

*The Norwegian Research Council  
and  
The Russian Academy of Sciences*

**Hosts the Second**

**“Norway – Russia Arctic Offshore Workshop”**

Co-organized by:  
The Norwegian Research Council  
and  
The Russian Academy of Sciences

and supported by the Offshore Northern Sea Foundation

**Venue:  
University of Stavanger,  
Arne Rattedals house**

**Date: August 19, 2006**

**09:45 a.m. – 04:00 p.m.**

Registration starts at 09:30 a.m.

## Background and Purpose

The principal objectives of the Norway – Russia Arctic Workshop are:

- to establish a joint Research and Technology Forum and a meeting place,
- to identify possible target areas for new and broadened co-operation within the area of Arctic Offshore Petroleum R&D
- to establish suitable frameworks for project common research and technology co-operation and financing.

The formats and scope of co-operation will be sought for projects focusing on new innovation and development of technology.

With technology and application of technology as a basis for the workshop discussions, participants are invited from basic and applied research institutions, from business and industry, manufacturers and service companies, oil and gas companies. Both Russian and Norwegian Government participants are invited to attend.

For each of the workshop sessions, key persons/organisations from Russia and Norway are specially invited, prepared to actively contribute to the discussions. They will also have good and up to date knowledge of technology development project currently in process, and areas of new technologies and applications. The goal will be to find areas of mutual interest for future cooperation.



## Program

09:15: Bus transportation from Clarion hotel

<b>09:45</b>	<b><i>Opening Plenary Session: Petroleum R &amp; D</i></b>
	<p><b>Moderator:</b>  <b>Erik Skaug</b>, Director PETROMAKS R&amp;D program, The Research Council of Norway</p> <p><b>Opening presentation:</b></p> <ul style="list-style-type: none"> <li>• <b>Academician Anatoly Dmitrievsky</b>, Russian Academy of Sciences</li> <li>• <b>William Christensen</b>, Ministry of Petroleum and Energy, Norway</li> <li>• <b>Roman Samsonov</b>, VNIIGAZ / Gazprom, Russia</li> <li>• <b>Else Gunhil Ormaasen</b>, NPD, Norway</li> </ul>

**11:30 – 15:15: Parallel Round Tables**

**12:30 – 13:30: Luncheon**

<b>Round Table 1: Integrated Operations in Arctic Environments</b>	<b>Round Table 2: Flow Assurance in Arctic Operations</b>	<b>Round Table 3: Environmental challenges in Arctic</b>	<b>Round Table 4: Challenges for Arctic LNG production and offtake</b>	<b>Round table 5: Geology and Development of Oil and Gas Fields in the Barents Sea</b>
Facilitators: <b>Fridtjov Øwre</b> , IFE <b>Jon Lippe</b> , NTNU	Facilitators: <b>John Olaf Rømme</b> , Scandpower PT <b>Dag Thomassen</b> , IFE	Facilitators: <b>Troels Jacobsen</b> , IRIS <b>Salve Dale</b> , Akvaplan Niva	Facilitators: <b>Mona J. Mølnvik</b> , SINTEF <b>Anatoly B. Zolotukhin</b> , Statoil	Facilitators: <b>Anatoly N. Dmitrievsky</b> , IPNG <b>Leonid Surguchev</b> , IRIS

**15:15 – 16:00: Round Tables Discussions**

<b>15:15 - 16:00</b>	<p><b><i>Summary and lead for further action by:</i></b></p> <p>Round tables 1, 2, 3, 4, 5: Short summary presentations by facilitators</p> <p><b>Moderators:</b></p> <ul style="list-style-type: none"> <li>▪ Academician Anatoly N. Dmitrievsky, Director of Oil and Gas Institute of the Russian Academy of Sciences</li> <li>▪ Erik Skaug, Director PETROMAKS R&amp;D program, The Research Council of Norway</li> </ul>
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16:15: Bus transportation from UiS to Clarion hotel

## **Saturday, 19 August**

19:00: Dinner at Bølgen & Moi restaurant

## **Sunday, 20 August**

12:00 - 16.30: Boat trip, Departure from [Skagen kaien](#)

