FMC Technologies

Future Challenges for Optoelectronics in the Oil and Gas Industry

Christina Johansen
Director, Eastern Region Technology Center
November 8, 2011

We put you first.
And keep you ahead.

Overview

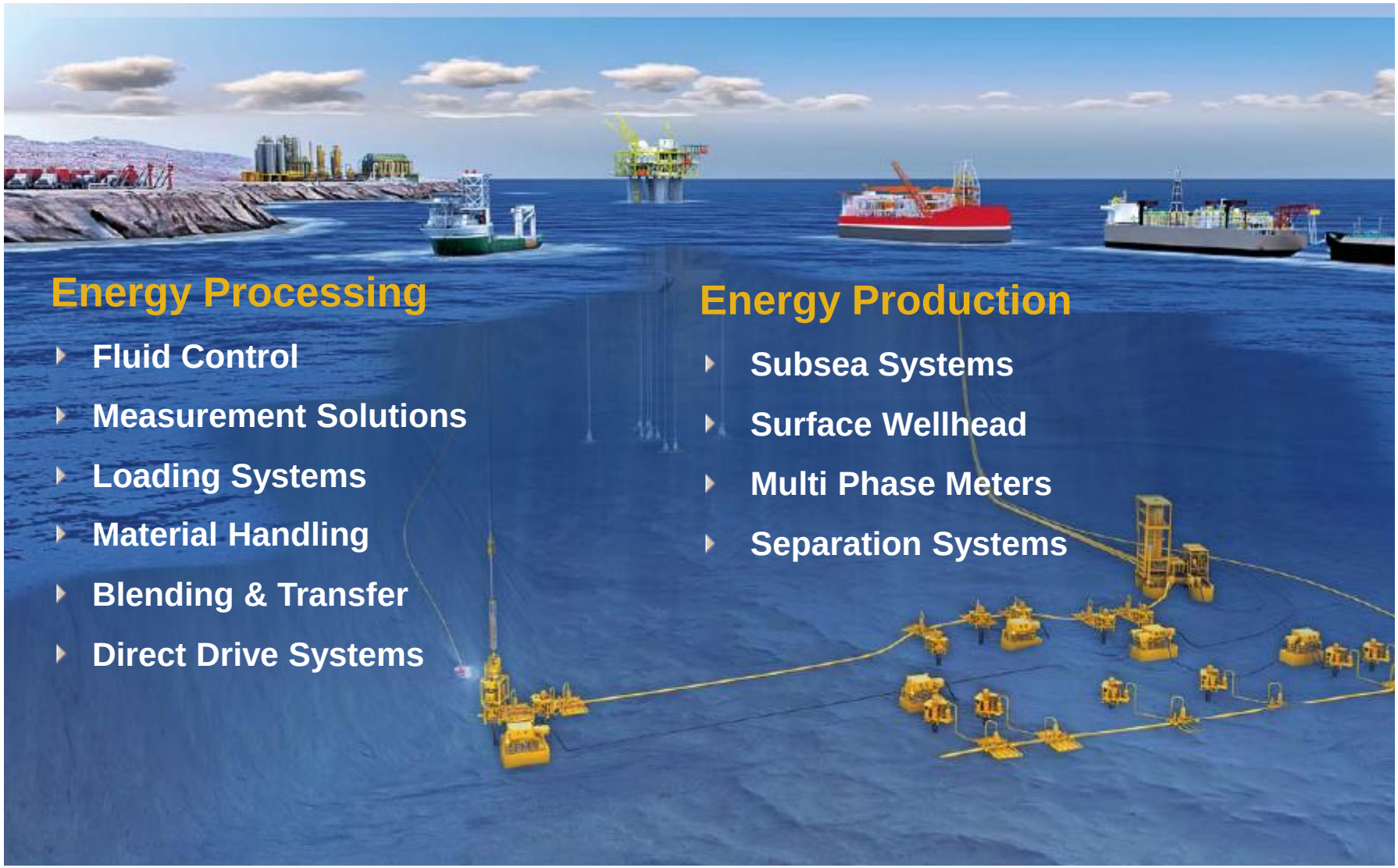
- FMC Technologies Overview
- Oil & Gas Industry Drivers
- Some Challenges
- Subsea Applications for Optoelectronics
- Opportunities for Optoelectronics
- Reasons for Optimism

