WAGENBORG SHIPPING B.V.


**GROWTH Project GRD2-2000-30112 "ARCOP"**

# D3.7.1 REPORT ON CURRENT PRACTICES

WP3: Integrated transportation system for Arctic oil and gas

WP3.7: Training for Arctic Navigation

Author(s): Anniek Platzer, Wagenborg Shipping

# DELIVERABLE D3.7.1

# REPORT ON CURRENT PRACTICES

| | |
|---|---|
| **CONTRACT N°:** | GRD2/2000/30112-S07.16174 |
| **PROJECT N°:** | GRD2/2000/30112-S07.16174-ARCOP |
| **ACRONYM:** | ARCOP |
| **TITLE:** | Arctic Operational Platform |
| **PROJECT CO-ORDINATOR:** | Kvaerner Masa-Yards Inc. (KMY) |

**PARTNERS:**

| | |
|---|---|
| Kvaerner Masa-Yards | FIN |
| Royal Wagenborg | NL |
| Hamburg University of Applied Sciences | D |
| Tecnomare SpA | I |
| Merenkulun turvallisuuskoulutuskeskus | FIN |
| Central Marine Research and Design Institute | RU |
| Arctic and Antarctic Research Institute | RU |
| Hamburgische Schiffbau-Versuchsanstalt GmbH | D |
| Alpha Environmental Consultants Ltd | NO |
| The Foundation of Scientific and Industrial Research at the Norwegian Institute of Technology (SINTEF) | NO |
| Fortum Oil and Gas | FIN |
| Helsinki University of Technology | FIN |
| Nansen Environmental and Remote Sensing Centre | NO |
| Finnish Institute of Marine Research | FIN |
| Technical Research Centre of Finland | FIN |
| Stiftung Alfred-Wegener-Intitut fur Polar und Meeresforschung | D |
| The Fridtjof Nansen Institute | NO |
| Lloyds Register | UK |
| University of Lapland | FIN |
| The Norwegian College of Fishery Science | NO |
| Ministry of Trade and Industry | FIN |

| | |
|---|---|
| **REPORTING PERIOD:** | From 01.12.2002 |
| **PROJECT START DATE:** | 01.12.2002 |
| **DURATION**: | 36 Months |
| **DATE OF ISSUE OF THIS REPORT:** | 15-11-2004 |

**Project funded by the European Community under the 'Competitive and Sustainable Growth' Programme (1998-2002)**

# DELIVERABLE SUMMARY SHEET

| **Short Description** |
|---|
| The purpose of this report is to review the existing practices for training captains, officers and ice pilots for safe, rational and effective navigation in ice-covered waters. |

| **Author(s)** | |
|---|---|
| Name | Company |
| Anniek Platzer, Project Manager | Wagenborg Shipping B.V., Netherlands |

| **Internal Reviewing / Approval of report** | | | |
|---|---|---|---|
| Name | Company | Approval | Date |
| Kimmo Juurmaa | KMY | | 11.02.2005 |
| Sergey Rodionov | CNIIMF | | December 2003 |
| Bob Derks | Wagenborg Shipping | | December 2003 |

| **Document history** | | | | | |
|---|---|---|---|---|---|
| Revision | Date | Company | Initials | Revised pages | Short description of changes |
| S. Saarinen | 110205 | AARC | SSa | Info-pages | Finalization |

## DISCLAIMER



**Project funded by the European Community under the 'Competitive and Sustainable Growth' Programme (1998-2002)**

## ABSTRACT

IMO has published Guidelines for ships in ice covered waters, but the guidelines are not (yet) mandatory. Several countries have their own national rules for navigating in ice covered waters that often only apply to national flagged vessels.
Shipowners in North and Middle Europe, if at all, do not train their personnel explicitly and extensively for navigation in ice-covered waters. Operators of Icebreakers in North Europe do train their personnel and training is mainly done through practical training and lectures on ice and its properties. Operators of Icebreakers in Russia do train their personnel and training is mainly done through training on the job.
It is presumed that operations in ice covered areas shall be carried out by certified personnel in the future.



