

Norwegian Space opportunities within ESA's ARTES Applications

- Integrated Operations in the Oil and Gas sector, Space based opportunities

[ESA] Workshop i Stavanger 13.4.2016 - European Space Agency – Den ukjente muligheten?

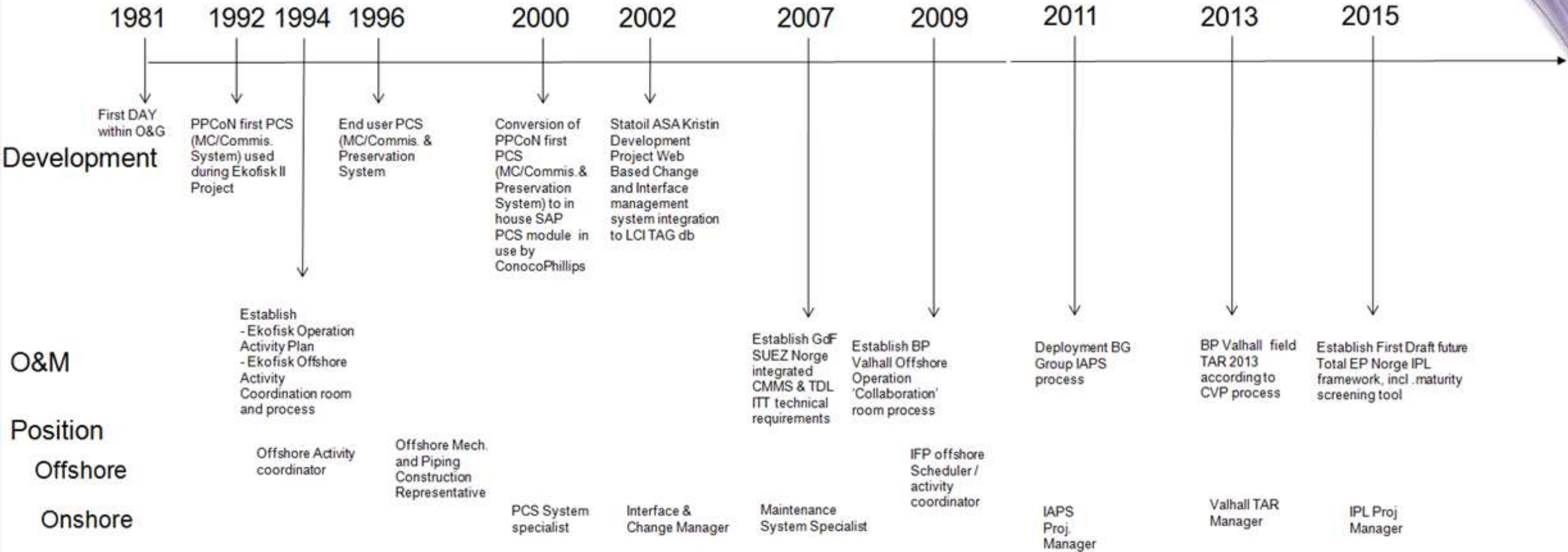
Karl Ernst Karlsen – IO Konsulenten

Vision:
 Contribute to Safe and profitable integrated operation throughout the entire asset life cycle!

