NEWSLETTER FOR CUSTOMERS OF KONGSBERG MARITIME

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KONGSBERG

The SUBSEA newsletter

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content

First new ACS500 system to Stena Drillmax 3

Key personnel from the FAT: From the left Torger Torgersen - Kongsberg, Archie Yates - Marinor/ Stena, Reno Elvestad - DnV, Finn Tore Knudsen - Kongsberg.

On Wednesday March 4th, Kongsberg Maritime in Horten completed the Factory Acceptance Test for the first 4000 m Acoustic BOP Control system. The system is to be delivered to the BOP manufacturer Cameron in Houston and Stena Drilling will install the system onboard their new drill vessel Stena Drillmax 3. The vessel is currently being commissioned at Samsung Heavy Industries in Korea – scheduled to be in operation this summer.

The ACS500 system is the first product in a new technology range with a new Kongsberg Maritime Cymbal acoustic protocol. The ACS500 has a complete new design compared to the previous ACS400 series and the new design is based on more than 25 years experience in producing and operating emergency acoustic BOP control systems. The Cymbal acoustic protocol is utilizing wide band technology to provide improved reliability for the acoustic telemetry data. The ACS500 system can be set up to be backward compatible to HPR and HiPAP systems.

DnV has been – and still is – heavily involved in the process with environmental testing and product certification. The system will have both DNV-OS-E101 and API 16 approval.

New Search for Amundsen's Airplane with HUGIN 1000

When the Norwegian Navy in August starts its search for Roald Amundsen's airplane Latham, which disappeared in the Barents Sea in 1928, the HUGIN 1000 MR autonomous underwater vehicle will play a vital role.

The Royal Norwegian Navy will start the search in August 2009 based on directions given by the Norwegian Aviation Museum. They will explore an area close to Bjørnøya where the plane is assumed to have gone down and where local fishermen might previously have found parts of an airplane engine. The HUGIN 1000 MR will be an important tool that the navy will operate from their logistic vessel KNM Tyr.

"HUGIN 1000 MR is the main search tool for this job. Covering 34 square nautical miles is not possible with a camera so we are very lucky to have this instrument. HUGIN 1000 MR is a state-of-the-art AUV with the capacity to go down to 1000 metres and an operational speed of 4 knots. We can have this out at sea for 18 hours continually. If the plane is there, we are confident that we will find it," explained Captain Lieutenant Helge Stian Telle of the Royal Norwegian Navy.

Vice President of AUVs for Kongsberg Maritime, Mr. Bjørn Jalving is positive that HUGIN 1000 MR is an ideal tool in the search for Latham, given its new and advanced technological developments.

"We are proud to support this project. The HUGIN 1000 AUV with the HISAS 1030 synthetic aperture sonar has a new level of resolution and range in acoustic imagery and is especially designed to find small, modern mines, efficiently searching large areas. It is therefore very well suited for finding the Latham airplane. Its advanced navigation system counters the fact that GPS does not work under water. Consequently, if the airplane is found, its position will be well known," commented Jalving.

An historic dream

75 years after Amundsen vanished on his mission to save the Italian general and aviation engineer Umberto Nobile, the Norwegian Aviation Museum decided to reinvestigate the disappearance. A search was carried out in 2004, but had to be called off due to bad weather. Since then, the Norwegian Aviation Museum has fought a battle to reopen the search for Latham, together with the Royal Norwegian Navy and Context TV, a Berlin-based production company specialising in documentaries related to scientific-historical expeditions and explorations with main emphasis on the underwater segment.

Context TV has shown an interest in the project from the beginning. They have conducted extensive research on the disappearance of Latham and will document the search. When the search reopens later this year, all parties are well prepared with better equipment and qualified personnel.

"Our historical dream is about to come true during this search for Amundsen. This is made possible thanks to Context-TV, Kongsberg Maritime and the Norwegian Navy," said Navigator Per Arvid Tellermann from the Norwegian Aviation Museum.

A common brochure for the HUGIN and REMUS Family AUVs is now Available

The brochure presents both the HUGIN family and the REMUS family and can be downloaded from our web page. http://www.km.kongsberg.com/ - support – document downloads - Autonomous underwater vehicles

Great success for AUV Conference and Demonstrations in Bergen

On 27th and 28th January, 68 participants from 12 countries gathered in the cultural capital of Norway to learn more about AUV technology and operations. The Conference day focused on existing and future AUV technology represented in the HUGIN and the REMUS families of vehicles from Kongsberg Maritime.

