MARINTEK

TECHNOLOGY CONQUERS THE OCEAN SPACE

2014

Contents

Foreword

2014 was another exciting year for MARINTEK. We have assisted the ocean industries to tackle demanding and challenging tasks, and made important contributions to innovation and technical development. At the same time, we have managed to strengthen our position for further development in the future.

2014 brought a breakthrough in our participation in the Centres for Research-based Innovation (SFI) awarded by the Research Council of Norway. MARINTEK is a research partner within three new SFIs, and is host institution to one of them; SFI Smart Maritime. We also participate in SFI Marine Operations and SFI Exposed Aquaculture. Together with the AMOS Centre for Research Excellence, these new centres will allow the research community at Tyholt to continue doing research and development for many years to come in fields of great strategic importance for Norway. The thematic focus in the centres are also in good harmony with the planned focus areas of the Ocean Space Centre, the future knowledge centre for ocean space technology.

In October 2014, the Solberg government presented its 'Long-term Plan for Research and Higher Education, 2015 – 2024'. This is the government's steering document for R & D in the immediate future. We are extremely pleased that the Ocean Space Centre is profiled in this plan as one of two centres that will be given high priority in the next few years. In concrete terms: "In its long-term plan, the government particularly prioritises two building projects that it considers to be most important for attaining the goals of the plan. These projects are the Life Sciences, Pharmacy and Chemistry Building at the University of Oslo, and the upgrading of the Marine Technology Centre in Trondheim (Ocean Space Centre) for MARINTEK and NTNU." We regard this statement as a very important milestone, perhaps the most important to date, that marks our efforts to realise the future knowledge centre for ocean space technology.

As part of efforts to implement the previously published benefits realisation plan for the Ocean Space Centre, a comprehensive reorganisation process was initiated in 2014. Key words describing the new organisation are 'market orientation' and 'optimal ability to meet future market challenges in a scientifically relevant way, for the benefit of society'.

In 2014, we continued our close cooperation with SINTEF and NTNU, particularly with NTNU Department of marine technology. We are pleased that in the course of the year, both institutions have emphasised the role of ocean space in their strategies. SINTEF has identified ocean space technology as one of five fields of special effort in its new strategic plan, while ocean space science and technology is one of NTNU's five thematic focus areas.

This report presents a cross-section of our contribution to the conquest of ocean space in 2014.

Oddvar Eide, President, MARINTEK

" We have assisted the ocean industries to tackle demanding and challenging tasks"

Rolls-Royce develops ultra-modern offshore vessel

Rolls-Royce has won a competition for the design and manufacture of equipment for an innovative vessel for the Norwegian company Island Offshore. The vessel will be no less than 169 m l.o.a, with a width of 28 m.

The new vessel has been designed to perform a wide range of subsea tasks, including top drilling, underwater construction and inspection, and maintenance and repair in deep water. It will also be capable of being adapted to perform light well interventions.

On behalf of Rolls-Royce, MARINTEK has carried out a comprehensive series of model tests with the aim of quality-assuring the design. The vessel's characteristics have been tested in calm water and waves, in addition to its manoeuvrability. The vessel model was fitted with advanced equipment that enabled its three moonpools, roll-damping tank and three rotating ducted thrusters to be thoroughly documented.

The innovative vessel will be built in Japan by Kawasaki Heavy Industries, and delivery is planned for 2017.

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Simulator for free-fall lifeboats

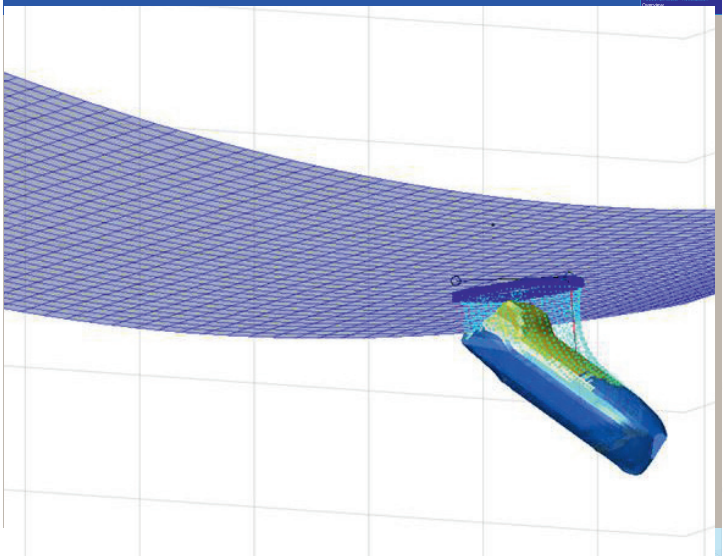
MARINTEK has developed a complete modelling tool capable of simulating lifeboat launches and behaviour in open waters. For several years, MARINTEK's scientists have been developing the VARUNA software model that simulates lifeboat launches, and VeSim, which simulates the progress, manoeuvring and motions of these vessels in waves, winds and currents. In 2014, these two programmes were amalgamated to form the VARUNA-VeSim simulator.

