



Artists impression of the 'Hrönn'

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Kongsberg Maritime: Automated Ships Ltd and KONGSBERG to build first unmanned and fully-automated vessel for offshore operations

Kongsberg, Norway, 1stth November 2016 – The UK's Automated Ships Ltd (an M Subs Ltd subsidiary) and Norway's Kongsberg Maritime have signed a Memorandum of Understanding to build the world's first unmanned and fully-automated vessel for offshore operations. In January 2017, Automated Ships Ltd will contract the 'Hrönn', which will be designed and built in Norway in

cooperation with KONGSBERG. Sea trials will take place in Norway's newly designated automated vessel test bed in the Trondheim fjord and will be conducted under the auspices of DNV GL and the Norwegian Maritime Authority (NMA). The Hrönn will ultimately be classed and flagged, respectively.

Currently, only small unmanned boats are being utilised for near shore operations but there are no technical limitations to constructing large, unmanned and automated systems. The only impediments are regulatory, but with the participation of DNV GL and the NMA, and Norwegian and UK companies and institutions, it will be possible to rapidly and at low-cost be the first to market with a full-size unmanned ship.

Hrönn is a light-duty, offshore utility ship servicing the offshore energy, scientific/hydrographic and offshore fish-farming industries. Its intended uses include but are not limited to: Survey, ROV (Remotely Operated Vehicle) and AUV (Autonomous Underwater Vehicle) Launch & Recovery, light intermodal cargo delivery and delivery to offshore installations, and open-water fish farm support. The vessel can also be utilised as a standby vessel, able to provide firefighting support to an offshore platform working in cooperation with manned vessels. Automated Ships Ltd is currently in discussion with several end-users that will act as early-adopters and to establish a base-rate for operations and secure contracts for Hrönn offshore, in the near future.

Hrönn will initially operate and function primarily as a remotely piloted ship, in Man-in-the-Loop Control mode, but will transition to fully automated, and ultimately autonomous operations as the control algorithms are developed concurrently during remotely piloted operations.

Automated Ships Ltd will be the primary integrator, project manager and ship-owner of this world's first fully automated and unmanned ship for commercial use. The project will leverage existing technology to develop a robust, flexible and low-cost ship to become the market leader and offer not only a capable work-boat but provide an unparalleled R&D asset for the furtherance of this emerging industry sector.

KONGSBERG's role in the project is to deliver all major marine equipment necessary for the design, construction and operation of Hrönn. The leading global maritime technology manufacturer will deliver all systems for dynamic positioning and navigation, satellite and position reference, marine

automation and communication. All vessel control systems including K-Pos dynamic positioning, K-Chief automation and K-Bridge ECDIS will be replicated at an Onshore Control Centre, allowing full remote operations of the Hrönn.

“The advantages of unmanned ships are manifold, but primarily centre on the safe guarding of life and reduction in the cost of production and operations; removing people from the hazardous environment of at-sea operations and re-employing them on-shore to monitor and operate robotic vessels remotely, along with the significantly decreased cost in constructing ships, will revolutionise the marine industry. Automated Ships Ltd will be at the forefront of that revolution, along with its many Norwegian partners,” said Managing Director Brett A. Phaneuf of Automated Ships Ltd.

“Research, innovation and technology development are at the core of DNV GL's business-development philosophy. In general, we are widely involved in the qualification of new shipping technology. Increased automation combined with remote monitoring and control is an inevitable trend and has the potential to create safer and more efficient transport and operations at sea. This may lead to unmanned ships, as in this case, and the technologies involved also have the potential to improve the safety and efficiency of manned ships in the form of increased decision support and operational assistance. The contract that has been announced today is a brave initiative and a major step towards the realisation of these technologies, and we look forward to moving technology frontiers together with all those involved,” said Bjørn Johan Vartdal, Head of DNV GL Maritime Research.