FMC Technologies at a Glance

An oilfield equipment & service company

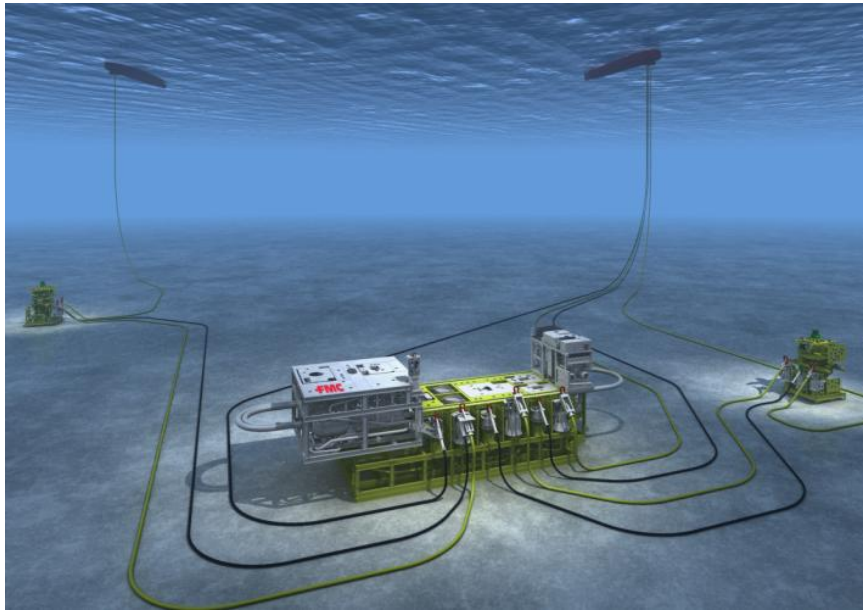
- $4.1 billion revenue in 2010
- 12,000 employees worldwide
- 27 production facilities in 16 countries
- FORTUNE® Magazine 2010 World's Most Admired Oil and Gas Equipment, Services Company
- Ranked #18 overall in the Forbes Magazine list of *The World's Most Innovative Companies* for 2011

FMC Business Segments



Oil & Gas Industry Drivers

- Challenging applications and added complexity
- Environmental responsibility
- Continuous focus on improved safety
- IOR



