



AUTOSHIP

Autonomous Shipping Initiative for European Waters



Updates on the project results. Focus on Inland Water Way and Short Sea Shipping, concepts and events attendance.

As the project goes on, many were the activities implemented in order to achieve new technical results towards the next generation of autonomous vessels, as well as to engage a wide number of stakeholders in the AUTOSHIP activities.

The project partners have performed an impressive number of dissemination activities to present the latest progresses and to catch the attention of relevant stakeholders groups and public general as well. Despite the spread of Covid-19, the consortium successfully managed to virtually attend several national and international events, in which they presented AUTOSHIP's vision.

The latest scientific publications by the partners are also available in the [Downloads](#) page of the project website.

Let's take a look at all the accomplishment obtained so far!

STAKEHOLDER CONSULTATION AND VALIDATION OF RESULTS

The project has performed an extensive dissemination activity, which let it gain a wide number of **contacts all over the world**. Besides, AUTOSHIP's **Special Advisory Group (SAG) was established**, which has already met twice this year: at first for an introductory meeting in July and later, in October, for a special discussion on the development framework from Work Package 3 (Common challenges, methodologies, standards and tools for KET).

In this context, [SINTEF Ocean](#) and [The University of Strathclyde](#) organized an online workshop with flag state authorities' representatives from SAG, during which some preliminary project's results were presented, focusing on newly a developed risk assessment process and safety assurance framework, from which a fruitful discussion on the acceptable risk level started. The SAG will be further involved for its input when new results will need stakeholders' feedback, but also for general consultation as well. Furthermore, some of its members will be part of expert panels when special events (e.g., with other twin projects) will be organized on specific topics. The consortium has also met the European Maritime Safety Agency (EMSA), to discuss its SAFEMASS study and coordinate with the AUTOSHIP results, providing inputs as well.

On the other hand, University of Strathclyde conducted **a comprehensive survey on the different stakeholders perspectives on autonomous ships**, with the aim to capture their understanding and positions of a wide audience including operators, owners, designers, builders, technology providers, regulators/flag states, port authorities, insurers/P&I clubs, seafarers, environmentalists, technical advisors, legal advisors, professional societies, international organizations, end customers/users, public, etc. The results are still being analyzed with the support of the project stakeholders and will be available in Summer 2021.

DESIGN, STANDARD AND FRAMEWORK

In the scope of the Work Package 2, dealing with the *Scenario Assessment and identification of Gaps and Barriers for Scale-up*, the mapping of the existing regulatory framework and the identification of gaps and requirements for autonomous ships compliance were conducted under the leadership of the Classification society [Bureau Veritas Marine & Offshore](#). The final deliverable D2.3: Regulatory framework mapping & Identification of gaps and requirements for autonomous ships compliance was released and published in July 2020.

Moreover, a first **comprehensible overview of concepts and terminology related to the design of autonomous ship systems was published** in the first version of the Deliverable D3.1: Autonomous Ship Design Standards, written by SINTEF Ocean and released in July 2020. This document is continuously being updated to make sure it can be used as a reference for work for other practitioners in the area and it is also defining the framework for the coming public deliverable D3.2: Autonomous Ship Design Methods and Test Principles.

Part of the D3.1 will also be **proposed as input to the ISO 23860 standard terminology for MASS to ISO TC8**, which has also been asked to provide input on their standardization work on terminology

to IMO MSC. One input paper was already submitted to MSC 102, but as this was a reduced virtual event, the paper was not presented. The plan now is to update the draft standard with inputs from D3.1 and provide a new input paper for MSC 103 that is planned for May 5th to 14th 2021.

In addition, in Autumn 2020, The University of Strathclyde organized a number of **hazard-identification workshops** with AUTOSHIP partners, focusing on the Inland Waterway ships investigated in the project. The results of the risk assessment have been provided in the Deliverable D2.4.

On top of that, **a novel methodology for cyber-risk assessment has been suggested** as part of the development analysis methods for autonomous ships. The methodology has published in a journal article at Safety Science journal in Summer 2020, which is also available for free download in the downloads page of the project website.

