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All Electric Subsea Tree System

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Abstract

This paper will present work that has been completed over the last several years to develop an all electric Subsea control system ending with an all electric tree. The work is now conducted in a joint StatoilHydro-FMC Technologies R&D program; Subsea MMX.

All electric systems provide CAPEX savings from reduced umbilical, OPEX savings from eliminating fluid consumption, and environmental benefits from eliminating emissions of hydraulic fluids.

The basis system discussed in this paper is currently in use for Subsea Choke Control and Manifold Valve Control, and it won the OTC Technology Award in 2006. This system is now further refined for application on safety critical applications like Christmas Tree valves with improved redundancy and fault tolerance in order to meet requirements for safety and availability.

This paper will discuss the analytical development and review of the safety critical electric tree system, as well as describe the technical solutions developed. The development have taken into account the standardisation efforts by the Subsea industry regarding control system interfaces and are compatible with the IWIS and SIIS RP standards.

Introduction

The Electric Tree system was derived from the already field proven All Electric System that so far have been controlling choke and manifold valves on the StatoilHydro operated fields Statfjord and Norne.

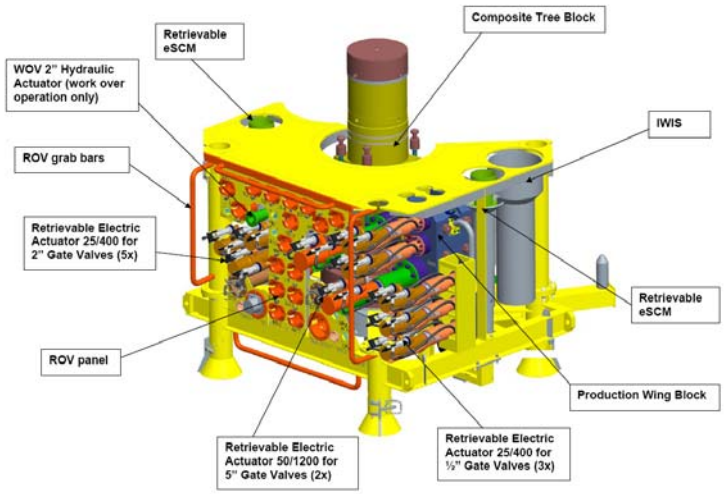

Figure 1 – All Electric Tree