

ERMS

Environmental Risk Management System

by

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Coordinator

Background

- Norwegian authorities' requirements of 1997: "Zero discharges to sea"
- DREAM (Dose-related Risk and Effect Assessment Model) JIP, 1998 – 2001
- The success of the Environmental Impact Factor for produced water discharges - EIF_{PW}

Objectives

- The overall objective was to develop an environmental risk-based decision supporting tool with focus on drilling discharges.
- This tool shall help the oil industry to establish cost-effective mitigation measures for reducing potential harmful discharges to the marine environment from drilling operations.

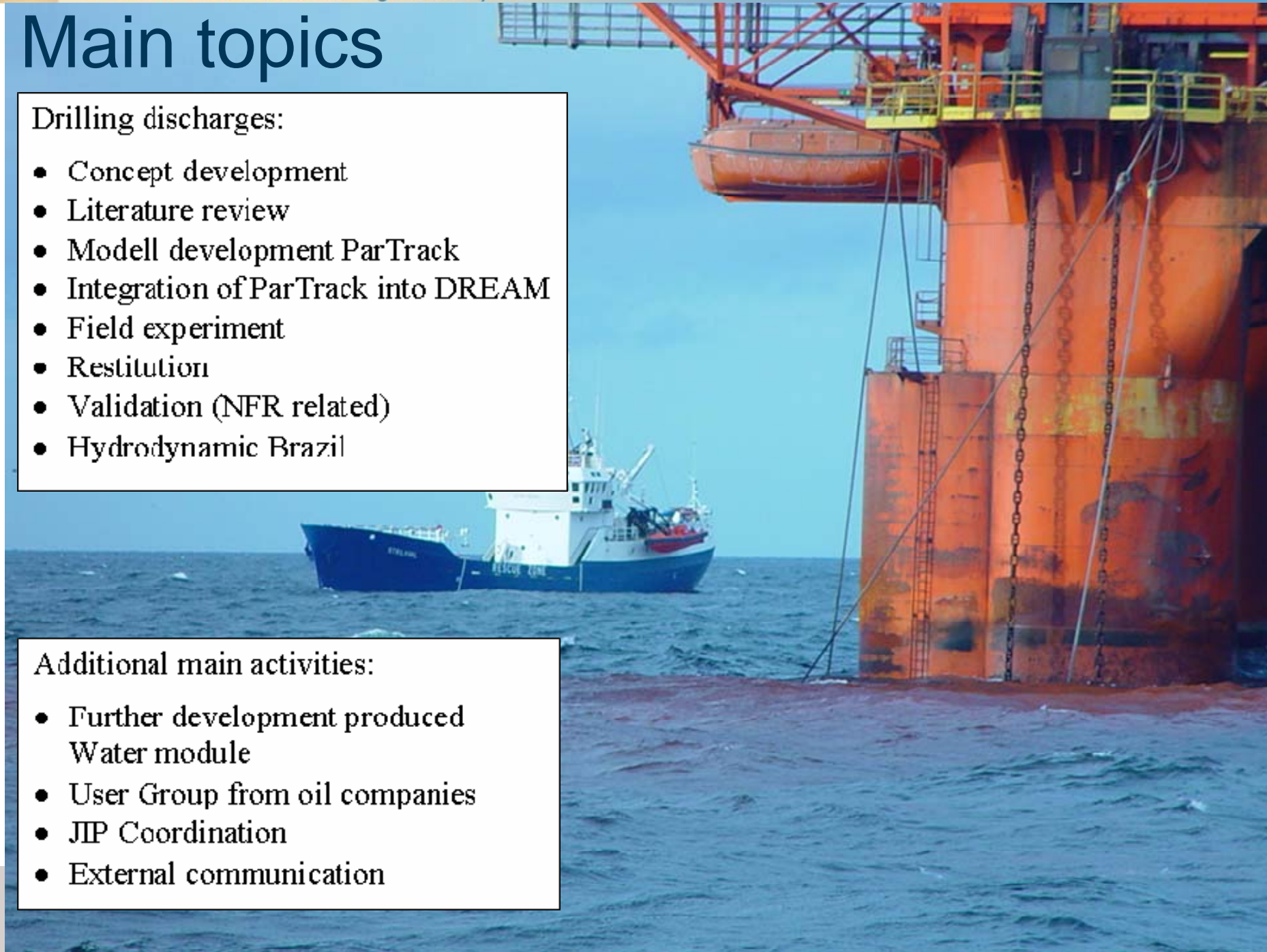
Main topics

Drilling discharges:

- Concept development
- Literature review
- Modell development ParTrack
- Integration of ParTrack into DREAM
- Field experiment
- Restitution
- Validation (NFR related)
- Hydrodynamic Brazil

