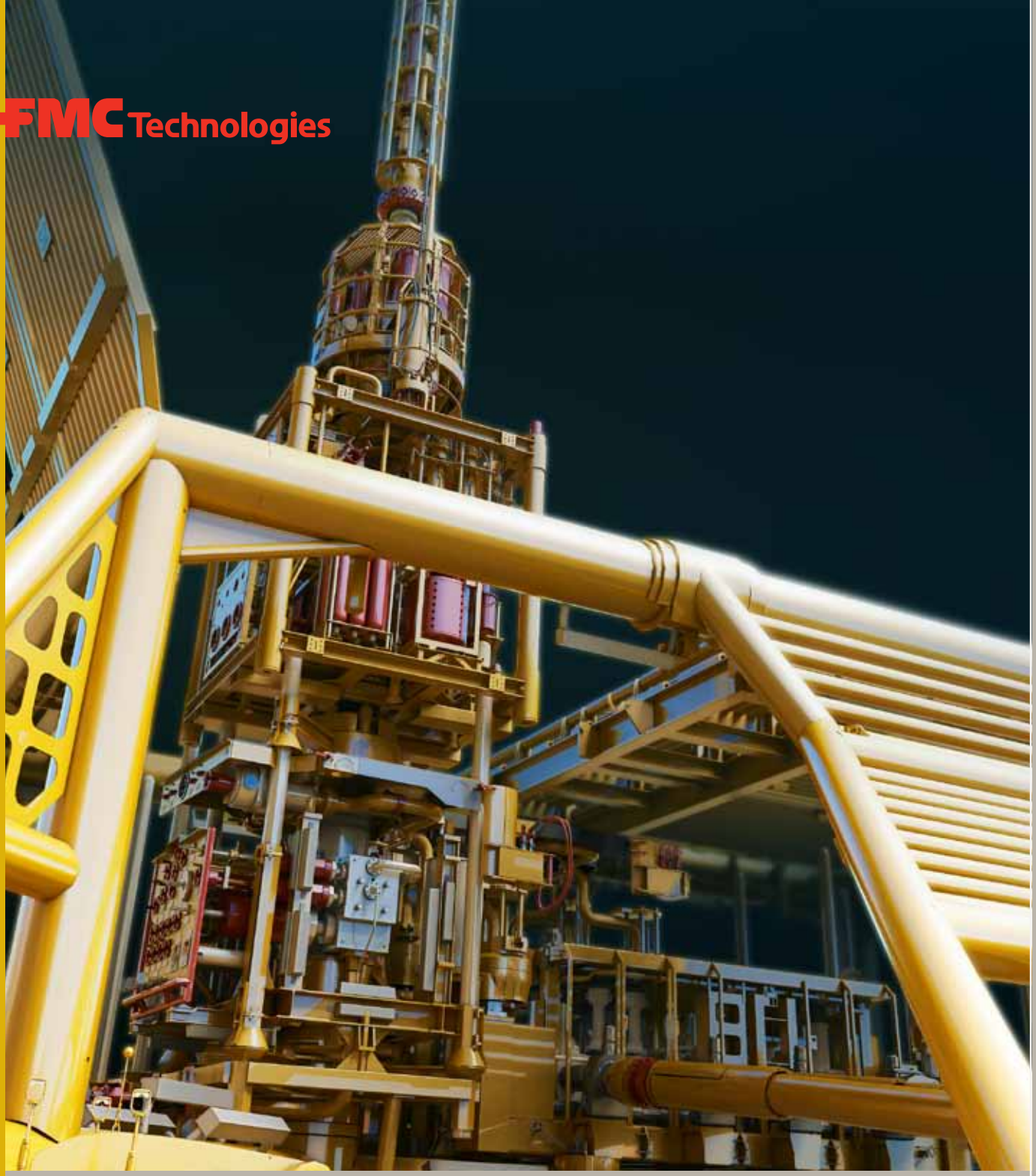
FMC Technologies



Light Well Intervention

Light Well Intervention

Improving the recovery of hydrocarbons from subsea wells has always been a challenge. Well intervention and drilling sidetrack wellbores are a means to increase the oil production from existing wells. FMC Technologies has proven technologies and methods which meet the challenges related to increasing oil recovery from subsea wells.

