Arctic Emergency Operations

- Main project application forwarded to Research Council of Norway (RCN) on October 13, 2005
- Project approved December 2005
- Kick-off meeting in Trondheim 9-10 March, 2006

Project vision:
- An efficient and well balanced emergency operation system/organisation including procedures, equipment and trained personnel to prevent oil spill from future shipping accidents in Arctic waters
The Selendang Ayu incident

- Engine repair outside Unalaska Islands (December 2004)
- Unable to start the engine after the repair work
- Drifting, wind and sea conditions increasing
- USCG vessel “Alex Healy” arrived, towline established, but broke
- Another tug was requested, new towline established, drifting speed reduced from 4 to 2 knots
The Selendang Ayu incident

- Unable to turn the bow of the disabled vessel against the wind
- Towline broke after 12 hours
- Then one anchor was dropped from Selendang Ayu
- Anchor slipped/broke after 70 minutes
- Second anchor was dropped
- Anchor slipped/broke after 105 minutes
- Ship drifted until it grounded
The Selendang Ayu incident

- During helicopter evacuation of crew members the helicopter ditched and 6 of the crew member died.
- Later the ship broke in two spilling some cargo (soy beans) and approximately 1000 m**3 fuel oil.
The John R incident

- John R grounded at Kvitvær, 25th December 2000
- Ballast voyage from Liverpool to Murmansk
- Weather was harsh, wind and sea from northwest
- A week after the grounding the ship broke in two
- Aft body was left and has later on been broken down by wind and sea
# Tentative project schedule

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Project participants

- Norwegian:
  - Ship Manoevring Simulator Centre
  - Norwegian Coastal Administration, Norwegian Coast Guard
  - Buksér og Berging, Østensjøs Rederi, Taubåtkompaniet
  - Knutsen OAS, Teekay Norge, Tschudi Shipping (?)
  - Norwegian Hull Club, Gard, Skuld
  - Statoil, Eni Norge
  - Norwegian Meteorological Institute/Storm Weather Centre
  - MARINTEK
  - Norwegian University of Science and Technology – MSc student project and thesis work?
Project participants

- **Foreign partners:**
  - Ifremer, Total (France)
  - ENI (Italy) – most probably through their Norwegian office
  - National Maritime Research Institute (Japan)
  - Central Marine Research & Design Institute - CNIIMF (Russia)

- **Potential foreign partners:**
  - US Coast Guard (WP1 and 2)
  - Admiral Makarov State Maritime Academy/Makarov Training Centre (WP 5)
Project work method

- Within each work package there will be:
  - Company specific workshops
  - Workshops for work package participants
  - Open workshop where parties outside the project partners will be invited to share knowledge and experience
- Research companies and training institutions will prepare background material for workshops
- An annual open seminar will be arranged to present project results and plans for further work
Project work method

- Research companies and training institutions will draft project deliverables based on workshop discussions
  - Drafts to be reviewed by work package participants
  - Review comments will be used by an editorial group preparing the final deliverable
- Project management committee will meet twice a year to review progress and approve working plans for next period
WP1 Mathematical models for drifting vessels

Objective:
Improve existing models for drifting vessels, verify and validate new mathematical models based on scaled model tests and selected field tests.

Tasks
- Review present knowledge and models
- Map ongoing activities by invited international participants
- Plan field tests for drifting tankers
- Plan model tests (if found necessary)
- Develop simulation and prediction model for drifting tankers
- Validation using field measurement on vessels taking part in real life contingency training cases
Objective:
Develop knowledge on motion of a vessel as a function of loading condition, rest hull strength, environmental factors etc to provide input to emergency lightering or towing operations

Tasks:
- Review present unified 6 degree of freedom (6 DOF) sea-keeping and manoeuvring models
- Are models valid for harsh weather operations?
- Model tests and verification of numerical tools
- Hydroelastic response of vessel with reduced hull strength
WP3 Open sea emergency lightering, extreme conditions

Objective:
Develop and verify guidelines for emergency lightering operations in harsh weather situations in Arctic waters

Tasks:
- Review scenario developed in pre project
- Develop operational procedures for different scenarios, without and with an initial oil spill
- Update existing simulation models for lightering operations
- Approve procedures based on simulator studies of selected scenarios
- Prepare simulator based training for emergency lightering operations
WP4 Best practice “Towing disabled vessels in harsh conditions”

