



# dTHOR

NOVEMBER 2024

## dTHOR CONSORTIUM NEWSLETTER #3



Dear Partners, Dear Readers,

Delighted to introduce you to the third edition of the dTHOR Consortium Newsletter. In this biannual format, you will find updates on the progress of the different work packages of the project to keep track of the latest developments in dTHOR.

For our new readers, the Digital Ship Structural Health Monitoring (dTHOR) project, funded by the EDF2021, is a 36-month research project that ambitions to develop the next generation of a predictive Ship Structural Health Monitoring system based on innovative utilization of sensor measurement and hybrid analysis modeling enabling digital twins with high physical realism.

In this edition, you will be able to dive into the last and major updates within the consortium, notably the first sea trial performed with the Gunnerus Vessel.

Feel free to reach out to us at [sr@seaeurope.eu](mailto:sr@seaeurope.eu) for any questions.

### IN THIS EDITION:

dTHOR Consortium Meeting #4 and General Assembly hosted by ISD S.A. in Athens

Jotne's Digital Twin Event, Oslo, Norway

Combined WP6/WP7 Meeting in September

dTHOR at Euronaval

Completion of first sea trial with Gunnerus

Upcoming Events

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## **dTHOR Consortium Meeting #4 and General Assembly hosted by ISD S.A. in Athens**

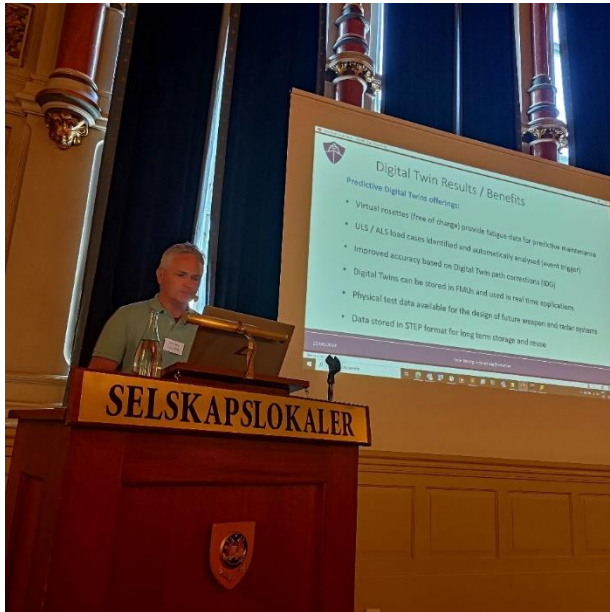
*"Reaching the halfway mark of the dTHOR project fills me with immense pride as the Project Coordinator. The collective effort to develop an innovative Ship Structural Health Monitoring system using sensors and hybrid modelling is truly inspiring. With the input and frequent feedback from European Navies, I am confident that we are on the right path to achieve our consortium's ambitions and the requirements set by the European Commission by December 2025", said Trond Kvamsdal, dTHOR Project Coordinator.*

From 11 to 13 June, dTHOR Consortium Partners were reunited in Athens, Greece, for the fourth Consortium Meeting and General Assembly. This meeting was particularly significant as the project is nearing its halfway point. The meeting included work package updates and specific alignment workshops to clarify interfaces between different work packages and identify the next steps. ISD S.A. also organized a visit to the Acropolis Museum and hosted a project dinner, fostering further collaborative discussions among the partners.

The Hellenic Navy highlighted the remarkable and collaborative effort of each dTHOR partner to create an SSHM system that will be invaluable and useful for European navies, the ultimate end-users. In addition, representatives from the French, Italian, Dutch and Norwegian Ministries of Defence joined the discussions and provided invaluable inputs that helped the consortium make significant progress and plan next steps.



**25 June 2024 – dTHOR at Jotne’s Digital Twin event in Oslo, Norway**



During Jotne’s Digital Twin event in Oslo, Norway, Prof. Terje Rølvåg (SINTEF) delivered a presentation focused on dTHOR, highlighting the benefits of using digital twins for naval ships.

## **18/19 September - Combined WP6/7 Meeting**

dTHOR partners of the work packages 6 (Condition-based maintenance of ship hull structure) and 7 (Battle damage and structural integrity) met on a common workshop held on 18 and 19 September 2024, hosted by DAMEN Naval in Vlissingen (NL).

The workshop featured a series of presentations, breakout sessions, and collaborative discussions. Participants included work package leads and partners who contributed valuable perspectives and expertise. Core objective of the workshop was to discuss the status of our studies, outline the path ahead for project deliverables due at the end of the year and explore potential synergies between the work packages. This thorough review highlighted the progress made so far and established a clear understanding of where each work package stands.