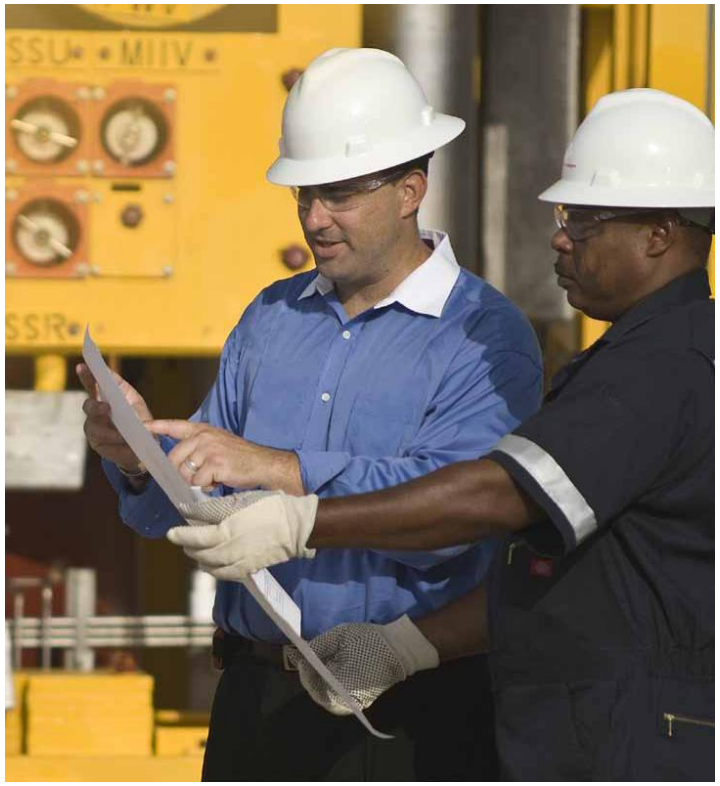
FMC Technology Focus Areas

Ice Management
Cold tolerant materials
Intervention challenges in the Arctic

System Integrity
Environmental Monitoring

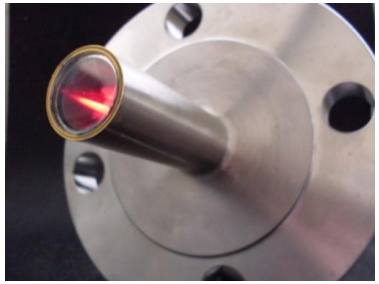
Challenges

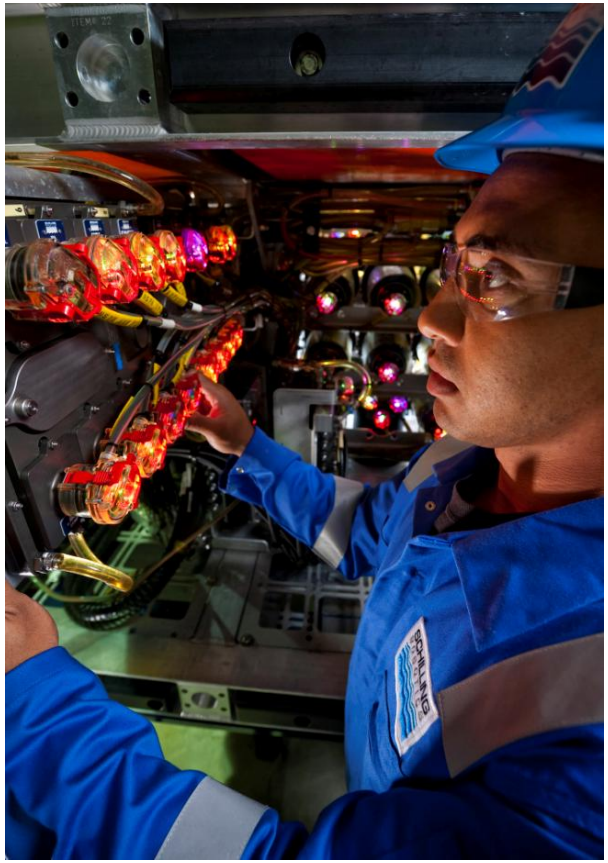
- Conservative Industry
- Expensive Infrastructure
- Installed Base
- Data Overload
  - Interpretation / Meaning
  - Enabling smart decisions



FMC Capabilities & Commitment

- Investing in technology to provide "asset awareness"
- Creating Monitoring Solutions
  - Process
  - Environmental
  - Product Integrity



