3D High Accuracy Subsea Surveys by VLS™: Video Laser Scan

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Summary

1. Introduction about DimEye
2. I-Photogrammetry: Principle & Typical Application
3. Flex Joint 3D Inspection
4. VLS™ Technology: Principle & Application to the Flex Joint Inspection
5. Sensor & Operations
6. Case Study: Pipe Inspection
7. Business Model
8. Back to the future
Dimensional EYE

• Specialists in 3D Measurement – Photogrammetry & Laser Technologies
• Inspections in Hazardous Environments
• Based in California
• ISO 9001 certified: “Definition and implementation of software, hardware, and methodologies in Close Range Photogrammetry”
I-Photogrammetry Technology: Principle

- HD camera turning around the object
- Images are extracted from the video and processed
- The Output is an as-built 3D CAD Model or accurate dimensions/angles
Photogrammetry Technology: Typical Application

20 min of Data Capture
50 images processed
+/- 1 mm local accuracy
Flex Joint Inspection: The Challenge
VLS™ (Video Laser Scan) Technology: Principle

Joint Development Agreement between DimEye and BP America

Addition of laser(s) to HD cameras: 3D Photogrammetry, Laser Triangulation on laser line
VLS™ (Video Laser Scan) Technology: Application to the Flex Joint 3D Inspection

Cameras and lasers rotating around the riser in about 2 minutes, looking up to the FJ

360 Images extracted from the HD video

High Density/High Accuracy Point Cloud

Mesh/Deviation to theoretical or previous shape

Rotation Angle

3D Analysis of anomalies/features

Cross Sections
VLS™ (Video Laser Scan) Technology: Application to the Flex Joint 3D Inspection
VLS™ (Video Laser Scan) Technology: Other Inspection Applications

Pipe/Mooring Line Inspection

Mooring Chain Inspection

Anode Inspection
VLS™: Sensor Development

PO: custom made partnership with Watershot and Bossanova Tech

P1 & P2: off the shelf equipment in partnership with SUB-C Control

Diver Unit: in partnership with DOER
Operations

- ROV, AUV, Drone “Plug & Play”
- HD cameras already in use
- Camera(s) and laser(s) on a bracket, on the pan & tilt unit, on a specific tool
- Data Capture by ROV pilots from the Control room

SUB-C MK5 Camera
Case Study: 3D Pipe Inspection

30 min of Data Capture
100 images processed
1 mm accuracy
Business Model

- Boat
- ROV
- Diver
- Drone

THE CLOUD

- Processing Center
- Dimensional Eye

3D CAD Model

Client
Impact

Better Knowledge means **better decisions**

Very fast Data Capture means **less Vessel Time**

ROV Operated means **no specialized additional personnel** (after a short training)

Off-the-shelf “Plug & Play” Equipment (very often required for visual inspections) means most of the time **no additional equipment costs**
Back to the Future

EXISTING VIDEOS

PAST

PRESENT

DATA PROCESSING CENTER

VIDEOS REQUIRED

FULLY AUTOMATIC

FUTURE

3D CAD MODEL
Dimensional EYE - Booth 208