KET, VESSELS AND INFRASTRUCTURE

Preparing the [Eidsvaag](#) Pioneer vessel for the demonstration is an essential task in the project, for this reason new sensors and upgrades of essential automation, control and navigation system are being installed, are planned and prepared, as well as required modification for KET integration. In addition, **a connectivity system is installed on Eidsvaag Pioneer** providing operational data for use in the different Work Package 4 tasks: *Demonstration & Validation of Enabling technologies for short-sea shipping*. This will all serve as an imperative platform for the demonstration of the installed KET's and sub functions. All the major upgrades and installations are planned during the vessel low season, preferably March 2021 and January 2022.



[Kongsberg](#), jointly with other project partners, is also finalizing important deliverables, which are on schedule for delivery in M19, December 2020:

- Deliverable D5.2: *Physical Inland Waterways Infrastructure*, together with [De Vlaamse Waterweg](#), will provide a good overview of potential efforts to prepare the waterways for autonomous vessels.

- Deliverable D5.5: *Shore Control Centre (SCC) Ergonomic Design*, developed in a joint effort between KOGM and KOGC, with important contributions from [Blue Line Logistics](#) and De Vlaamse Waterweg. Even if Covid-19 have put limitations on the user testing that normally is a very important part of Kongsberg design process, the consortium managed to achieve a good overview of SCC ergonomic design in general and specific for WP5.
- Deliverable D5.6: *System Architecture & Design – Autonomous Control System, SCC and K-SIM*, developed in a joint effort between [Kongsberg Maritime](#) and [Kongsberg Digital](#). A top-down approach by defining the main building blocks identified for autonomy and breaking down into components was used, trying to find a balance between general architecture best practices and Kongsberg technology decisions.

Planned installation of sensors onboard Zulu 4 and system survey onboard has not been possible to execute due to Covid-19, delaying data capture required to train the situation awareness AI, and delaying detailed engineering required for installation of vessel control systems. However, **simulator modelling of the Zulu 4 barge and the sailing area are moving forward with both hydrodynamics for the barge model and model of waterways with locks, bridges and buildings close to finished.**



PRESENTATION OF AUTOSHIP IN NATIONAL AND INTERNATIONAL EVENTS

Since the official presentation of the project held in Norway directly from the bridge of the ship Pioneer from Eidsvaag, in January 2020, which gathered Authorities from Belgium and Norway, AUTOSHIP participated in several national and international events, and successfully caught the interest of the stakeholders and the general public.

The University of Strathclyde presented early results of AUTHOSHIP at the **International Seminar on Safety and Security of Autonomous Vessels (ISSAV) and European STAMP Workshop and Conference (ESWC)**, held in September 2019, which attracted high interest from the public, both from industry and academia.

AUTOSHIP sponsored the **6th annual World Open Innovation Conference** on “Opening Up for Managing Business and Societal Challenges”, In December 2019. [CiaoTech \(PNO\)](#) joined leading industry and academic experts at LUISS University in Rome with the aim to bridge the gap between theory and practice to foster stronger connections between business practice and

academia, accelerating innovation and providing focus for further research.

More recently, with the spread of the Covid-19 pandemic, the consortium managed to take part in several virtual events and successfully presented the project to companies, research institutions, policy makers, administration and professional associations from across the European Union and had the chance to share ideas with experts of the autonomous ships field.

The University of Strathclyde attended the **RINA** (Royal Institution of the Naval Architects) Conference in June 2020, presenting the paper "[Paving the way toward autonomous shipping development for European Waters – The AUTOSHIP project](#)", written jointly by Maritime Safety Research Centre of University of Strathclyde, SINTEF Ocean, Bureau Veritas and [PNO Consultants](#).

In August 2020, AUTOSHIP participated in the virtual **OMAE 2020** (International Conference on Ocean, Offshore & Arctic Engineering) represented by SINTEF Ocean which presented the paper "Analysing supply chain phases for design of effective autonomous ship technology in new transport system solutions", which highlighted how structured supply chain analysis enables stakeholders to evaluate costs and benefits associated with increased use of automation in waterborne transport systems.