## KEY WORDS

Northern Sea Route, Training for Navigation in Ice, Existing Practices


**Project funded by the European Community under the 'Competitive and Sustainable Growth' Programme (1998-2002)**

# CONTENTS



**Project funded by the European Community under the 'Competitive and Sustainable Growth' Programme (1998-2002)**

# 1. Introduction

The development of the Arctic offshore oil and gas reserves and the use the Northern Sea Route as an alternative transportation route for the Arctic oil and gas in general, involves risks and questions, which should be investigated.
ARCOP aims to find the practical solutions to the major problems including the training of crews navigating in ice.

The purpose of this report is to review the existing practices for training captains, officers and ice pilots. Today shipping companies developing transportation in ice bound sea areas experience the lack of possibilities to train sea personnel for these new conditions. The practical problems that shipping companies encounter need to be recorded.

The information in this report is derived from a questionnaire that Wagenborg sent to 4 participants of ARCOP and 2 non participants, from a survey conducted by Merituva some years ago Wagenborg experience and the experience of Wagenborg's Joint Venture Partner for the Sakhalin Project; Sakhalin Shipping Company

**Project funded by the European Community under the 'Competitive and Sustainable Growth' Programme (1998-2002)**

# 2. Rules and Regulations

## 2.1. International

Training requirements with regard to navigating in ice do exist, but are not specifically mentioned in applicable international rules and regulations like STCW 95 and the ISM Code, moreover they do not set standards for training requirements.
In 2002 IMO has published Guidelines for ships operating in ice covered waters, but the guidelines are not mandatory because most countries have not incorporated the guidelines in their national legislation and because the guidelines are not an IMO convention or part of an IMO convention.
In accordance with the guidelines all ships in ice-covered waters should carry at least one ice navigator qualified in accordance with these guidelines. Besides that continuous monitoring of ice conditions by an Ice Navigator should be available at all times while the ship is underway and making way in the presence of ice. The guidelines instruct that all of the ship's officers and crew should be made familiar with cold weather survival by training of self-study of course material or publications and as many as possible of the ship's deck and engine officers should be trained in ship operations in ice-covered waters.
The ice navigator should have documentary evidence of having satisfactorily completed and approved training in ice navigation. Such a training program should provide knowledge, understanding and proficiency required for operating a ship in Arctic ice-covered waters including:

- Recognition of ice formation and characteristics
- Ice indications
- Ice manoeuvring
- Use of ice forecasts, atlases and codes,
- Hull stress caused in ice
- Ice escort operations
- Ice-breaking operations
- Effect of ice accretion on vessel stability

## 2.2. National

Norway intends to make the rules mandatory for Norwegian flagged ships by incorporating the guidelines in the national merchant laws.
All the countries in the Working Group for development of the Guidelines for ships operating in ice covered waters -Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, USA- and Japan have committed themselves to make the guidelines mandatory for ships flying their flags.
Russia has set rules for access to the Northern Sea Route with regard to experience in operating vessels in ice with their "Guide for Navigation through the Northern Sea Route". The Guide is applicable to both the NSR itself (from Nova Zembla to Bering Strait) and to the Barentsz and Bering sea areas covered by ice. To this moment in Russia training seafarers for operations in ice conditions is not mandatory.

Canada has set demands on the crew training in CASPPR (Canadian Arctic Ship Pollution Prevention Regulations). Whether the Canadian plan agrees with ASM is a subject for discussion.

**Project funded by the European Community under the 'Competitive and Sustainable Growth' Programme (1998-2002)**

# 3. Current Practice

To collect information on current available training, we have set-up a questionnaire which was sent to shipping companies and other parties all over the world. See attachment 1.
From the questionnaires, the survey conducted by Meriturva some years ago and Wagenborg experience we may conclude that shipowners in North and Middle Europe, if at all, do not train their personnel explicitly and extensively for navigation in ice-covered waters. Operators of Icebreakers in North Europe do train their personnel and training is mainly done through practical training and lectures on ice and its properties. Operators of Icebreakers in Russia do train their personnel and training is mainly done through training on the job and/or through theoretical training. Training is limited to nautical officers mostly.
Presently not all companies can send seafarers that have received a certificate for a higher rank on training for navigation in ice.

