Arctic Operations Handbook

Joint Industry Project

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Arctic Operations Handbook

Introduction

"No standard available for safe operations in Arctic offshore areas"
The Dutch offshore industry has the ambition to execute operations at a large scale in Arctic areas, for instance for installation and operation of oil- and gas production facilities and pipelines. The term Arctic refers to areas where ice, permafrost and low temperatures may influence offshore operations and field development. The areas can be found in e.g. the Beaufort Sea but also the Caspian Sea.

Currently, there is no standard for safe operations by service companies in Arctic offshore areas. To support this industry and to ensure development steps towards minimum environmental impact for the service capabilities to be available, it is proposed to develop guidance/standards for such operations, focused on dredging, trenching, pipe lay, installation and decommissioning activities. Detailed design of facilities & equipment is not covered as it is already supported through ISO 19906 for Arctic Structures.

The development of guidelines and regulations in modern industry is functional (goal based) and depends on methods and technology used, in this case for Arctic operations. International accepted standards and guidelines require links between the subject project initiative and i.e. Class Societies, Arctic Governmental Authorities and international standards organizations like ISO and IMO. It is the intention to link with these through organizations, e.g. through the NEN platform for the Subcommittee 8. Furthermore, the viability of setting up an international Arctic Engineering network will be explored through liaisons with DNV, OGP and IMCA.

Objective

The purpose of the project is to carry out the necessary investigations to enable the formulation of guidelines for specific offshore contractors' skills, and to contribute to internationally accepted standards and guidelines for Arctic operations.
The investigations aim to better understand operational restraints in the Arctic environment and to define best practice limitations, such that working seasons can be better assessed and hopefully increased and overall risks reduced.

Scope

The project will address safety and sustainability of offshore operations in the Arctic, with focus on operations associated with activities like Dredging , Pipe laying and Fixed and Floating Production Facilities (installation, operation & decommissioning).
It is the intention to link with other international initiatives such as through the EU Coordination action and/or ISO standards development to obtain the more generic guidelines on e.g. ice management, navigational (met-ocean) support, winterization and emergency response as well as the risk of oil spills.

The project scope comprises:

1. **Survey of available guidelines to identify the gaps** which are related to offshore operations related to earlier mentioned specific offshore contractor skills. The Gap analysis will focus on the following operations:
    - Dredging
    - Pipe lay and trenching
    - Fixed and floating platform installation, operation and decommissioning
2. **Develop technical notes on the methods and needs** that follow from working in the Arctic areas during extended periods. It may be concluded that separate, more detailed R&D work is carried out, but the main objective is to deliver proposals for guideline and standard development. On the following areas specific analysis will be performed:
    - Define appropriate modeling of ice flow around and under floating structure hulls (*IceStream pilot project*)
    - Develop a framework to support the environmental impact analysis of offshore Arctic operations such as trenching & backfill (*Env-Impact pilot project*)
    - Determine ice induced forces on typical dredging and installation equipment (*Ice Load pilot project*)
3. **Prepare an Arctic Operations Guide document** with proposed guidance and recommended practice based on the conclusions from the project. The document will also contain comments to existing Arctic standards and guidelines insofar as they relate to the specific offshore skills and therewith related practices .
4. **Liaise** with Class Societies and Authorities to support the acceptance of technical notes, proposals and comments in the development and updating of the standards and guidelines.

Aspects which will be reviewed with respect to their relevance to offshore operations are among others management of Health, Safety and Environmental impact due to the operations, limitations due to fog and icing and low temperature, metocean and ice management aspects, winterization, emergency response and logistics.

Many of these 'Arctic operations' aspects have been addressed in the Barents 2020, NORSOK, ISO 19906 and IMO draft polar codes. The goal within this project is to identify those topics which need further development, given relevant service industry operations.

Executing body

The project is executed by a number of offshore contractors, design engineering companies, knowledge institutes and Arctic experienced consultants. At present the following companies joined the project:
Heerema Marine Contractors (HMC), Boskalis Offshore, MTI Holland, Bluewater Energy Services, INTECSea, GustoMSC, Shell, Huisman, Allseas, MARIN, TU Delft, IMARES, TNO, Canatec and Deltares. HMC will act as project coordinator.

Planning

The project will start in 2012 Q1, with a duration of about 1.5 year. In the chart below the activities schedule is given. The Dutch Maritime Innovation Programme will provide part funding for this project.

	Arctic Operations Handbook Planning	Project Month	Q1	Q2	Q3	Q4	Q5	Q6	Q7
	version 10		2011	2012				2013	
Area	TITLE	Lead	Q4	Q1	Q2	Q3	Q4	Q1	Q2
0	Milestones								
	Kick-Off meeting	HMC							
	Contracts in place March 2012								
	First GAP workshop in March 2012								
	Second GAP workshop April or May 2012								
	Final Gap report September 2012								
	Study reports issued End 2012								
	International information achieved April 2013								
	Arctic Operations Guide issued May 2013								
	Seminar June 2013								
1	Project coordination								
	Project management	HMC							
	Meetings	HMC							
	Seminar	HMC							
2	Gap analysis								
	Dredging gaps	Boskalis							
	Pipelay and trenching gaps	Allseas							
	Platform Instal, Operation & Decom gaps	Bluewater							
	Input to pilot studies	HMC							
3	ICE-Stream pilot project	Bluewater							
4	ICE-Load pilot project	IHC							
5	Env-Impact pilot project	HMC							
6	Liason with International organisations	MARIN / TU Delft							
7	Prepare Arctic Operations Guide Report	HMC							

