Integrating Laser Scanning and 3D Capture in Shipbuilding

Jen Rizzo, AVEVA
Greg Lawes, point3D
About AVEVA

The leading supplier of engineering design and information management software solutions
About point3D

AVEVA partner, 3D data capture experts providing cost effective and innovative solutions to meet project needs and solve challenging problems.
Global growth

Our sustained investment in product development and ever-closer customer support teams makes AVEVA the key technology partner of the world’s most successful engineering companies.

55 Offices
37 Countries

1,600+ employees +9% in 2014/15

R&D Investment

$48.5m  2014/15
$56.8m  2013/14
$52.7m  2012/13
$47.6m  2011/12
$41.7m  2010/11

During the past five years, AVEVA has invested over $247 million in innovation.

Stability and growth

$258.1  2011
$290.6  2012
$326.7  2013
$352.0  2014
$309.6  2015

Annual revenue in $ million

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A History of Innovation

- 1967: CADCentre established from Cambridge University
- 1976: Launched Intelligent P&ID
- 1979: Launched AEVMA Review
- 1988: Launched AEVMA Global™
- 2001: Launched AEVMA’s first Engineering Information Management Solution
- 2002: Launched AEVMA.NET™
- 2004: Acquired Tribon
- 2006: Launched AEVMA Laser Model Interface™
- 2010: Acquired Logimat MARS & ADB System<br>
- 2011: Acquired AEVMA Everything3D™<br>
- 2012: Acquired AEVMA Everything3D &<br>Acquired AEVMA Global Mail<br>
- 2015: Acquired AEVMA FabTrol<br>
- 2015: Acquired AEVMA FabTrol
AVEVA’s Digital Asset Vision
Integrating Laser Scanning and 3D Capture in Shipbuilding

- 3D Data Capture Vision
- 3D Data Capture Overview
- Shipbuilding Use Cases
- Upcoming Developments
Integrating Laser Scanning and 3D Capture in Shipbuilding

3D Data Capture Vision
3D DATA CAPTURE VISION (MORE THAN JUST REVAMP)

- New Manufacturing
- Lifecycle Management
- Facility Management
- Service Life Extension
Integrating Laser Scanning and 3D Capture in Shipbuilding

3D Data Capture Overview
SHIP BUILDING & LASER SCANNING
SPATIAL 3D DATA COLLECTION

• Tripod Scanner
  – Phase Based
  – Time-of-Flight

• Hand-held Scanner
  – Structured Light

• Total Station
  – Metrology / Survey
SHIP BUILDING & LASER SCANNING
VISUAL 3D DATA COLLECTION

- Color Laser Scanner
  - Phase Based
  - Structured Light

- 360 Degree Panoramic Camera
  - High resolution, panoramic HDR data

- 360 Degree Panoramic Video
  - High resolution, panoramic video data
AVEVA AND LASER SCANNING
AVEVA/LFM Laser Scan Workflow
LFM SERVER - 3D POINTS VIEW
LFM Server - BubbleView
LFM NETVIEW 4

Visual Data
LFM NetView 4

Spatial Data
LFM NetView 4

Collaboration
LFM NetView 4

Color where it counts
LFM NetView Going Mobile

Offline Access
AVEVA E3D – 3D POINTS View
AVEVA E3D - 3D POINTS

AVEVA MARINE HULL DATA

Version 2.1

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AVEVA E3D - BUBBLEVIEW

AVEVA MARINE HULL DATA COMBINED WITH SCANS

Version 2.1
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**AVEVA Marine Hull Data Combined with Scans**
LFM SERVER – HYPERBUBBLE

New - Real-time Walk-thru!
Integrating Laser Scanning and 3D Capture in Shipbuilding

SHIP BUILDING USE
3D Data Capture for Ship Building

- Project Scope
  - Equipment or systems
  - Individual compartments
  - Complete deck or entire ship

- Capture Technologies
  - Spatial: laser scanning, survey
  - Visual: picture, pano-images, 3D video
**SERVICE LIFE EXTENSION**

- **Demolition and Decommission**
  - Visual and spatial reference

- **Design Engineering**
  - Enables use of 3D design tools

- **Logistics**
  - Reduced manpower required on walk downs
    - Measurements and images of remote asset
NEW MANUFACTURING

➢ Accuracy Control
  - Outfitting complete and correct
  - Fabrication validation
  - Check sub-assemblies
  - Mating surface check
  - Plate flatness

  Compare directly to design
Digital Asset Management

- Starts with capture at asset/ship commissioning
- Allow change track changing, historical review
- Integrate with 3D model and design data
- Supports maintenance and repair
FACILITY MANAGEMENT

- Planning and Support
  - Configuration management
  - Visual and spatial reference
- Design Engineering
  - Enables use of 3D design tools
LASER SCANNING TECHNOLOGY
FOR THE SHIPBUILDING INDUSTRY

UPCOMING DEVELOPMENTS
UPCOMING DEVELOPMENTS
INTEGRATION OF MARINE MODEL WITH LASER SCAN FOR QA

AVEVA Marine Design Model

Update Model

Field Adjust

Manufacturing Fabrication

Export Step Model

Laser Scan Module

QA Compare
INTEGRATION OF MARINE MODEL WITH LASER SCAN FOR QA
LASER SCAN QA REPORTING
FABRICATION - MODEL ANALYSIS
Thank you
AVEVA Point of Contact

Jen Rizzo / Senior Account Manager
jen.rizzo@aveva.com
281-796-6719
www.aveva.com

3D Data Capture Experts

Greg Lawes / Principal
GLawes@point3D.us.com
www.point3D.us.com