



# The SUBSEA newsletter

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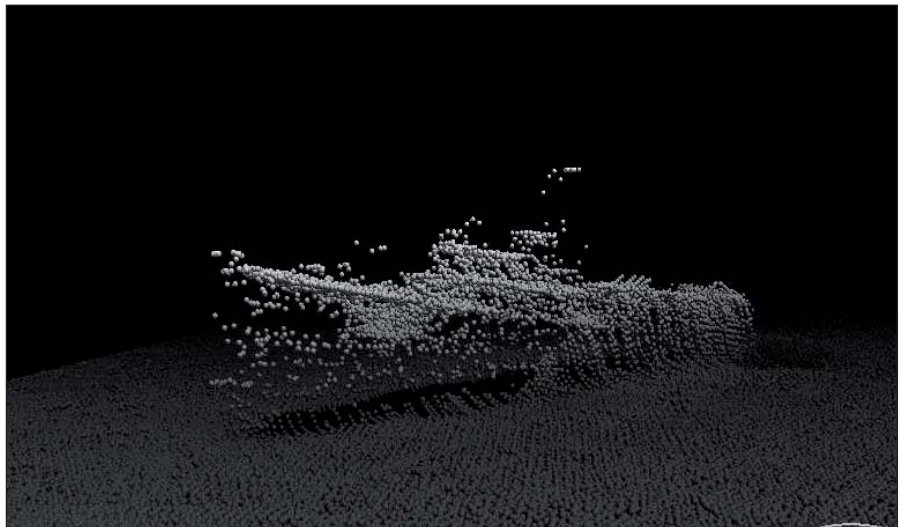
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## EM 3002 results



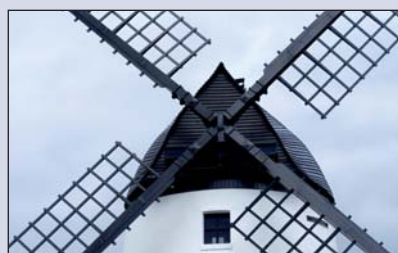
*The wreck is in 85 meters of water. The approximate size of the vessel is 61m in length, 11.6m in width and 13.8m in height.*

These data were collected by Knut Lyngberg of the Canadian Hydrographic Service (CHS) on a Kongsberg EM 3002 multibeam sounder mounted on board the Canadian Coast Guard Launch 'Otter Bay'. This previously unknown wreck was discovered during a routine multibeam charting survey of the west coast of British Columbia, Canada. The survey was funded by the CHS and Natural Resources Canada and the image created using CARIS 6.0 in 3D

subset mode. As the wreck is unknown the Registrar of Wrecks has been notified and steps are underway to confirm it's identity. Water column data was collected at the time but has not yet been processed. However, from the EM 3002 data, we can calculate the following:

The wreck is in 85 meters of water. The approximate size of the vessel is 61m in length, 11.6m in width and 13.8m in height.

## FEMME 2007 (Forum for EM Multibeam Experience)



The FEMME conference will take place from 20 to 23 March at Marriott Hotel, Amsterdam. More than 200 delegates from about 30 countries have registered. We are looking forward to an informative and pleasant week with our customers in focus.

## HUGIN 3000 for FUGRO NV



The next HUGIN 3000 for FUGRO is ready for acceptance testing. As for the first HUGIN 3000 delivery, FUGRO brought one of its survey ships to Norway for installation and testing, during two weeks starting mid February. Initial acceptance testing took place outside the Kongsberg Maritime location in Horten (the Oslo Fjord) with final deep water test at the west coast of Norway.

A team of FUGRO people from Lafayette and Aberdeen and Kongsberg Maritime HUGIN Team members worked closely together to ensure the installation and testing was a success. In accordance with HUGIN Team practice a number of FUGRO people have participated during the final production assembly/testing phase of their new vehicle. This takes place for all HUGIN deliveries and has proven to be a significant contribution to the success for our customers and for Kongsberg Maritime with the HUGIN AUVs.

HUGIN 3000 is the offshore work version with 3000m depth capability and 60 hours endurance at 4 knots, simultaneously running multibeam echosounder, sidescan sonar, sub

bottom profiler and CTD. The power source is the novel AIHP semi fuel cell battery developed by FFI and Kongsberg Maritime. Collectively, HUGIN AUVs have surveyed a distance of more than 120, 000 kilometres for the offshore oil and gas industry. That corresponds to a voyage roughly three times around the equator!

### **New HUGIN 1000 for 3000 meter waterdepth**

A new step in the development of HUGIN AUVs will take place with the delivery of a 3000 meter dept rated HUGIN 1000 for FFI (The Norwegian Defence Research Establishment) at the end of 2007. The Norwegian Marine Research Institute will also be a stakeholder in the vehicle. The HUGIN 1000 will mainly be operated from the research vessel HU Sverdrup, but will also be made available for dedicated marine research projects.