19:00: INTSOK reception at Hall Tall

## **Bus transportation:**

### **19 August**

9:15: from Clarion and SAS Royal Hotels to University of Stavanger

16:15: from University of Stavanger to Clarion and SAS Royal Hotels

## **Round table 1: “Integrated Operations in Arctic Environments”**

### **Facilitators:**

**Fridtjov Øwre, Institute for Energy technology (IFE)**

**Jon Lippe, The Norwegian University of Science and Technology (NTNU)**

In Norway *Integrated Operations (IO)* is a concept which in the first phase (G1) has been used to describe how to integrate processes and people onshore and offshore using ICT solutions and facilities that improve onshore’s ability to support offshore operationally. The second generation (G2) Integrated Operations aims to help operators utilize vendors’ core competencies and services more efficiently. Utilizing digital services and vendor products, operators will be able to update reservoir models, drilling targets and well trajectories as wells are drilled, manage well completions remotely, optimize production from reservoir to export lines, and implement condition-based maintenance concepts. The total impact on production, recovery rates, costs and safety will be profound.

When the international petroleum business moves to the Arctic region the setting is very different from what is the case on the Norwegian Continental Shelf (NCS) and new challenges will rise. The Norwegian Ministry of Environment has recently issued an Integrated Management Plan for the Barents Sea (Stortingsmelding 8 2005-06) where one focus is on “Monitoring of the Marine Environment in the North”. The Government aims to establish a new and more coordinated system for monitoring the marine ecosystems in the north.

The Snøhvit field is the first Norwegian field developed in the Arctic area. The challenges and solutions developed for Snøhvit will probably be typical for the future developments in the Arctic area: the offshore development contains no surface installations; none of its installations will interfere with fishing; the subsea facilities can be overtrawled; the field, transport systems and on-shore factory is a closed system providing neither harmful emissions nor discharges; piping systems for transporting unprocessed wellstreams over long distances are implemented; a biological treatment plant on land deals with environmentally-harmful components; carbon dioxide in the wellstream is separated on shore, piped back to the field and stored underground.

### **Main issues to be discussed at the round table on "Integrated Operations in Arctic Environments"**

- What major operational challenges will the oil and gas industry face in the Arctic environment?
- Can the concept of Integrated Operations be implemented from the very start of the oil and gas development in the Arctic area? What would be the prioritized IO topics to implement? Can the “classic” IO concept be developed to include Environmental monitoring? Shall vendors’ core competencies and services be remotely connected to the foreseen Integrated Operation Centers?
- How can general operational experience from both Russian and Norwegian side be integrated to provide safe and efficient field operations in the Arctic area?
- How can Russian and Norwegian R&D institutions - together with major Russian and Norwegian based oil companies/suppliers team up to solve some of the challenges both in the short and the medium time frame

## **Round table 2: “Flow Assurance in Artic Operations”**

**Facilitators:**

**John Olaf Rømme, Scandpower PT**

**Dag Thomassen, Institute for Energy technology (IFE)**

Flow assurance is all about identifying and preventing potential problems for oil and gas production throughout the field life. In artic or cold climates, where production piping and facilities are exposed to permafrost and sub-zero temperatures over long distances, flow assurance can be very challenging. Design but also operating strategies and procedures must identify and quantify threats, and mitigation alternatives must be available when the operating conditions change. During the design and preparation phases the engineers rely on various simulations tools including dynamic multiphase flow simulations to determine the limitations of the operational area due to surges of liquid and pressure as well as the potential blocking of the flow by solids precipitation such as hydrates and waxes. However, during design and planning it is not possible to foresee all potential problems that must be handled adequately during the operation. With a dynamic multiphase flow simulator integrated in an e-operation environment the flow assurance is brought to operators by providing new windows into the parts of the system where there is no instrumentation. This gives unprecedented abilities to handle the unexpected and also to predict future events through reliable look-ahead simulations based on actual present conditions. The effect is safer operations and less downtime leading to increased recovery and lower overall costs.

## **Round table 3: “Environmental challenges in Arctic”**

**Facilitators:**

**Troels Jacobsen (IRIS)**

**Salve Dale (Akvaplan Niva)**

Environmental challenges related to potential spills in arctic are numerous. After the workshop in Russia in November 2005 several topics were presented. This has been addressed and a dialogue between IRIS, SINTEF and Akvaplan-Niva has come forward with the following topics that are envisaged to be discussed in a round table session.

- Environmental risk and ecosystem models for the arctic
- Effect studies of oil spills in arctic waters
- Environmental technologies / biosensor based monitoring
- Environmental monitoring based on satellite in the arctic
- Bioremediation in cold water

We expect that the invited participants should together have the necessary knowledge about current projects within the topics mentioned in order not to duplicate already existing R&D projects.