Additional main activities:

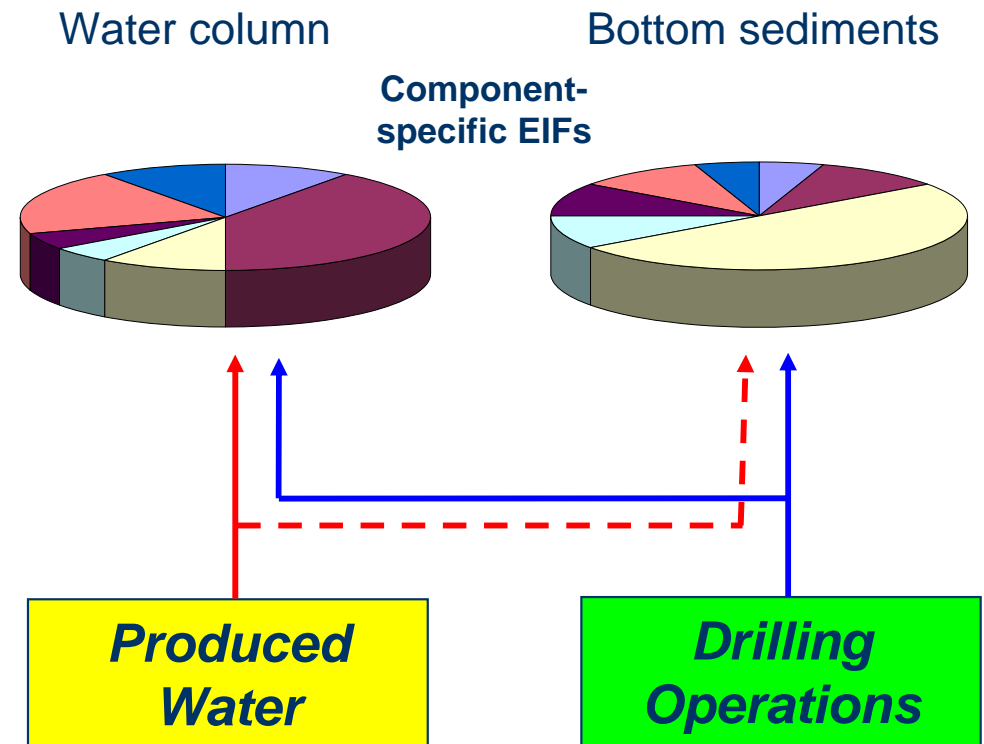
- Further development produced Water module
- User Group from oil companies
- JIP Coordination
- External communication



Main differences EIF_{PW} vs. EIF_{DD}

For drilling discharges:

- Additional environmental compartment
- Non-toxic stressors in addition to toxicity
- Different time scale
- Long monitoring experience in Norway



ERMS in numbers

- **Duration**

Initiated in 2002 and formally finalized in 2007

- **Budget**

Total budget of 28,5 mill NOK (approximately: 3,6 mill Euro)

- **Workshops (WS)**

Totally 7 workshops: 4 in Norway, 1 in Holland and 1 in Italy.

- **Steering Committee Meetings (SCM)**

Totally 14 SCMs: 7 in Norway, 1 in Holland, 1 in Italy and 5 phone meetings.

Deliverables

- License to the final DREAM model for simulation of produced water and drilling discharges
- 28 scientific reports
- 8 papers in scientific journals
- Oral presentations and posters
- 2 Newsletters distributed
- A brochure on Environmental Impact Factor for Drilling Discharges
- A CD including key information from the program, copy of reports and key presentations of the program and main findings

Publishing

- SETAC IEAM (Integrated Environmental Assessment and management) and ET&C (Environmental Toxicology and Chemistry) Journals:
4 papers accepted with modifications; 2 paper in review
- Chemometrics and Intelligent Laboratory System Journal:
1 paper in review
- Marine Environmental Modelling Seminar, Rio de Janeiro 2006:
1 paper in proceedings

Program management

Steering Committee: Eimund Garpestad, ConocoPhillips

Melania Buffagni, Eni

Ingvild Skare, ExxonMobil

Odd-Arne Follum, Hydro

Leticia Falcao Veiga, Petrobras

Knut Bakke, Shell

Ståle Johnsen, Statoil

Ulf-Einar Moltu, Total

Program coordinator: Ivar Singasaas, SINTEF

Cooperating R&D institutions with contact persons

MUST: Frode Brakstad

Univ. of Oslo: Anders Bjørgesæter

TNO-IMARES: Mathijs Smit

Akvamiljø: Steinar Sanni

Battelle: Greg Durell

Akvaplan-niva: Salve Dahle

SINTEF: Henrik Rye; Mark Reed

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