The HUGIN 1000 will be depth rated to 3000m. Payload systems include multi-beam echosounder, sidescan sonar, sub bottom profiler and CTD. The vehicle will also be prepared for installation of a laser plankton counter instrument. The battery system will be the HUGIN electrical rechargeable pressure tolerant lithium polymer battery allowing

survey mission endurance of 20-30 hours depending on vehicle speed.

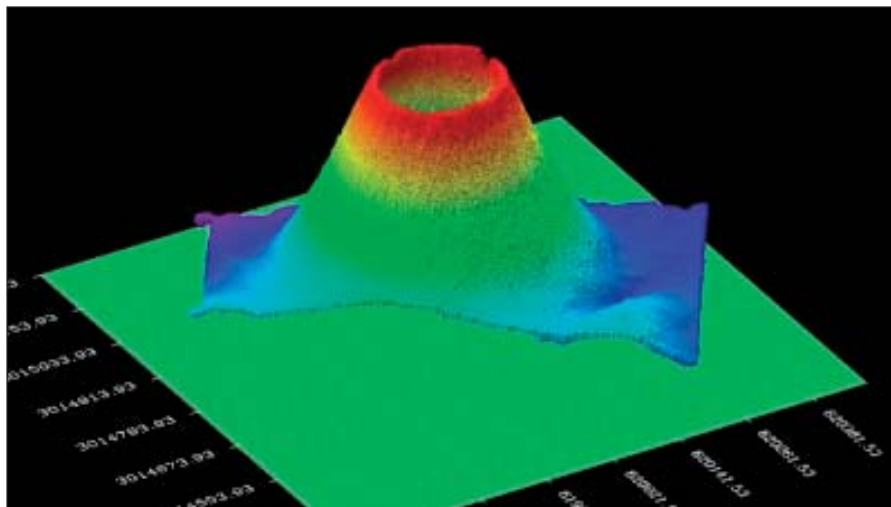
### **Next HUGIN 1000 for the RNoN**

The delivery of a second HUGIN 1000 to the RNoN, scheduled for second half 2007, will be equipped with the new high performance HISAS 1030 Synthetic Aperture Sonar (SAS) developed by Kongsberg Maritime in co-operation with the Norwegian Defence Research Establishment (FFI).

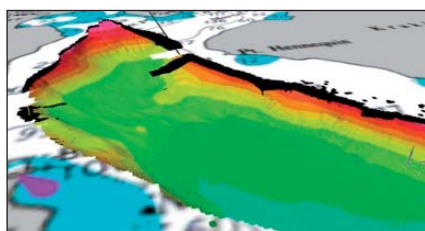
### **Delivery of the first HUGIN 4500**

C&C Technologies took delivery of the first HUGIN 4500 in late 2006. HUGIN 4500 has an extended depth rating to 4500m, 30% increased battery capacity and a higher performance payload sensor package. C&C Technology supplied itself the sensor package consisting of a multibeam echosounder, chirp side scan sonar, chirp sub-bottom profiler, CTD system and a methane detector. The extended sub-bottom profiler is customized with narrow transmit and receive beams to permit significantly deeper seabed penetration. In addition to the sub-bottom profiler, a customized dynamically focused sidescan sonar system is installed to provide significantly higher resolution than traditional systems.

## From the HMS Endurance ship's diary: Surveying in Antarctica



Volcanic Cone – labelled Cap 1



A multibeam data set draped into the published chart (Admiralty Bay – South Shetland Islands), colour is used to define the depth contours.

For generations mariners have relied on the information contained on Admiralty Charts to safely navigate ships of all sizes around the globe. The technology that the surveyor has at his disposal has changed dramatically. From sextant and lead line to early single beam echo sounders and now to the latest in multibeam survey systems. HMS ENDURANCE has developed in keeping with these changes and is fitted with a Kongsberg EM 710 multibeam echo sounder.

Previous to having multibeam capability, any survey platform would be required to run along pre-planned lines while collecting single points of depth along a very narrow single beam directly beneath the ship. At the same time a Side-Scan sonar would be towed behind the platform to 'look' between lines of depth data in order to detect any objects

which may require further investigation (a practice virtually impossible in ice conditions). Multibeam offers the surveyor a 'fan' of hundreds of beams which in the case of ENDURANCE run from 25 degrees below the horizontal plane through the vertical to 25 degrees below the horizontal on the opposite side of the ship.

