ADVANCED INTEGRITY INSPECTIONS

DRONE REMOTE VISUAL INSPECTION & REMOTE DIGITAL INSPECTIONS

Presenters: Paul Hughes (Stork), Stewart Wallace (Stork) & Murray Stewart (Air Control Entech).







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WELCOME & INTRODUCTIONS





Stewart Wallace Digital Transformation Manager



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Paul Hughes Principal Integrity Engineer





Murray Stewart Operations Manager



ADVANCED INTEGRITY INSPECTION DRIVERS FOR CHANGE



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REMOTE DIGITAL INSPECTION (RDI) WHAT DOES IT MEAN TO STORK AND ACE?

- Using technology to support new, improved ways-of-working
- Addressing current operator issues in an innovative way
- Tailoring our offerings to the specific challenge at hand
- Connect the site and office environment bringing together virtual teams to collaborate in real-time







Collaboration
techniques allow
anomalies to be
tagged in real-time
to allow more
detailed inspection to
take place.

 $^{\rm RS}$ Pictures and measurements can taken using drones in real-time without the need to shut-in. Taken from case study.



REMOTE DIGITAL INSPECTION (RDI) TOOLKIT SELECTING THE RIGHT APPROACH FOR THE JOB AT HAND





REMOTE DIGITAL INSPECTION (RDI) WHAT CHALLENGES CAN IT HELP SOLVE?





REMOTE DIGITAL INSPECTION (RDI) HEALTH, SAFETY & ENVIRONMENT

Prevent sending people into hazardous environments - Working at Height (Flares, Air-Gap), Confined Space (Storage/Ballast Tank, Vessels)



Reduce requirements to travel (Road, Rail, Air) to Hazardous Sites - Offshore, Onshore Refineries



Sustainability - Improved data collection, processing and presentation can highlight efficiencies to reduce carbon emissions and minimise waste



REMOTE DIGITAL INSPECTION (RDI) EFFICIENCY



Onsite Remote Collaboration (Real-time at point of work) and Accelerated Decision Making - Inspector, SMEs, Client

Reconnaissance - Deployment of Inspection Resource and Expertise where it is needed



Improved Productivity - Timely Compliance and Data Collection Speed



REMOTE DIGITAL INSPECTION (RDI) COST





CASE STUDY





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<u>Case Study #1</u> Flare Inspection

Inspection Objectives

CVI/GVI Inspection of the following:

- Flare Tip
- Flare Stack
- Flare Boom

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• Fuel & Gas Pipework

Additional Objectives:

- Dropped Object Survey
- Aerial Footage of Asset





Operational Overview

Flight Team

- 1 x Fully qualified UAV Pilot (ACE)
- 1 x Fully Qualified NDT Technician (Stork)

Equipment

• 1 x Visual Inspection UAV

Duration

• 5 Days







- 1000 + HD Inspection Images
- Aerial Footage of Asset
- Video Footage of Asset
- Video Footage of Live Flare
- HD Still Images of Live Flare
- Detailed Inspection Report







Benefits

- Reduced Inspection Time
- Removed the Rope Access Requirement
- First Pass Inspection That Allows for Targeted Rope Access Follow-up
- No Support Vessel Required
- Flare Remained Operational During Inspection
- Large Volume of Data Sets Delivered to Support Future Inspections
- Ability to Perform Additional Drops Survey Whilst Offshore
- Removed Need For Working At Height (Safer)







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REMOTE DIGITAL INSPECTION WHAT NEXT?

Full Asset Inspection Capabilities by Air and by Water

Capability to Deliver Real Time Inspection Results from Tried and Tested Technologies

- Mini-ROVs (Visual & Ultrasonic)
- Magnetic Crawlers
- Internal Inspection UAVs
- Ultrasonic Inspection UAV

New Technologies Constantly Under Development to Resolve Emerging Challenges



Data Storage and Sharing Capabilities

Live streaming between the field and the office -Integration with office collaboration tools e.g. Teams

Cloud based data storage platforms and visualization tools

Integration with Digital Twins



THANK YOU

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