Launching a lifeboat in free fall from a skid involves a series of different phases, which makes great demands of the simulation software:

- The lifeboat is released, slides down the launch skid and begins to rotate. If the lifeboat is installed on board a vessel, the behaviour of the skid during the launch must be simulated, as this affects the exit velocity of the lifeboat and its effective fall height.
- The boat leaves the skid and falls through the air. High winds will greatly affect its trajectory, and the wind field will be significantly affected by the configuration of the host installation.
- As the boat impacts the surface, high water impact forces will decelerate and rotate it.
- The boat disappears beneath the surface, which closes over it.
- An air pocket forms behind and above the boat, but this eventually collapses, generating significant impulse forces.
- The boat reaches its deepest position, then rises again to break through the surface.
- The lifeboat's propeller is coupled in and the boat is manoeuvred away from the installation. Forces from waves, winds and currents will affect this phase. Forces from the propeller and rudder duct must be accurately simulated and interactions with the hull need to be taken into account.

The VARUNA-VeSim simulator handles all of these phases. For lifeboats installed on board vessels or floating platforms, for example, SIMO is used to simulate the floater's motions. An important feature of VARUNA-VeSim is its speed. Commercially available computational fluid dynamics (CFD) programs are capable of performing similar simulations, but are several thousand times slower. In order to take shifting wind and wave conditions into account, thousands of simulations must be performed, which rules out CFD as a realistic alternative.

MARINTEK is continuing to develop VARUNA-VeSim. Validation of the submergence and water exit phases will be given high priority in 2015.



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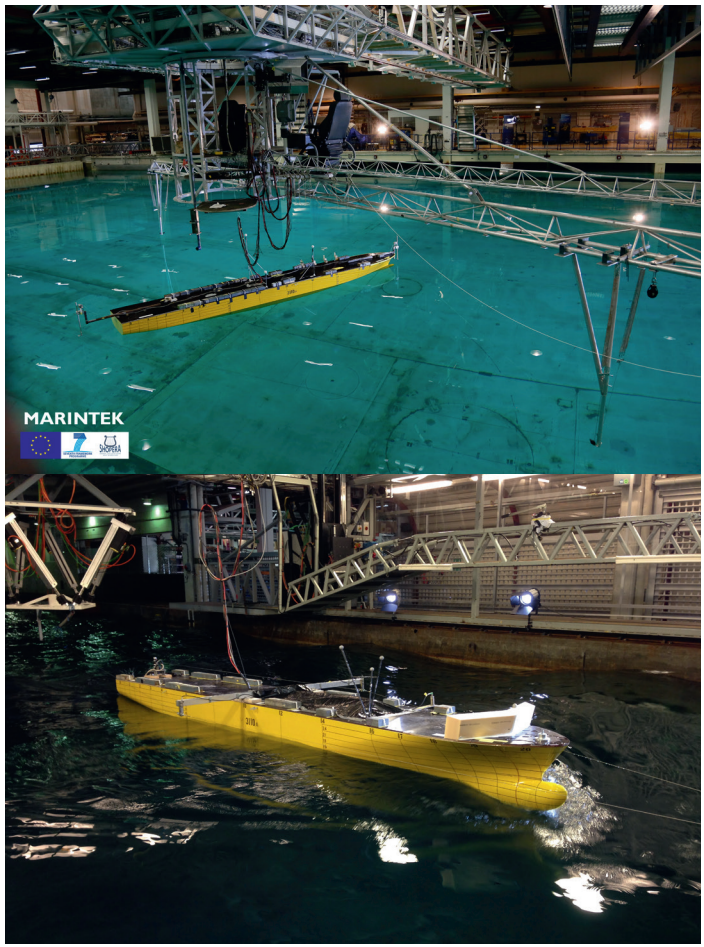
Energy-efficient Safe Ship Operation (SHOPERA)

MARINTEK forms part of a large European Union consortium consisting of classification societies, shipyards, designers, ship-owners and research institutes that is investigating integrated ship design and operating environments to ensure that shipping is safe and 'green'.

The background to this research programme is the implementation of the Energy Efficiency Design Index (EEDI), which was introduced by the International Maritime Organization (IMO) in January 2013, and the associated requirements for every new-built vessel to satisfy the requirements regarding vessel emissions. An obvious way to meet these requirements is to reduce installed power. However, this approach may lead to significant safety issues for certain types of ship, as their ability to manoeuvre under adverse conditions may be compromised.

MARINTEK is leading a comprehensive programme of model testing, which involves more than 1300 tests of three types of vessel with different hydrodynamic characteristics (RoPax ferry, container vessel and tanker). The work load is being shared with CEHIPAR, Flanders Hydraulic Research and TU Berlin. The wide range of tests of sea-keeping and manoeuvrability in waves is being used to validate the high-fidelity software tools and methods that will be developed as part of the project.

The project will enable a holistic assessment of ship performance to be carried out and will formulate minimum power requirements for safe operation under adverse weather conditions, while maintaining a balance between efficiency, safety and economy.



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Better planning improves efficiency and safety

MARINTEK has been a participant in the SFI Integrated Operations in the Petroleum Industry (The IO Center), along with central partners in the petroleum sector. Ongoing for seven years the research program ended on 31.12.2014.

The project made a number of contributions to current knowledge and developed methods that are useful in managing complex offshore operations, in which integrated planning is particularly important. For example, Total E&P Norway is using the results of the research programme in their efforts for developing integrated planning practices at the Martin Linge field.

