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Trelleborg Helps Ensure the Future of Subsea Storage is Dynamic

Capitalizing on the strategic alliance agreement between Trelleborg's offshore operation and Safe Marine Transfer, LLC (SMT) announced last year, the two companies are working to develop a step-change technology for the offshore installation and subsea operation arena. With US patents issued and additional ones pending, the new technology enables subsea deployment of equipment and chemical storage using SMT's **Subsea Shuttle™** powered via jointly developed **Pumpable Buoyancy™** technology.

To continue to move this project forward, SMT, under contract with a major International Oil Company, has recently completed Subsea Shuttle™ design testing and validation of performance at Seanic Ocean Systems' onshore test tank facility in Katy, Texas. The scale model performed as predicted from Computational Fluid Dynamics (CFD) and dynamic simulation studies. Successful model tests of the Subsea Shuttle™ design performed with static buoyancy to lay the foundation for qualification of dynamically adjustable Pumpable Buoyancy™.

Art J. Schroeder Jr., Principal with SMT, states: "This jointly developed Pumpable Buoyancy™ technology has the capability to reduce overall project costs by eliminating the requirement for heavy lift installation vessels for all kinds of subsea facilities including pumps, compressors, separators, and motor control systems. In the case of subsea chemical storage and injection, the technology will greatly extend tie-back distances to up to 100 miles. This innovation has the potential to dramatically improve economics and operational flexibility for both greenfield and brownfield developments."

Antony Croston, Business Group Director with Trelleborg's offshore operation, states: "The core technology in Pumpable Buoyancy™, macro spheres, has been proven over the course of decades. What we are doing now is utilizing SMT's patented method of deploying and retrieving the spheres as a service. It is an interesting new business model of having buoyancy when you need it, where you need it, for only the duration required for the job at hand."

The new buoyancy technology facilitates the transportation of equipment or chemicals safely from the surface to the seafloor on the deck of the Subsea Shuttle™. Through this method, equipment or chemicals can be accurately and safely placed on the seafloor during normal operation and



brought back to the sea surface and then on to shore for equipment inspection, maintenance, repairs and upgrades as needed throughout the life of the field. Today this approach is cost prohibitive due to dependence on heavy lift vessel high day-rates and availability.

Pumpable Buoyancy™ allows for real-time, in-operation modification of Subsea Shuttle™ uplift through the movement of specially engineered macro buoyancy spheres supplied by Trelleborg. The versatility of adjustable buoyancy presents significant benefits over current static buoyancy designs. Foremost is the ability to re-use a single buoyancy package across numerous Subsea Shuttle™ installations that are deployed for extended periods of time.

Substantial cost savings can be achieved through the Pumpable Buoyancy™ service model where buoyancy costs are distributed over the service of numerous Subsea Shuttle™ operations rather than for each individual operation under a fixed buoyancy design. Pumpable Buoyancy™ additionally allows for simplified retrieval of subsea equipment, where the weight may vary after operation (i.e. sand in separators, chemical injections, marine growth, and removal of part of equipment).

Find out more about [Safe Marine Transfer](#).

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For press information:

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Notes to Editors:

Safe Marine Transfer, LLC

Safe Marine Transfer was established to enable longer, cheaper, and more productive subsea tie-backs via subsea chemical storage and injection of production chemicals subsea at the point of need (to 10,000 fsw) as a service. Their patent issued technology can also be utilized to drastically reduce subsea facility build-out and operational costs by facilitating construction, testing, and pre-commissioning work at quayside on the deck of a Subsea Shuttle™ and then utilizing Pumpable Buoyancy™ quickly, safely, and reliably deploy the facilities subsea utilizing low-cost, readily available anchor handling vessels.

Trelleborg's offshore operation and Trelleborg Group

Using advanced polymer material technology, Trelleborg's offshore operation provides high integrity solutions for the harshest and most demanding offshore environments. As part of the Trelleborg Offshore & Construction Business Area of Trelleborg Group, **Trelleborg's offshore operation** specializes in the development and production of polymer and syntactic foam based seismic, marine, buoyancy, cable



protection and thermal insulation products, as well as rubber-based passive and active fire protection solutions for the offshore industry. Within its portfolio are some long established and respected brands including, CRP, OCP, Viking and Emerson & Cuming. Trelleborg's offshore operation has been providing innovative solutions to the industry for over 30 years. www.trelleborg.com/offshore

Trelleborg is a world leader in engineered polymer solutions that seal, damp and protect critical applications in demanding environments. Its innovative solutions accelerate performance for customers in a sustainable way. The Trelleborg Group has annual sales of SEK 31 billion (EUR 3.23 billion, USD 3.60 billion) and operations in about 50 countries. The Group comprises five business areas: Trelleborg Coated Systems, Trelleborg Industrial Solutions, Trelleborg Offshore & Construction, Trelleborg Sealing Solutions and Trelleborg Wheel Systems. In addition, Trelleborg owns 50 percent of Vibracoustic, the global market leader within antivibration solutions for light and heavy vehicles. The Trelleborg share has been listed on the Stock Exchange since 1964 and is listed on Nasdaq Stockholm, Large Cap. www.trelleborg.com.