On the second day, the Royal Norwegian Navy together with KM demonstrated HUGIN 1000 MR from the mine hunter KNM Karmøy and the REMUS 100 in the Bergen harbor. The HUGIN 1000 MR equipped with the new Synthetic Aperture Sonar HISAS 1030 from KM is the second AUV in service for the RNoN Mine Warfare Service. In 2009 the new AUV will undergo OPEVAL in the RNoN as part of the final test and approval.

The REMUS 100 is undergoing similar testing by the Norwegian Naval EOD Command. This was also the first time the HUGIN and REMUS vehicles were demonstrated together.

The HUGIN 1000 MR and REMUS 100 are both results of more than 15 years of AUV development, testing and operations world wide in both commercial and military applications. They are therefore today, reliable and proven systems.

The data gathered during the operations earlier the same day was presented to the attendees and clearly demonstrated the high resolution and high area coverage in mine hunting and REA operations capable with the new HISAS 1030 in combination with EM 3002.

REMUS AUVs for the CATALYST Program

The CATALYST Program, which commenced on December 4, 2008 from Fort Pierce, Florida, is a series of deep-sea expeditions that will significantly transform undersea exploration and the future of our oceans. The program makes available for the first time a versatile and highly portable deep-sea tool kit and operations team that is rapidly deployable all over the world.

CATALYST Technology

The CATALYST Program uses a pair of Hydroid REMUS 6000 AUVs. They are multi-sensor platforms equipped with the latest technology that is capable of recording critical oceanographic data, photo-imaging deep-sea features, and producing detailed sonar maps of the ocean floor. Through the CATALYST Program's pioneering approach, scientific organizations all over the world will now be able to expand the depths of their research to 6000 meters, or 3.7 miles, below the ocean's surface.

CATALYST Partners

The CATALYST Program gathers world-renown scientific organizations to create synergistic collaborations, maximize scientific expertise, and merge institutional resources. It marks an unprecedented collaboration between the Waitt Institute for Discovery and the Woods Hole Oceanographic Institution. The Waitt Institute for Discovery commissioned the construction of two REMUS 6000 AUVs and initiated the CATALYST Program and the Woods Hole Oceanographic Institution developed and engineered the original REMUS autonomous underwater vehicles. WHOI has an AUV operations team that possesses the expertise to conduct REMUS 6000 expeditions anywhere in the world. For initial expeditions, the Harbor Branch Oceanographic Institute brings its ocean exploration expertise and resources to the CATALYST Program in the form of expedition logistics and science plan development, as well as through the utilization of Harbor Branch's research vessel R/V Seward Johnson as the first CATALYST AUV launch vessel.

In additional to current partners, a diverse assortment of organizations will contribute additional resources, funding and expertise to future CATALYST expeditions, including university, private, non-profit, and governmental institutions.

iXSurvey Australia wins LINZ Survey Contract of Great Barrier Island with Kongsberg EM 3002D

In October of 2008 iXSurvey Australia signed a NZD$2.5m contract with Land Information New Zealand (LINZ) for an IHO Order 1 survey of the entire west coast of the Great Barrier Island and surrounds. This island group lays approximately 60nm NE of Auckland and is a very popular destination for numerous large and small recreational vessels that routinely navigate in the region. The aim of the survey was the detection and delineation of all low water drying rocks and islets and the determination of least depth of all significant bathymetric features throughout the survey area.

iXSurvey has a policy of utilizing the very latest and most appropriate survey systems available for each and every survey they perform. For this survey, the only Multi-beam echo sounder that could meet the stringent LINZ Specification MB-1, whilst offering a high rate of effort, was the Kongsberg EM 3002D. In the planning phase of the survey, a close relationship was formed with the team from the Kongsberg Maritime Pte Ltd - Singapore office. Kongsberg Maritime Pte Ltd were instrumental in making a new system available and having it delivered to Auckland at very short notice. Likewise, Kongsberg Maritime Pte Ltd support engineer's - were equally critical to the success of the survey. In late November, they travelled to New Zealand to assist with the Set to Work of the MBES system. Once it had been installed by the iXSurvey team, they ensured that it was working perfectly prior to the start of the survey and provided the iXSurvey operators some final advice on how to achieve optimum results from the system.