Objectives:
- Reduce consequences of all types of oil spills from incidents/accidents involving all types of vessels
- Improve competence related to emergency towing operations
- Develop new training offers for senior officers on emergency towing vessels/nominated contingency vessel

Tasks:
- Lessons learned from previous accidents
- Workshop on emergency towing in harsh weather (Honningsvåg, June 2006)
- Special factors due to Arctic conditions
- How to include critical Arctic factors when planning an emergency towing operation?
- Development of new ship models at SMS (Beta/Harstad/KV TBN/tug TBN)
- Simulation of different operational scenarios
- Preparing first guideline draft
- Workshop no. 2 in Brest, October 2006
WP4 International workshops

Objective:
- Collect and discuss lessons learned from previous accidents
- Discuss special factors due to Arctic conditions

Workshop will be arranged at Norwegian Coastal Administration office in Honningsvåg/on the coastal express ferry to Kirkenes (5 – 7 June, 2006)

International experts will be invited (outside of project partner organisations)

2nd workshop to be arranged by Ifremer in Brest during SAR week in October 2006 (16-20 October)
Objective:
- Describe and rank different ways of performing an emergency offloading operation with respect to safety, environmental and cost aspect.

Tasks:
- Ship handling in ice infested waters with/without icebreaker assistance (model tests and numerical simulation).
- Conventional ice strengthened tankers or double ended as offloading vessels?
- Operational aspects of side-by-side and tandem operations in case of an emergency offloading in ice covered waters?
- Application of icebreakers to support tanker operation in ice covered waters.
- Oil spill in ice, reduction of consequences.
WP6 Collision scenario – passenger and bulk carrier at Svalbard

Objective:
- Identify critical factor for a successful emergency operation

Tasks:
- Revision of “Barents Rescue 2005” scenario, new location in ice covered waters at Svalbard
- Lessons learned from the “Barents Rescue 2005” exercise
- Co-operation with ongoing Strategic University Program at NTNU “Scenario-based approach to risk analysis of ship collision and grounding” to establish consequences of a collision
- Simulation of scenarios at SMS
WP7 Dissemination activities

Objective:
- Support knowledge sharing activities within the project and with external stakeholders

Tasks:
- Prepare specific knowledge sharing activities as part of internal project communication (work groups, workshops and web based communication)
- Prepare quarterly (?) project newsletters
- Arrange open information meetings/workshops/seminars
- Prepare presentations and papers for national/international conferences and publications
WP8 Project administration

Objective:
- Make the project a success by supporting work package leaders and keeping administrative work at a minimum for project partners

Tasks:
- Nominate administrative project team
- Support WP Leaders with administrative matters
- Prepare formal reports to Research Council of Norway
- Develop and maintain project web site
- Coordinate project internal workshops
- Coordinate joint external dissemination activities
Benefits for stakeholders (1)

- **Oil companies**
  - Increased knowledge on possible emergency operations for tankers
  - Improved emergency preparedness for reduction of consequences of oil spill from ships
  - Better understanding of ship handling in ice

- **Tug operators**
  - Increased knowledge on possible emergency operations for tankers
  - Better input to planning of emergency towing operations
  - Increased safety for tug crew
  - New/improved simulator based training options
Benefit for stakeholders (2)

- **Shipping companies**
  - Improved knowledge and understanding of loads on vessels in harsh weather
  - Improved simulator based training options
  - Testing of emergency procedures
  - Reduced risk for oil spill

- **Insurance companies**
  - Improved knowledge on motion of disabled vessels
  - Reduced number of claims
  - PR value related to work to improve sea safety in northern regions
Benefits for stakeholders (3)

- **Maritime training and education centres**
  - Improved knowledge and understanding of harsh weather operations
  - Improved knowledge of ice navigation
  - New training offers with respect to emergency operations in harsh weather and ice covered waters
  - International co-operation

- **Research companies**
  - Development of new knowledge and understanding
  - Application of competence in a operational setting
  - Development of new modules for table top and full mission simulators
  - New customers
  - Increased international co-operation
Benefits for stakeholders (4)

- **Governmental bodies**
  - Increased knowledge on emergency towing operations
  - Increased knowledge on emergency lightering operations
  - International co-operation
  - New training tools for personnel involved in planning and performing emergency operations
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