



The SUBSEA newsletter

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Season's Greetings

Kongsberg Maritime wishes to thank all customers and partners for a valuable collaboration throughout the year. This holiday season the companies comprising KongsbergMaritime have decided to donate the funds traditionally set aside for gifts to business associates.

As last year Bola Pra Frente in Brazil have been named as the recipients.



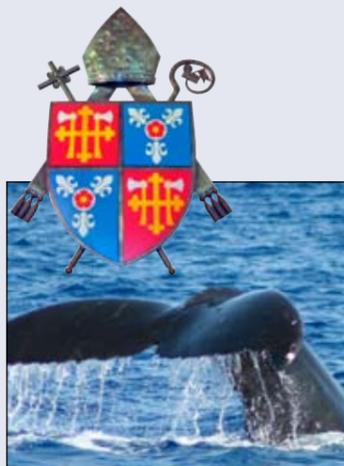
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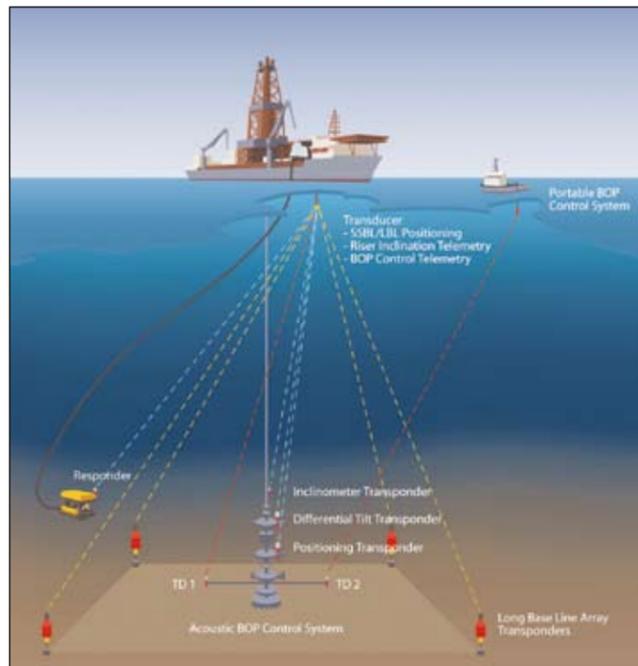
Kongsberg Maritime is pleased to announce that the FEMME 2011 Multibeam User Conference will take place in Trondheim, Norway, 5th–8th April 2011. Invitations will be sent out in August/September 2010 and a web page for information and online registration will be established.

As before, presentations by users of Kongsberg Maritime multibeam echo sounders will constitute a very central part of the conference, so we invite you to send suggestions of topics, abstracts and other ideas to the paper committee: helge.uhlen@kongsberg.com.

If you have any questions about the conference or would like to discuss possible presentations please contact torbjorn.kjar@kongsberg.com or nina.hovland@kongsberg.com.



ACS system No 100 delivered



The type approved acoustic control system (ACS) is designed for acoustic control of blow out preventor (BOP) and other subsea production units requiring a control system. Two major subsystems build up the system: The surface part and the subsea part depth rated to 4000m. Each of these two subsystems has transceivers connected to acoustic transducers. The total system is designed based on the principle of full dual redundancy – “two of everything”.

The subsea unit controls several different functions with readback, monitors

analogue inputs and has additional functionality such as sequence control, auto shutdown etc. An advanced acoustic telemetry link provides a reliable communication in noisy and reverberant offshore environments. The system is available for both Emergency BOP Control and Surface BOP Control. The ACS system is delivered as low frequency (LF) or medium frequency (MF) systems.

Since the early 80's Kongsberg Maritime has now delivered more than 100 ACS systems.

