

# EKOFISK I CESSATION

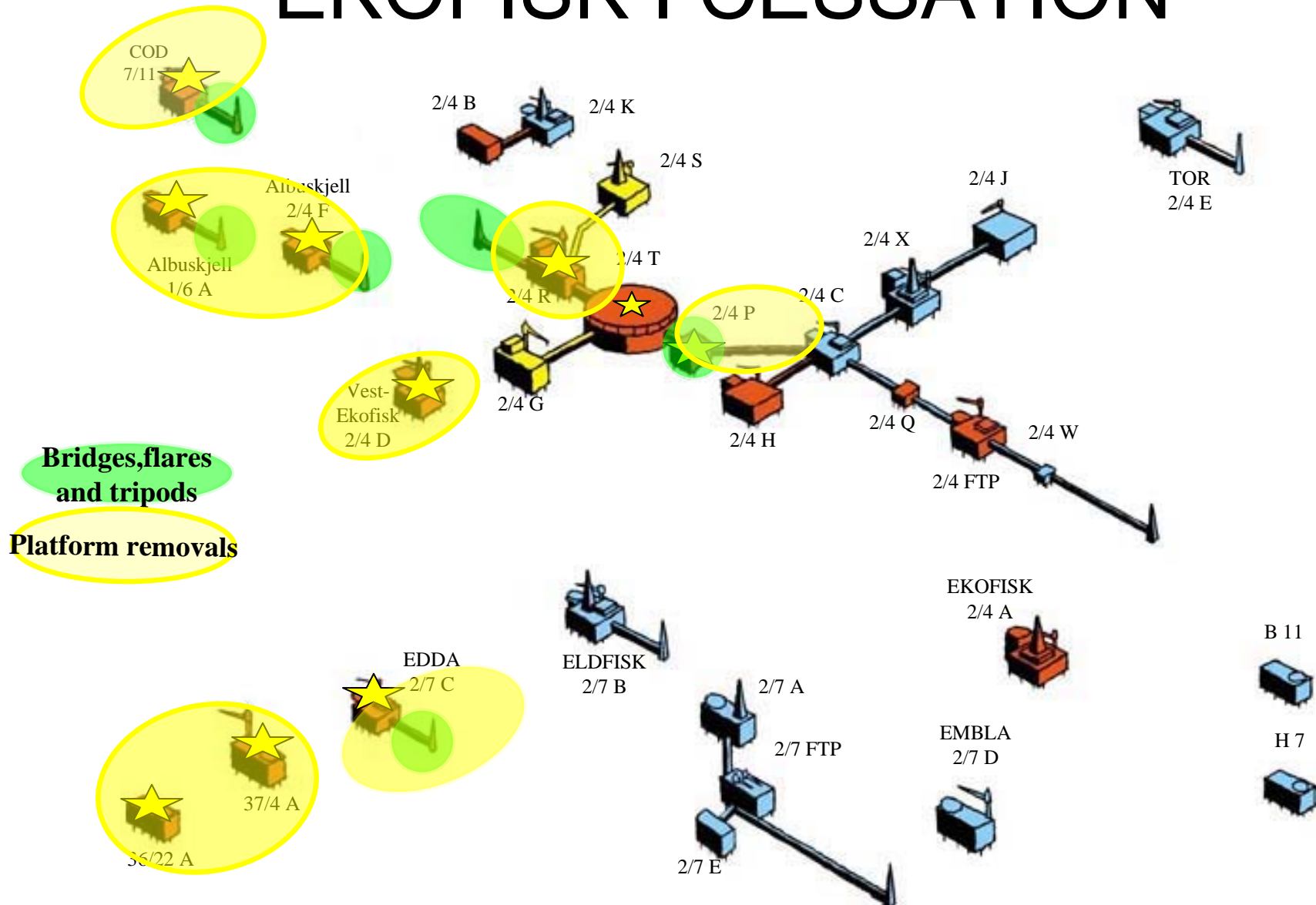


# EKOFISK I CESSATION

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# Ekofisk I Cessation Project

