Remote Control & Monitoring of a Not Permanently Manned Offshore Platform

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Introduction - Important Information?
Integrated operations (IO) refers to new work processes and ways of performing oil and gas exploration and production, which has been facilitated by new information and communication technology. Multi-discipline collaboration in plant operation is one example. IO has in a sense also taken the form of a movement for renewal of the oil and gas industry.

In short IO is collaboration with production in focus.

http://www.integrated-operations.co.uk/ "Integrated Operations is about ensuring people, processes and technology work much more efficiently together"
Introduction: Solan Development

- UK CS – West Shetland Isles
- 137m water depth
- Peak Flow of 28,000 Bpd
- Not Permanently Manned Installation (NPMI)
- Operated from Onshore Control Room (ONCR)
Introduction: Key Project Requirements

- Main Electrical & Automation Contract (MEAC): An NPMI Oil Platform: fundamental O&M philosophies and key requirements:
  - Safety: Asset & Environment (DECC), Personnel (HSE)
  - Reliability: Redundancy, Predictive Maintenance
  - Integration: Numerous systems must work seamlessly
  - Execution: Numerous companies must work seamlessly
  - Commercial & Technical Risk Mitigation: One company guarantees it will ALL work
  - Economics: Marginal Oil & Gas Fields become viable

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**Emerson North Sea Automation Activity**

Device Signal Tag (DST) = 140,000
Solan Overview: Articulated Tower 2010
Emerson: The MEAC Delivery

- Project Management, Planning & Scheduling
- Technical Consultancy, Design Reviewer & Quality Auditing of:
  - Emerson, UK: ICSS, Instrumentation, Machinery/Asset Health, UPS
  - Wartsila, Norway: Electrical: MV/LV/PMS
  - RigNet, UK: Telecommunications
  - Tracerco, UK: Nucleonic Topsides & Subsea Tank Profiler
  - IVC, USA: CCTV / Oil Spill & Intruder Detection
- Procurement, Expediting & Logistics of the Above Alliance Partners
- Site Support, Onshore & Offshore Commissioning and Long Term Support for Operations and Maintenance.
The Relationships

Premier Oil

- Aker Solutions (Operator)
- Schlumberger (ESP)
- Solar (Gas Turbines)
- RRC (Subsea)
- Daniel - Flow Measurement
- 3rd Party Interfaces (Qty ~30 e.g. Air Comp, Diesel Generators etc.)
- Tracerco (Nucleonic)
- Wartsila (Electrical)
- Chloride Emerson Network Power (UPS)
- IV&C (CCTV)
- BIFab/ ODE (Fabricator/Design House)
- Tyco (Addressable + F&C)
- RigNet (Telecom/satellite)
- Rutter + Synetics (Radar/IR Camera)
Emerson: Scope of Supply

PCS/PDCS/SCS
Operator Training Simulator (OTS)
ESD/F&G
DeltaV

Coriolis Flow
Micro Motion

H2SO4 Analyser
Rosemount Analytical

AMS Suite
Asset Performance & Machinery Health

Remote Automation Solutions
OSI-PI Historian

EMERSON Process Management

Multiphase/Sand/Watercut
CSI

CHLORIDE
AC/DC UPS

knürr
Operator Console Onshore/Offshore

FISHER
DVC Valve Positioners

ROSEMOUNT
Press/Temp/Level

Rare Metering
Roxar

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Electrical: Scope of Supply

- 1 x MV 6.6kV Switchboard
- 2 x LV 440V Switchboards
- Distribution Transformer 6.6/440
- Power Management System (PMS)
- Navigational Aids

- Technical Design of: Emerson Chloride UPS
  - 2 x Dual Parallel 120kVA AC UPS NiCAD
  - 1 x Single DC UPS NiCAD
Telecoms: Scope of Supply

- Dual Redundant Onshore & Offshore Satellite Systems
- PAGA / Telephone (VOIP) / Dispatcher Console
- VHF Aero / Marine & UHF Marine Radios
- Greenline Tanker ESD / Artemis DARPS Dynamic Tanker Positioning Systems
- Entertainment System / Internet / Email
- Aeronautical Non Directional Beacon
- Meteorological System
- Rutter Radar / Synectics Thermal Camera: Oil Spill & Intruder Detection System
**CCTV: Scope of Supply**

- ATEX1 **PTZ** movable **Cameras** c/w Wash/Wipe
- Fixed Internal Cameras
- **Relay Server** Integration of Synectics Thermal Cameras & Rutter Radar: Oil Spill & Intruder Detection
- Offshore Relay Servers for Camera **Recording**
- Onshore Relay Servers for Camera Recording
- Relay Server **Integrates** directly with **DeltaV HMI**
Level Profilers: Scope of Supply

- Nucleonic Profilers to determine sand, water, oil foam and gas contents for:
  - Topsides Separator Vessel 1
  - Topsides Separator Vessel 2
  - Subsea Tank

- Geiger Muller detectors integrate directly with DeltaV controllers that perform density calculations, vessel contents analysis and operator graphics
Solan Architecture
Project Timeline