EM 2040 selected by IFREMER

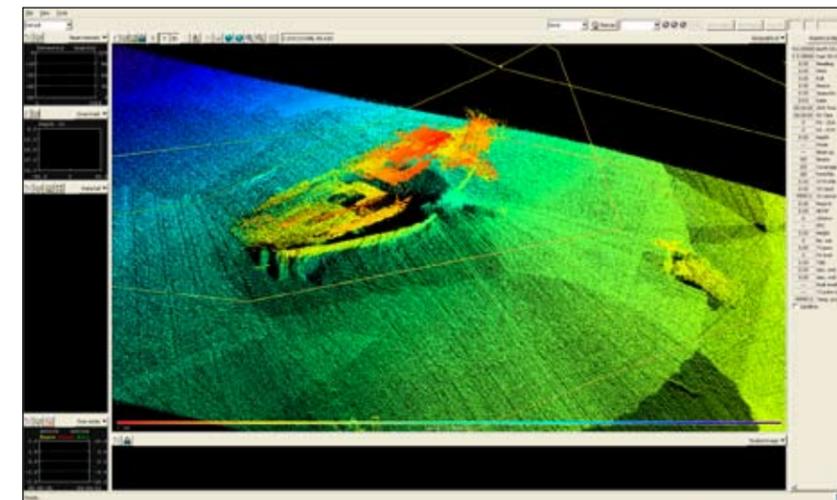
We are pleased to announce that we have been awarded the contract to supply the EM 2040 to IFREMER - French Institute for Exploitation of the Sea for use on its AUV, 'ISE Explorer'.

“We decided on the EM 2040 due to its modular concept, which makes it easy to integrate with an AUV. Its multi frequency operation with real time motion compensation, water column data, 6000m depth rating and its general high



acoustical performance gave us a good feeling that this was the right choice for IFREMER this time.” said Chef deservide, Dr. Jan Opderbecke.

Capacity building



The 10th Meso American & Caribbean Sea Hydrographic Commission Meeting took place in Bridgetown, Barbados, 3rd – 6th November 2009. Supported by the International Hydrographic Bureau, it is mainly a meeting for reporting National status on hydrographic and navigation issues, such as navigational charts and collection of data, etc. As part of the conference, the industry is invited to participate as observers and to give technical presentations to support the capacity building in the region.

Find out more here : <http://www.iho-machc.org/welcome.html>

Prior to the meeting, CARIS and Kongsberg Maritime AS had agreed to take the capacity building one step further by mobilizing a complete EM 3002 multibeam echo sounder configuration with sensors for data acquisition and a full CARIS software setup for the processing and presentation of the acquired data.

The Port of Bridgetown, through Captain George Fergusson, had kindly made one of the port's pilot boats available for the EM 3002 installation and a one week of survey. Over three days, an EM 3002, Seapath 200 with dGPS corrections and associated sensors were installed on the pilot boat. The system was tested and calibrated, and during the five days of the conference the participants from the 20 participating

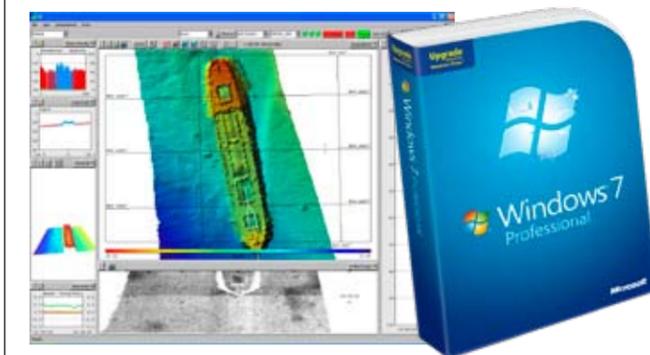
countries went onboard to learn about modern seabed mapping techniques.

Several areas outside Bridgetown including parts of the approaches for large cruise ship were surveyed. All the acquired data was processed with CARIS software and presented to all

participants, and the final results were compared with the existing navigational charts.

The whole operation was very successful, and everybody accepted Kongsberg Maritime as the leading supplier of modern seabed mapping systems.

Windows 7 and Seafloor Information System (SIS)