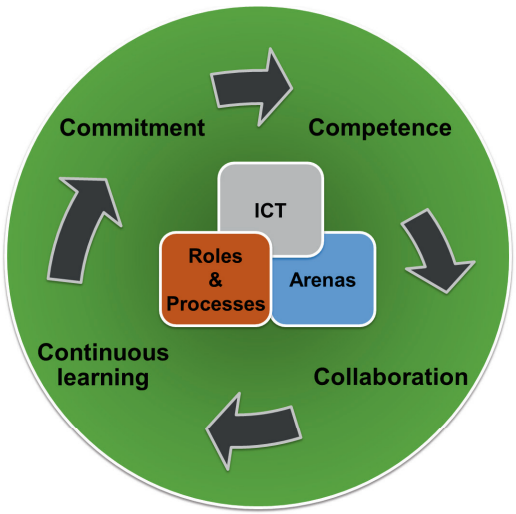
The overall objective of integrated planning is to ensure cost-effective and safe operations. To achieve this it is important to have a complete overview of all operations, facilitated through efficient coordination across professional boundaries, organisations and locations. Introducing integrated planning therefore involves both development of the organisation, adoption of new technological tools and increasing the competence for all involved in operational planning and execution.

One important result of the IO Center has been the writing of a web-based eBook that presents a number of methods, tools and approaches for how to develop integrated planning capabilities. As such, the eBook is a valuable tool to people/actors involved in operational activities in the petroleum industry, including operating companies as well as vendors and suppliers.

The research team has collaborated closely with global energy companies such as Petrobras, Statoil and Total, in addition to Aker Solutions, which is a major subcontractor in the area of maintenance and modifications. The Institute for Energy Technology (IFE), NTNU, the University of California, Berkeley and SINTEF Technology and Society have all been important research partners in the IO Center.

Read more: www.iocenter.no

Photo: Harald Pettersen - Statoil



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Emergency helicopter landings tested

Helicopter manufacturer AgustaWestland has been carrying out model tests in MARINTEK's Towing Tank in order to study emergency landings on water and helicopters' subsequent seaworthiness. Very few test facilities anywhere in the world perform tests of this sort today.

A large number of tests under severe weather conditions were performed, involving such important parameters as weight, centre of gravity, moment of inertia and buoyancy.

The objective of the seaworthiness tests was to validate and evaluate the ability of a helicopter to withstand wind and waves under severe weather conditions. The emergency tests studied loads and stresses on the helicopter, as well as how it lands under difficult conditions. The tests involved fitting the helicopter with advanced instrumentation in order to measure pressure and lift on the rotor.

The model helicopter is prepared for the seaworthiness test in MARINTEK's Towing Tank.

The model makes an emergency landing in high waves in the Towing Tank.

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New test rig for offshore cables

In 2014 MARINTEK completed the construction of a full-scale test rig for offshore cables. The rig has been designed to enable cables to be subjected to both dynamic compression and bending, similar to conditions that a cable is likely to experience during installation and operation.

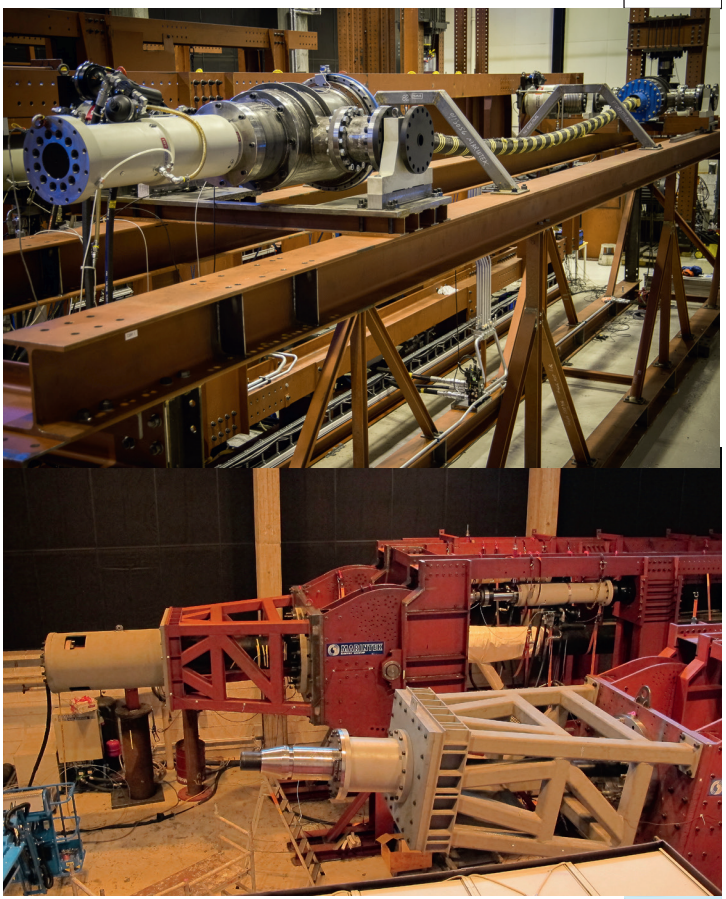
Compression in cables occurs on nearly all new fields. The normal practice is to permit a certain level of compression. However, the feedback from the industry is unanimous: current methods are not good enough.

The topic therefore requires research and development of new methods and procedures. The availability of cables qualified for compression will significantly reduce costs and the risk of failures during operation.

In response to this demand, MARINTEK has focused on the development of numerical and analytical methods, as well as testing and qualification of cables that are exposed to compression.

Advanced measurement methods have been installed in the test rig in order to identify any faults or instabilities in the cable. A number of tests have already been carried out, both to verify the methods that are being developed and to qualify commercially available cables.

Cables are usually installed under low tension, and can thus be subjected to compression during installation and operation as a result of the vessel's or platform's motions in waves, and due to currents. Even a low level of compression can lead to overload of local components and to general instability as a result of torsion. Current regulations provide no specific guidelines with regard to response, consequences or acceptable levels of compression. MARINTEK will continue the research on offshore cables in 2015.



