Subsea All-Electric Technology
Now available for the future field developments

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Agenda

- Introduction
- Technology features
- Case study
- Summary
Introduction
All-Electric system business drivers

- Reduced overall system CAPEX and OPEX
- Higher flexibility in field and area development
- Easier field expansion
- Enabler for long step-out and deep water projects
- Higher reliability and availability
- HSE benefits
All-Electric system simplification potential

- Distributed controls architecture and removal of hydraulic distribution
- Less topside equipment
- Reduced size of Umbilicals
- XMTs smaller and lighter
Technology features
Technology overview - video
Technology features

■ Electrical rotary actuator
■ Designed for 25 years operational lifetime
■ Industry standard class 4 interface
■ Single ROV handle for installation and locking
■ Qualified for 4,000 m water depth
■ Advanced condition monitoring
■ Modular electronic architecture
■ Configurable speed and torque limits, configurable power consumption
Qualified configurations

High duty redundant channel

- Power supply = 400 VAC 3 phases
- Nominal / max output torque = 1800 / 2700 Nm
- Size and weight = HxW 85x48 cm, 110 kg (in air)

Low duty single channel

- Power supply = 24 – 48 VDC (SIIS II)
- Nominal / max output torque = 1800 / 2700 Nm
- Size and weight = HxW 85x40 cm, 110 kg (in air)
Multiple uses

Linear valve actuation

Linear valve actuation with mechanical fail safe

Rotary valve actuation

Rotary valve actuation larger ball valves
Case study
Case study

Assumption

- Subsea field with different Xmas trees
- Same functionality as for electro hydraulic configuration
- All instruments are available in SIIS2 format

Goal of the study

- See if CAPEX costs could be reduced on a large SPS utilizing All-Electric technology
All-Electric system distributed control architecture

32 DCV
8 SEM
2 SRM
4 SCMs

SRM-A  SRM-B

SCM
SEM-A  SEM-B
Hydraulics

SCM
SEM-A  SEM-B
Hydraulics

SCM
SEM-A  SEM-B
Hydraulics

SCM
SEM-A  SEM-B
Hydraulics

XMT

32 El. actuators
2 SEM
0 SRM
0 SCM

SEM-A  SEM-B
CAPEX effect of All-Electric system

- All electric
  - Removal of topside hydraulic system, transportation, storage etc
  - Cheaper umbilical
  - Less tie in scope
  - Simpler control system
  - Smaller SPS equipment
  - Reduced CAPEX
OPEX effect of All-Electric system

- All electric
  - No hydraulic transportation consumption, storage and cleaning
  - No recharge time
  - No contamination from hydraulic fluid
  - Better monitoring of component health enables planned interventions
  - Higher availability and reliability
  - More easily replaceable equipment
  - Reduced OPEX
System cost reduction potential

- Significant reduction in less topside equipment
- Significant reduction in reduced size of umbilicals
- Significant reduction in XMTs smaller and lighter
- 15% reduction in subsea production system
Summary
Summary

- All-Electric is a technology available today
- Different projects using this technology are currently in operation or under execution
- The main benefits provided are the cost reduction and higher reliability
- To adopt this technology on a large scale we need also a different field development mind-set.
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