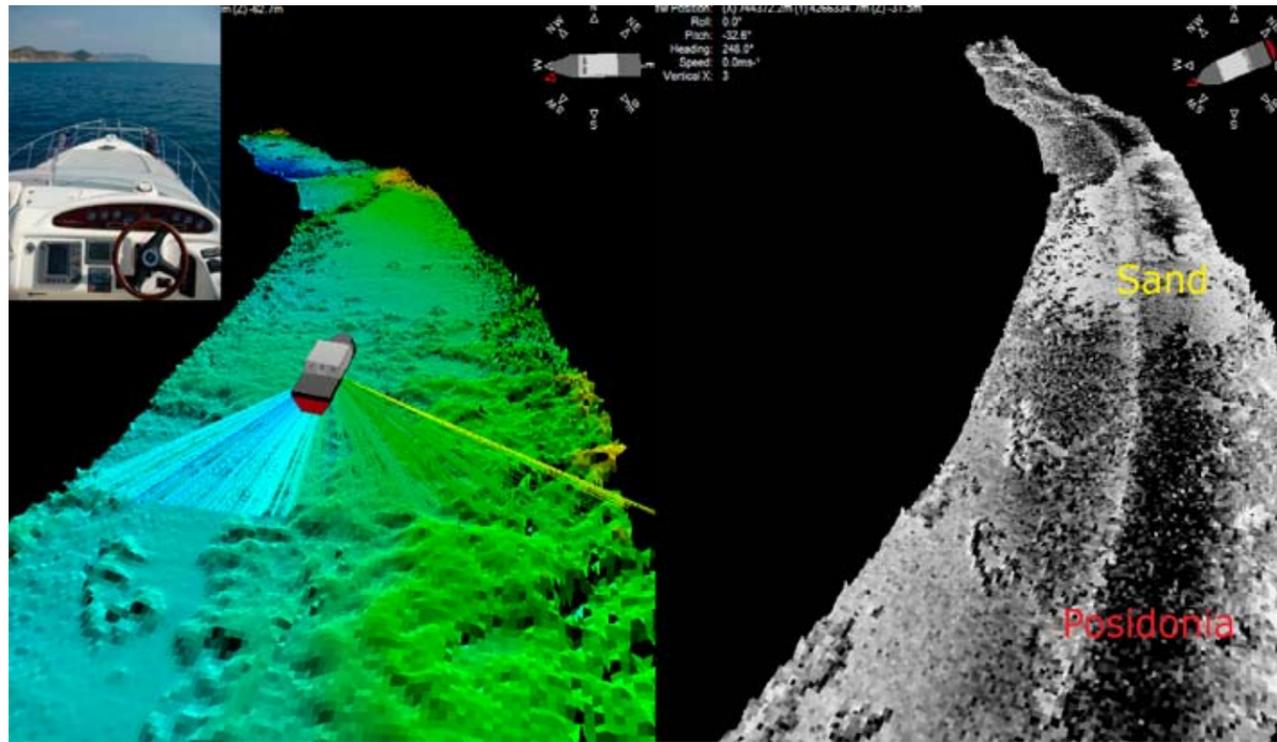
The objective of our strategy to incorporate Windows 7 within our SIS application is to deliver it with a next generation of PCs that will run the 64-bit version of Windows 7.

With the arrival of Windows 7, Windows XP will eventually fade away. As the PCs delivered with our multibeam echo sounders use XP today, a strategy for moving to Windows 7 has to be made.

The SIS topside application version 3.7 will be compiled and tested on Windows XP whilst Version 3.8 will be compiled and tested on Windows 7, including the 64-bit version.

SIS itself will still be a 32-bit application, and the information we have so far is that it will work on both XP and Windows 7.

We will continue to support the delivered XP systems for the forthcoming versions of SIS, and existing installations will be able to upgrade the SIS topside application.



The three technologies, wide swath bathymetry, side scan sonar and single beam echosounder

The Treasure of the Oceans

Posidonia is the foundation of marine ecosystems. It is a priority habitat and fundamental to the ecological balance of the seas. Recent research has established a new scientific method for its detection, classification and volume estimation. Simrad Spain proposes the use of hydroacoustic technology for this purpose.

Why is Posidonia vital to the marine ecosystem?

The grass meadow is a 'climax community', representing the highest level of development and complexity that a marine ecosystem can reach. Posidonia in coastal ecosystems plays a major role for several reasons:

- Thanks to its leaf development, the environment frees up to 20 liters of oxygen per day, per m² of meadow
- It produces and exports biomass both to surrounding ecosystems and to greater depths
- It provides shelter and breeding grounds for many fish, cephalopods, bivalves, gastropods, echinoderms and tunicates

- It consolidates the seafloor to help offset costs and excessive sediment transport due to coastal currents
- It acts as a barrier, attenuating the force of currents and waves and thus preventing coastal erosion
- It dampens the waves through the layer of dead leaves deposited on the beaches, which protects against erosion, especially during winter storms.

The disappearance of grasslands has negative effects not only on the micro-ecosystem itself but also on linked ecosystems; just think that the loss of a single meter of grassland can lead to the disappearance of several meters of beach due to erosion. Furthermore, regression of grasslands involves a loss of biodiversity and deterioration of water quality. The research on Oceanic Posidonia has seen a major boom in recent years. The importance of the flora in the marine ecosystem balance has become obvious and is beyond question. Among the underwater flora of our environment the Posidonia Oceanica is of special importance. It is a species that has a powerful

attraction to be endemic to the Mediterranean and the key to ensuring biodiversity of the seabed. It is subject to many threats, given the increase in human activities such as chemical spills, discharge of brine from desalination plants, construction of port infrastructure and indiscriminate trawling. In addition, other non-human factors such as the encroachment of invasive species to the Posidonia also pose a threat to their survival. We must consider the slow processes of growth and recovery of a damaged area. It is estimated that the Posidonia extends through the meadows at the rate of one centimeter per year, so if you try to retrieve a square foot, it would take a century to achieve your goal.