From the very first day of the survey until the final day the EM 3002D performed faultlessly: "The system exceeded our expectations in every respect," commented Dave Field, the iXSurvey Australia Operations Director and Surveyor in Charge for this survey. "It was simple to install and calibrate, it achieved compliant data at wider swaths than we had planned for and the data was considerably 'cleaner' than previous systems we have used." As a result, the survey was completed several weeks ahead of schedule and has added to the profitability of the survey for iXSurvey Australia, which has been in business for just over one year."The date collected by iXSurvey and the EM 3002D will be used to produce a new chart series of the region at scale 1:50,000 and 1:25,000. These charts should be produced and available to the mariner before the end of the year and will ensure the safe navigation for all mariners in the region for many years to come.

Gardline Purchases EM 122 and EM 710 Multibeam Systems for its Survey Vessel Sea Surveyor

Survey Vessel Sea Surveyor

Gardline has purchased its third full ocean depth multibeam system, the latest generation EM 122 in 1 by 2 degree configuration, this system will compliment the existing two EM 120 systems on the Ocean Endeavour and the L'Espoir. Gardline has also purchased its forth medium depth EM 710 multibeam system, a 1 by 1 degree version. Both systems will be commissioned on the Sea Surveyor during March 2009 to replace existing previous generation multibeam systems.

Gardline is a leading geophysical, geotechnical, hydrographic and environmental survey specialist, operating a fleet of dedicated multi role survey vessels and coastal survey vessels permanently mobilised with fully integrated equipment packages, which can be readily deployed and can easily accommodate additional specialised equipment as each survey dictates

GARDLINE MARINE SCIENCES

For further details contact hydro@gardline.com

EurOceanique - the New Kongsberg Maritime Agent in France

EurOceanique employees in Rousset, France.

EurOceanique has been operating since 1994 and is a part of the MacArtney Group, Headquartered in Esberg, Denmark which supplies products and engineering solutions to the worldwide underwater technology market. They are located in the South of France in Rousset, near Aix en province where they recently opened a modern and fully equipped workshop for moulding, repair and testing of electrical underwater cables. "We are very excited about this new agent. Eur Oceanique in France consists of a highly skilled, experienced, motivated and devoted team of nine employees from which we expect great things," said Eddy Lund, Sales Manager Hydroacoustics, Kongsberg Maritime.

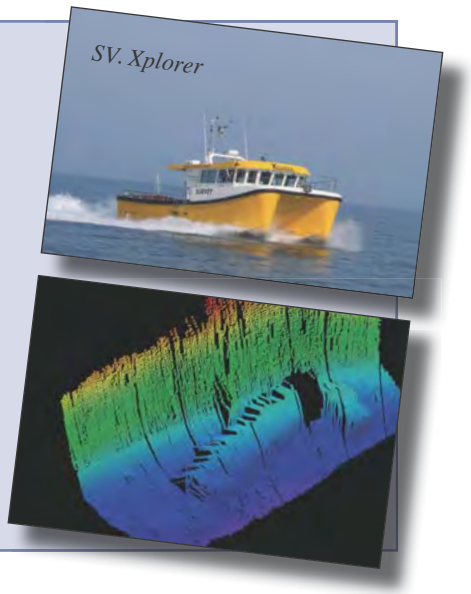
As part of the new team, EurOceanique recently hired Phillippe Goarant who will be devoted to selling hydrographic equipment. Previously employed at 'Service Hydrographique et Oceanographic de la Mer' (SHOM), Goarant, has the advantage of several years of experience with hydroacoustic products from Kongsberg Maritime.