Budget

The budget of the project is based on an amount of 4490 hours distributed over the various participating and supporting companies. The budget for the project is € 498.350,- which is to be financed through contribution in the following manner: All offshore companies contribute € 20.000,- while knowledge institutes contribute 25% of their man-hour effort. The Dutch Maritime Innovation Programme is funding € 235.000,- of the budget. Participant efforts will be paid from this budget. Cost breakdown is indicated in the following table:

		2012				2013					
Area	TITLE	Q1	Q2	Q3	Q4	Q1	Q2	Hours	Hour cost	Expenses	Total
1	Project coordination	40	20	20	30	20	60	190	€ 20,900	€ 4,600	€ 25,500
2	Gap analysis	70	270	240	0	220	230	1030	€ 111,800	€ 0	€ 111,800
3	ICEstream pilot project	70	200	840	250	150	0	1510	€ 137,600	€ 33,500	€ 171,100
4	Ice loading assessment	0	0	120	95	75	70	360	€ 37,750	€ 0	€ 37,750
5	Environmental impact study	10	160	220	440	100	0	930	€ 102,600	€ 0	€ 102,600
6	Liason with International organisations	20	40	40	40	30	30	200	€ 21,000	€ 2,000	€ 23,000
7	Prepare Arctic Guide	0	0	0	0	140	110	250	€ 26,600	€ 0	€ 26,600
	Total	210	690	1480	855	735	500	4470	€ 458,250	€ 40,100	€ 498,350

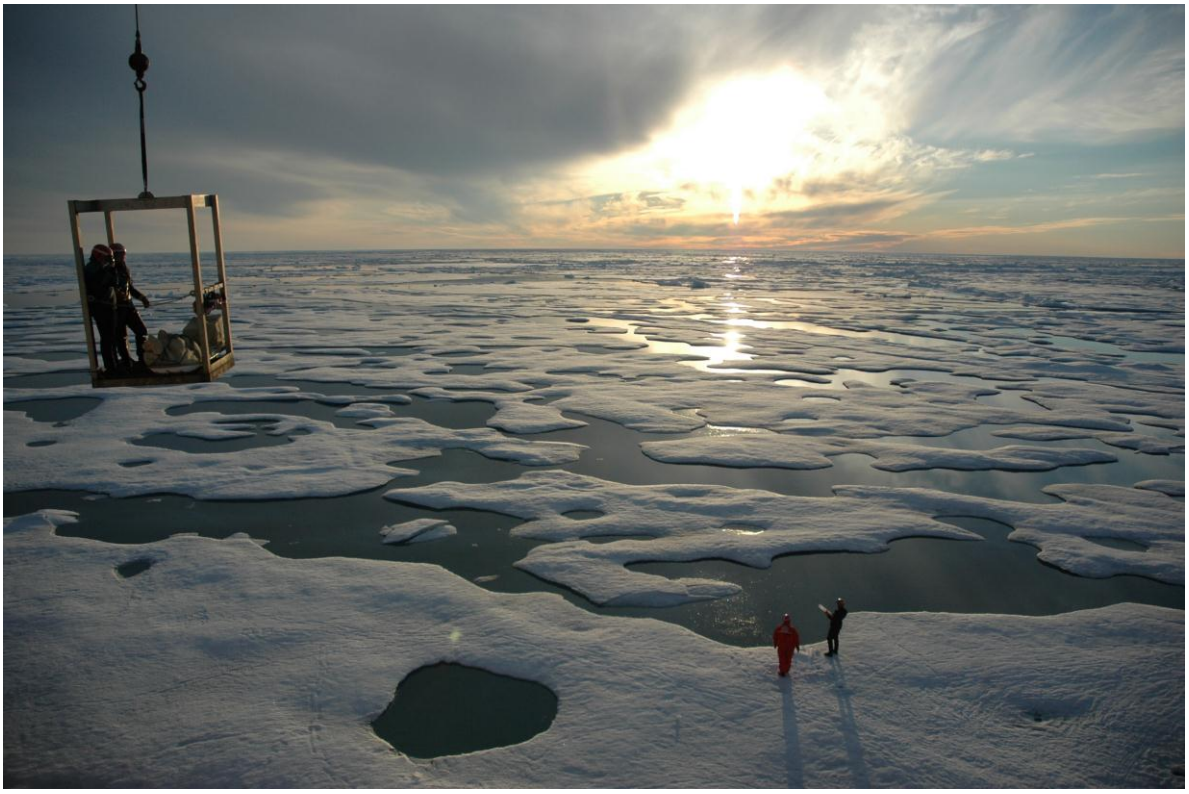
Liaison with international parties

The work will need integration in wider international context for two reasons: to create out of the results new internationally accepted guidelines and to obtain technological support on specific Arctic technologies. Under the ISO Technical Committee TC67 a sub-committee SC8 on Arctic Operations is being established. The scope of activities of this sub-committee will be defined in 2012, but the envisaged work programme concerns: Working conditions, EER, Maintenance, Ice management, Logistics and Security. A liaison –in collaboration with a NEN platform to that purpose - between the present project and the SC8 is relevant to avoid overlapping activities and to exchange relevant information.
In the Barents 2020 program relevant gap analyses have been carried out, among others serving as input to above ISO SC8 initiative. Gus Cammaert (TUDelft), having been member of the Barents 2020 JIP will be able to liaise and provide information exchange on operational gaps and new proposed guidelines and best practices.

Benefits

Participating in the project has the following benefits;

1) Obtain an understanding of the state of art guidelines available in the industry on operating in the Arctic environment.
2) Provide input on those areas which need further development in order to commence safe operations in these Arctic areas with limited environmental impact.
3) Obtain first hand results from analysis and study work on relevant knowledge gaps.
4) Participate in defining the guidelines for future Arctic operations.
5) Participate in development of international Arctic network with the purpose to identify relevant knowledge holders.



Prepared by:
Heerema Marine Contractors /MARIN