Scientific studies by hydroacoustic systems

Until recently, scientists have used methodologies based on diving and capturing video images in their study areas. Current technology has improved the qualitative and quantitative research capabilities, and the application of different hydroacoustic detection systems provides a

variety of information. Documents published by the 'European Acoustics Association', highlighted the excellent results obtained in detecting and classifying seabed vegetation by combined application of acoustic methods. They combined a single beam echosounder, which enables classification of the seafloor and its vegetation, a multi-beam sonar, which generates micro-relief, and a side scan sonar, imaging the seafloor reflectivity and thus enabling the spatial classification of seafloor types and vegetation. The data from these systems are merged and processed, resulting in 3D images of the same quality and precision as found in the field of biomedicine.

Quantitatively speaking, this technology can work simultaneously with oceanographic parameters. All this information is linked to the presence and quantity of Posidonia. As for the quantitative method, prospecting new technologies allow a wide area of study while minimizing data collection time. Thanks to the digital storage of all data acquired during the survey, one can make historical databases that allow monitoring of the expansion or reduction in the length of the field of underwater flora. You can also study how quality varies over time by comparing contemporary data with the previous sampling. Many authors emphasize the new possibilities opened by the combined application of different acoustic systems. Each of the systems available, depending on their features, offers various types of information about the flora.

KONGSBERG and Simrad systems applied to new methodologies

In an experiment conducted in France by the company in collaboration with TS SEMANTIC GESMA, for defence purposes, the aim was to detect mines hidden in the vegetation. Several systems were combined to cross-correlate the signals from different types of bottoms (sand with and without plants, rocks) with samples obtained at different depths and with different settings of the systems (transmit power and pulse length between them). Acoustic systems combined in this test were:

- A side scan sonar
- The GeoAcoustics shallow water wide swath bathymetry system GeoSwath Plus, which simultaneously acquires bathymetry with a swath width of 12 times the water depth and geo-referenced side scan data
- The scientific high-precision echosounder Simrad EK60

The side scan sonar shows the reflectivity of the seafloor and discriminates areas where there are plants or sand. The GeoSwath Plus system provides bathymetry and geo-referenced side scan data. Both datasets can be merged to generate a three dimensional image representing the bathymetry and backscatter of the seafloor. This unique feature allows us to correlate the three-dimensional data with the location and extent of Posidonia meadow areas.

The scientific probe records the acoustic pulses to generate a profile of the

seafloor. These data are recorded simultaneously with the DGPS position. Since the sandy areas and vegetation meadows provide different signatures, by applying the algorithm analysis, it discriminates between different types of seafloor. In this first phase, it detects the presence of Posidonia. In that case the system estimates its height and abundance. The presence of Posidonia is limited to the depth to which sunlight reaches, the photic zone, so most of these studies are conducted in shallow water. This combined with the high resolution of the acoustic systems, generates maps that resemble virtual reality. This methodological concept corroborates that the innovations technology offers high performance and provides scientists with a new and improved way to study. Moreover, these technologies enable the direct study of large areas with very high resolution, whereas the traditional approach of visual sampling was limited to very small zone and therefore the use of statistical extrapolation.

The methodology provides several advantages: the mappings are very precise and there is no need to repeat the survey again and again to compare results. Another advantage is that it significantly reduces the costs of underwater inspections: divers, cameras, videos, etc. A direct scientific application is the fact that the concentration of plants has civil and military uses: the plants can hide mines placed on the seafloor and also alter the performance of the sensors used for detection (especially the laminaria species).

KM AUV Conference 2010



Kongsberg Maritime is pleased to announce that the next KM AUV Conference will take place in San Diego, USA 4 - 8 October 2010. Plans and detailed program is still in progress and invitations will be sent out in March/April 2010.

KM like to invite our customers and users of HUGIN and REMUS AUV's to participate in the program, and we will therefore contact you direct in the near future.