**P&A 5 PLATFORMS**  
**1998 - 2005**

Completed 1Q 2005

**TANK CLEANING**  
**2003 - 2008**

H<sub>2</sub>S and 2/3 oil/wax volume removed  
Offshore restart June 2008

**TANK TOPSIDE REMOVAL**  
**2005 – 2007**

Completed May 2007  
Approx 24 500tons removed

**TANK FINAL  
CONFIGURATION 2008 →**

Studies ongoing

**REMOVE 9 PLATFORMS**  
**2006 - 2013**

Bridges, flares, tripods  
~85% completed  
Bid process ongoing

**5 OPERATING PLATFORMS**  
**~ 2015 →**

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## Personal Safety Commitment

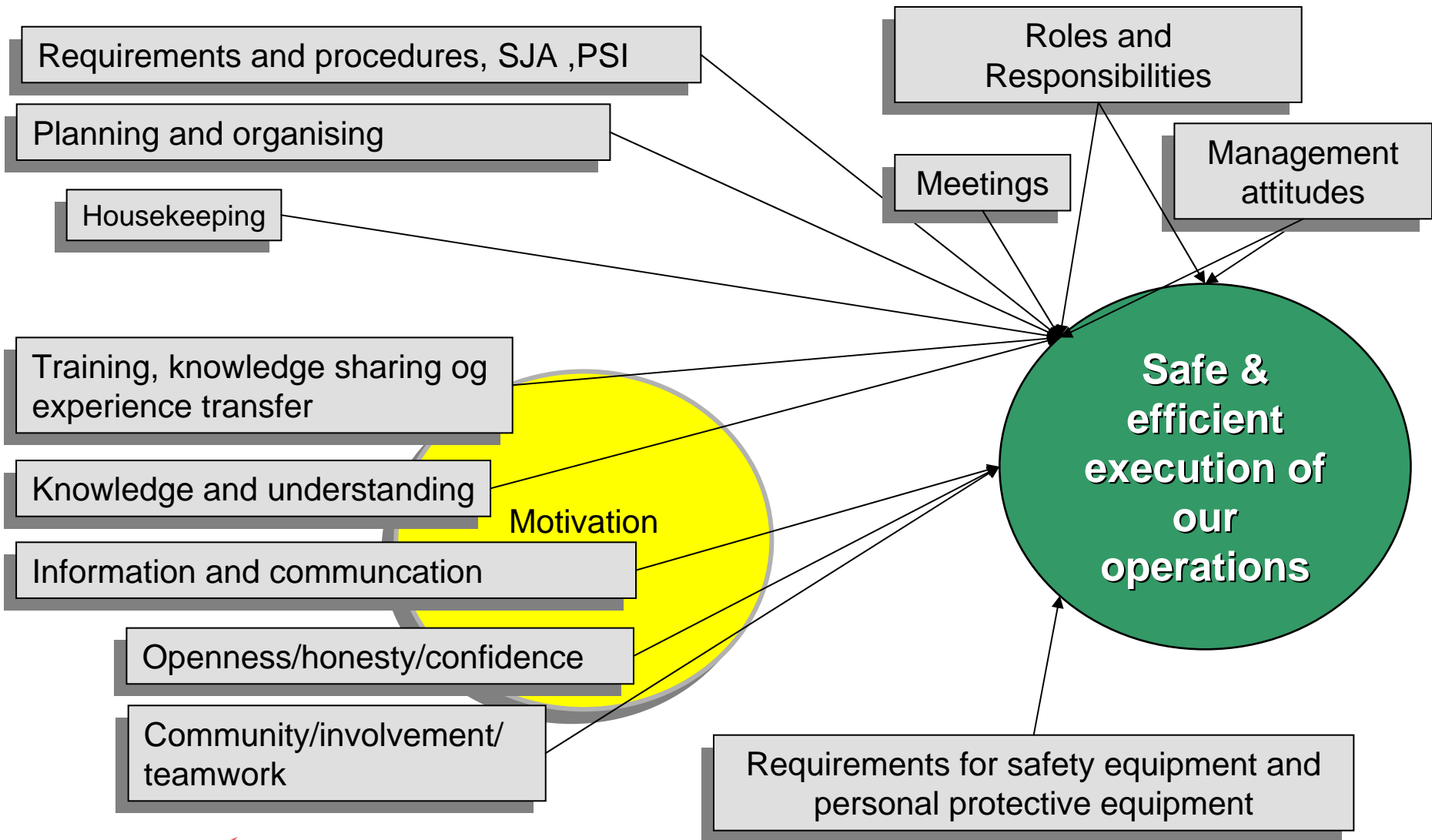
I believe that zero incidents is achievable through hard work and the right mindset. A specific HSE culture program focusing on behaviour to support zero accidents and incidents is developed for the Cessation Project together with SINTEF