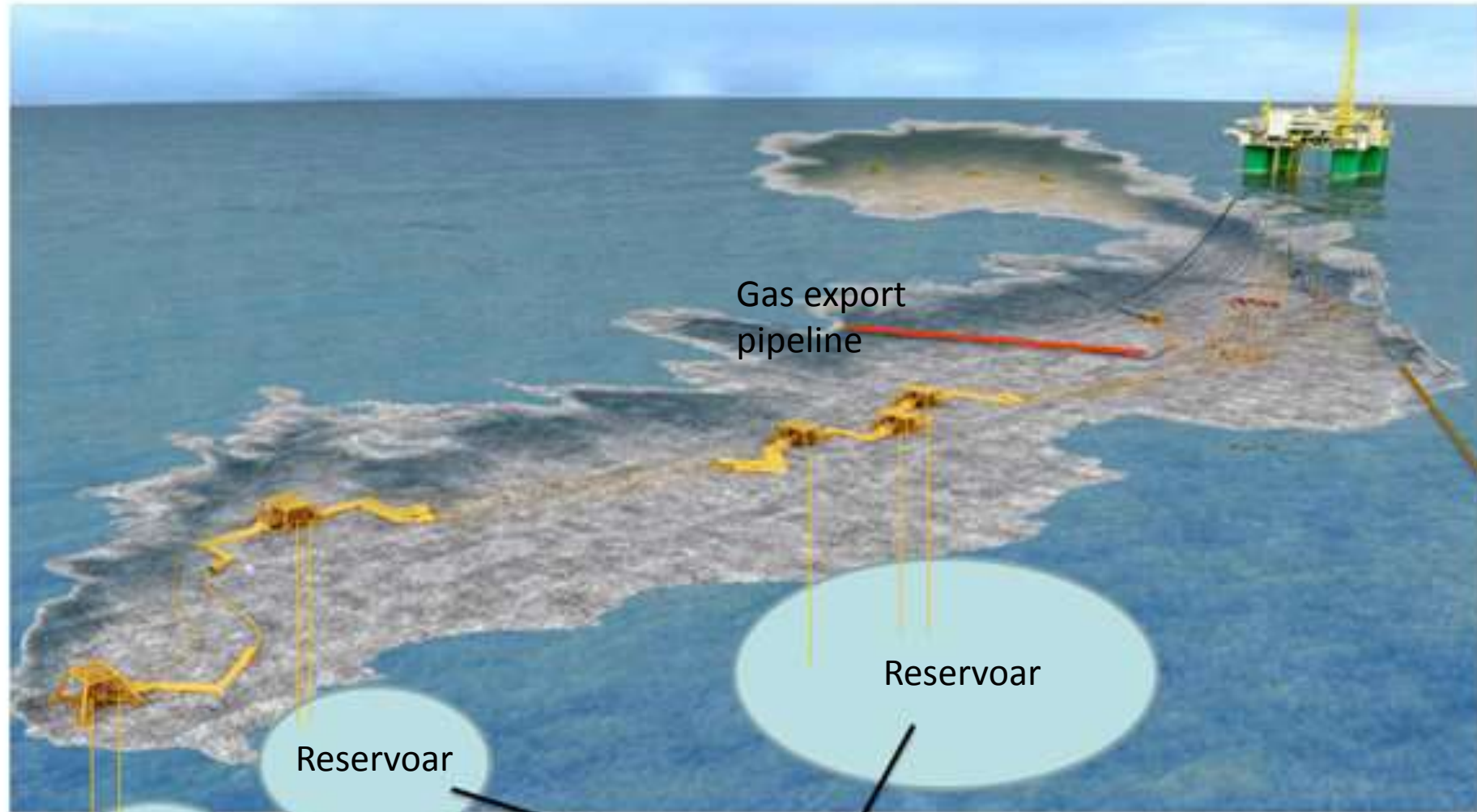
IO Konsulenten

Karl Ernst Karlsen

Trosavigveien 187
 4375 Hellvik
 Norway
 +47 46 93 72 76
 io.konsulenten@gmail.com



