

Joint industry program on:

Oil spill response for Arctic and ice-covered waters



Technology



Windows of
opportunity



Knowledge



Laboratory and
Field experiments



Being prepared for future challenges

AGIP KCO - BP - Chevron - ConocoPhillips - Shell - SINTEF - StatoilHydro - Total

Joint industry program on oil spill contingency for Arctic and ice-covered waters

The “JIP oil in ice” program will improve our ability to respond to oil spills in Arctic and ice-covered waters - for better protection of marine ecosystems and resources.

The oil and gas activity in Arctic and ice-covered waters has been ongoing for years and it will continue to grow in the future. Although there is a low risk of large oil spills, the increasing activity in Arctic waters, (ship traffic, exploration and production) requires continual improvements in the ability to protect the environment.



This is the major reason why 7 oil companies, together with a number of cooperating organisations has agreed to join forces with SINTEF to further improve our knowledge, capability and technology on oil spill response for Arctic and ice-covered waters. The R&D program was started in September 2006.

The most extensive oil in ice research program to date

The research program involves leading global research institutes and organizations specializing in oil spill response in ice infested waters, and it is being funded by major international oil companies with extensive experience in Arctic waters.



The objective of the program is to improve the capabilities of efficiently managing oil spills in ice-covered waters by improving knowledge about how oils behave and how they respond to traditional response technologies when there is ice present, as well as extending the operability of existing equipment.

Key elements of the program are;

P1. Fate and behaviour.

The fate and behaviour of oil is crucial information when deciding on response tactics and as input to oil spill response modelling. The main focus of this project is oil weathering properties under various ice conditions.

Contact: [Per Johan Brandvik](#),
per.johan.brandvik@sintef.no

*The “JIP Oil in ice” program
will improve our ability to protect the Arctic environment against the impact of oil spills*

P2 In situ burning

In situ burning is one of the response techniques with the highest potential for Arctic conditions especially under conditions of high concentration of ice and in snow. The suitability of in situ burning depends on the initial oil characteristics and the weathered state of the oil. A better basis for decision-making on when to use burning as a method to remove oil from the sea and ice surface will be established.

Contact: Ian Buist, ian@sloss.com



P3 Mechanical recovery

The highest potential for improving mechanical oil recovery in Arctic and ice-covered waters will be to further improve and adapt existing concepts. A number of existing concepts will be tested to define limitations and make suggestions for improved operation in Arctic and ice-covered waters.

Contact: Ivar Singasaas, ivar.singasaas@sintef.no



P4 Chemical dispersants

The use of dispersants has potential in ice-covered waters.

The technology will be improved and the understanding of the effects will be increased to further improve the knowledge on how and when to use dispersants in ice-covered and Arctic waters. The effectiveness of dispersants will be studied and the “window of opportunity” defined for operational use of dispersants in ice-covered waters. A basis for improvement of dispersant application systems will also be established.

Contact: Per S. Daling, per.daling@sintef.no

P5 Remote sensing

Remote sensing systems (surface, airborne and satellite) and sensors can detect and map oil under a range of ice conditions (under ice, encapsulated, on ice under snow, in water or slush, among thicker ice floes etc). Different systems will be tested under different field conditions to verify their applicability through a number of field experiments. This will improve the ability to use remote sensing systems as a tool in oil spill response operations.

Contact: David Dickins, dfdickins@sbcglobal.net



Better protection of marine ecosystems and resources

The “JIP Oil in ice” program will improve our ability to respond to oil spills in Arctic and ice-covered waters

Program coordinator:

Stein Erik Sørstrøm

phone: +47 99536050

e-mail: stein.e.sorstrom@sintef.no



Agip KCO



ConocoPhillips



 **SINTEF**

StatoilHydro



Cooperating Organisations

Alaska Clean Seas, Arctic Slope Regional Corporation, The Norwegian Coastal Administration, Oil Spill Recovery Institute, Coastal Research Response Centre (University of New Hampshire), The University Centre in Svalbard

Research Associates

DICKINS

SLR
SL ROSS

www.sintef.no/jip-oil-in-ice

P6 Generic OSCG

One important outcome of the R&D program will be to establish a generic oil spill response guideline. The guideline will give recommendations for preferred response measures under different ice conditions.

Contact: Gina Ytteborg,
gina.ytteborg@shell.com



P7 Coordination

The JIP on oil in ice is a complex and large program requiring overall coordination to make sure that those activities, tasks and projects can be accomplished in a timely and professional manner. This project takes care of the overall coordination, management and communication including overall scientific as well as economic coordination, regular meetings (scientific meetings and Steering Committee Meetings) and work shops.

Contact: Stein Erik Sørstrøm,
stein.e.sorstrom@sintef.no

P8 Field experiments

Field experiments are an important part of the R&D program as they are crucial for the final testing and verification of solutions developed during the R&D program. Full scale field tests will be carried out at Svalbard as well as offshore Svalbard and in the marginal ice zone in the Barents Sea.

Contact: Stein Erik Sørstrøm,
stein.e.sorstrom@sintef.no

P9 Effects

Project 9 became part of the program after a request from University of New Hampshire (Coastal Response Research Centre) in cooperation with U.S. National Oceanographic and Atmospheric Administration (NOAA). CRRC suggest utilizing the field experiments to collect data that will improve the knowledge of the process related to effects when oil enters ice-covered waters.

Contact: Amy Merten, amy.merten@noaa.gov



The "JIP Oil in ice" program will advance and build new capability (tools, skills, and operational experience) for responding to oil spills in ice covered waters

Why do we need the JIP Oil-in-Ice program?

Oil spill response for open water (knowledge, technology, capability and experience) was developed through numerous R&D programs since the beginning of marine oil and gas development. These programs and field experiments continue to play an important role in the development of effective response strategies.

One quarter of the remaining unexplored and undiscovered oil and gas resources might be located in Arctic and ice covered regions. As future oil and gas activity is expected to move further north, and as shipping activities in these regions increase, new environmental safeguards must be developed. R&D programs that focus on these rapidly evolving Arctic issues will help find effective solutions to the challenges of northern offshore development.

Major oil companies with Arctic experience are sponsors

The principal partners are oil companies, R&D centers and a number of cooperating organisations. In addition to this a number of organisations and persons are taking active part in reference groups and various projects and subprojects. Further information on each project can be obtained directly from the project managers listed in the brochure.



The JIP will produce invaluable results

- Improved modelling capabilities.
- Improved knowledge of windows of opportunity for in situ burning and the use of chemical dispersants
- Modified mechanical recovery tools for ice conditions (e.g.: skimmers, dispersants application systems).
- Field studies to test new ideas
- A generic oil spill response guideline to help plan oil spill response strategies.
- Improved general knowledge of the use of fire proof booms and in situ burning
- Testing the application of remote sensing systems

The program is fully financed through direct funding and in-kind support.

With a total budget (direct funding) of NOK 50 mill (US\$ 9,5 mill) and in-kind support with an estimated value of as much as NOK 10 mill (US \$ 1,85 mill), the JIP on Oil-in-Ice is the largest R&D program on oil spill contingency ever initiated.