## 3.1. Icebreakers

From the data collected from the questionnaire we may conclude that navigators of icebreakers do receive specialised training.

| Vessel | Area | Training | |
|---|---|---|---|
| Icebreakers | Baltic | Theoretical training<br>Practical training<br><br>Training on the job | Special courses by FMA<br>Special courses for ice navigation and assisting vessels<br>Rotation on different icebreakers |
| Icebreakers | Baltic | Theoretical training<br>Practical training<br>Simulator training | One week<br>Four weeks training o/b icebreakers<br>Attempted , but was found not very effective |
| Icebreaking Passenger Vessels | Far East | Theoretical training<br><br>Training on the job | Courses by Marine College and Training Institute on Sakhalin<br>Inexperienced Navigtors and Engineers learn from their experienced colleagues |
| Icebreakers | Far East | Theoretical training<br><br>Training on the job | Courses by Marine College and Training Institute on Sakhalin<br>Inexperienced Navigtors and Engineers learn from their experienced colleagues |

| | | | |
|---|---|---|---|
| Icebreaking Supply Vessels | Caspian | Theoretical training<br><br>Practical training<br><br>Training on the job | Creating a general understanding of ice navigation, icing breaking, operations and assistance in ice<br>O/b MSV (Multi Service Vessel) Nordica in the Gulf of Finland<br>How to use the Azipods most effectively in life situations through ice tests of new designed vessel |

### 3.2. Ice strengthened vessels

Navigators of vessels that are assisted by icebreakers do not always receive training and the training that is provided is less intensive and less specialised.

| Vessel | Area | Training | |
|---|---|---|---|
| Ice strengthened cargo vessels | Baltic | Training on the job | An inexperienced Chief Officer learns from his experienced Captain, but also the other way around |
| Ice strengthened cargo vessels | Far East | Training on the job | Inexperienced Navigtors and Engineers learn from their experienced colleagues. |
| Merchant Navy | Baltic | Theoretical training | How to act during assistance of icebreaker |

# 4. Effect of the training

The general opinion is that practical training combined with theoretical training is essential or for navigators of icebreakers, whereas theoretical training or training on the job is considered sufficient for navigators of vessels that are assisted by icebreakers.

## 4.1. Practical training

Practical training is most effective when the navigator is considered a trainee and is on board in addition to the regular crew and can observe experienced officers and practice under supervision of experienced officers. Practical training gives inexperienced navigators the opportunity to increase their skills in actual operations.

## 4.2. Training on the job

Another form of practical training is training on the job when the navigator is on board as part of the regular crew and has to learn ice operations from his experienced colleagues.

## 4.3. Theoretical training

Theoretical training creates a general understanding of ice navigation, icing, icebreaking operations and assistance in ice. Theoretical knowledge prepares inexperienced navigators for problems that might occur in ice infested water and gives guidance on how to secure operability of the ship under severe ice conditions.

## 4.4. Simulator training

Opinions on simulator training are divided, it is not always found to be effective. Because reliable and efficient modelling techniques are currently not available it is very difficult to create models for ships operating in ice.

## 5. Conclusions

Navigation in ice requires special knowledge and skills and it is expected that the guidelines that were issued by IMO will be mandatory in the near future, which will create standards for training of navigators in ice.
The high expectations of customers and the safety of crew, vessel, cargo and environment will become more and more a motivator for shipping companies to increase the knowledge and experience of their crews. But at the same time the freighrates are under great pressure and the labour market is very tight.
Al the more reason to investigate the possibilities and feasibility of training crews in navigating in ice further.

**Project funded by the European Community under the 'Competitive and Sustainable Growth' Programme (1998-2002)**

## 6. References


- Navigation in Ice Infested Waters and Icebreaker Assistance, published by Meriturva, recide Edition dated March 11th 2002
- Lecture on Polar Navigation and Trafficability in Arctic and Baltic Ice held by Norwegian Maritime Directorate on April 10th 2003
- Working Paper no 17 Operations Aspects published in 1995 by INSROP (International Northern Searoute Program)
- Working Paper no 91 Operations Aspects Volume 2 – 1994 project work published in 1997 by INSROP (International Northern Searoute Program)
- Working Paper no 101 Operations Aspects Volume 3 – 1995 project work published in 1998 by INSROP (International Northern Searoute Program)
- Guidelines for Ships Operating in Arctic Ice-Covered Waters published in December 2002 by International Maritme Organisation (IMO)

# QUESTIONNAIRE

## PURPOSE OF THE QUESTIONNAIRE

Part of the ARCOP project is the work package “Training for Arctic Navigation” (WP 3.7). Wagenborg, being the leader of this WP, would like to ask for your co-operation in investigating current practices for training crew in navigating in ice.

