

## RFID Technologies in NCS Integrated Operations of Oil and Gas Production

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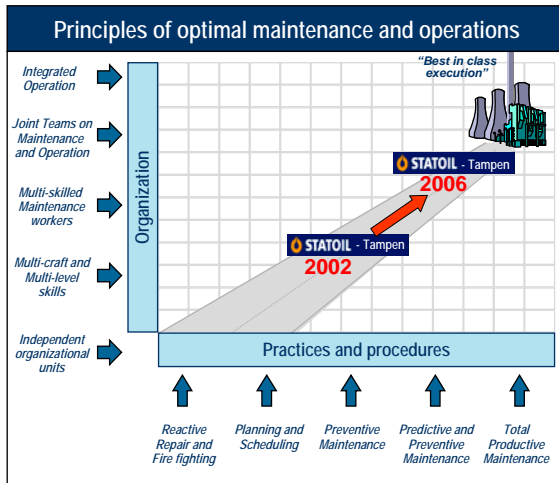
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#### Short explanations:

OPEX	= OPERating EXpenditures
CAPEX	= CAPital EXpenditures
Tampen Area	= Statfjord A, B & C Gullfaks A, B & C Snorre A & B and Visund offshore oil & gas production installations
ISPS	= The International Ship and Port Facility Security Code of 2005

## Both Statfjord and Gullfaks have reduced their OPEX considerably during the period from 2002 till 2006



Source: Capgemini Operations & Maintenance Centre of Excellence, 1999

### Benefit case

- The OPEX reduction which the Statfjord field has attained through its SF 2007 programme is exceptionally impressive!
- From an OPEX of 2.700 Mnok in 2001, the operating costs are reduced with 700 Mnok to 2.000 Mnok in 2006.
- This means an OPEX reduction of approx. 25 % over a period of 4 years!

### Personnel reduction

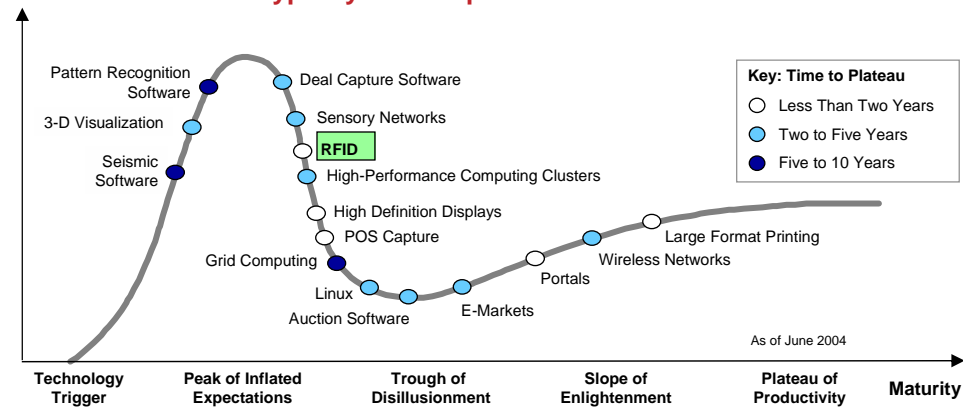
- The number of offshore operators is reduced with 220 from 700 to 480, approx. 30%. Luckily most have retired at 62 years of age!

Source: Statoil in Teknisk Ukeblad, 03.2006

**Statfjord's impressive OPEX reduction was an important condition for the decision to carry out the Statfjord Late Life Project – producing oil and gas for another 15 years worth some 100 Billion nok!**

## Convergence in Maturity of Specific Technologies is Critical to New Advances in Digitalization of Oil Fields and Production