Offshore Production Facility



Reservoir

Reservoir

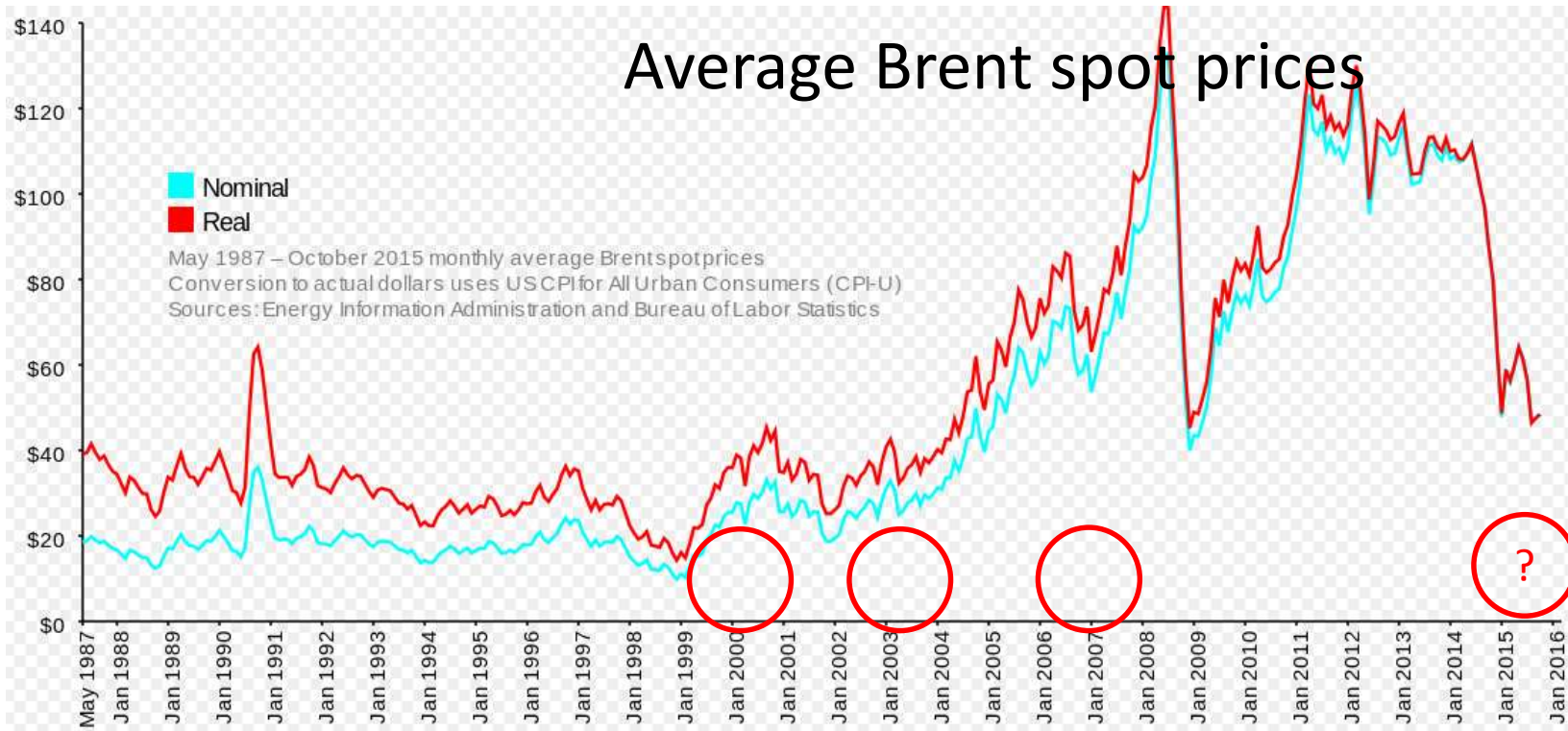
Reservoir

Gas export
pipeline

Oil export
pipeline

O&G Asset

Historical background - Integrated Operations in the Oil and Gas sector



US \$43



eDrift -> Integrerte Operasjoner

Juni 2003

Mai 2004

April 2006



St.meld. nr. 38
(2003–2004)

Om petroleumsvirksomheten

Tilråding fra Olje- og energidepartementet av 11. mai 2004, godkjent i Stortinget samme dag. (Regjeringen Bondevik II)



eDrift på norsk sokkel - det tredje effektiviseringspranget



IO scenario 2007



Integrated Plan & Logistics

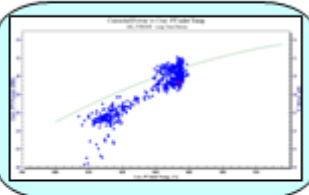
MMO, Drilling etc

Performance Monitoring

DAS

ANALOG
PROCESS
DATA

TURBOWATCH
(Performance Monitoring
& Alarms)



