Kongsberg Maritime worked with students and researchers aboard the R/V Gunnerus

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Kongsberg Maritime: University Students and Researchers Test Own Control Algorithms on Industrial DP System Platform

- *Unique experience for NTNU students and researchers using the KONGSBERG DP system donated to the research vessel Gunnerus*
- *Supporting research and education initiatives is key to ensuring a sustainable future for maritime technology development*

Kongsberg, Norway, 25th November 2016 – Students and researchers from the Norwegian University of Science and Technology (NTNU) were given the opportunity to test their own Dynamic Positioning (DP) algorithms in a full-scale setting last week. The trials took place in the Trondheimsfjord aboard the 'R/V Gunnerus', the NTNU-owned research and education vessel to which KONGSBERG donated a state-of-the-art K-Pos DP system in 2015.

Called 'The AMOS DP Research Cruise 2016', PhD students and researchers were given access to the K-Pos system on R/V Gunnerus for a total of six days, allowing them to fully understand how their algorithm research and development translates to real-life operations at sea. It is believed that this is the first time that access to an industrial DP system platform has been provided for research and educational purposes, which was possible due to Kongsberg Maritime's donation of the K-Pos system and on-going support of the R/V Gunnerus.

"This DP test campaign is unique. For the first time our PhD students have been given the opportunity to test their own work in real conditions," said Roger Skjetne, Professor at NTNU's Department of Marine Technology and cruise leader. *"While our simulators provide a deep insight into how different DP control algorithms will affect a DP vessel dynamically, to actually have access to a vessel with an industrial-level DP system allows the PhD students and researchers at NTNU AMOS to truly understand the effects and relevance that their work has on the complete DP system and operation."*

The NTNU's centre for Autonomous Marine Operations and Systems (AMOS) was awarded a Centre of Excellence (CoE) by the Research Council of Norway in 2013. AMOS is focused on creating a world-leading centre for autonomous marine operations and control systems.

In operation for NTNU since 2006, the R/V Gunnerus is equipped with the latest technology for a variety of research activities within biology, technology, geology, archaeology, oceanography and fisheries. The vessel is arranged with a wet lab, dry lab and a computer lab in addition to a large aft deck, and is a key asset in research activities for the university.

In addition to research projects, the ship is used for educational purposes and is an important platform for training courses at all levels and disciplines. As probably the most technologically advanced vessel operating on a daily basis in the Trondheimsfjord, the R/V Gunnerus is also regularly used as a highly

efficient test-bed for technology developed by Kongsberg Maritime.

"It's vital that industry works with the academic sector to enthuse and inform a new generation of engineers who will become the driving force behind new maritime technology revolutions," said Arne Rinnan, Vice President Technology – KONGSBERG Group. *"By sponsoring R/V Gunnerus and contributing to other education and academic programs we are supporting a sustainable future for maritime technology development."*

"This unique R&D cruise represents a true innovation in the collaboration between industry and academia on the development of advanced vessel control technology," said Morten Breivik, Head of Department of Engineering Cybernetics at NTNU. *"It is also a milestone in the collaboration between KONGSBERG and NTNU, which goes back to 1975 when development of Norway's first DP system started. Such a rapid-prototyping platform can prove to be very useful in the coming years when we will focus increasingly more on developing technology for autonomous ships."*

Ensuring safety at all times, the DP algorithm trials were supervised by the R/V Gunnerus' expert crew and a team of Kongsberg Maritime engineers. Vincenzo Calabro, Principal Engineer, Kongsberg Maritime said: *"This sea trial has been the fruit of a synergic cooperation between Kongsberg Maritime and NTNU. For the first time, we provided unique fast prototyping tools to implement the latest control systems technologies into our reliable and modular DP development platform. It has been very exciting to see the state-of-the-art of academic research working within an industrial product. This has been a first step towards a limitless innovation."*

Rune Skullestad, Lead Engineer, Kongsberg Maritime who was also on board R/V Gunnerus for the trials said: *"This is a typical example of how KONGSBERG is practically contributing to R&D. It is a win-win situation, since the researchers and students can test their ideas and development in real life, and KONGSBERG can potentially pick up new ideas and concepts. Together we are actually shaping the next generation of DP technology."*

KONGSBERG is heavily involved in R&D projects within the Trondheim region, having recently played a key role in establishing the Trondheimsfjord as one of the world's first official test-beds for autonomous ships. Kongsberg Maritime enjoys close co-operation with Norway's largest university NTNU, and the largest independent research organisation in Scandinavia SINTEF and

its subsidiary MARINTEK (The Norwegian Marine Technology Research Institute).

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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.

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