If you have any questions regarding the conference at this point, please contact; Ernest Petzrick, epetzrick@hydroid.com or Lorna Banstra, LBanstra@hydroid.com

Dual HiPAP® 500, HAIN Subsea and DP to 'Flintstone'



DEME Group ordered the dynamically positioned fall-pipe rock dumper 'Flintstone' from Sembawang Shipyard, Singapore, in July 2008. She will be commissioned in early 2011 and be operated by Breda based Tideway BV, the offshore specialist company within DEME group.

Flintstone has a load weight of 19,000 ton and is specially designed for creating high precision structures on the sea bed, using rock and gravel in bulk, etc. Typically, the structures are rock capping and bedding on top of or underneath an oil/gas pipeline; rock tables for crossing pipe lines and gravel layers for wind turbine foundations etc.

The vessel features two large rock bunkers on the main deck. In the centre of each rock bunker is a large Liebherr excavator, which discharges into a hopper fitted starboard of the rock dumper. The bulk of each rock bunker is transported to the central hopper by a longitudinal conveyor belt. Subsequently a 2000ton/h belt conveys the rock across the beam to the fall pipe. The ID 700 fall pipe hangs

in the middle of a moonpool and the rock material falls through this pipe to the seabed. Accurate positioning of the fall pipe mouth is handled by an ROV.

Huisman designs and builds the new Stone Dumping Unit. This is a tower like construction mounted over the moonpool, which allows the swift build-up and retrieval of the fall pipe, even in rough seas. Rock bulk production through the fall pipe is controlled by means of the rock handling system.

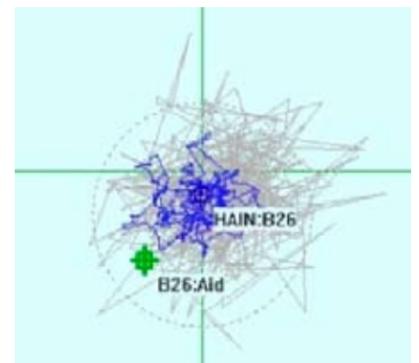
Thanks to advanced Kongsberg Dual HiPAP 500, HAIN Subsea and DP system, and the comparatively high DP capability of the all electric propulsion based on 6 thrusters, Flintstone is able to track (a pipeline) with great accuracy and fast update rate at all times, which supports the quality of the subsea structures being built.

Use of two HiPAP 500 transducers increases the electrical and acoustic redundancy, and also increases the accuracy, as it opens for redundant measurement with position estimation based

on two independent measurements and a quality control. The dual system uses both transducers to measure the position of one single target (transponder) by separately controlling the beam forming and phase measurement for each system in parallel.

HAIN Subsea combines the acoustic measurements from the Dual HiPAP 500 and the readings from the sensors onboard the ROV in an optimum way. The navigation equations update the ROV position, velocity, heading and attitude almost continuously based on the readings from the Inertial Measurement Unit. The advanced Kalman filter corrects these values when new acoustic positions and readings from the other ROV sensors are available. This results in improved position accuracy and update rate compared to the acoustic measurements.

The innovative self supporting fall pipe is a joint development of DEME/Boskalis and IHC Merwede. Thanks to this newly conceived fall pipe operations in water depths of up to 2000m are possible.



New HiPAP Training in Aberdeen



From left: Conway Lawson, Training Manager, Technical, Keira Togneri, Training Instructor, Operations, Lee Tobin, Training Manager, Operations Kerry Johnston, Training Coordinator, Iain Fullerton, Training and Simulation Business Manager, Nikki Machell, Training Instructor, Technical.

From early 2010, Kongsberg Maritime Ltd, will be offering HiPAP Technical & HiPAP Operator (APOS) training courses on a regular scheduled basis from their new, custom fitted, Training and Marine Simulation Centre at Westhill, Aberdeen.

A range of HiPAP courses are aimed at offshore, marine & construction surveyors & technicians, vessel electrical staff and DP operators, in order to provide participants an understanding of:

- HiPAP (High Precision Acoustic Positioning) principles and training on the effective operation of the system in USBL and LBL modes using the APOS s/w
- Offshore Loading using the HiPAP APOS s/w for Navigators and DP operators from shuttle tankers and standby vessels involved in different offshore loading operations
- HiPAP 350 & HiPAP 500 system operating principles and the main

components of these systems, including transponders, and their maintenance.

Why choose Kongsberg Maritime Training Services?