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Development of the Dudgeon offshore wind farm

MARINTEK has been heavily involved in both the pre-design and design phases of the Dudgeon wind farm in waters to the east of the UK.

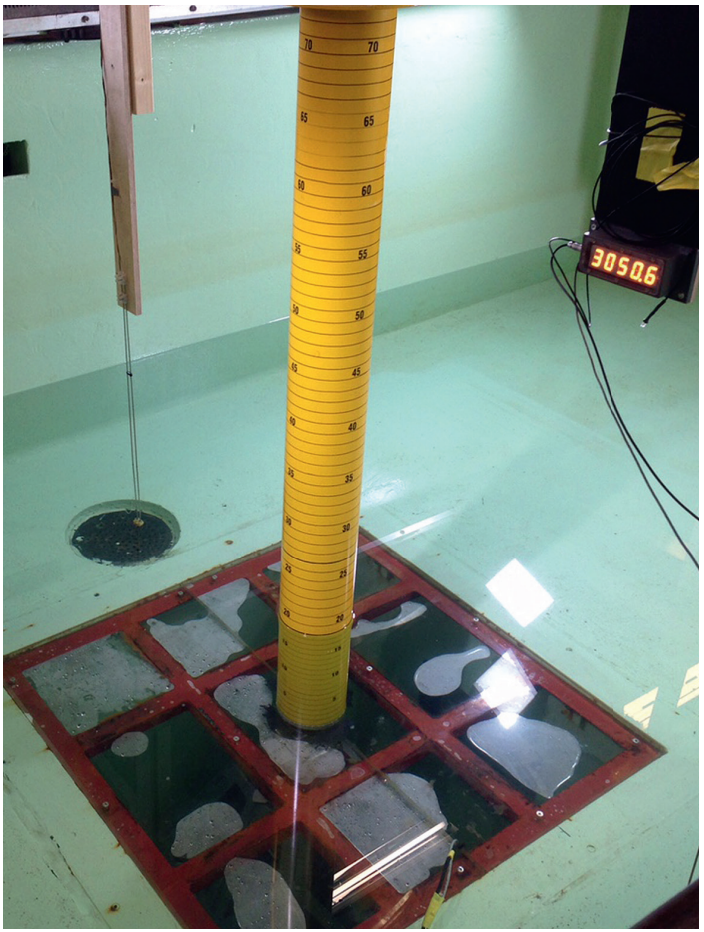
At the end of 2013, the decision was made to develop the field, in which Statoil and Statkraft own 75 and 25 per cent respectively. Around 65 wind turbines rated at 6.3 MW will be installed, and electricity generation for transmission to land will start by the end of 2016.

MARINTEK's delivery to the first phase of the project was an important part of the data that underlay the decision-making process. During autumn 2013, model tests and computational fluid dynamics (CFD) analyses of wave forces were carried out, as were integrated structural analyses of the wind-turbine.

Wave forces at a depth of 20 metres are difficult to estimate, since such waves are very short and thus extremely nonlinear. In order to reduce uncertainty in the integrated structural analyses, the results of the model tests and the CFD analyses were used to validate the wave forces in the structural analysis. Both fatigue and extreme conditions (wave events with a 50-year return period) were investigated.

In 2014 and 2015, a further three phases of the project in which extreme conditions (50-year waves) were addressed: the first was model tests to investigate wave run-up on the monopile foundations, then a theoretical approach that aimed to improve our understanding of the extreme wave loads, and finally, new model tests to verify estimated wave loads used in the design of the turbines for the Dudgeon wind farm.

According to the project, the final design is made during early 2015, and MARINTEK's contribution has been an important part of this.



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SARiNOR aims to improve safety

SARiNOR has put safety on the agenda in the Arctic.

The project, which is owned by Maritim Forum Nord, is surveying the current situation at strategic level, and looking to the future for smart, innovative solutions capable of improving safety, a priority for those who work in the high north. Search and rescue in the north is a challenging problem, given the huge distances involved and the lack of infrastructure.

SARiNOR has investigated the alarm procedures and way of communicating an alarm. In 2013, more than 8000 alarms were received by the national Joint Rescue Coordination Centre, of which 1700 were characterised as emergency calls; no less than 95 per cent of these were false alarms. That also means 5 percentages was reported from people in a distress situation. All alarms must be taken seriously until they can be cancelled.

The aim is that Norway should be a world leader in planning and implementing rescue operations. To manage this, alarm equipment will have to be developed, and routines and technology improved. One such need is the capability to transmit position reports from local equipment such as an Emergency Position-Indicating Radio Beacon integrated in a survival suit or safety equipment. This would simplify searches for persons in the sea. Good vessels and helicopters capable of picking up them up from the sea are also vital.

Adequate communications are also on the list of deficiencies. Most of the satellites that are used to transmit data is placed in a GEO orbit (Geostationary Earth Orbit), which means that the Earth itself shadows the route of signals to the far north, making it more difficult for these to reach the people located high north. The COSPAS-SARSAT satellites that are actually used to trigger a distress report have good coverage, but when anything more than an emergency call needs to be sent, the problem is greater.

SARiNOR is helping to ensure that research on safety in the maritime sector is being strengthened. Value creation in this sector has never been greater, and seagoing personnel deserve good, reliable responses to such emergencies as occur. MARINTEK lays great stress on this work, and is carrying out research on suitable technologies, communication coverage, as well as on organisational and procedural challenges.