For this purpose we would like you to fill out this questionnaire concerning your experiences with training of crews in navigating in ice.

| NAME | COMPANY | POSITION |
|---|---|---|
| | | |

## QUESTIONS

**1.** What kind of experience does your company have with regard to operating vessels in ice infested waters. The information we are looking for is for example are you operating ice breakers or cargo vessels and what is the ice class and trading area of the vessels.

| | | | |
|---|---|---|---|
| ☐ | Ice breakers | Trading Area | |
| | | Ice Class | |
| ☐ | Cargo vessels | Trading Area | |
| | | Ice Class | |
| ☐ | Other, namely | Trading Area | |
| | | Ice Class | |
| | | Trading Area | |
| | | Ice Class | |

**2.** Has your company ever trained crew for navigating in ice through training on the job

| | |
|---|---|
| ☐ | Yes |
| ☐ | No |

If yes, please give a short description

**3.** In case you have experience with training on the job was it

**a)** on similar vessels, but in different conditions

| | |
|---|---|
| ☐ | Yes |
| ☐ | No |

**b)** or in similar conditions, but on different vessels

| | |
|---|---|
| ☐ | Yes |
| ☐ | No |

Please give a short description

**4.** Has your company ever trained crew for navigating in ice through lectures or studies

| | |
|---|---|
| ☐ | Yes |
| ☐ | No |

If yes, please give a short description

| **5.** Has your company ever trained crew for navigating in ice through simulator training | |
|---|---|
| ☐ | Yes |
| ☐ | No |
| If yes, please give a short description | |
| | |

| **6.** Is there a report available on the results / experiences | |
|---|---|
| ☐ | Yes |
| ☐ | No |
| If yes, could you please send it to us so we can use it for the ARCOP project | |
| I no, could you please give a description of the results / experiences. | |
| | |

| **7.** Did you quantify the effectiveness of the training | |
|---|---|
| ☐ | Yes |
| ☐ | No |
| If yes, could you please send us the details so we can use it for the ARCOP project | |

| | | | |
|---|---|---|---|
| **8.** Please indicate the time involved in the training | Training on the job | | days |
| | Lectures / studies | | days |
| | Simulator training | | days |

| | | | |
|---|---|---|---|
| **9.** Please indicate the frequency of refresher courses | Training on the job every | | years |
| | Lectures / studies every | | years |
| | Simulator training every | | years |

| **10.** Do you have a dedicated training officer | |
|---|---|
| ☐ | Yes |
| ☐ | No |

| | | |
|---|---|---|
| **11.** What are the costs of training per person per year | Training on the job | |
| | Lectures / studies | |
| | Simulator training | |

| **12.** Where is training performed, in-house or elsewhere, If elsewhere, where |
|---|
| |

| | | | |
|---|---|---|---|
| **13.** How long has your company been doing this training | Training on the job | | years |
| | Lectures / studies | | years |
| | Simulator training | | years |

| | | |
|---|---|---|
| **14.** For which positions have training been organised | Training on the job | |
| | | |
| | | |
| | Lectures / studies | |
| | | |
| | | |
| | Simulator training | |
| | | |
| | | |

| **15.** Is there a difference between the training programs used for icebreaker or cargo vessels | |
|---|---|
| ☐ | Yes |
| ☐ | No |
| If yes, please give a short description | |
| | |

## ADDITIONAL INFORMATION

Anticipating the second part of the work package, we would like to ask you to send us as much information on training Arctic Navigation as possible. E.g. the content of the training programs, information on training institutes, etc.

## THANKS

Thank you very much for making the effort to fill out this questionnaire.