**SAFETY**  
We complete all  
Cessation activities  
without serious  
personnel injuries.



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# EKOFISK I CESSATION

## Tank Topsides Removal



 Approx 24 500tons removed in May 2007, and 98 % recycled in Nov.2007

# Ekofisk I Cessation Project

## Crane statistics

No of lifts with 2 barrier cranes and crawler crane,  
from July 2005 until May 2007: (Max weight 23 tons)

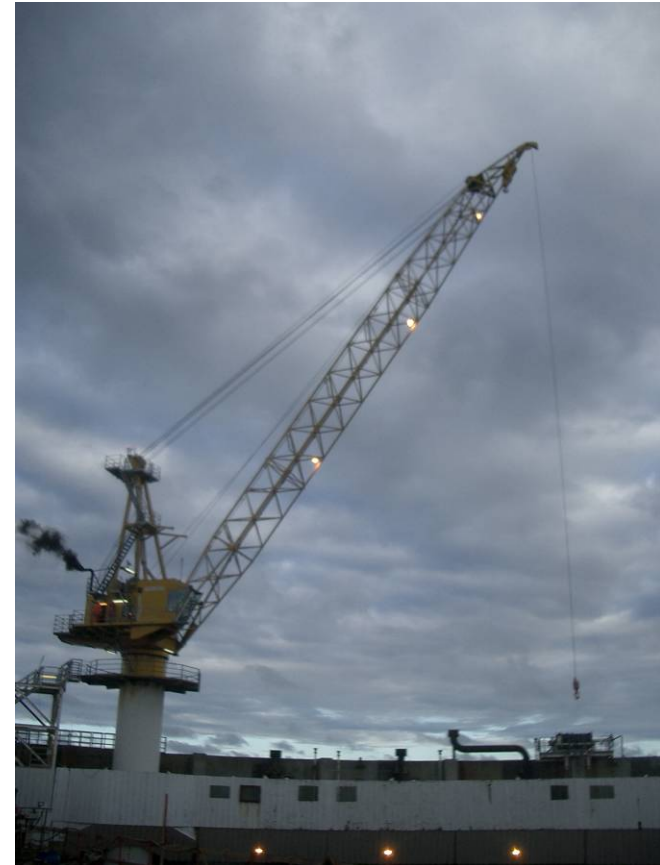
### West + East Barrier cranes:

To and from vessel: 5540

Platform internal lifts: 9874

Crawler crane, internal only: 3958

Total number of lifts 19372





# Ekofisk I Cessation Project

## Material Movement & Waste Accounting

### Total Material Output:

• Metals	21331 Tonnes
• Non-metals	154 Tonnes
• Sold components	744 Tonnes
• WEEE	200 Tonnes
• Hazardous waste	1837 Tonnes
• General waste	<u>553 Tonnes</u>
Sum	24820 Tonnes

- Degree of recycling target 96 %, actual 98%

# Ekofisk I Cessation Project

## So what have we learnt....

- Important to set Qualifications for de-construction personnel
- Focus on training
- Establish barriers to protect people and environment
- Pro actively “think ahead” and be prepared
- Extensive SJAs
- Learn from hazardous observations and incidents
- Short feedback cycle
- Good working relations with Operations

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## Safe execution - Training

30 courses established covering key topics – training is a significant contributor in ensuring safe execution of projects

- Safety courses for offshore work
- Introduction to procedures and HSE
- Stopping and rigging
- Access techniques
- Hot work and work permits
- Safety Job Analyses (SJA) training
- Handling of various hazardous materials
- Waste handling
- ADR/IMDG (transportation of hazardous materials at sea)
- Prevention and protection of oil spill
- Radiation protection





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## Learning from accidents, incidents and hazardous observations reports

- ECP Project management has a high focus on the use of hazardous observations reporting (reported in Synergi)
- Approximately 1500 hazardous observations reports submitted in the Tank Topsides removal project
- All reports reviewed in :
  - Morning meetings offshore (workforce)
  - Daily video meeting with management onshore
  - Safety meetings onshore (workforce)
  - by management in weekly meetings
- Actions taken promptly and follow up reported back to workforce
- The reports gave a significant contribution to completing the project in a safe manner and gave valuable experience that we can bring forward in the coming projects.