Photo: Ruben Molnes

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Research on seaweed cultivation systems

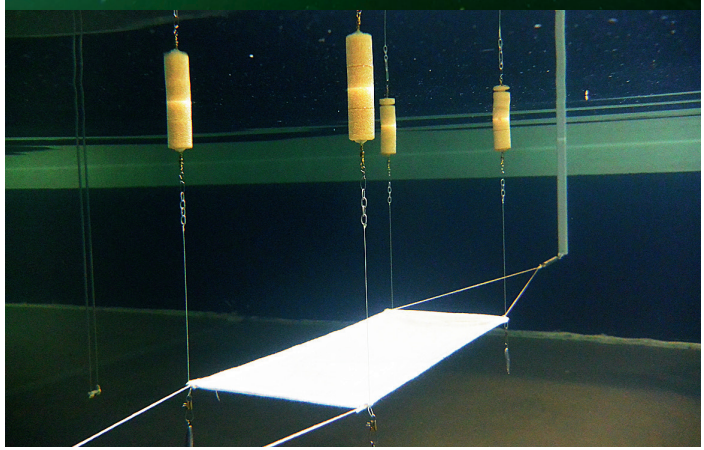
MARINTEK is participating in the interdisciplinary European At~Sea research project, which aims to develop advanced textiles for use in seaweed cultivation.

The project also aims to demonstrate that open sea cultivation of seaweed is technically and economically feasible. Seaweed can be utilised as an ingredient in food for human consumption and animal feed, in the production of biofuels and in a number of biochemical processes. The role of MARINTEK is to calculate the dimensions of the mooring systems required, by estimating how the forces from the sea affect seaweed cultivation systems.

This project has developed textiles and processes that allow seaweed to be cultivated at sea on horizontal textile substrates, thereby increasing seaweed production and easing the task of harvesting in comparison with traditional methods. Systems of this sort are exposed to hydrodynamic forces from the sea. In order to analyse these forces, MARINTEK has performed simulations using the analysis tool SIMO-RIFLEX. The mooring system was designed on the basis of the results of the analyses.

Several versions of the system have been analysed. MARINTEK has also carried out model tests in order to study how textile substrates behave under various current and wave regimes.

More information about this project can be found at http://www.atsea-project.eu/



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Ocean Space Centre

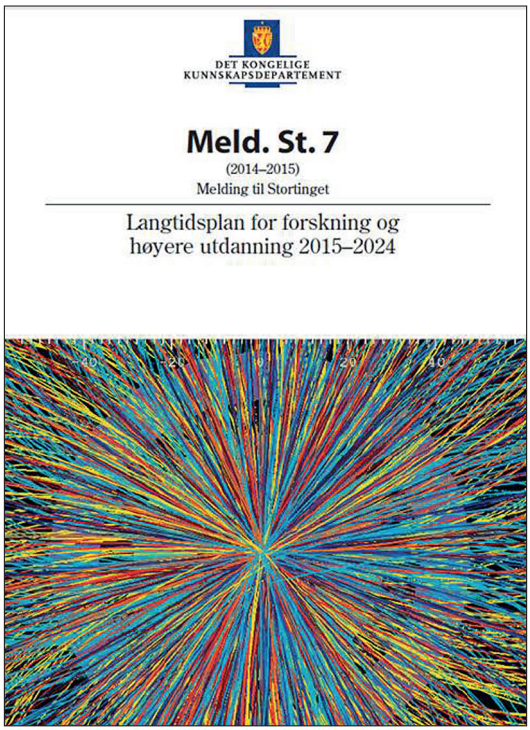
Our efforts to realise the future ocean space knowledge centre – the Ocean Space Centre – continued in 2014, a year that in many ways can be regarded as a breakthrough year for the project. The reason for this is that Norway's Solberg government promoted the Ocean Space Centre as one of two R & D infrastructure projects that will be prioritised in its Long-term Plan for Research and Higher Education, 2015 – 2024.

In 2014, a long series of measures designed to 'anchor' the project were implemented, and a very large number of central politicians from most political parties in Norway visited MARINTEK in the course of the year.

The project has also involved a good deal of investigative activity. Efforts have focussed on implementing the strategy in the Benefits Realisation Plan for the Ocean Space Centre and on clarifying the state's planned investment in the centre, while paying due attention to national regulations for financial support. The Benefits Realisation Plan includes a strategy for maximising the benefits to society of the investment programme. The Ocean Space Centre will be built in the vicinity of the Marine Technology Centre at Tyholt in Trondheim, and is planned to be completed in 2022.

In 2014, the Ministry of Trade, Industry and Fisheries (NFD) began the work of establishing a suitable organisation to carry out the next phase of the technical definition and development of the Ocean Space Centre. The project now answers to NFD's Research and Innovation Department. It has been decided that Statsbygg, the Norwegian government's key advisor in construction and property affairs, will lead the pre-engineering of the further development of the Ocean Space Centre concept until the next quality assurance point (KS2), which is expected to be reached at the end of 2016. MARINTEK and NTNU will collaborate closely with Statsbygg.

All in all, 2014 has been a challenging, exciting and positive year for this important project.



OCEAN SPACE CENTRE
VISIONARY REALISTIC ESSENTIAL

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The Towing Tank 75 years old

September 1, 2014, was the 75th anniversary of the official opening of the Towing Tank at Tyholt in Trondheim. This anniversary was jointly celebrated by MARINTEK and NTNU with a number of events.