In the matter of conferences and other type of event, November 2020 was a successful month; AUTOSHIP was in fact presented on several occasions: the project took part in the **ICMASS 2020** conference, mostly virtually but it also gathered some audience in Busan (Korea), which is the leading technical and scientific conference on Maritime Autonomous Surface Ship.

SINTEF Ocean presented 4 papers in this year's conference:

- [Integrating accountability in the systems design of autonomous and remote-controlled operations](#),
- [The need for a public key infrastructure for automated and autonomous ships](#),
- [A framework for description of autonomous ship systems and operations](#),
- [A taxonomy for autonomy in industrial autonomous mobile robots including autonomous merchant ships](#).

In addition, representatives from Kongsberg Maritime and Blue Line Logistics presented the project in the panel discussion.

SINTEF Ocean was part of the organizing committee of the **2nd International Ship autonomy and sustainability summit, arranged by NFAS (Norwegian Forum for Autonomous Ships) and DG MOVE. The virtual conference gathered by close to 700 people from all over the world** and AUTOSHIP was presented through participation in panels, by representative from Kongsberg Maritime, and it was also promoted in the virtual exhibition, together with other EU funded projects on autonomous ships.

SINTEF Ocean and Kongsberg Maritime took part in the "Autonomous Shipping and its contribution to sustainability" panel, included in Session 3: Post-Pandemic Mobility: Sustainable and Smart?, of the **RTO Innovation Summit 2020**.

Kongsberg Maritime was invited as speakers to present AUTOSHIP, in the **Open Data for Smart Mobility in Europe Conference 2020**, hosted by the German Federal Ministry of Transport and

Digital Infrastructure, which virtually coordinated the event. The project displayed its aims and objectives in front of more than 500 invited experts, innovators, researchers, developers, government representatives and guests from the private, public and media sectors, during the Panel “Autonomous and Always Connected: The Ships of the Future”.

Kongsberg Maritime also presented the State-of-the-art of automation in the maritime industry highlighting autonomous shipping initiatives including a detailed description of the AUTOSHIP project at the **Scandria Alliance Webinar**, with the topic “Potentials of Automation in Maritime and Inland Waterway transport”.

SCOUTING INNOVATORS

De Vlaamse Waterweg organized the **Smart Shipping Hackathon**, a two-days event with the aim to find solutions for unlock the potential of Smart Shipping by exchanging ideas to solve one central problem: the automation and digitization in the inland shipping sector, and to find solutions for four concrete challenges regarding communication protocols, corridor planning and practical problems with unmanned navigation.



The [Hackaton](#), virtually held from 26th to 27th November 2020, successfully gathered more than 200 participants from all over the world to support innovative thinking and acting in the inland shipping sector and to stimulate cooperation with all stakeholders involved.

AUTOSHIP, sponsor of this unique event, picked the Smooth Lock Transit project as the winner of the Autoship H2020 prize, which has shown the most mature solution for a remote-controlled vessel, passing a lock and having correct and secure communication protocols with the infrastructure. The project coordinator PNO will soon support the project team with a specific mentoring! Good luck!

Together with the AUTOSHIP H2020 Prize, four other teams were awarded, one for each of the four key challenges of this event:

- Challenge 1: Crewless Lock Passage – Smart Ropes
- Challenge 2: Communication – Flumen Platform
- Challenge 3: Corridor Management – Wave
- Challenge 4: Operations for the Future – Remote Terminal for Vessel Train Application.

Take a look at the Hackathon Aftermovie [here!](#)

To know more about all the events attended by AUTOSHIP, check the [News & Press](#) page of the [project website](#) and be always updated about the latest results and progresses by following the AUTOSHIP [LinkedIn](#) and [Twitter](#) account!

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The project has received funding from the European Union's Horizon 2020 research and innovation program under Grant Agreement N°815012.