Output

Condition Parameters & Soft alarms

TAG no	Parameter	Unit	Danger HI	Alarm HI	Alarm Lo	Range Lo
22K0001	Efficiency Deviation, %	%	12	6		
22K0002	Efficiency Deviation, %	%	12	6		
22K0001+002	Power balance 1st + 2nd stage	%			65	90
22K0003	Efficiency Deviation, %	%	12	6		
22K0004	Power balance	%			65	90
22K0004	Efficiency Deviation, %	%	12	6		
20CB0003	Relative Clogging	%	90	60		
27K0001-R01	GT Compressor Efficiency Deviation	%	10	2		
27K0001-R01	GT Shaft Efficiency Deviation	%	7	4		

Export to
CMMS

**Collaboration
Arena(s)**

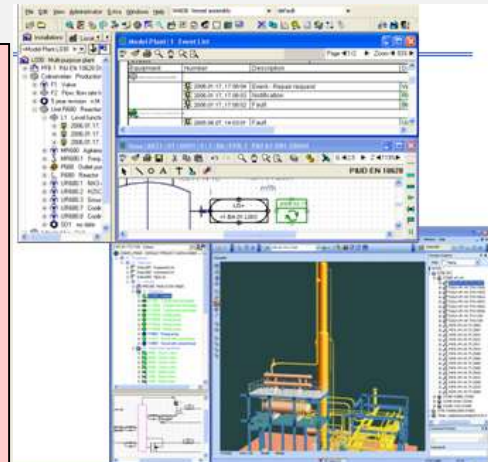
**M & I
Status**



**Condition
Monitoring
System (s)**

Nonconformity
event alert

**Computerized
Maintenance
Management
System /
Technical data
library
(CMMS/TDL)**

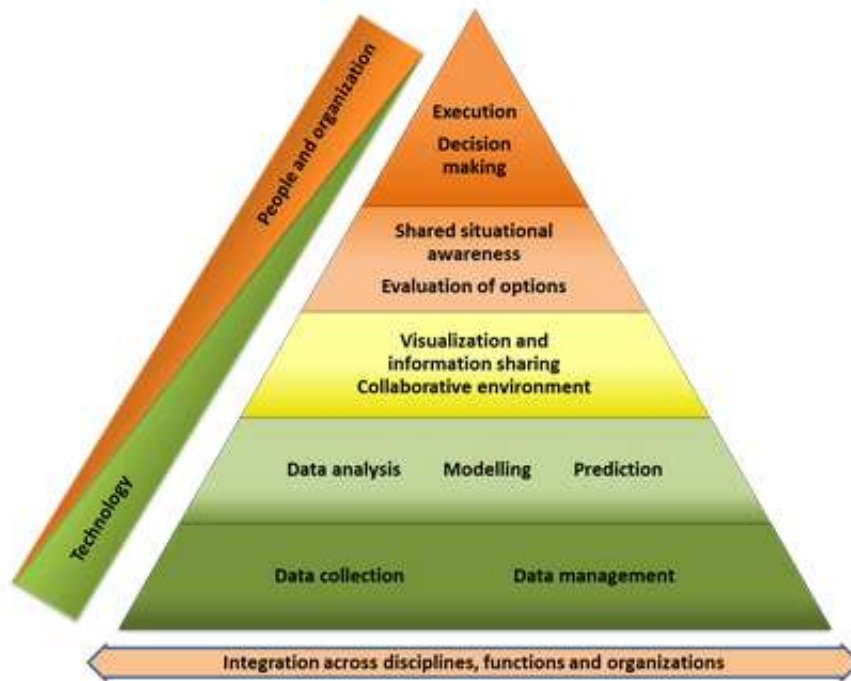


Production forecast

Constraints

Integrated Operations (IO) is the integration of people, organizations, work processes and information technology to make smarter decisions.