Kongsberg Maritime, Demonstration Vessel Alongside at Ocean Business 2009

The vessel is setup with the following equipment for real-time demonstrations:-
- EM 710 Multibeam Echo Sounder
- EM 3002D Multibeam Echo Sounder
- SIS (Seafloor Information System) Real-Time Software
- EA 400 Single Beam Echo Sounder
- EA Single Beam Side Scan, Sub Bottom Profiling and Seabed Classification Options
- Seapath 200 Precise Heading, Attitude and positioning Sensor

The vessel will be running regular demonstrations throughout the three days of the exhibition. For further information please visit the vessel or the Kongsberg stand No. N1

ocean business 2009



New Scanning Sonars & Profilers Unveiled at Subsea 09

The 1171 Series is a complete range of multi-frequency, fast scanning obstacle avoidance imaging and profiling sonars offering unrivalled resolution, from an industry leader in sonar technology. The 1171 Series of sonar heads have been developed to meet the requirements for both shallow and deep ocean applications. As well as the choice of operating frequencies, the new sonar heads feature faster scanning rates, improved range resolution and even clearer, sharper images, all in a more compact lighter housing.

1171 Series - Obstacle Avoidance Imaging Sonar Heads

The dual transducer design allows optimised operational configuration for both long range obstacle avoidance and shorter range imaging detail. The transducer is protected within an oil-filled, pressure compensating dome. The telemetry is RS485 and RS232 compatible and is automatically sensed and configured at start up to match the telemetry link used. The sonar head operation is configured and controlled using the MS1000 Software Processor. Other features include:

- Dual transducers for multi purpose obstacle avoidance and inspection use
- Multiple frequency capability (330 to 400 kHz and 450 to 700 kHz)
- Improved range and scanning rate
- Improved sampling resolution & beam foot print resulting in clearer, sharper images
- Improved Range Resolution
- Lighter 4000m depth rated design
- Optional Ethernet telemetry interface

1171 Series - Multi Frequency Profiling Heads

The Multi-Frequency design allows optimising of the profiling configuration for different applications. Like the sonar head, the transducer is protected within an oil-filled, pressure compensating dome and the telemetry is automatically sensed and configured at start up to match the telemetry link used. The sonar head operation is also configured and controlled using the MS1000 Software Processor.

- Multiple frequency capability (675kHz to 1.35 mHz)
- Improved range and scanning rate
- Clearer, sharper images and a >0.5 cm range resolution

An 1171-system

- Sample resolution of > 0.5mm
- Lighter 4000m depth rated design
- Optional Ethernet telemetry interface

Kongsberg Mesotech Ltd. is the Canadian subsidiary of Kongsberg Maritime. Today the company supplies a worldwide customer base with a range of products for military, fisheries, oilfield, scientific, and other offshore market applications. Kongsberg Mesotech's strength lies in its unique engineering capabilities. Ongoing research and development has ensured the company's position as a world-leader in high-resolution sonar systems, and acoustic technology. Kongsberg Mesotech manufactures over 100 models of multibeam, scanning, echo sounder, and altimeter sonar combinations.

Hydrography department activities in South America

Multibeam workshop in Niteroi (Rio), some of the participants.

In recent years the field of Hydrography, often together with research, has had increasing activity in South America, which has happened in line with capacity building.

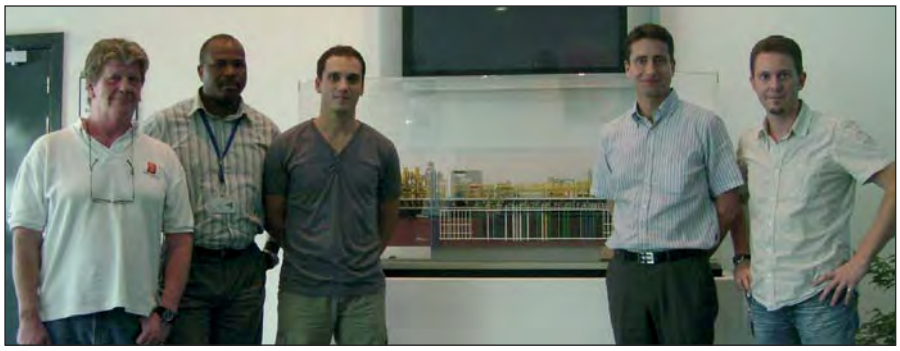
In 2008 the Kongsberg Maritime Hydrography Department was one of the industry's leading players in this field, through actively participating in conferences, training courses and demonstrations and also winning important contracts, like the MEDUSA project in Chile.

During the autumn we participated in a one week workshop/training course in November arranged by the Brazilian Navy at the Centro de Hidrografia da Marinha in Niteroi. The target for this workshop was to give theoretical and practical training and experience in multibeam echo sounder operations. Among the lecturers were professor John Hughes Clarke from the University of New Brunswick and Mike Lamplugh from the Canadian Hydrographic Service. All practical training was done with one of the Brazilian Navy's EM 3000 systems. The participants were from Hydrographic Offices around South America as well as research organizations.

