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Texas Two-Step

Signet Maritime's new Rotortugs will operate in Corpus Christi, Texas.

Doug Stewart

By Ken Hocke, Senior Editor

Signet Shipbuilding & Repair (SS&R), Pascagoula, Miss., recently delivered the first of two new **Robert Allan** Ltd.-designed Rotortugs to **Signet Maritime**.

SS&R is owned by Houston-based Signet Maritime, which operates a fleet of tugs that provide ship assist, ship escort, towing, offshore support, subsea and rig moves.

In 2016, the shipyard spent \$7.5 million in infrastructure enhancements to accommodate construction in a protected environment. Additions included the

purchase of a 600-ton **Marine Travelift** boat hoist. The recent addition of the *Signet 1650* floating drydock further enhanced the shipyard's capabilities. The drydock has a 1,650-ton lifting capacity and a 90' beam. The shipyard can now accommodate nine vessels simultaneously.

"Close collaboration between the fleet and shipyard, as the same company, has ensured that the design 'lessons learned' from the dozens of other vessels in our fleet are applied to this design," said Hans L. Schmidt, the shipyard's president.

The *Signet Capella* is scheduled for delivery later this year.

NEW TUGS

The shipyard delivered the first of two new 103'4"×45'6"×15'7" **Robert Allan** Ltd.-designed Rotortugs, the purpose-built *Signet Sirius*, to Signet this fall.

Its sistership, the *Signet Capella*, is scheduled for delivery later this year.

Gale C. Snyder, Signet's executive vice president, said she believes that the new tugs are the first towing vessels to receive an ABS ENVIRO notation, first in the U.S. to achieve an ABS LEV (low-emissions vessel)



The *Signet Sirius* before leaving the Signet shipyard in Pascagoula, Miss.

notation, and first in the U.S. to receive an ABS Cybersecurity-1 (CS-1) notation.

“From an ESG (environmental, social, and governance) posture, we’ve pushed the boundaries in attaining the ABS ENVIRO and full ABS LEV notations, awarded for meeting a higher defined standard of ecological stewardship and



Main propulsion comes from three MTU 12V4000 M65L Tier 4 marine engines producing a total of 7,725 hp.

performance than is required by statute,” said Schmidt. “In recognition of rising cybersecurity risks in the maritime industry, we’ve achieved the ABS CS-1 notation with a much greater level of scrutiny applied to the security of our operational technology systems.”

The tugs will work for the **Enbridge Ingleside (Texas)**



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The tugs will operate through Aransas Pass and its unique geography. It's a narrow channel with a strong cross-current from the north and up to 6.5', six-second wave periods. The Rotor-

tugs will have to maintain outbound speed to steer the ships properly and pull the ships against the crosscurrent at the bar.

"Robert Allan specially designed these tugs to be able to make the tight turn needed in the Corpus Christi ship channel," Snyder said.

The steel hulls are designed to meet intact damage stability criteria in each

compartment.

A hull breach in any space will keep the vessel upright. In addition, the tugs will carry custom-designed, modular ultra-high-performance polyurethane elastomer fenders from **Buoyant Works**. The fenders are 30% lighter than materials normally used and can be individually replaced. This eliminates the need to replace an entire fender because of damage to one section of it.

Main propulsion comes from three MTU 12V4000 M65L Tier 4 marine engines producing a total of 7,725 hp.

The mains connect to **Kongsberg** US 205 controllable pitch Z-drives with 2,500mm-dia., 4-bladed nibral propellers in nozzles.

Ship's service power comes from a pair of Tier 3 **John Deere** 6135 AFM85 gensets, sparking 300 kW of electrical power each.

The tugs have two **Markey Machine** winches on deck — a DESF-52 AGILE, 200-hp, electric winch on the bow; and a TESF-32 AGILE, 200-hp, electric winch on the stern. These were complete winch redesigns. Both winches transition between gears for increased line tension and speed to protect the vessel from high pitch and roll moments in two-meter, six-second seas and protect ship and tug from shock loads and zero-tension (slack line) issues.

The tugs are the result of years of "iterative" simulation and are designed to meet the demand of deep-draft VLCC escort, said Schmidt. "After defining this scope of work in simulation, close collaboration between Signet, Robert Allan, and Markey Machine resulted in a truly unique, next-generation advanced Rotortug design that exceeded our initial criteria."

Also on deck, the tug is equipped with a **Fire Fighting Systems AS** (FFS) SFP 1,000-kW centrifugal fire pump, and two FFS 1200LB remotely operated monitors with 10,600-gpm flow and a range of 400'.

"This Rotortug design is the only



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In addition to maintaining its own fleet, the shipyard also services commercial and military repair customers.

available technology to assure the safe movement of future, deeper-draft VLCCs through the currents in the jetties in Corpus Christi,” said George Burkley, executive director, Maritime

Pilots Institute, Covington, La.

The *Sirius* and the *Capella* have a three-thruster design — two forward and one aft — making them able to steer and affect line tension in different directions.

The new tugs’ design was supported by computational fluid dynamics.

Snyder said the new tugs’ direction of travel and line tension vector do not need to be aligned.

The tugs are built for close-quarter operations in narrow marine terminal slips and can shoulder indirect and accelerate assist maneuver deep-draft VLCCs not otherwise possible.

“The result is a tug with the combined maneuverability of three controllable-pitch thrusters and the high-speed, high-torque performance of the agile winches, unmatched close-quarters ship-handling and constant line ‘time under tension’ to safely maneuver laden 300,000-dead-weight ton-plus ships,” said Schmidt.

Tankage includes 45,000 gals. of fuel oil; 3,500 gals. diesel exhaust fluid; 5,300 gals. potable water; 500 gals. lube oil; and 160 gals. hydraulic oil.

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