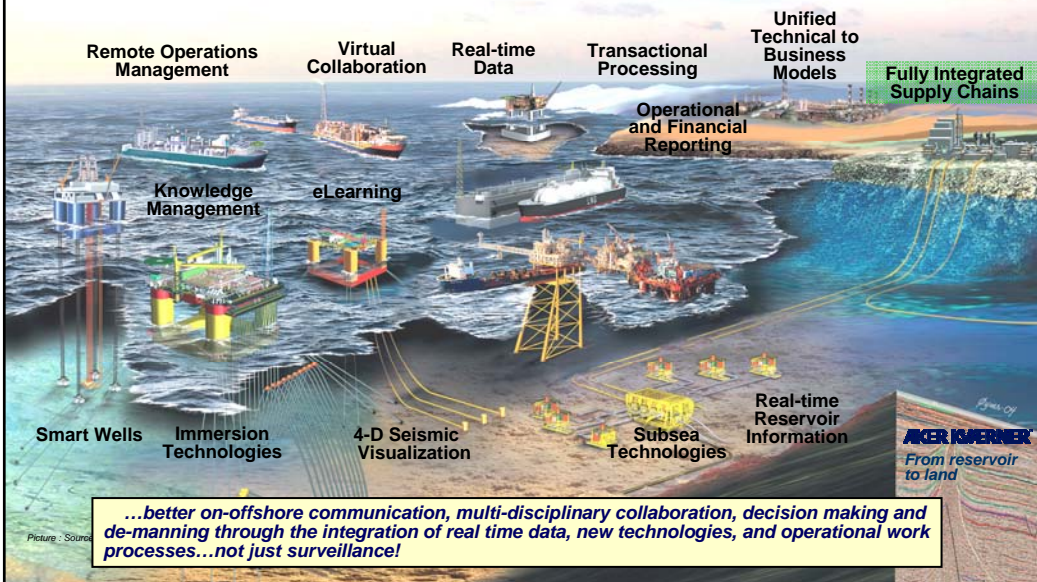
### Visibility Gartner's Hype Cycle for Upstream O&G Summer of 2004



**Recommendations for Producers and Refiners:**  
**Use technology to improve business performance and the ability to manage different types of risk.**

Source: 2004/2005 Forbes/Gartner CEO Business Issues Survey

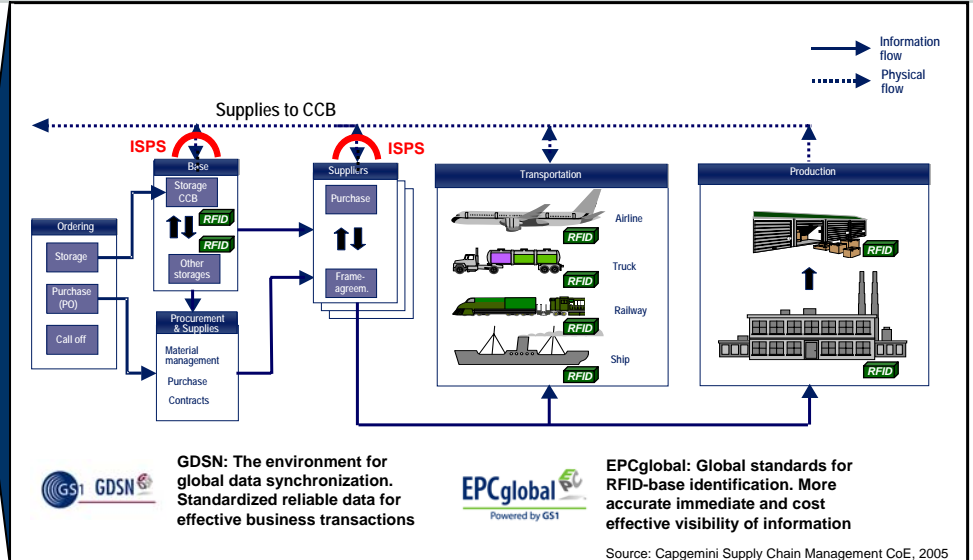
**Integrated Operations on the NCS is cost reduction, work process efficiency and volumetric improvement via...**



**...better on-offshore communication, multi-disciplinary collaboration, decision making and de-manning through the integration of real time data, new technologies, and operational work processes...not just surveillance!**



**The RFIDs have for some time been used in land based production, transport and logistics ...**



**GSDN**: The environment for global data synchronization. Standardized reliable data for effective business transactions

