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Status and New Developments in Subsea Processing

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Abstract

Due to its huge potential, subsea processing has been given increasingly more and more attention by operators and subsea contractors for the last decades. After successful implementation of subsea pumping, extensive technology development work on subsea separation and gas compression solutions and a few pilot installations, subsea processing seems to finally become the important field development element as expected for several years. This has been demostrated by the start-up of the first commercial EPC project for subsea separation during the summer of 2005 at the Tordis field in the North Sea. This is a major milestone for the subsea processing business. An activity of pioneers is now believed to become an important business segment trigging new subsea field developments.

This paper presents a summary of the value drivers for subsea processing and it discusses the building blocks required to perform technically feasible and economically viable field developments. Attention is both drawn to subsea separation and gas compression applications. This paper presents typical field development solutions where the use of this technology has been considered. Especial emphasis is made to deep and ultra deep water applications.

Furthermore, the paper presents both already qualified technology as well as ongoing and future required technology qualification for necessary building blocks. This to describe the expectation with respect to when different types of subsea processing solutions can be applied in the future.

Introduction

Since the first diverless subsea X-mas tree- and production system was installed in 1985 subsea production systems have, for most operators, become part of the standard toolbox when considering how to develope offshore fields.

New and future offshore regions have been identified, Figure 1, as the possible growth potential in mature regions is reduced. Although some of the worlds mature offshore regions already have very harsh meteoroligcal conditions and deep seawater this is also true for the new and future offshore regions and in some cases even more true. An example of this is artic regions where potential fields may be wholly or partly covered by ice during the course of a year. As subsea processing building blocks are reaching a higher and higher level of maturity, subsea processing may ensure further growth potential in mature offshore regions by enabling increased oil recovery (IOR) to existing fields and be *the enabler* of field developments in new and future offshore regions.

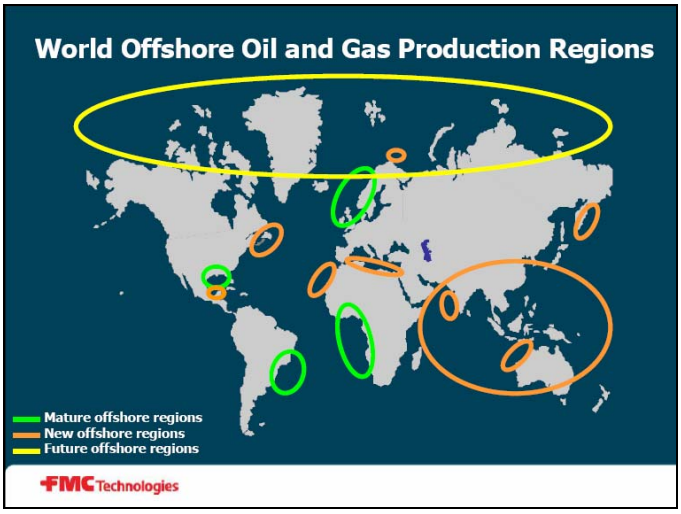

FIGURE 1 – World offshore oil and gas production regions.

A combination of further development in new and future offshore regions with the required technology qualification may give a timeline as represented in Figure 2, showing the past, present and future of subsea processing technology.