

# Unlocking connectivity below deck

**Start-up Sealution is introducing a new solution to help tackle one of shipping's current challenges – lack of connectivity below deck. *Digital Ship* spoke with CEO and founder Sebastian Hamers.**

**D**uring his time at sea, Sebastian Hamers, former mariner and now CEO and founder of maritime start-up Sealution, used to spend as much as four hours a day below deck, checking reefer containers and manually recording temperatures and other data. Ships' steel walls below deck are impenetrable, making it near impossible to receive signal and preventing the automation of data collection and transfer in these areas. Physically going below deck and manually recording the data was the only option, a repetitive and monotonous task with a high-risk of human error. Moreover, Hamers saw how dangerous it was for people to be working below deck with zero signal. In one incident he witnessed, a colleague fell down the stairs and broke his wrist during a night shift. "No one noticed he was missing for several hours and by the time we found him the next morning, he'd been lying injured and unable to move for around five hours," Hamers noted. "This shouldn't be happening in the 21st century. But it still is because many people assume this kind of problem has already been solved and there's connectivity all over a ship," he explained.

Realising there was an urgent need to deliver below deck connectivity to both improve onboard safety and enhance data collection for predictive equipment maintenance, Hamers and his co-founder Ruben Verplancke launched Sealution in 2020. The Belgian start-up has designed an IoT (Internet of Things) solution that uses existing infrastructure onboard ships to deliver connectivity where signal is limited or non-existent.

## Preventative maintenance

Mitigating risks to ships and their equipment is critical to continuous, safe, and efficient vessel operation. Real-time feedback on the status of equipment enables maintenance to be completed before a problem even arises, reducing the likelihood of total equipment failure and possible ship breakdown.

Sealution's patent pending system delivers these necessary insights through a network of IoT devices that collect data from sensors and IoT devices already installed onboard a ship, before transferring the data to a central database. The system consists of two key components, the Central Module and Room Modules.

Room Modules are placed around the ship, wherever connectivity is required. These modules extract data from sensors and IoT systems in their vicinity, and via physical cables, they transfer the data to a Central Module, described by Hamers as "the brain of the network." The Central Module is typically located in the bridge or control room, or sometimes both.

"The Central Module analyses the data, filtering it and ranking it from high to low relevance and passing this on to the server where it can be visually represented on the bridge," explained Hamers. "Via the Central Module, crew can view the processes, performances and irregularities on board, without needing to physically inspect the systems, allowing them to acquire a better understanding of equipment condition."

The company chose a wired network versus a wireless one to maximise reliability. According to Hamers, a wired interface is more consistent than a mesh network, since it is not wholly dependent on each node. "If one fails, the other ones will still work," he said.

Alerts are only provided when vessel machinery may need attention, but otherwise the system runs quietly in the background to avoid alarm fatigue. According to Hamers, Sealution is currently working with an artificial intelligence (AI) development team to improve insights and deliver recommendations on ship performance and fuel efficiency.

## Boosting crew safety

In addition to the Room Modules and Central Module, Sealution has also developed a Crew Safety System (CSS) that includes a wearable smartwatch to

improve crew wellbeing and ensure immediate help in the event of a seafarer's compromised safety. The device features a heartbeat sensor and an accelerometer that monitors the wearer's health status. The technology detects lack of movement from the wearer and requests them to confirm, via the press of a button on the smartwatch, that they are safe and not in any danger. If no response is given, the device sends a distress signal to the Central Module to alert officers on the bridge that a crew member may require assistance. This facilitates easy automated mustering of the crew or a specific person from the bridge.

The smart device also logs sleep and rest periods to provide better insight around crew mental and physical health, and to ensure they are not disturbed by movement alarms during their rest periods. Each smartwatch comes with two rechargeable batteries, enabling continuous wear.

## Installation and cost

Each Sealution package features one (or occasionally two) Central Modules, plus as many Room Modules as needed to deliver the required connectivity. A large engine room, for example, may require up to five Room Modules to be able to gather the required data.