Around 100 invited guests from all over the world came to the anniversary seminar that was held in Telenor House close to the Marine Technology Centre. The participants included a number of prominent experts connected with the International Towing Tank Conference (ITTC), good clients of MARINTEK, political decision-makers and contacts in local, national in international research. All of MARINTEK's staff and our external guests were invited to a concert of organ music in Nidaros Cathedral, the concert being a 75th anniversary gift from Trondheim City Council, followed by a very enjoyable banquet for the invitees in beautiful weather in the Skybar of the Clarion Brattøra Hotel.

History was also the topic of MARINTEK's Day 2014, which was dedicated exclusively to the 75th anniversary of the Ship Model Tank. Among the highlights was a historical overview given by Knut J. Minsaas and Sverre Steen. Following the conference, all of MARINTEK's employees were invited to a banquet where they were entertained by Charlotte Audestad. A new film about the history of MARINTEK was shown for the first time at the anniversary seminar. The film was entitled 'Technology Conquers Ocean Space', and it put the infrastructure dating from 1939 into a wider context that looked ahead to the realisation of the Ocean Space Centre. It took 26 years from the birth of the idea to build the Towing Tank until it was ready in 1939, and this was a reminder of the need to look well ahead and hold out where the realisation of plans for ocean space R&D are concerned. On the day of the 75th anniversary itself, all the staff of MARINTEK and NTNU's Department of Marine Technology were invited to lunch at the Towing Tank, at which short talks discussed the significance of the day. Later on the same day, the Towing Tank hosted a meeting of members of Mid-Norway Maritime Forum, at which some 40 persons were given a historical survey and tour of the facility.

SKIPSMODELL TANKEN TRONDHEIM 75 1939-2014 MARINTEK NTNU

Contact: Communications Director Jo Stein Moen
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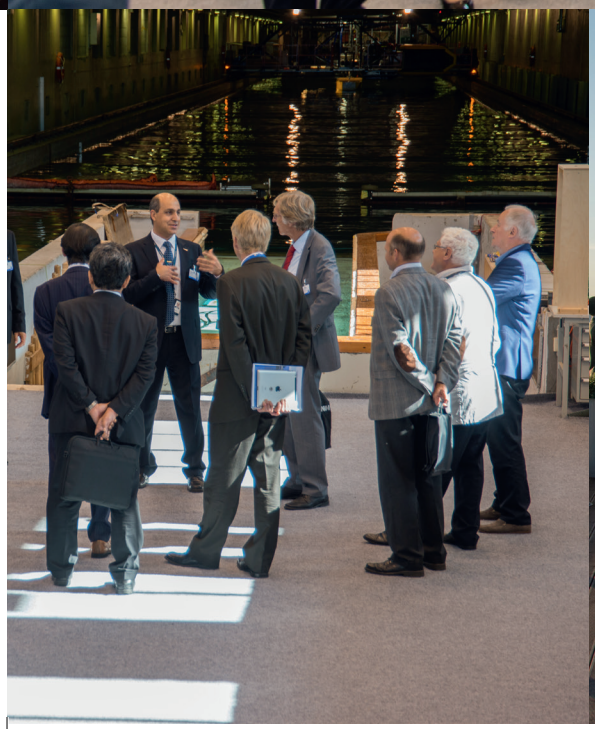
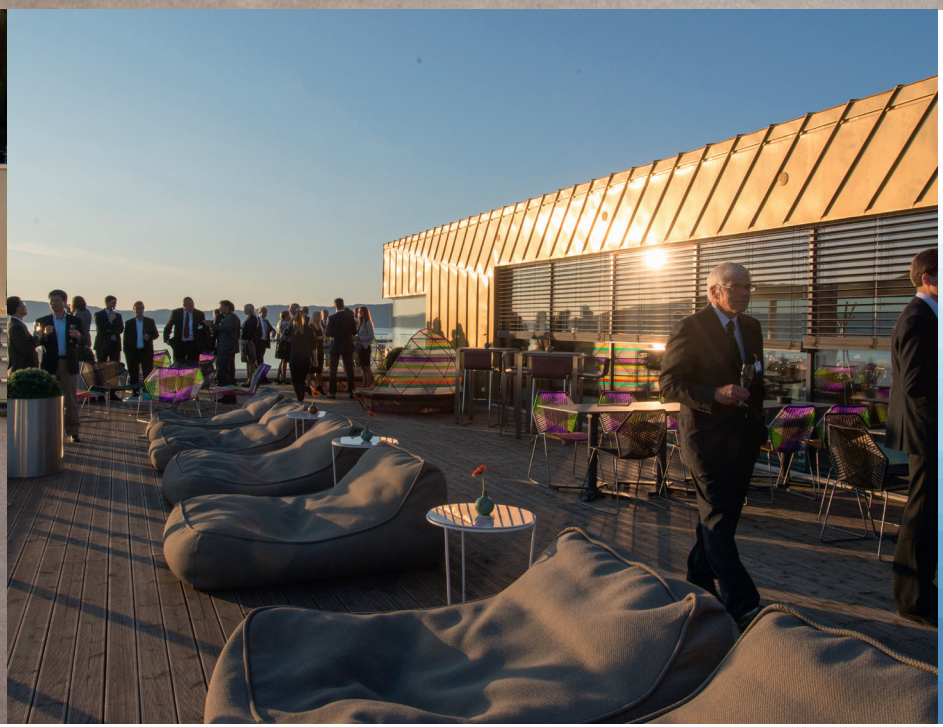
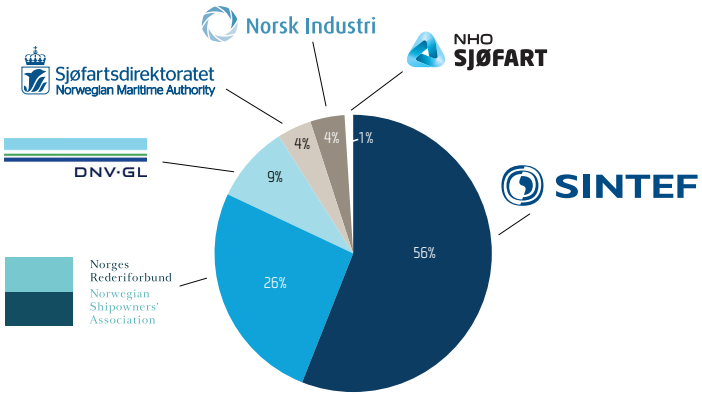
SKIPSMODELLTANKEN 75 ÅR