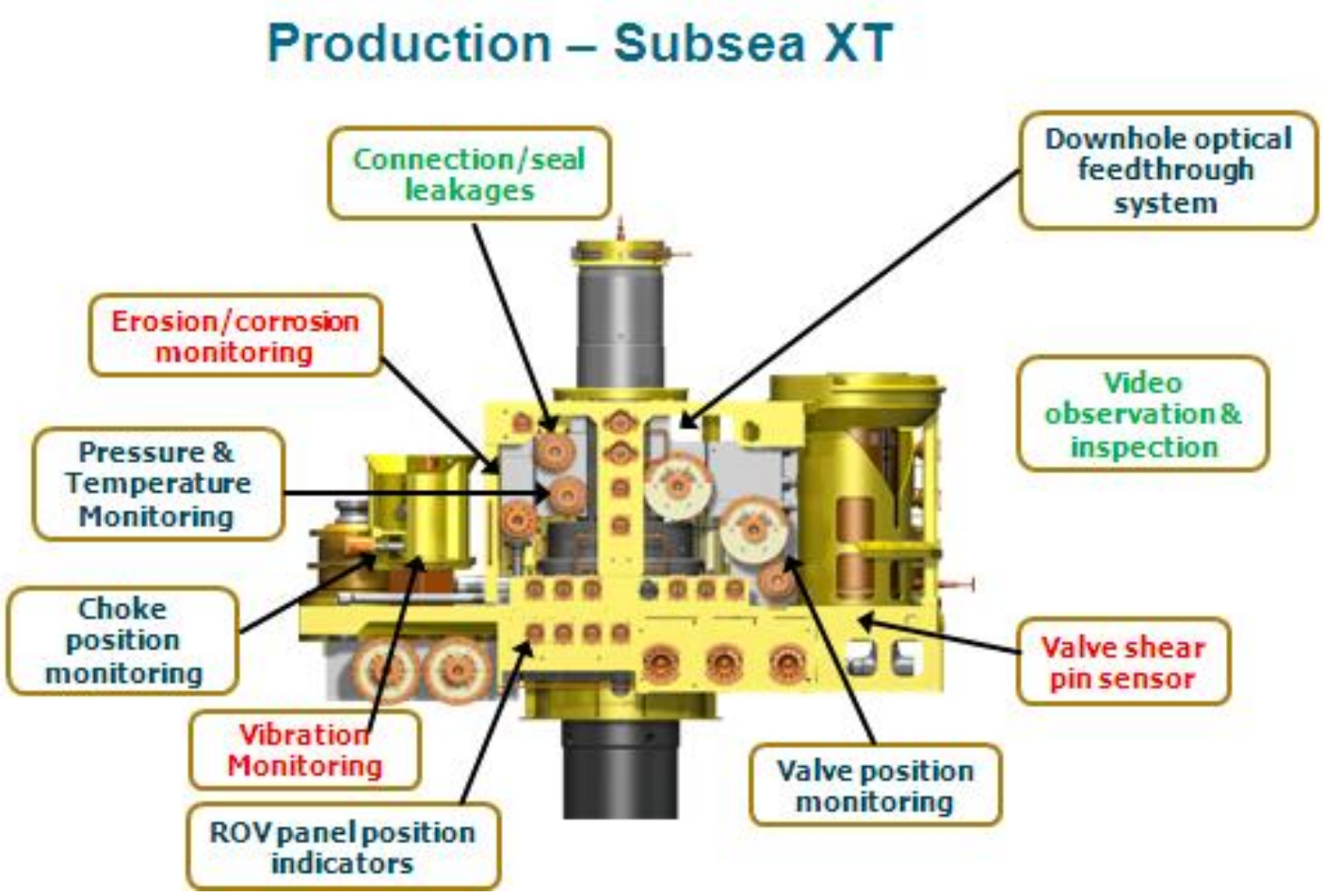


Moving From Data to Decisions

- **Provide Full Subsea Asset Awareness**
- **Ensure Safe Operations**
- **Production Optimization & Flow Assurance**
- **Intelligent Maintenance**

Opportunity: Provide the Right Data at the Right Time to the Right Person and enable the operator to make the right decision.

Truly intellligent tree, Beyond Yellow Steel



Industry Partnership Example

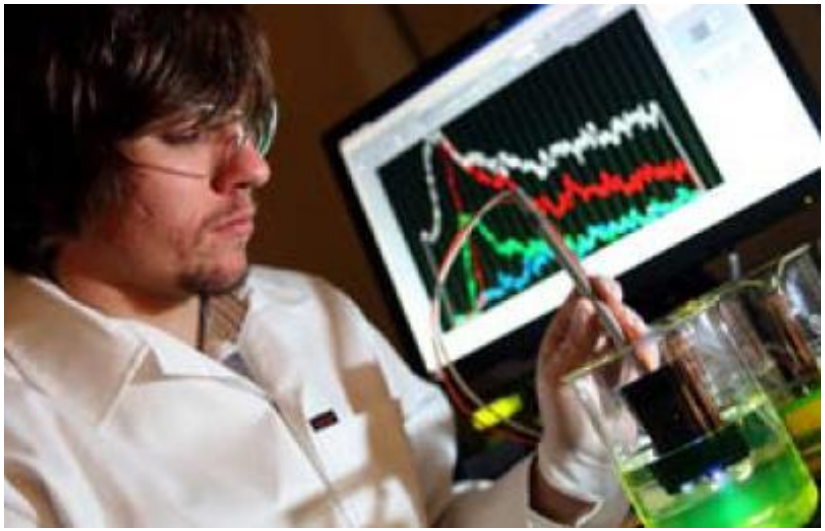
Optical Fiber Feed Through System
installed Nov 2009

