainment cannot fabricate everything needed to fulfill the contract.

Equipment must be procured from a supplier and distributed system components must be outsourced to a fabricator

These items are shipped to the facility in accordance with the PO need by date

Often these items are not inspected prior to arriving at the facility

Not Everything is “Off-the-Shelf”

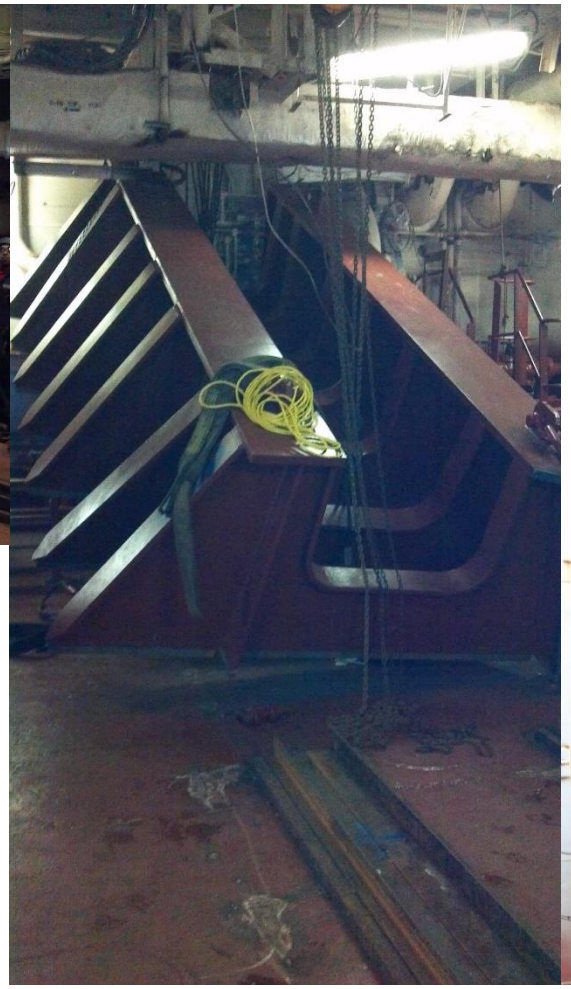
"Off-the-Shelf"

Off-the-shelf items may be superseded with a new variant, which does not duplicate the requisitioned item with connection types, sizes, and locations even though it is considered a "direct replacement" per the supplier

Outsourced Fabrication

Problems

Problems



A Viable Solution

Using a handheld highly portable 3D laser scanner added onto a tablet, laptop computer, cell phone, and / or using a COTS 3D camera.

Using software to interpret the 3D scan

Using a Product Lifecycle Management (PLM) tool, to access the 3D model of the equipment

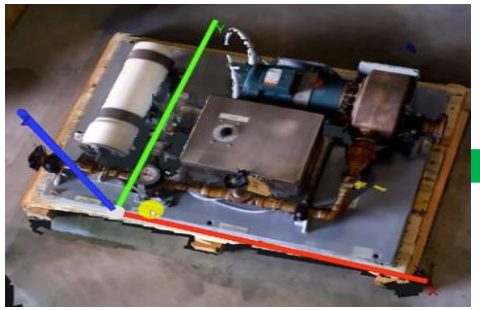
Using software to compare the 3D scan data against the 3D model data to automatically validate requirements are satisfied.

The 3D scanning can occur while an item is:

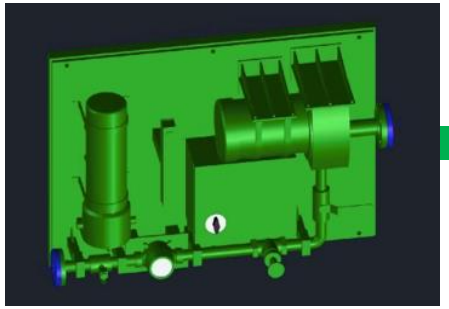
- being manufactured,
- prior to shipping from the supplier,
- prior to being unloaded at the shipyard, and / or
- prior to being loaded onto the vessel

Scanning – vs – Modeled

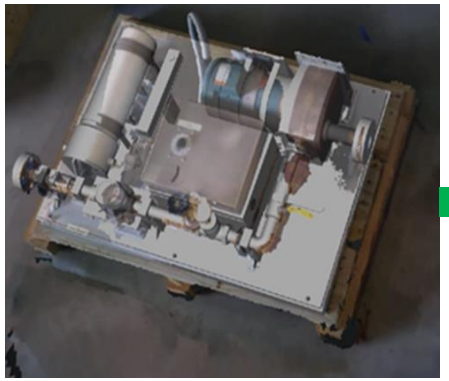
3D Camera



3D Scan



3D Model



3D Point Cloud Model

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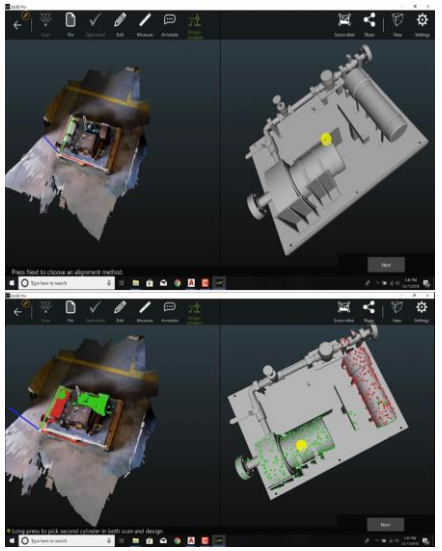
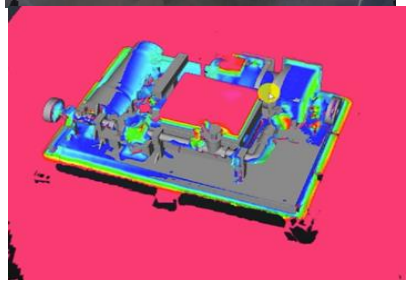
3D Model and Point Cloud loaded into the COTS DotProduct Software



3D Model and Point Cloud Alignment Selected

3D Model and Point Cloud Aligned



Mapping the Differences between the 3D scan and the 3D model

Validation