A new large industry financed programme “oil in ice” coordinated by SINTEF will be presented at the round table. It would be interesting to develop projects that can make use of the costly field experiments planned within that programme.

Depending on the main interest maybe there will be a focus on a few of the proposed themes.

11.30 - 11.45: introduction to the round table and what we expect to achieve - financing mechanisms by Troels Jacobsen /IRIS

11.45 - 12.00: presentation of the oil in ice JIP by Tore Aunås - SINTEF

12.00 – 12.30: Environmental risk and ecosystem models for the arctic - introductory presentation (10 min) by Mark Reed / SINTEF

12.30 – 12.45: Effect studies of oil spills in arctic waters intro presentation

12.45 – 13.15: Environmental technologies / biosensor based monitoring - intro presentation by Shaw Bamber / IRIS (10 min)

13.15 – 14.00: Environmental monitoring based on satellite in the arctic - intro presentation by NERSC + NIVA

14.00 – 14.20: Bioremediation and degradation in the arctic - intro presentation by SINTEF (10 min)

14.20 - 15.00: General discussion – key elements to first project possibilities

## Round Table 4: “Challenges for Arctic LNG production and offtake”

### Facilitators:

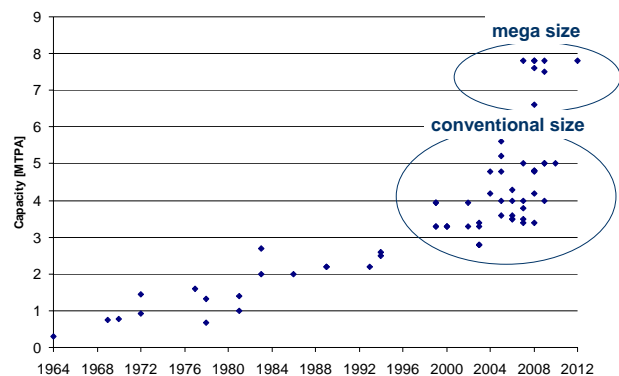
**Mona J. MølInvik (SINTEF)**

**Anatoly B. Zolotukhin (Statoil)**

### Abstract

Recent assumptions tell that 25% of the world’s undiscovered fossil fuels are hidden in Arctic regions - especially in Russia, underneath the Barents Sea and in Alaska.

During the last decade the international LNG trade has undergone an unprecedented growth, and due to economy of scale the LNG train size has increased from 1-2 Mtpa in the 1970-ies, towards 8 Mtpa, as planned for Qatar by 2008. Moving towards large train sizes, however, requires large equipment, which represents a huge challenge for the on-site installation.



Late 2005 SINTEF launched an initiative for establishing a Centre for Research-based Innovation (CRI), ARCTIC GAS. The initiative was not funded. The Round-table conference might be a nice opportunity to discuss possible future initiatives.

Main topic for the round table discussion:

- Arctic LNG – the challenge
- Possible R&D tasks
- Possible cooperation

### Program

Introduction and welcome:

Anatoly B. Zolotukhin, Technical Director, Statoil Russia and Mona J. MølInvik, Senior Scientist, SINTEF

Presentations:

Ove Tobias Gudmestad, Senior Technical Adviser, Statoil: *Technology for transport of hydrocarbons in the Arctic as an important issue to reduce risk in Arctic offshore developments*

Inge R. Gran, Research Director, SINTEF: *The Arctic Gas initiative*

Tore Løland, Staff Engineer LNG, Statoil: *LNG Plant construction and operation in Arctic climate*

Mona J. MølInvik, Senior Scientist, SINTEF: *Baseload LNG - Technology trends*

**Round table 5:  
“Geology and Development of Oil and Gas Fields in the  
Barents Sea”**

**Facilitators:**

**Anatoly Dmitrievsly (IPNG)**

**Leonid Surguchev (IRIS)**

**Presentations:**

**Roman Samsonov, Dilizhan Mirzoev (VNIIGAZ/GAZPROM)**

"Major Statements of JSC GAZPROM Working Program on the Russian Shelf until the Year 2030".

**Leonid Kulpin (NIPI Morneftegaz)**

"Problems of the development of Arctic off-shore hydrocarbon fields in the conditions of gashydrates saturated near bottom layers"

**Leonid Kulpin (NIPI Morneftegaz)**

"Forecast of the hydrocarbon production up to 2030 on Russia's shelf and the development of corresponding infrastructure."

**Willy Fjeldskår (IRIS)**

"Petrobar project"