It is enabled by global access to real time information, collaborative technology and integration of multiple expertise across disciplines, organizations and geographical locations.

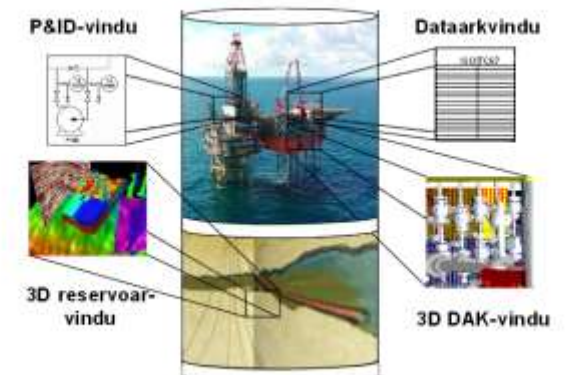


IO Business processes



Figure 1. The different sub-projects within the IO Center

eDrift på norsk sokkel år 2010



Figur 3-5: ISO 15926 gjør det mulig å dele undergrunns- og anleggsinformasjon i sanntid på tvers av disipliner og selskaper

Space based opportunities - Traffic Management

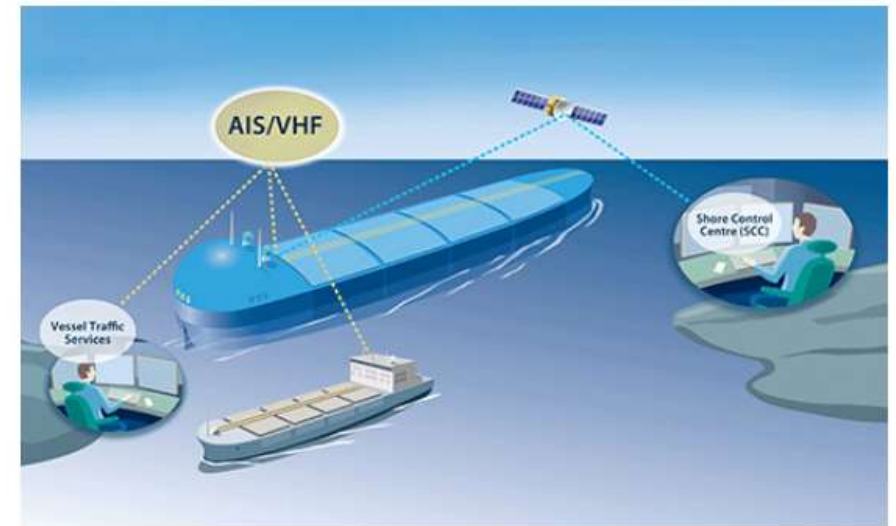


Modernizing Air Traffic Management through Iris

Space based opportunities – Maritime logistics



The autonomous ship – where does it go?