- KO August 2012 – Post FEED
- DD complete, HFAT completed/delivered, CFAT Oct to Feb 14
- Required On-Site (Delivery to Fabricators) 30th Oct 2013
- Mechanical Completion November 2013 – jacket delay
- Site Acceptance, System Integration and Commissioning at Fab (From Dec 2013 to May 2014)
- Sail Away (May 2014)
- Final In Situ Commissioning (July to Sep 2014)
- 1st Oil (Q2 2015)
Lessons Learnt

Engage your automation partner(s) early:
- Maintain technology reviews – latest technology savings
  - Provide expert ‘handholding’ – not just to specification, but ‘best fit’?
  - Process designer not part of the team – ODE

Project Control Team: PM/PA but need Engineering Manager!
  - Project Engineer invaluable – oversee technical advise commercial – cannot just leave to the Lead PCS/SIS/HW

Modular Testing & Acceptance:
  - Expenses higher but saving in FAT using Portable Test Units & Teams at various locations
  - Simplify SIS testing from hardwired to softwired ~ trust IEC61511

Relationship:
  - Alliance Partners not just ‘subs’
  - Being constructive and collaborative - have to gain not given trust!
Commendation: Reality of Solutions!

From: Mark Condren
Sent: 25 February 2014 09:52
To: 'John.Pattison@Emerson.com'
Subject: Solan Project

John

As the Solan project is gradually getting the point where we leave Leicester and relocate to the fabrication yard I would just like to thank the team from Emerson for their hard work and dedication to the Solan project.

It has been a difficult process with a high degree of changes and challenges constantly thrown at Emerson, but these have all been handled extremely well and the final product I am sure, will be a major benefit to the overall Solan development.

It has been a pleasure to work with everyone here, and I appreciate the way the team has worked together with Premier Oil personnel with the combine goal of achieving the targets set by the project. It hasn’t always been easy, but in the end it has been very rewarding.

I look forward to continuing working Emerson as move forward from system build/development into transforming the Solan platform into an operating asset for Premier Oil and partners.

Best Regards

Mark Condren
C&I Engineer
Solan Development Project
UK Business Unit

please consider the environment - do you really need to print this email?
Project Goals

→ Minimize Unscheduled Trips to the Field:
  – Predictive Diagnostics and Maintenance
→ Minimize Personnel Exposure
  – Safety and Cost Saving
→ Simplified Technical & Commercial Contract:
  – Emerson responsible for entire MEAC Scope & Delivery
  – ‘One stop shop’ approach
→ Seamless Integration:
  – Project Teams / World Areas
  – Quality focused, coordinated flawless delivery of design
Summary

- Remote monitoring of a not permanently manned platform (NPMI) is achievable today with complete integrated operations including CCTV/Thermal Camera’s to ensure the asset is remotely protected.

- Technology available today enables smaller fields to be commercially viable with environmental and safety design approved by UK Government agencies.
What is Happening Now?

- Reliability solutions – Asset Performance Management
- Lifecycle Services (Aberdeen)
Asset Performance Management

The Five APM Work Processes and enabling software

APM Foundation
- APM Framework
- EAM Integration (SAP, Maximo, Oracle)
- Analytical Interfaces (AMS, OPC, OSI-PI)
- Asset Health Manager
- Policy Manager
- Mobile Inspection (OPR, LMS)

Failure Elimination
- Metrics & Scorecards
- Production Loss Accounting
- Root Cause Analysis
- Reliability Analytics
- Generation Management

Asset Strategy
- RCM/FMEA
- Asset Strategy Management
- Asset Strategy Implementation
- Asset Strategy Optimization

Mechanical Integrity
- Risk Based Inspection
- Inspection Management
- Thickness Monitoring

Asset Safety
- Hazards Analysis
- SIS Management
- Calibration Management
Asset Management Architecture

CMMS - Maximo
Asset Management System

APM - Meridium
Asset Performance Management

Operator Rounds

PI Process Workbook

AMS Device Management System

CM Calibration Management

Operator data Collection

AMS Device Management System

DCS Digital Control System

Smart Calibration

MHM Machinery Health Management

Field Devices

Process & Process Systems

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Lifecycle Services (DeltaV)

- BPCS/SIS / AMS / APM
  - Software Support (Guardian 24/7/365)
  - Emergency Response
  - System Health check service (PM)
  - Bonded Spares
  - Resident Engineering
  - System Health Monitor
Lifecycle Services (Measurement Devices)

  - Emergency Response
  - Diagnostics
  - Calibrations
  - Maintenance Visits
  - Spares
  - Lifecycle Care Performance (SAM & MPFM)
Lifecycle Services (UPS)

- Chloride Power Uninterruptable Power Supply
  - Priority Emergency Response
  - 24/7 Technical Support
  - Software/Firmware Updates
  - Spares
Lifecycle Services (Other Companies)

- Tracerco (nucleonic)
- IVC
- Wartsila
- Rutter (intruder detection system)
- Synectics (Thermal imaging)
- Tideland (NAVAIDS)
Questions/Comments?
Let’s Connect

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