Statoil FMC Technologies DEUTSCH Weatherford

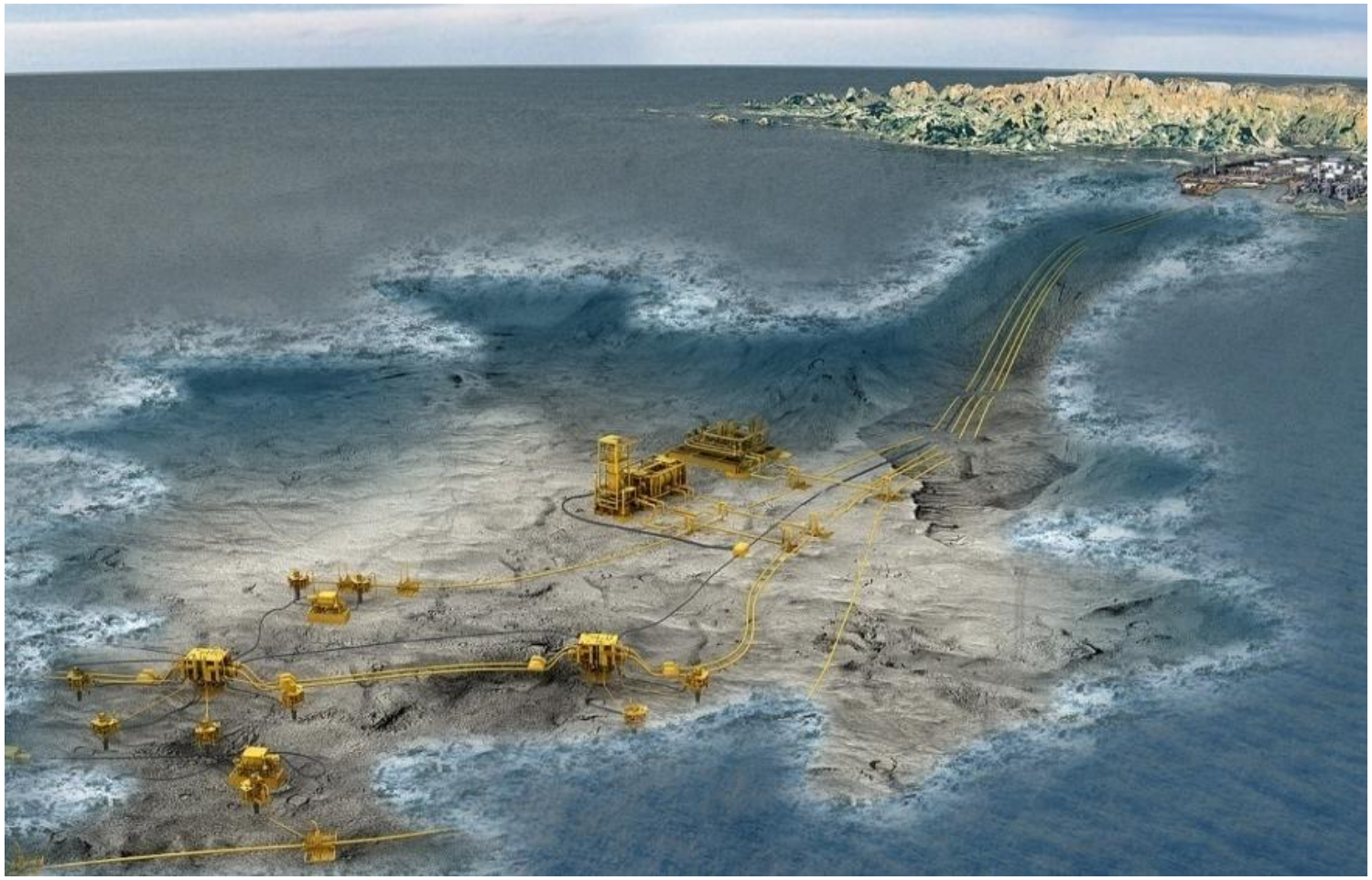
Tubing Hanger with optical fiber feed through system running in hole

Reasons for optimism...

- Fiber instrastructure almost standard in today's installations
- DH fiber optic sensing gaining experience
- Fiber optic seabed monitoring solutions developing
- Riser Monitorring Systems maturing



The Future



The All-Subsea Development of the Future Will Have Even Greater Demands For Data and Informed Decision-Making