The agenda also included a combined session with all WP6 and WP7 partners, designed to foster dialogue and enhance coordination between the work packages. Furthermore, the work package leaders of WP2 (Requirements and specification), WP4 (Modelling) and WP10 (Use cases and technology demonstrations) presented their current working status, enabling an interesting discussion and ensuring alignment with our overall dTHOR project goals.

The two-day workshop was a significant step for these work packages ensuring progress towards the projects final objectives and reinforcing our commitment to collaboration and innovation. Thank you to everyone who participated and contributed to the success of this event, especially to our hosts from DAMEN Naval. We look forward to implementing the strategies discussed and continuing our journey together.



## **dTHOR at Euronaval – Paris Villepinte, 4 to 7 November 2024**

From 4 to 7 November, dTHOR will be showcased as part of the European naval projects booth organized by SEA Europe. In addition to this major opportunity, dTHOR Project Manager will participate in different events:

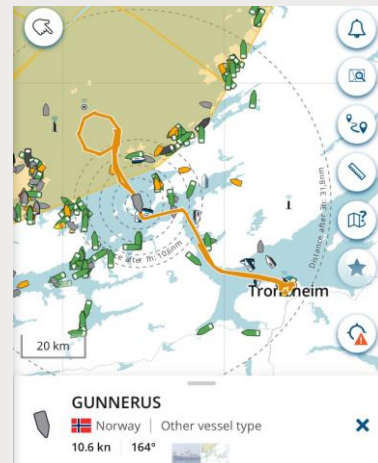
- On 5 November, from 10:00 to 10:30 - Workshop on Smart Ship Techs: naval platforms of the future (BREST Room) – moderated by Francisco Casaldueiro (DGDEFIS), with Trond Kvamdsdal and Juan Ignacio Silvera Vez (EDINAF)
- On 6 November, from 16:15 to 16:30 – dTHOR Pitch Session (Cherbroug Room).

In addition, the dTHOR booth will be honored to welcome delegations from the European Defence Agency RTI Directorate and from the European Commission DGDEFIS.

## Completion of dTHOR 1<sup>st</sup> sea trial with the Gunnerus Vessel

The dTHOR project has achieved a major milestone with the installation of a cutting-edge Light Structures fiber optic structural health monitoring (SSHM) system on the research vessel RV Gunnerus. Owned and operated by the Norwegian University of Science and Technology (NTNU), the Gunnerus is a valuable resource for marine research and has been made available to both the dTHOR and EDINAF projects.

This new SSHM system, developed by Light Structures, integrates seamlessly with a state-of-the-art instrumentation package that includes sensors for vessel motion, wave monitoring, navigation, and propulsion data. All data from these sensors will be collected by NTNU's IT infrastructure and made available to project participants for ongoing analysis, providing dTHOR team members with invaluable real-time insights into the vessel's performance.



A successful sea trial of the system was conducted on 23 October, during which the Gunnerus was maneuvered in a systematic octagonal pattern in the Frohavet, or "Fro Sea," near Trondheim. This trial allowed for the comprehensive collection of data that will drive further developments in the SSHM system, including the integration of advanced models currently under development by the dTHOR team.

The coming year will see the SSHM system enhanced even further, as dTHOR researchers incorporate these advanced modeling capabilities, transforming the Gunnerus into a highly sophisticated demonstration platform for dTHOR and EDINAF concepts. Once the project concludes, NTNU will take over the system as a research tool, opening doors for further studies and advancements in ship structural health monitoring.

This installation and ongoing research mark significant steps forward in SSHM technology, positioning NTNU and its partners at the forefront of maritime research and safety innovation.





## UPCOMING EVENTS:

- **4-7 November 2024:** Euronaval, Paris Villepinte (France)
- **3-5 December 2024 :** Consortium Meeting and General Assembly, Rome, Italy (hosted by CNR-INM)
- **17-21 February 2025:** DTE-AICOMAS 2025 & Mini Symposium on Digital Twins for Ships and Offshore Structures
- **19-23 May 2025:** MARSTRUCT 2025 – thematic session on Structural Health Monitoring of Marine Structures (session organized by NTUA)

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## RECENT PUBLICATIONS:



- Nikolaos Angelopoulos, Alkiviadis Tromaras, and Vassilios Kappatos, HIT and CERTH, Assessment of acoustic emission testing in effectively detecting surface deterioration on steel plates, published on MDPI/Sensors journal - [here](#)