Riserless Light Well Intervention (RLWI) operations are normally carried out from a dynamically-positioned intervention vessel to perform various wireline deployed operations.

StatoilHydro

"Light well intervention is vital if StatoilHydro is to meet its IOR ambition of 55 percent recovery from subsea fields."

ØYSTEIN ARVID HÅLAND,
Senior Vice President,
Sub-surface technology, TNE

RLWI Operations

Typical intervention operations performed on subsea wells include:

- Running/pulling of tubing hanger crown plugs and seat protectors
- Running caliper/gauging
- Running production logging tools
- Plugging and zone isolation
- Re-perforation of new production intervals
- Installation of insert downhole safety valves
- Well stimulation and scale removal

Reducing the cost of such operations is the principal driving force behind the development of the RLWI technology. FMC's RLWI technology enables cost-effective intervention operations into existing subsea wells. This results in additional production volumes from mature subsea fields at highly competitive costs for the incremental volumes of oil.

FMC's technology includes a patented lubricator system for inserting downhole tool packages into the wellbore under full pressure without taking hydrocarbons back to the vessel. All equipment to connect to and control the subsea well is deployed from a lower cost dynamically-positioned mono hull vessel without using drilling or workover risers and anchors. The technology is enabling integrated operations increasing safety and reducing cost.

Second generation lubricator system

Design criteria:

- Subsea flushing of hydrocarbons from lubricator to well
- Subsea closed hydraulic systems
- Subsea grease injection pump and reservoir
- All-electric control system with subsea hydraulic power generation
- Conformance to relevant API and ISO standards

Riserless Light Well Intervention stack up

Main assembly test of second generation RLWI

Key Facts

- Increases recovery from subsea wells
  - creating added values
- Is cost effective
- Releases rig for drilling

Through Tubing Rotary Drilling

Through Tubing Rotary Drilling (TTRD) enables efficient drilling, intervention and completion of existing wells through existing subsea completion systems. The TTRD system is currently designed for use on horizontal subsea trees. However, the TTRD system will be upgraded for vertical subsea trees. The installation is based on guide wires and is run with water-based hydraulic fluid, though the system can interface with mineral-based hydraulic oil systems.

TTRD subsea equipment used for sidetrack drilling

Traditional TTRD operations have been performed with a conventional blow-out preventer (BOP) and with a marine riser tied-back to the surface using heavy intervention vessels. However, the system still requires a completion riser in order to carry out well intervention.

For increased optimization, a TTRD system with a high-pressure riser was developed which utilizes a single system for both drilling and well intervention. A Surface BOP (SBOP) with pipe RAMs and an annular preventer is connected to the marine riser slip joint, providing functional requirements for drilling. In intervention mode, high-pressure riser joints are stabbed through the slip joint and are connected into the top of the SBOP, allowing a high pressure conduit directly to the surface flow ree.
The TTRD system does not utilize a conventional BOP in any of the operation modes and medium duty intervention vessels can be employed for these operations.

The Surface BOP, which can be lowered through rotary, makes drilling through high pressure risers possible

The TTRD system does not utilize a conventional BOP in any of its operation modes, and medium-duty intervention vessels can be employed for these operations.

The TTRD system is able to operate in the following modes:

- Through Tubing Drilling through a high pressure riser
- All types of wire line operations carried out by conventional braided wire (mono conductor) or slickline
- Coil Tubing operation
- Well stimulation
- Through tubing completion
- Well testing and clean-up

References

FMC has been involved in riserless well intervention since 2003 and has undertaken projects on behalf of the following operators:

- BP
- Nexen UK
- Chevron UK
- StatoilHydro

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FMC Technologies

We put you first.
And keep you ahead.

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