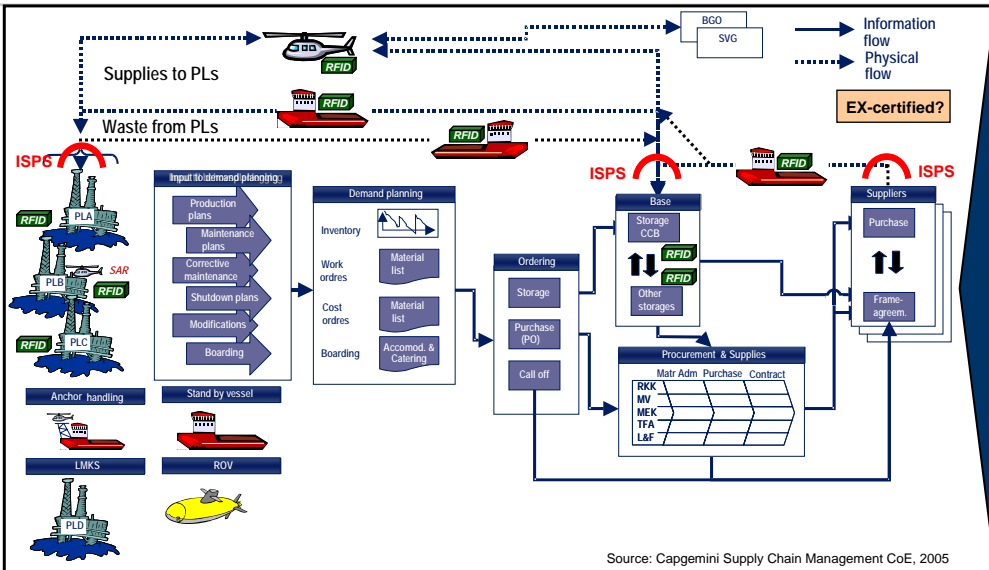


**EPCglobal**: Global standards for RFID-base identification. More accurate immediate and cost effective visibility of information

Source: Capgemini Supply Chain Management CoE, 2005



## ... hence, where and how to introduce RFIDs in various offshore supply chain activities?



Source: Capgemini Supply Chain Management CoE, 2005

## RFID key solution areas and target opportunities

Four primary opportunity areas have been identified across the industry value-chain. These solutions understand the point of production through distribution and transfer of an object – both transactional and depreciating.

### Asset Tracking

Industry focus: Vendor direct

Description:

Depreciating goods - tools, hardware, equipment, or leased items



### Container Tracking

Industry focus:

Federal and global

Description:

Tracking the vessel of transport – pallet, crate, train, trailer, or truck



### Product Tracking

Industry focus:

Distribution, retail, operation

Description:

Tracking of a goods or equipment in or through the value chain

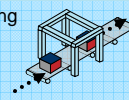


### Work in Progress

Industry focus: Manufacturing

Description:

An object down an assembly line or tracked through the process of manufacture



Source: IBM Business Solutions

## The handling of warehousing, tools and equipment will be more efficient using PDAs with readers and RFID marking



### An operator at Hinna reading information



Photo: AKOP Orion RFID Pilot Project

### AKOP Orion RFID Pilot Project

At the Aker Kværner Hinna Tools and Equipment Facilities, a Pilot is ongoing since the winter of 2006, to improve their operations by introducing RFID technologies and solutions.

The Hinna Facilities handle some 1000 different types of tools and equipment, totalling some 6000 individual units that will be tracked with the RFID solution presently under implementation and linked to their ERP computer system

Both Statoil and Hydro O&G are also reported to be piloting similar RFID based tracking systems on their NCC offshore installations.

Reference: AKOP Orion RFID Pilot Project

*The tracking and tracing possibilities will facilitate the recovery of "lost" tools and equipment!*

## The new ISPS regulations may increase the OPEX of the Supply Chain operation considerably!



### The Norwegian ISPS solution



### The basics of the ISPS regulations

The International Ship and Port Facility Security Code (ISPS Code) is a comprehensive SET OF MEASURES TO ENHANCE THE SECURITY OF SHIPS AND PORT FACILITIES, developed in response to the perceived threats to ships and port facilities in the wake of the 9-11 attacks in the United States.

The ISPS Code is implemented to enhance maritime security in the International Convention for the Safety of Life at Sea (SOLAS). The Code has two parts, one mandatory and one recommendatory. The code supports 3 security levels.

In essence, the Code takes the approach that ensuring the security of ships and port facilities is a risk management activity and that, to determine what security measures are appropriate, an assessment of the risks must be made in each particular case.