In the first week of December we were at EXPONAVAL in Valparaiso in Chile. This is the largest maritime/naval exhibition/conference in South America. Our focus was on the MEDUSA project and all the related products. We also had a paper on the HISAS 1030 at the conference.

Business-wise, 2008 has been a good year for the Hydrography department in South America with contracts in Chile, Venezuela, and Brazil. Also, we recently received an order from the Brazilian Navy for 10 EA 400 and 7 EA 400 SP single beam echo sounders as well as one EM 3002 multibeam echo sounder with Seapath 200. This order has a value of more than 5 MNOK.

Training Course for TOTAL Surveyors - Acoustic Positioning with and without Inertial Sensors



Participants in front of the model of Girassol FPSO (fitted with HiPAP® for riser tower positioning) from left to right: Ian Florence (Kongsberg Maritime), Manuel Luis (TOTAL), Arnaud Vidal (TOTAL), Tore Osvold (Kongsberg Maritime), David Simon (TOTAL),

A group of TOTAL surveyors attended a three day training course in Angola during February 2009. The main focus of the training course was use of SSBL (Super Short Base Line), LBL (Long Base Line) and MULBL (Multi User Long Base Line) positioning from HiPAP® (High Precision Acoustic Positioning) systems on surface vessels/ rigs and from HPR 408S systems installed on ROVs (Remotely Operated Vehicle).

The training was run as a combination of theoretical lessons, discussions and in-depth hands-on operation using HiPAP® APOS Trainers. Additional exercises for transducer alignement, converting and entering sound profiles, and telegram outputs, etc. were given.

The use of HAIN (Hydroacoustic Aided Inertial Navigation) for both surface vessels and ROVs was also covered. The HAIN Subsea systems offer operators the opportunity to maximise subsea positioning performance, both for shallow and deepwater projects, while the vessel version of HAIN outputs improved reference data to DP (Dynamic Positioning) systems and extends both SSBL and LBL operation limits.

Kongsberg Maritime appreciates these opportunities to discuss acoustic and inertial navigation and bring useful information back to our different R&D departments. The training was prepared and conducted by Ian Florence from Kongsberg Maritime's Operational Support team.

New Generation Low-Light Underwater Camera

Kongsberg Maritime Ltd is pleased to announce the launch of its new generation low-light underwater camera, the OE13 124 BIT. The new camera delivers unprecedented light sensitivity, image quality and range performance, enabling users to undertake more accurate, longer range underwater vehicle navigation in low-light and in turbid water conditions.

Building on previously successful enhanced SIT (Silicon Intensifier Target) and 1st Generation EMCCD based low-light camera products, the new OE13-124 BIT features an advanced back illuminated and thinned (BIT) CCD light sensor, thermo-electric cooling and integral image-processing algorithms, which delivers up to six times the light efficiency in water of 1st Generation EMCCD sensors. This performance, combined with a host of other best-in-class features, results in significantly optimised image detail, contrast, sharpness and low-noise levels across a wide dynamic brightness range.

The enhanced viewing capability enables users to undertake more accurate, longer range underwater vehicle navigation and surveillance in harsh environments, low light and turbid water conditions down to 4500m depth and beyond. The OE13-124 has significantly reduced image lag, immunity to image-burn and offers improved reliability, maintainability and throughlife savings.

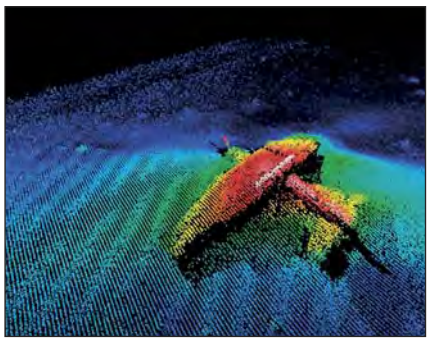
The OE13-124 is built and tested to rigorous quality standards and incorporates the highest levels of temperature, humidity, shock, vibration, over-voltage and electromagnetic compatibility protection and comes supplied with an individual light sensitivity performance test certificate and 2 year warranty as standard.