Space based opportunities - Weather



Situational awareness in the Arctic



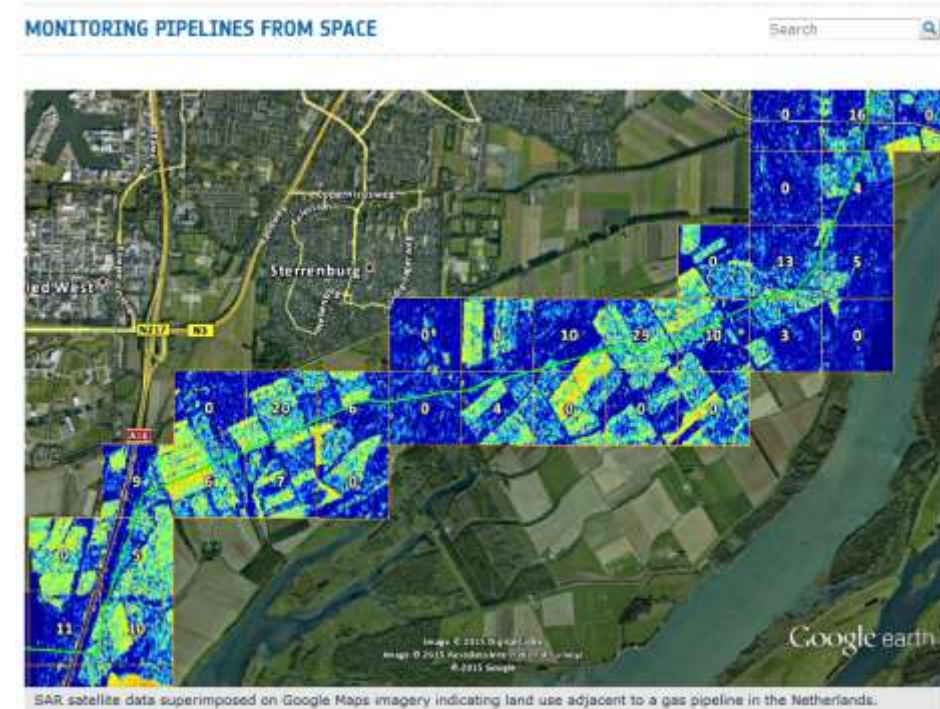
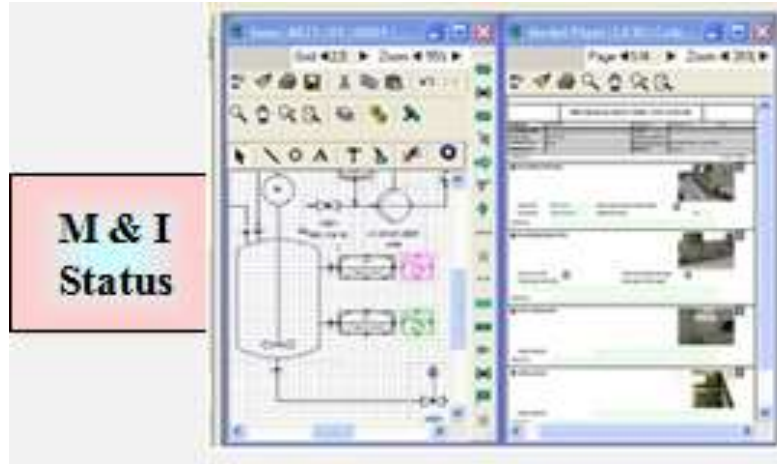
MARINTEK / Projects / Projects Maritime / Situational awareness in the Arctic

