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## PROJECT ENGINEERING OVERCOMES THE T&I CHALLENGES OF SUBSEA STRUCTURES

Global Marine Systems Limited, a specialist in subsea cabling and engineering projects supports the oil & gas, telecoms and deep-sea research industries. Their in-house project engineering department complements the business' comprehensive skill set offering a broad range of services supporting a rapidly expanding customer base.

A case in point is the recent successful T&I (transportation and installation) of a Cable End Module (CEM) in the North Sea, which was not without its challenges. Here, Global Marine's project engineering department was tasked with demands that included pre-planning, interfacing with project stakeholders, design engineering and precision installation.

When the contract from Tampnet, an expert in offshore high capacity communication networks, was awarded to Global Marine in October 2014, the initial concept design for the CEM was very different to what was finally deployed. Indeed, the early involvement of the company's project engineering team in the design phase was a key part of this successful platform-to-platform fibre optic communications project.

The design changes requested by the project engineers were important to allow successful installation given the tight parameters set by the client. Essentially, the CEM had to be installed within a set distance of a pre-installed SSIV (subsea isolation valve) to allow jumper cables to be connected by divers at a later date. Additionally, the operation was to be performed in close proximity to surrounding structures, which added further complications to the offshore execution.

Interfacing with a multitude of stakeholders is always an important element in any project but particularly when different companies are responsible for design, fabrication, installation and hook-up. Throughout the design process, the project engineering team was involved in review meetings with all parties, including the field owner, and visited the fabrication yard to ensure the changes incorporated were satisfactory for the CEM T&I project.

The team was also able to offer its expertise to design the installation rigging, which allowed the methodology for subsea release to be developed by Global Marine. When engineering the rigging for subsea deployment, it is important to have a contingency for subsea release in the event that the primary system does not work. For this project, Global Marine engineered a primary, secondary and tertiary method for releasing the CEM rigging, with the primary method, using ROV hooks, successfully working as planned.

A further important aspect of installing subsea structures is positioning on the seabed. On the Tampnet project, tolerances of  $\pm 2.5\text{m}$  for position and  $\pm 2.5^\circ$  for heading meant Global Marine used a Sonardyne Ranger 2 USBL (ultra-short baseline) acoustic positioning and tracking system (with transponders fixed to the structure), while EIVA Navipac template software was used to ensure precise placement.

Of course, contingency plans are also a pre-requisite when it comes to positioning subsea structures,

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and on this project the secondary method in place was a second USBL system, while a third strategy was the deployment of pre-installed sandbags to box-in the target area for landing the CEM.

The CEM was installed successfully in April 2015, achieving all of the necessary installation tolerances. Positioning this subsea structure accurately was a crucial part in the overall delivery of the project, and relied heavily on sound project engineering both in the planning phase and subsequently during marine operations. Indeed, the CEM deployment for Tampnet builds on Global Marine's historical success in similar projects, such as the T&I of subsea nodes for scientific research at VENUS (Victoria Experimental Network Under the Sea), a unique subsea laboratory that provides live data to the ocean research community.

Global Marine was selected as the project contractor to lay the foundation for the laboratory off the coast of Vancouver Island, British Columbia, Canada. First, the company completed a desktop survey identifying the optimum location for node and sensor positioning, which was followed by system installation.

The first phase involved the deployment of 40km of cable and two node bases in offshore waters just north of Vancouver International Airport. At the ocean observatory site, the second phase was completed with the installation of nodes at three previously identified sites. The node in the Saanich Inlet is located 95m below the surface, while in the Strait of Georgia there are two nodes, one at 300m in the central strait and the second at 175m towards the Fraser River Delta.

Both the Tampnet and VENUS projects reinforce the industry perception that Global Marine is both reliable and flexible in its approach to complex projects, including those with extensive project engineering content. It should also be noted that safety was paramount throughout the entire T&I processes, with a complete commitment to QHSE playing a big part in the success of both projects.

## **Forward Looking Statements**

"Safe Harbor" Statement Under the Private Securities Litigation Reform Act of 1995: This release contains, and certain oral statements made by our representatives from time to time may contain, forward-looking statements, including statements regarding the commencement or completion of the offering. Generally, forward-looking statements include information describing the offering and other actions, events, results, strategies and expectations and are generally identifiable by use of the words "believes," "expects," "intends," "anticipates," "plans," "seeks," "estimates," "projects," "may," "will," "could," "might," or "continues" or similar expressions. These statements are based on the beliefs and assumptions of HC2's management and the management of HC2's subsidiaries (including target businesses). Factors that could cause actual results, events and developments to differ include, without limitation, capital market conditions, the ability of HC2's subsidiaries (including, target businesses following their acquisition) to generate sufficient net income and cash flows to make upstream cash distributions, HC2 and its subsidiaries ability to identify any suitable future acquisition opportunities, efficiencies/cost avoidance, cost savings, income and margins, growth, economies of scale, combined operations, future economic performance, conditions to, and the timetable for, completing the integration of financial reporting of acquired or target businesses with HC2 or HC2 subsidiaries, completing future acquisitions and dispositions, litigation, potential and contingent liabilities, management's plans, changes in regulations, taxes and the risks that may affect the performance of the operating subsidiaries of HC2 and those factors listed under the

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## About Global Marine Systems

Global Marine Systems Limited is a leading provider of engineering and underwater services, responding to the subsea cable installation, maintenance and burial requirements of our customers around the world. With a fleet of vessels and specialised subsea trenching and burial equipment, we bring a 160 year legacy in deep and shallow water cable operations. Global Marine holds the Order of Distinction in recognition of 15 consecutive years of outstanding occupational health and safety results, as recently awarded by the Royal Society for the Prevention of Accidents (RoSPA). In September 2014, Global Marine was acquired by HC2 Holdings, Inc.

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## About HC2 Holdings, Inc.

HC2 Holdings, Inc. is a publicly traded (NYSE MKT: HCHC), diversified holding company, which seeks to acquire and grow attractive businesses that generate sustainable free cash flow. HC2 has a diverse array of operating subsidiaries across a broad set of industries, including, but not limited to, telecom/infrastructure, large-scale U.S. construction, energy, subsea services and life sciences. HC2 seeks opportunities that generate attractive returns and significant cash flow in order to maximize value for all stakeholders. Currently, HC2's largest operating subsidiaries are Schuff, a leading structural steel fabricator in the United States, and Global Marine, a leading global offshore engineering company focused on subsea cable installation and maintenance. Founded in 1994, HC2 is headquartered in Herndon, Virginia.

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