The resulting 'swath' is stabilised for heave, pitch and yaw and a very accurate differential GPS position is blended into the solution to position each data point on the sea bed. The system fitted to HMS ENDURANCE produces a swath width of between 3-4 times the water depth, giving the ship the capability to produce lanes of data up to 1200m across that are ideally suited to the narrow inlets and bays of Antarctica. These lanes can provide safe highways for HMS ENDURANCE to operate within when conducting flying or boat operations, as well as providing much needed survey data for the update of published charts.

The requirement for modern, reliable survey data (very little of which exists) in and around the Antarctic Peninsula is on the increase. The numbers of visitors embarked in cruise ships grows every year. Inevitably with this increase an element of commercial competition will

develop with operators wishing to push further south into areas not offered by competitors.

HMS ENDURANCE receives her survey tasking from the United Kingdom Hydrographic Office, she also routinely collects and expands her own data sets whilst embarked on tasking in support of British Antarctic Survey.

The survey team and Ship's Company of HMS ENDURANCE continue to collect high quality survey data in order to further our understanding of the Antarctic environment and increase the levels of reliable and accurate charting available in the area.

## Fugro Survey AS



Fugro Survey AS in Norway has recently signed a contract for an EM 710 0.5x1, a HiPAP 500 and a Seapath 200. The systems will be installed on a trawler owned and operated by Birkeland Br Fiskebåtrederi AS. The installation will take place in April with sea trials end of April.

Fugro Survey AS is part of the Fugro Marine Survey Division which is the world leader in the provision of off-shore survey services. Fugro provides high precision positioning systems, positioning services, hydrographical, geotechnical, geophysical and geodetic surveying.

Fugro Survey AS has 70+ employees in offices strategically placed in Bergen and Oslo.

## Kongsberg installs echo sounders for Argentine Navy



Kongsberg Maritime recently completed the installation and firing up of the bathymetric systems in two Hydrographic ships belonging to the Argentine Navy: the ARA 'COMODORO RIVADAVIA', and the ARA 'PUERTO DESEADO'.

In both cases, the purchase was sponsored by the UNDP (United Nations Development Programs), the first through the Environmental Secretary of the Ministry of Health, and the second through COPLA (Argentine Commission to determine the Continental Platform Limits) belonging to the Ministry of Foreign Affairs, both of Argentina.

Both ships will be operated by experts and personnel from the Argentine Navy's Hydrographic Division

The system installed in the ARA 'COMODORO RIVADAVIA' is intended for shallow waters, and will be used for research and chart production of coastal waters and internal rivers. It consists of one two head multibeam EM 3000, operating at 300Khz with a transducer hoisting system, one EA 400 single

beam operating at 38 and 200Khz, and one EA 400P on the same frequencies.

The system, which also benefits from having a Kongsberg Seatex MRU and DGPS positioning unit, had its first task working on the South America's southern channel, the Beagle channel, with great success.

It is also interesting to point out that the transducer hoisting system was installed in the same location where the ship had another old Simrad sonar unit: an SK3.

The Oceanographic Ship ARA 'PUERTO DESEADO' has been equipped with two redundant Kongsberg Single Beam EA 600s, each one with two frequencies: 200 KHz for shallow waters and 12 KHz for depths down to 11.000 metres. This ship will be available to fulfil COPLA's needs.

The installation of complex systems, with all the necessary sensors to obtain high quality information, was a real challenge for Kongsberg Maritime, its representative RC International and the installation company IEA (Ingenieros Electronicos Asociados) of Argentina.

The original offer presented by Kongsberg indicated 18 weeks for all installation and trial procedures, but due to COPLA's need to make their first trip to the Antarctic during the summer months in the southern hemisphere, the proximity of the end of the year, a very short time available at the drydock and a very dedicated job by Mr. Murphy (the Lawyer), work was completed in only 8 weeks. It was a hectic time, full of tension and doubts on the final success but in the end, the installation was completed in time.

Added to the short time available, the ship has a very important bulb bow and also a thruster tube in front of the transducers location, which had to be installed in the same place as the old transducers. This can be seen in the picture of the ship. Training for operators and maintenance courses were also conducted during the installation period.

Added to all this was the strict check list prepared by COPLA, which was much longer than the normal HAT and SAT from Kongsberg, because all external sensors to the system had to be checked and verified.

After leaving the shipyard, all trials showed the high quality of the systems. The first surprise was getting marks up to 700 meters with 200 KHz operation, in not too cold waters and with not very hard bottom. The other surprise was the lack of noise in the picture up to the 6000 meters, especially with the difficult conditions found in the hull.

All systems involved worked perfectly, and it is important to mention the excellent job made by all the people involved in the installation, configuration, logistics, adjustment and training courses, not only for Kongsberg equipment but also for the other parts of the system.