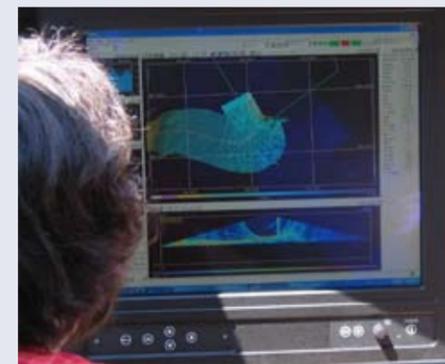
- Unique access to the latest Kongsberg Maritime systems & operating software
- Instructors with direct operational experience and knowledge of Kongsberg Maritime systems
- Custom designed training consoles and aids
- Range of Nautical Institute approved DP courses
- Courses designed for specific installations, vessels and their operational teams
- Project specific training
- Adds value to your investment in personnel and their individual development
- Refresher training – continuity and update on the latest Kongsberg Maritime systems
- Course accommodation provided/ recommended

Kongsberg Maritime system training offers a broad range of benefits, including:

- Develops operator skills and confidence
- Enables better operational planning
- Increases operational efficiency
- Maximises system performance
- Increases project productivity and profitability
- Reduces overall operational risk
- Motivates and aids the retention of employees
- Prevents accidents and system failure due to operator error or mistake
- Enhances company HSE profile and operational reputation
- Reduces downtime and disruption to the project schedule
- Reduces operational costs

For further information contact Iain Fullerton at +44 (0)1224 617671 or Email: km.training.aberdeen@kongsberg.com

SIS Operator course



We are pleased to announce another five day open SIS Operator course, which takes place in Horten, Norway, March 1st – 5th, 2010.

The course will consist of four days of theory and one day of practical, hands-on training at sea. It will be held at our Training Center in Strandpromenaden 52, starting at 09:00 and finishing at 15:45 every day. The cost for the five day course is NOK 23,000 per person. We will enroll 8 participants in total.

You can book your seat via email on km.training.horten@kongsberg.com, please include name of participant, company name, name of vessel and the invoice address.

The new HUGIN 1000 Portable AUV System demonstrated in Republic of Korea



HUGIN 1000 AUV Resting on Extended L&R Stinger

HUGIN 1000 Portable AUV System

The portable AUV system is fully containerized into one 20-foot ISO container for storage, battery management, vehicle maintenance and launch and recovery (L&R), and one 10-foot ISO container for mission planning, vehicle checkout, mission execution, and post-mission analysis (PMA). This advanced AUV system covers a wide range of operations like MCM, REA, route survey and high-quality bathymetric mapping surveys in areas of interest.

The main advantage of the HUGIN AUV is its small overall system footprint. This is primarily due to the multi-function 20-foot container, providing AUV storage, shipping, maintenance, battery charging, launch and recovery facilities, and furthermore due to compactness of the 10-foot operations container, with only two operators needed for the entire operation.

The system allows fast and easy mobi-

lization onto vessels of opportunity due to ISO containerization, well-defined and simple interface points, and the self-sufficient nature of the system. The entire system fits on a standard truck, and can use all standard shipping methods, including overnight airlift to anywhere in the world.

AUV operations are run directly from the 10-foot ISO container, with no need to tie into a ship's systems or internal spaces. In the portable system, a Kongsberg High-Precision Acoustic Positioning (HiPAP) 350 system and a tow-fish transducer for acoustic communication are included, as well as a Kongsberg SeaPath system for accurate ship reference position and attitude.

The 20-foot container includes a two-stage L&R "stinger" (hydraulically controlled hinged ramp) which allows AUV operations from vessels with a stern freeboard of up to 5 meters. Both ISO containers are insulated and equipped with

heating systems to enable operations in Arctic environments, as well as air condition system for operations in tropical climate.

Recent Demonstrations

The HUGIN 1000 Portable AUV System was recently demonstrated in Korean waters. The operations were carried out by Kongsberg's AUV Department in close cooperation with the Agency for Defense Development (ADD) in the Republic of Korea (ROK).

The sea trials took place southwest of the city of Busan and covered both search for mines in shallow water and REA in deeper waters. The HUGIN AUV executed all test dives autonomously without problems in up to sea state 4.

It took one week, from start of transportation in Horten to the HUGIN 1000 first touched the Korean waters, which is quite fantastic, Svein Otto Schjerven, Manager S & M HUGIN AUV's explains. He continues; "The first operation of this kind with the HUGIN 1000 system was a great success, and demonstrated fully the capacity of such an AUV system."



HUGIN 1000 Portable AUV System on the ADD vessel



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