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**Sweat the small stuff**

*Major incidents very often have small beginnings, that is why it is so important to look at every injury and incident, however small, as having important learning potential.*





10 May 2007





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2/4 Tank Substructure -What was different from expected ?

- Volume of oil/wax about 3 times more
- Consistency of oil/wax, more stiff wax
- The more fluid oil did not easily flow between cells
- Settling time for oil longer than normal Ekofisk crude
- Much more debris than expected
- Extensive erosion and corrosion of equipment

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## 2/4 Tank Cleaning Skimmer Tools

- Skimmer principles worked, the rotating drum can chew the stiff wax
- Manoeuvring hampered by stiff umbilical, the thrusters made the oil and water to an emulsion
- Installation into cell difficult
- Debris caused severe problems
- Leakage, loss of buoyancy



- Conclusion: The hi-wax skimmer principle can do the job, however, redesign and new tool are required.

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## Rigid pump testing carried out:

- 60 hours of running in up to 1% sand - 99 % oil mix, grain < 1mm.
- To withstand digestion of debris like gloves, hard plastic, rope, etc.



**AFTER**

Ø 25mm

ConocoPhillips



**BEFORE**

- Two pump types failed already during the sand test.
- Third pump type made it.

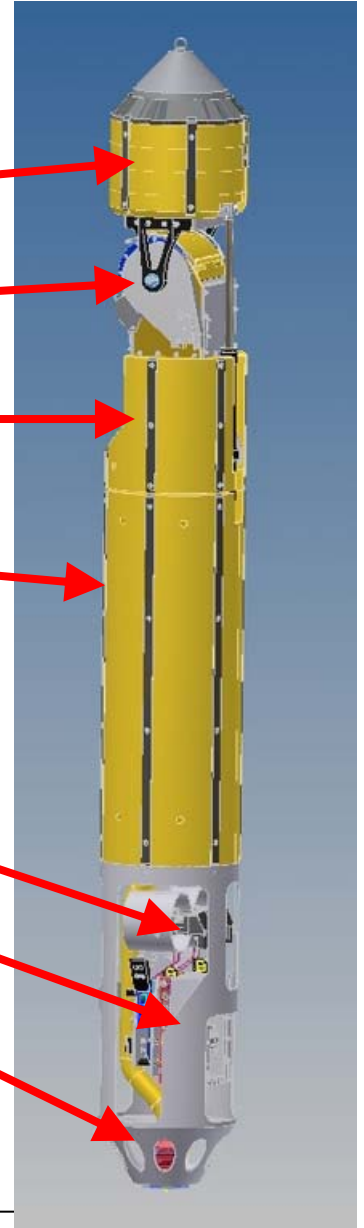


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## 2/4 Tank Cleaning Skimmer Tools

Consists of the following main elements:

- Main Buoyancy
- Skimmer Drum
- Pump Unit
- Secondary Buoyancy
- Thrusters - tiltable
- Control Box
- Swivel / Water Lubrication
- Umbilical



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## 2/4 Tank Cleaning Skimmer Tools Testing Program