Space based opportunities - Inspection

SENTINEL-1



<https://sentinel.esa.int/web/sentinel/missions/sentinel-1>



<https://artes-apps.esa.int/projects/showcases/monitoring-pipelines-space>

Space based opportunities - Automation & Robotics

ROBOTS UNDER TEST FOR OIL AND GAS RIG DUTY



Foxiris robot

Space based opportunities – Concurrent Design Facility

SYSTEMS ENGINEERING, INCL. COST ENGINEERING

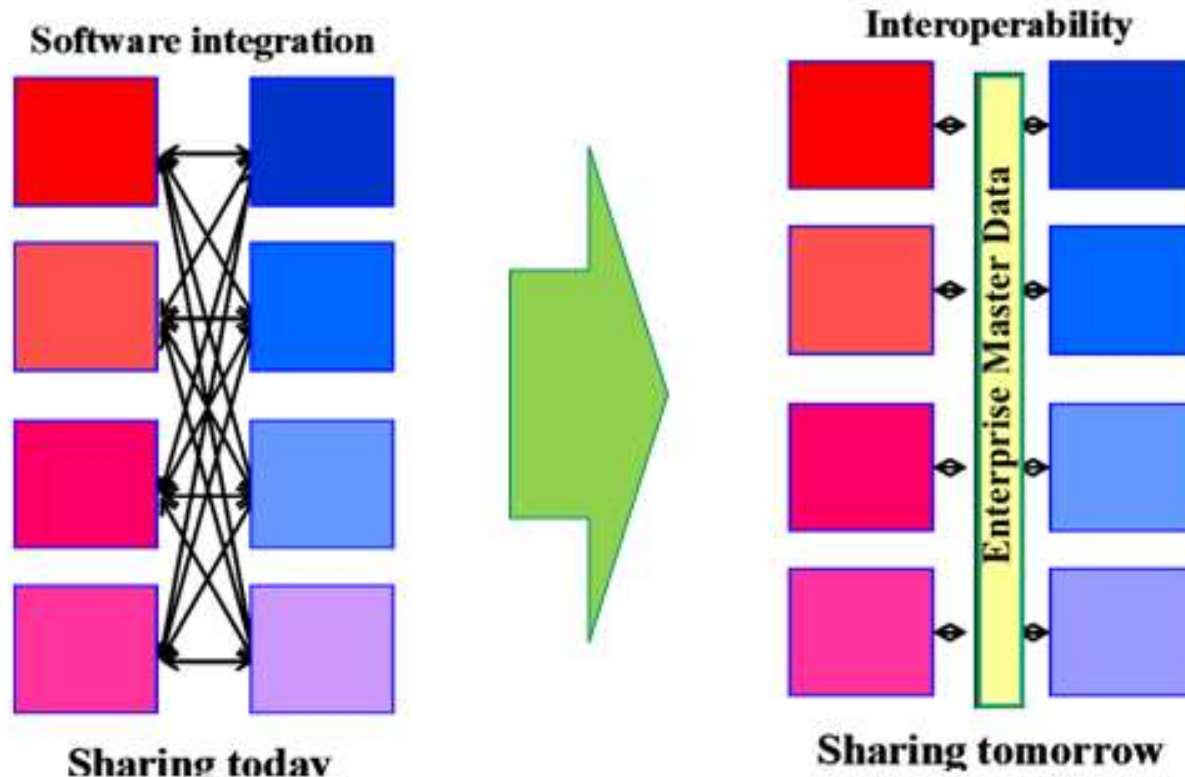


The Concurrent Design Facility at ESTEC

[ESA](#) > [Our Activities](#) > [Space Engineering & Technology](#)

Systems versus data integration

2014
Mapping is
50% of the
IT costs



Integrated Operations in the Oil and Gas sector, Space based opportunities

IO Business processes

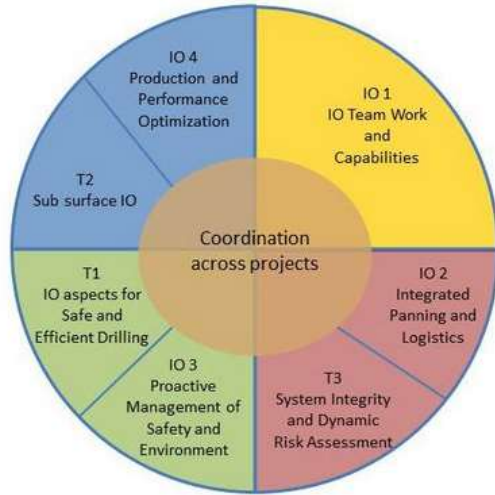
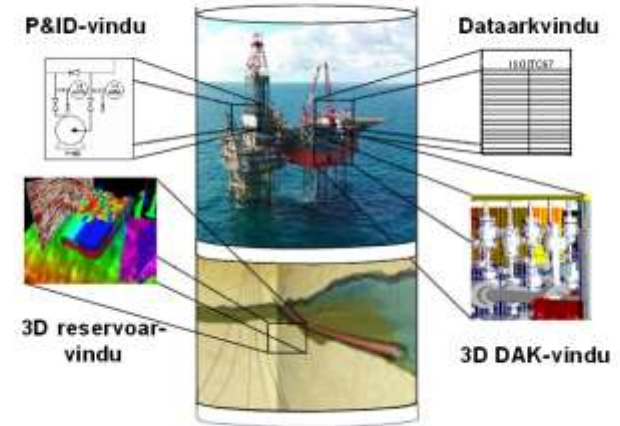


Figure 1: The different sub-projects within the IO Center

eDrift på norsk sokkel år 2010



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