“We are proud and excited to be part of the first project to actually realise the potential of unmanned vessels by supporting the construction of the first full size, fully operational example,” added Stene Førsund, EVP Global Sales & Marketing, Kongsberg Maritime. *“The Hrönn is an incredible ship and a great example of KONGSBERG's commitment to developing autonomous and unmanned vessels. We are involved in several major projects in this field including AUTOSEA, which focuses on integrated sensor technology and fusion, and automated collision avoidance systems. KONGSBERG is also a key stakeholder in the world's first official autonomous vehicles test bed, which opened this September in the Trondheimsfjord.”*

Hrönn is expected to be built by Fjellstrand AS, a Norwegian shipyard with a long history of building state-of-the-art aluminium fast ferries in addition to a

number of steel offshore vessels and aluminium work boats. As the builder of the world's first battery driven car ferry, 'Ampere', Fjellstrand AS is well known for taking the lead in maritime innovation and green technology.

"Fjellstrand AS has for years worked within the high-end development of new vessels. To design and build future ships with autonomic technology will be an exciting challenge, and follows the path laid from the recent building of Ampere where technology is pushed forward in good cooperation with partners," said Morten Berhove, Technical Director, Fjellstrand AS.

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About Kongsberg Maritime

Kongsberg Maritime is a global marine technology company providing innovative and reliable technology solutions for all marine industry sectors including merchant, offshore, subsea and naval. Headquartered in Kongsberg, Norway, the company has manufacturing, sales and service facilities in 20 countries.

Kongsberg Maritime systems for vessels cover all aspects of marine automation, safety, manoeuvring, navigation, and dynamic positioning. Subsea solutions include single and multibeam echo sounders, sonars, AUV/Underwater Robotics, underwater navigation, communication and camera systems.

Training courses at locations globally, LNG solutions, information management, position reference systems and technology for seismic and drilling operations are also part of the company's diverse technology portfolio.

In parallel with its extensive technology portfolio, Kongsberg Maritime provides services within EIT (Electro, Instrument & Telecom) engineering and system integration, on an EPC (Engineering, Procurement & Construction) basis.

Kongsberg Maritime delivers solutions that cover all aspects of technology underwater and on the water, aboard new build and retrofit vessels, and on offshore platforms and rigs, often under a single supplier strategy called The Full Picture.

Kongsberg Maritime is part of Kongsberg Gruppen (KONGSBERG), an international, knowledge-based group that celebrated 200 years in business during 2014. KONGSBERG supplies high-technology systems and solutions to customers in the oil and gas industry, the merchant marine, and the defence and aerospace industries.

www.km.kongsberg.com

About Automated Ships Ltd

Automated Ships Ltd, is a wholly owned subsidiary of M Subs Ltd, that will focus on the design, construction and operation of the first full-sized, commercial, unmanned ship. Built in Norway, the construction of this market-making ship-type will be a world-first and watershed moment for the maritime industry and will leverage the world-leading technology and expertise of numerous Norwegian companies and academic institutions, i.e.: Kongsberg Maritime, Fjellstrand and DNV GL.

www.automatedshipsltd.com

About Fjellstrand AS

Founded in 1928, Fjellstrand AS is located at Omastrand in the Hardangerfjord, at the west coast of Norway. Fjellstrand is a modern shipyard which develops, markets and constructs technically advanced high speed passenger and car-carrying catamaran ferries in aluminium. In addition it also designs and builds living quarters, superstructures, ROV hangars and other marine and offshore constructions in aluminium. A new range of products from Fjellstrand is offshore special vessels such as survey vessels, ROV vessels, multi-purpose subsea construction vessels (MPSCV), platform supply vessels (PSV), seismic vessels and anchor handling and tug supply (AHTS) of different designs.

www.fjellstrand.no

About DNV GL

Driven by our purpose of safeguarding life, property and the environment, DNV GL enables organizations to advance the safety and sustainability of their business. Operating in more than 100 countries, our professionals are dedicated to helping our customers in the maritime, oil & gas, energy and other industries to make the world safer, smarter and greener.

In the maritime industry

DNV GL is the world's leading classification society and a recognized advisor for the maritime industry. We enhance safety, quality, energy efficiency and environmental performance of the global shipping industry – across all vessel types and offshore structures. We invest heavily in research and development to find solutions, together with the industry, that address strategic, operational or regulatory challenges.

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