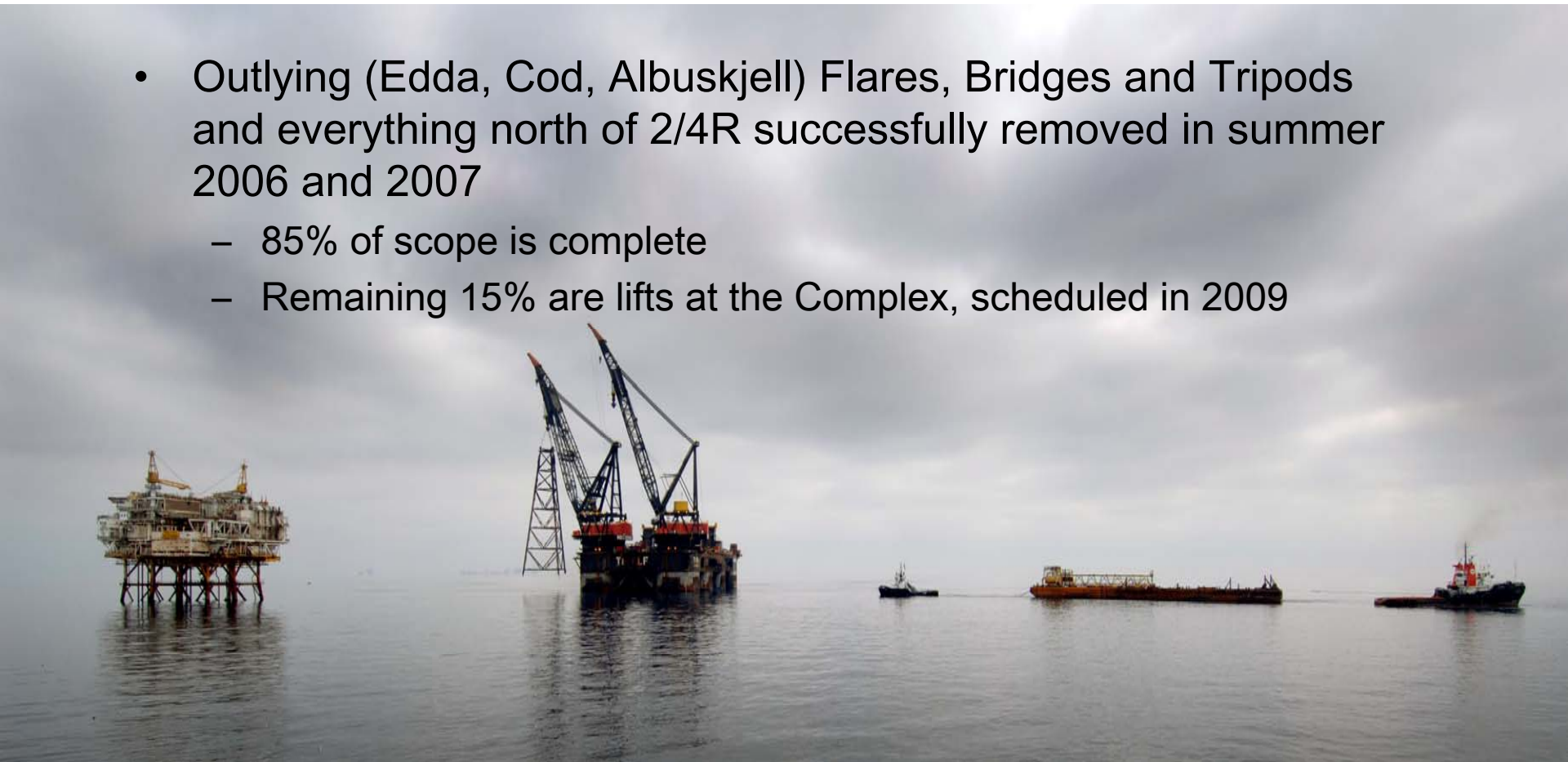
- **Parts tests**                      February-March
  - Pump, umbilical, thrusters, etc. shall be individually tested
- **FAT test**                      May
  - Shall be performed at quayside at Framo
- **Integration test**              May-June
  - Shall be performed on a boat at min 20m depth
  - Testing marine behavior
  - Maneuverability of the tool in a simulated cell
- **Skimming test**              July
  - Shall be performed in a pit at AKERSTORD
  - Test and train operators to use the equipment
  - Simulate the lowering through access shafts
- **Operations**                      Sept - Nov



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## Removal of Bridges, Flares and Tripods

- Outlying (Edda, Cod, Albuskjell) Flares, Bridges and Tripods and everything north of 2/4R successfully removed in summer 2006 and 2007
  - 85% of scope is complete
  - Remaining 15% are lifts at the Complex, scheduled in 2009





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## ACKNOWLEDGEMENT

THE AUTHOR THANKS CONOCOPHILLIPS NORWAY AND  
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FOR PERMISSION TO PUBLISH THE DATA PRESENTED