For shipping companies requiring a quick and easy installation, Sealution benefits from being plug and play. "Installation can be done by the crew, enabling the vessel to remain in operation during set up," confirmed Hamers. Sealution experts are also on hand 24/7 to deliver any support that may be required as and when.

The entire system is based on a monthly subscription, meaning there is no upfront investment cost. The monthly fee includes the use of the hardware and any software that is needed. According to Hamers, the total cost depends on how many Room Modules and smartwatches are required, but he believes that it should cost no more than USD 100 per day per ship.

Sealution's in-house software development team can design and develop specific applications and interfaces geared towards individual clients' needs. "Some of our clients will use Sealution for machine monitoring, while others will prefer to use it for crew safety. We have many applications that we can help each company find the right fit for their needs," Hamers confirmed.

Thanks to the subscription-based approach, all maintenance requirements and spare parts deliveries are covered with no additional or hidden costs.

## Pilots and trials

Sealution's testing facility in Belgium has enabled the company to replicate the onboard environment to test and improve



*CEO and founder of start-up Sealution, Sebastian Hamers*

the solution. In February 2022, Sealution was selected to join the Eastern Pacific Accelerator powered by Techstars, a programme that helps start-ups to develop and improve their technology and launch it into the maritime world. Hamers emphasised that this was a key platform in helping the start-up to get its technology off the ground. "The connection between us and Eastern Pacific Shipping (EPS) has been wonderful. We get so many insights through them and are always able to contact them for any questions or struggles that we have," Hamers said.

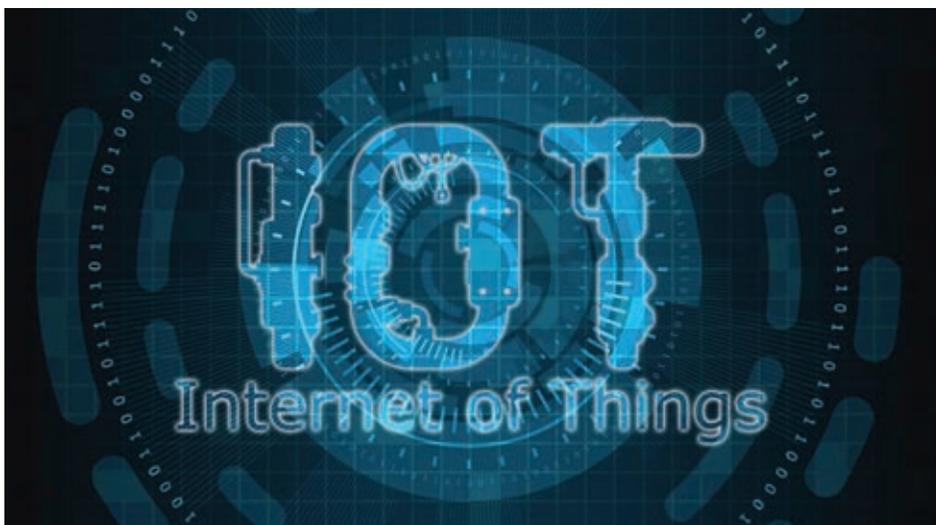
The programme has also helped Sealution to meet shipping companies and introduce their technology. "We've spoken with over 70 big ship-owning companies since we joined. As such a young start-up, this is something I couldn't imagine we could have done alone. Each day we have over four calls with firms or interested parties from the maritime sector, all being set up and managed by Techstars," Hamers explained.

Thanks to Sealution's participation in the Techstars programme, the company has recently signed a letter of intent for two pilots, one with EPS and the other one with a Dutch Belgian reefer company.

The company has also garnered the support of Lloyd's Register and Bureau Veritas to ensure safety protocols are met, with approval anticipated for summer 2022 following upcoming pilot trials. Sealution is also working with companies that develop onboard devices, including marine sensor and solution provider, Schneider Electric.

The next step for Hamers and his team is to secure APEX approval, which is anticipated to take a couple of years due to the lengthy process.

Hamers and his team also expect to welcome more members to the company throughout 2022, building on the seven-person team that currently operates. **DS**



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