*... however we will surely see more creative RFID-based anti-terror security systems soon!*

## The Maersk Shipping Star View solution is keeping track and trace of some 150 000 Containers



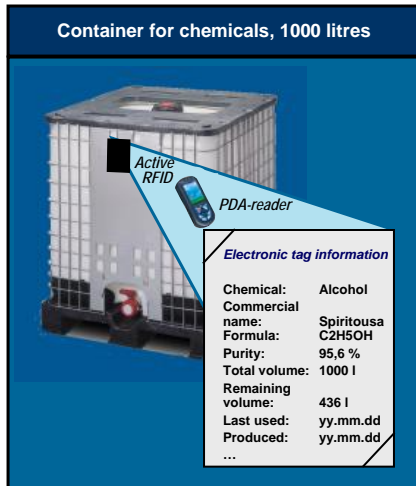
### The Top 10 Business Benefits

- Reduce Fleet Size
- Reduce Maintenance & Inspection Costs (Manual Resource)
- Improve Asset Utilization (Convert Idle Time to \$)
- New Revenue Opportunities for Free Space and Yard Space Utilization
- Improved Per Diem Collection
- Reduce Lost Equipment (& Associated Costs)
- Improve Inventory Reconciliation & Data Quality
- Improve Call Centre Productivity and Customer Satisfaction:
  - Reduce Trace Time
  - Reduce Track Time
  - Other Customer Enquiries

Ref: Maersk Star View Solution in cooperation with Capgemini, IBM, RFSAW and VIEWLOCITY

*This kind of RFID Seal Tag on each container combined with PDA RFID reader, has been requested from the onshore supply base operators to comply with the ISPS regulations!*

## RFID marking of containers containing chemicals for offshore use with information read and write functionality



### Carriers of goods and chemicals

*RFID systems designed for each of the various containers, will make it easier not to follow the loading regulations:*

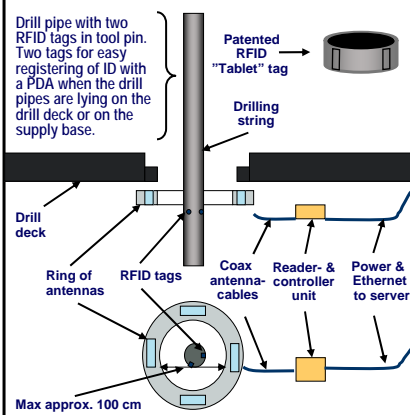
- Not to overload the container
- To secure the content
- To correctly mark the and document the content
- To use the correct type of container for each type of goods
- To optimise the filling of the container
- To see to that the container is returned as soon as possible

*This kind of PDA with RFID reader solution has been requested from offshore oil operators!*

## Drilling Operations Tracing System (DOTS)



### Physical lay-out with the ring of antennas



Source: Fine Technologies AS

### The objectives for DOTS

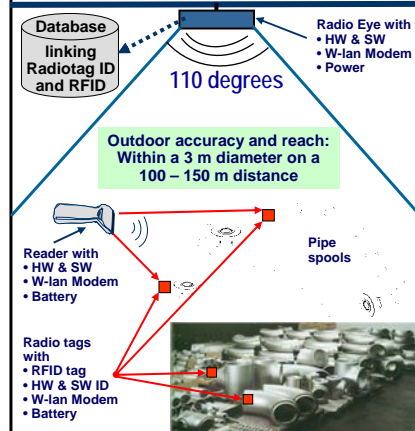
- Improved health & safety
- Increased drilling productivity
- Reduced risk of miscounting drill pipes in strings during drilling operations
- Improved administration of drill pipes;
  - Linked to platform where used
  - Linked to all technical and historical data of each drilling pipe
  - Linked to status (overdue, etc.)
  - For selection of sequence of pipes in a drilling string
  - Keep track of running list for tripping
- Enable linking of pipe-ID to other systems, such as:
  - Dosing of drilling mud
  - Monitoring of torque data from the top drive
  - Maintenance planning and execution

Source: Fine Technologies AS

## Object localizing using Radio Eye and Radio tags with RFID



### Principal of Radio Eye object localizing



Source: Fine Technologies AS

### The objectives for Radio Eye

- Introduce a new technology, leading to smarter and more effective work processes
- Improve the effectiveness of existing work processes & asset management
- Faster to localize objects, such as spare parts, equipment and tools

### Introduction of new technologies

*As part of the drive on Integrated Fields and Integrated Operations, many work processes will be fully or partly automated with new or improved technologies.*

*The expected result is further substantial reduction of the OPEX in the petroleum industry!*



## Questions and Answers

What could be the next steps?



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