"Significant advances in core imaging sensor technology have enabled us to yet again provide a step-change in low-light underwater camera performance," comments Kongsberg Maritime Ltd's General Manager David Mackay. "After rigorous testing and performance benchmarking, our customers believe the OE13-124 will offer major advantages in the field, including improved ROV navigation and underwater surveillance efficiency. The development of this new lowlight camera and recent advanced HD cameras keeps us at the forefront of underwater camera technology."

OE11-150F Dye Detection LED lamp

OE11-145 General Purpose ROV lamp

GeoSwath Sonars Operational at Rijkswaterstaat



GeoAcoustics Ltd (Gt Yarmouth, UK), a Kongsberg Maritime company, reports that four GeoSwath systems have been delivered to Rijkswaterstaat (RWS) in the Netherlands.

Rijkswaterstaat is the arm of the Dutch Ministry of Transportation and Water Management wit sibilities including the construction and maintenance of waterways and flood prevention. RWS chose the GeoSwath interferometric multibeam due to its ability to provide very wide swath bathymetry and side scan from small survey vessels. It is particularly suitable for the shallow rivers, canals and seas in Holland.

All the GeoSwath installations on RWS vessels are configured with the the QINSy real time interface (from QPS BV, Zeist, The Netherlands) and are set up to provide highly accurate bathymetric mapping data along with co-registered side scan images. A requirement during system tests was that the survey results accurately matched previously acquired survey data, to within 7cm. The trials demonstrated the GeoSwath data accuracy and repeatability.

As of end February 2009 three RWS vessels were operational with GeoSwath sonars: the S/V Speurder is being used in the SE corner of Holland to monitor the Maas river and local canals; the S/V Siege is deployed mainly in the Waddenzee (the shallow sea in the North of Holland) - it's prime purpose is to survey and monitor the ferry shipping channel from the mainland to the islands, with an additional task of carrying out hydrographic surveys for various ports in the region; the S/V Markermeer is located in the Ijsselmeer and is tasked with monitoring the channels that provide access from the Rhine, Waal and Maas rivers. A fourth vessel will join the Siege in the Waddenzee this summer.

The GeoSwath can rapidly be moved to a vessel of opportunity if required; for January 2009 the Speurder's GeoSwath was deployed on a small shallow draft vessel to survey the Maas river when water levels were high due to melt water from the Alps.

Contact details for further information and image requests:
e-mail: tom.hiller@geoacoustics.com

About GeoAcoustics Ltd.

GeoAcoustics Ltd. (Great Yarmouth, UK) has been manufacturing marine survey equipment for more than 25 years, and is a world-leading manufacturer of sonar survey equipment for engineering geophysics and Naval survey applications. Principle product lines are swath bathymetry systems for shallow waters, side scan sonars and sub-bottom profilers.

Kongsberg Maritime has acquired GeoAcoustics Ltd in September 2008.

Workshop in Angola - Acoustic Positioning, Monitoring and BOP Control

Instructor Ian Florence emphasizing an importanct topic.

Kongsberg Maritime has conducted an Acoustic Positioning Workshop in Angola. Drilling engineers from Sonangol attended the event, which was held at the Continental Hotel in Luanda. The focus of the event was a technology update on the HiPAP® (High Precision Acoustic Positioning) Family and ACS acoustic BOP control systems. Recent system developments were shared and discussed, accompanied with simulations of the different systems.

Guests from Sonangol and C&C Technologies appreciated the opportunity to discuss and respond to the possible methodology related to the use of these systems. The event strengthened the vital relationship between manufacturer and operator and provided Kongsberg Maritime with very useful feedback.

INTSOK Conference in Moscow

Kongsberg Maritime's team at the INTSOK conference. From left to right: Roar Hansen, Torgeir Løvmo, Jean-Yves Bressand and Peter Grindem.

The 'Full Picture' was well represented at the last INTSOK conference in Moscow from 27th to 29th of January.

Kongsberg Maritime was represented with people from Subsea, Oil & Gas - Simulation & Optimization and Offshore & Marine. It was a good opportunity for networking with some of the key people from the Russian Oil & Gas Industry. The Shtokman project was of particular focus. Located in the Barents Sea, this is one of the biggest gas fields in the world. It is being developed by Total, StatoilHydro and Gazprom.