Under the direction of Torbjorn Kjaer, head of Kongsberg single beam Maintenance Dep. and Harold Orlinsky from Hypack, we must also mention the great job made by the RC International people: Alan and Maximiliano Rozenblum, in adjustment and collaboration of courses and trials. We must also mention the



**Back line:** Gerardo Mannavela (IEA), Andres Dorta (IEA) **Front line from left to right:** Alan Rozenblum (RCI), Maxi Rozenblum (RCI), Harold Orlinsky (Hypack), Alejandro Monte (IEA), Wendell Jones (IEA), Torbjorn Kjaer (KM)

valuable work of IEA's engineers Wendell Jones, Gerardo Mannavela, Alejandro Montes and the rest of IEA's men, who produced an excellent installation, as can be seen in the pictures. All this in 8 weeks, which should be considered a real record, due to the special conditions, and considering that Argentina is at the other end of the World.

A good part of this success also came

from the support obtained from the Argentine Navy personnel and COPLA's supervisors, who co-operated with Kongsberg people to form an excellent group.

Finally, we should not forget the marketing and sales work of RC International supported by the Horten office through Jan Haug Kristensen and Bjorn Hoyum Larsen, and the support in legal

## EM 3002 Multibeam systems for Ireland

Kongsberg Maritime has been successful in two recent tenders to supply shallow water high resolution EM 3002D dual head multibeam systems to both the Geological Survey of Ireland and the Marine Institute. These systems will be used in support of the INFOMAR Programme and other programmes.

The Government of Ireland mandated the Geological Survey of Ireland (GSI), in conjunction with their strategic partner the Marine Institute (MI), to carry out and manage the Irish National Seabed Survey (INSS), between 1999 and 2005. The follow-on strategy to INSS, the Integrated Mapping for the Sustainable Development of Ireland's Marine Resource (INFOMAR) project, is a joint venture between GSI and the MI.

The INFOMAR Programme commenced in 2006 and is a multiyear project that will concentrate on the map-

ping of priority bays and areas around Ireland. Designed to incorporate all elements of an integrated mapping programme, the key deliverables of the data acquisition will include hydrography, environmental and heritage data. This data is required to underpin the delivery of a range of requirements, including: management plans for inshore fishing, aquaculture, coastal protection and engineering works, environmental impact assessments related to licensing activity, Water Framework Directive requirements, and to support evolving needs in the coastal zone management area. Hydrographic data will be gathered to internationally accepted LINZ and/or IHO standards.

The EM 3002D systems were selected for their excellent real environment operating characteristics, where the benefits of a wide swath and stabilised seabed image provide the operators



with the maximum productivity in the minimum survey time.

### The survey spread for the GSI included:-

- EM 3002D Multibeam echo sounder system
- EA 400 Single beam echo sounder system
- Post processing software, Neptune, Caris and Fledermaus

### The survey spread for the MI included:-

- EM 3002D Multibeam echo sounder system
- MRU 5 Motion reference unit complete with subsea bottle.



## New Hydrographic Regional Sales Manager



Clemens Pellenwessel joined Kongsberg Maritime in Hamburg as sales manager for hydroacoustic products, with effect from July 2006.

Clemens graduated from the University Hannover with a degree in Surveying Engineering. At the beginning of his career he was engaged in GPS technology as a Trimble distributor between 1988 and 1990. He has worked as a sales manager internationally over the past 15 years, mainly for SAM Electronics in

the field of Navigation, Automation and Propulsion systems.

Prior to joining Kongsberg Maritime he held sales positions in satellite communications for a Telenor company in Germany.

“I’m pleased that I can bring my background and my experience in the maritime industry to a highly motivated team. The innovative technology of hydrographic systems makes my new job very exciting.”

## New Hydrographic Regional Sales Manager



Grant Rawlinson has been appointed as the Sales Manager for Hydrographic Systems for Asia, based in Singapore. Grant is 33 years old and has spent 9 years in Singapore, involved in sales and support of Hydrographic and Land based survey systems.

He has 3 years working experience as a Land and Hydrographic surveyor based

in Singapore and the United Kingdom. Originating from New Zealand Grant has a Bachelor’s Degree and a Post Graduate Diploma in Surveying from the University of Otago in New Zealand.

During his spare time Grant enjoys traveling, playing rugby, mountaineering and the occasional beer!

### Overview – Standard courses

### HPR & HiPAP Acoustic Positioning courses



Week	Course
10	APOS Basic + LBL/MULBL
12	APOS Basic + ACS operator/technical
13	ACS Operator/technical
17	APOS for Offshore Loaders

Contact person:  
Frank Lian, instructor  
(Mobile +47 992 03 963)

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