



Armach's bespoke on-hull navigation system is key to its business model (Image: Armach Robotics Inc)

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First truly proactive in-water cleaning solution for ships' hulls launched

Plymouth, MA, Tuesday 8th March 2022 - Marine software pioneer GREENSEA SYSTEMS INC. (Greensea) has launched spin-off company Armach Robotics (Armach), that capitalises on Greensea's digital expertise to offer a subscription model robotic hull cleaning system using autonomy, intelligence and data fusion.

Armach Robotics will launch at the AMPP Conference & Expo in San Antonio, Texas, from Monday 7th to Wednesday 9th March 2022, Booth 2357.

Keeping ships' hulls clean of biofouling and its subsequent drag and performance penalties has challenged humanity since humans took to the seas. Armach Robotics offers a significant leap forward in this long-fought battle by offering an autonomous hull cleaning solution capable of 100% coverage of the hull surface excluding niche areas.

Armach, while a new name in the industry, began the journey several years ago through the development of the novel technology required to change the paradigm of ship husbandry. The hull cleaning robot has some distinct advantages such as its small platform to get it into tighter spaces on the hull and make it one-man-portable, caterpillar tracks which are kinder to hull coatings and a non magnetic adhesion to the hull, suitable for military vessels and non steel hulls. But the real game changing aspects of the Armach system are around the navigation and hull intelligence systems. With accurate navigation, robots can be autonomous, data can be referenced to the hull, and 100% coverage can be assured.

While Armach's technology is what makes it stand out in an industry that has been doing things the same way for a long time, Armach is not a technology company and does not sell robots. Armach provides a subscription service for clean hulls and hull intelligence. Armach is a service provider.

Shipowners signed up for the Armach service can be confident that their vessels will always have clean hulls, with all the attendant benefits that brings from slashing fuel consumption by up to 10% to regaining complete control over invasive species. Because the company was born out of Greensea Systems, it uses Greensea's industry-leading navigation systems to ensure that the robot cleans the hull in the quickest and the most efficient way possible.

As the robot cleans, the software operating it builds up an inch perfect 'mental map' of every feature of the hull so it can be more efficient next visit and it does so without the human input of divers or operators.

Because the Armach system is so scalable and efficient, cleanings can be performed more regularly, so it's only ever slime that the robot has to tackle. The use of a thoroughly tested brush system that is non destructive to the hull coating with the built-in system intelligence means it won't overwork the coatings - adding yet another cost benefit.

The system also saves costs by reporting back to the shipowner with valuable information, effectively creating a hull condition survey every time it cleans a hull. Any damage or corrosion is picked up early by the robot's cameras and sensors, so a decision can be made on whether rectification is necessary or whether ongoing monitoring will suffice.

Armach is currently in the 'Build it prove it phase'. This key phase will allow Armach to build, develop and iterate the robotics platforms and prove that the technology and model work in the real world.

The company is also working with first adopter partners towards a wider roll-out of pilot programs in 2022.

Ben Kinnaman, Greensea Systems and Armach Robotics CEO says: "You can't offer shipowners 100% hull cleaning coverage using an autonomous, robotic solution unless you have a very accurate navigation solution. We (Greensea) began working with the Office of (US) Naval Research back in 2018 on just a system to make proactive in-water cleaning with a robotic solution a reality for the first time. But we couldn't find a manufacturer or vehicle partner that would enable us to enter this industry and achieve the level of potential that we saw. So we have spun the Greensea technology out into this new entity, Armach Robotics."

Rob Howard, VP Growth and Strategy at Armach Robotics says: "Hull drag is time and money in the shipping business. The system we have devised represents the closest any company has got to fully autonomous hull cleaning. With our navigation solution, the robot's route across the hull is optimised to within inches ensuring no areas are missed or over cleaned, so we can be efficient and fast in performing our service."

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Image captions:

Armach_image_1 caption: Armach's bespoke on-hull navigation system is key to its business model (Image: Armach Robotics Inc).

Armach_image_2 caption: Armach's small form factor hull service robot is man portable, greatly reducing costs over competitor systems (Photo: Armach Robotics Inc).

Armach_image_3 caption: Armach's system promises near to 100% hull cleaning coverage (Photo: Armach Robotics Inc).

Armach_image_4 caption: The Armach model provides resident cleaning robots to ships, ports, harbours and established service providers on a monthly subscription basis (Photo: Armach Robotics Inc).

About Armach Robotics

Incorporated in November 2021 as a spin-out company from Greensea Systems Inc., Armach offers shipowners a proactive, autonomous in-water robotic cleaning solution. Our service simply offers shipowners a constantly clean hull and following each cleaning operation provides an accurate georeferenced hull condition survey.

The technology is not coating specific and is based on a state-of-the-art system, powered by Greensea's autonomy, intelligence and data fusion technologies. Our business model provides resident cleaning robots to ships, ports, harbours and established service providers on a monthly subscription basis.

www.armachrobotics.com

About Greensea Systems

Greensea started in 2006 based on the belief that a commercially available

open architecture software platform could break down siloed technology and dramatically change the marine industry. We felt confident that robust, precise, integrated navigation and control systems were possible in offshore vehicles and that they could be operator friendly.

Until 2008, we spent every day designing and developing the architecture behind a software suite that could deliver precision and accuracy to ROVs and AUVs that was easy to use, easy to maintain, robust, and portable. Since 2008, we have provided hundreds of installations to the offshore and military industries. Based on a common architecture and a central software library, our system grows stronger every day, with every dive, and by every hour underwater. We feel this is the most powerfully integrated control and navigation technology available in the offshore market today.

www.greensea.com