Organisation

Ownership



A certified institute

MARINTEK and MARINTEK USA, Inc. are certified in accordance with ISO 9001 quality standards. We make systematic efforts to improve our work processes in order to ensure focus on our clients' needs, and high quality and precision of our deliverables. MARINTEK is accredited in accordance with ISO/IEC 17025 for measurements of exhaust gases from gas turbines and internal combustion engines.

MARINTEK operates in accordance with all current laws and regulations. We have the highest regard for personal safety, and our goal is zero harm to personnel, the environment and materials. In 2014 we met our goal of zero lost-time injuries.

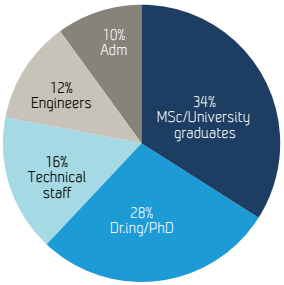
MARINTEK is a signatory to the Agreement on Inclusive Working Life (the IA Agreement) and an approved apprenticeship company.

Godkjent lærebedrift

ia inkluderende arbeidsliv

Employees

Composition of academic staff



The Board of Directors

• Unni Steinsmo (Chair)	SINTEF
• Hanna Lee Behrens	Norwegian Shipowners' Association
• Liv Hovem	DNV GL
• John Malvin Økland	Norwegian Maritime Authority
• Terje Hjalmar Michelsen	Grieg Star
• Torgeir Moan	NTNU
• Kjetil Berget	MARINTEK
• Beate Kvamstad-Lervold	MARINTEK
• Chittiappa Muthanna	MARINTEK

Management

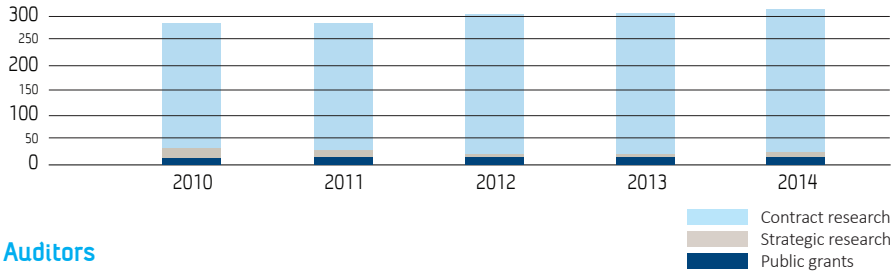
Oddvar Eide	President
Birger Åldstedt	Executive Vice President
Hege Margrethe Sand	HR Director
Jo Stein Moen	Communications Director
Kirsten Solås	Quality Manager
Tone Lyse	HSE Manager
Per Magne Einang	Research Director
Egil Giertsen	Research Director
Øyvind Hellan	Research Director
Kourosh Koushan	Research Director
Ørnulf Rødseth	Research Director

Main financial figures - The concern (in NOK 1000)

Result	2010	2011	2012	2013	2014
Gross operating revenue	296 705	295 692	318 788	315 630	331 544
Net operating revenue	253 705	250 168	277 405	272 725	285 173
Operating result	12 724	10 236	11 798	13 186	21 021
Annual result	**14 182**	**13 328**	**15 084**	**14 684**	**19 351**
Balance					
Fixed assets	89 868	85 388	97 735	108 930	97 441
Liquid assets	256 309	276 534	270 988	271 286	292 368
Total assets	**346 177**	**361 921**	**368 723**	**380 217**	**389 809**
Equity capital	211 100	219 824	230 226	238 275	251 772
Liabilities	135 077	142 097	138 497	141 942	138 037
Total equity and liabilities	**346 177**	**361 921**	**368 723**	**380 217**	**389 809**
Profitability					
Operating margin %	5.0	4.1	4.3	4.8	7.4
Total profitability %	3.7	1.4	1.6	1.8	2.7
Profitability on equity %	6.7	3.1	3.4	3.1	3.9
Liquidity					
Net cash flow from operations	105 600	4 656	888	4 955	57 171
Degree of liquidity	1.9	1.9	2.0	1.9	2.1
Solidity					
Equity capital in %	61.0	60.7	62.4	62.7	64.6
Operating working capital	143 303	155 860	154 563	156 966	159 331

Turnover

(Mill. NOK)



Auditors

Deloitte

Income statement 2014 (in NOK 1000)

OPERATING REVENUES AND EXPENSES	
Revenues	331 544
- Direct project expenses	46 371
Net operating revenues	**285 172**
Salaries, social security and other security costs	192 810
Other operating expenses	71 341
Operating costs	**264 152**
OPERATING RESULT	**21 021**
FINANCIAL RESULT	-1 670
ANNUAL RESULT before taxes	**19 351**

Balance (in NOK 1000)

ASSETS	
Intangible assets	43 550
Fixed operating assets	40 418
Financial long-term assets	13 473
Fixed assets	**97 441**
Other current assets	161 920
Cash, bank accounts	130 448
Current assets	**292 368**
ASSETS	**389 809**

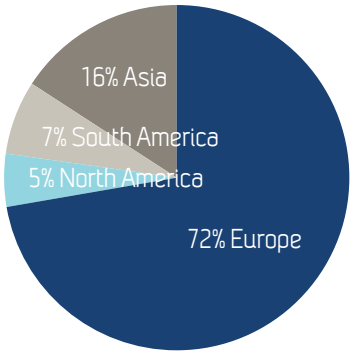
EQUITY AND LIABILITIES	
Paid-up liabilities	11 600
Earned equity	240 172
Equity	**251 772**
Long-term liabilities	**5 000**
Current liabilities	**133 037**
Liabilities	**138 037**
EQUITY AND LIABILITIES	**389 809**

An international company

A total of 204 employees from 26 countries

Foreign trade

27% foreign share of turnover



Subsidiary company

MARINTEK USA Inc.

The activities of MARINTEK (USA), Inc. target the oil and gas sector and are headquartered in Houston, Texas. Based on research and complex analyses and an interaction between hydrodynamics and structural engineering, we contribute to solving our clients challenges. Customers are the major research departments of the oil companies in the Houston area, as well as engineering companies. We have also established good connections with important universities in the USA. Such relationships provide important interfaces with the rapidly expanding ocean energy industry, in which improving the efficiency of installations and marine operations are important topics. Thanks to these initiatives and MARINTEK (USA)'s interactions with the mother company in Norway, there is a good basis for further expansion.

MARINTEK (USA), Inc.

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Report of the Board (extracts)

In 2014, the Research Council of Norway provided support for 17 new centres for research-based Innovation (SFIs) with a planned project duration of eight years. MARINTEK participates in three of the new centres, one of which it leads:

- 'SFI Smart Maritime': this centre focuses on improving energy efficiency and reducing emissions from the maritime sector, for example by developing a system-oriented software tool that analyses the effect of energy-efficient solutions and measures for hulls and propellers, power systems and fuels under realistic full-scale conditions. (Host institution: MARINTEK)
- 'Exposed Aquaculture Operations': The principal objective of this centre is to develop solutions for operating fish farms in open and exposed waters with high waves and strong winds and currents. The centre will improve the conditions for sustainable growth of the aquaculture sector by combining knowledge and experience from the marine, maritime and offshore sectors. (Host institution: SINTEF Fisheries and Aquaculture)
- 'Marine Operations Centre': The objective of this centre is to develop new tools and prototypes and provide training in the safe and efficient installation and maintenance of ocean space structures in hostile waters. Examples include operations in deep water, installation of offshore wind turbines and operations in the Arctic. (Host institution: Ålesund Regional College)

These SFIs are extremely important for MARINTEK's strategic development, and they will make important contributions to the development of strategic areas of research and innovation in the future knowledge centre for ocean space technology, the Ocean Space Centre.

Our participation in these new SFIs will be of great importance for MARINTEK's scientific development in the future. Obviously, they will thus contribute to strengthening MARINTEK's market position in these areas.

The second half of 2014 was marked by a dramatic fall in the price of oil (...). Cuts in oil company budgets can be expected to lead to a tighter contract research market for MARINTEK's services that are aimed at new field developments. This applies to both the pure offshore market and the shipping market that targets the offshore service market. We are constantly evaluating measures that will enable us to face the negative consequences of such a development. Although a high degree of uncertainty is currently associated with the offshore market, we expect that this market will improve in the somewhat longer term.

In the shipping sector, there continues to be a major need for investment in new and cost-effective technology for increased energy efficiency, and in order to meet new environmental and emissions requirements, for example of the International Maritime Organization (IMO) and the European Union.

Together with other centres of expertise, we intend to generate valuable knowledge that will contribute to our ability to carry out a wide range of shipping activities and operate vessels in vulnerable arctic regions.

MARINTEK has a growing portfolio of projects in renewable ocean energy, and we regard this as an exciting market that is displaying a positive tendency thanks to heavy political pressure, particularly on the part of the European Union. Ocean energy is still an immature area that will require major research efforts in the near future to develop solutions that are competitive with other forms of energy. Norwegian maritime industries, including the oil and gas, have a unique range of expertise that could enable it to assume a central position in the development of offshore wind, and indeed renewable ocean energy in general.

The development of ocean space structures for aquaculture in exposed waters is an increasingly important area for MARINTEK. These are demanding structures for which testing in our ocean laboratory is essential as a means of studying and developing complete, escape-proof systems.

MARINTEK continues to regard participation in the European Union's research programmes (Horizon 2020) as important. In addition to participating in a number of maritime-related projects, we are important research partners in several offshore wind projects.
The Board wishes to thank our employees and management for their fine efforts in 2014. We also thank the NTNU staff involved in MARINTEK's activities, and our customers for excellent cooperation.

Trondheim, December 31, 2014
Unni Steinsmo,
Chair, MARINTEK

MARINTEK

Norsk Marinteknisk Forskningsinstitutt AS
Norwegian Marine Technology Research Institute

DEEP INSIGHT
HIGH AMBITIONS

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SINTEF