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Brian Gauvin photos

Bill Skinner, marine superintendent for Boston Towing, has been keeping a close eye on the new tug taking shape at Derecktor Shipyard in Connecticut. Another tug for Boston takes shape at J.M. Martinac Shipbuilding, in Tacoma, Wash., below.

Offshore LNG projects provides boost for Boston Towing company

by Brian Gauvin

In June 2007, Boston Towing & Transportation signed a 20-year contract with Suez Energy to provide support for their Neptune LNG terminal, 10 miles offshore from Gloucester, Mass. As a result of the project award, Boston Towing is building two FiFi-1, ASD tractor-style tugs, both designed by Robert Allan Ltd. of Vancouver, B.C.

The 128-foot *Independence*, 5,400 hp, the larger of the two vessels, is a RAstar 3900 Class tug, purpose built and dedicated to the project. She is under construction at Derecktor Shipyards in Bridgeport, Conn. *Independence* will be based in Gloucester, Mass.

The smaller tug, *Justice*, is a 98-foot, 5,400-hp RAmparts 3000 Class, ASD vessel, also designed by Robert Allan Ltd., and presently under construction at J.M Martinac Shipbuilding of Tacoma, Wash.

The offshore Neptune LNG Terminal is scheduled for completion later this year. It consists of a deep-water buoyage system whereby the ship moors and discharges its cargo, utilizing an onboard vaporization process. The natural gas is then transported via a 13-mile sub-sea pipeline connected to the Spectra Energy pipeline, and delivered to New England consumers.

"The arriving LNG ship will connect to one of the two buoys and discharge its cargo," said Bill Skinner, marine superintendent for Boston Towing. "This type of parameter determined the size of the vessel necessary for this operation. We looked at the 100-year weather patterns for this region and determined the length and hull form, based on crew comfort, safety and mission."

Boston Towing focused on the mission to chart a course through the design and construction process of the tug. The vessel will be working with LNG carriers capable of offloading cargo year round.

"Our mission with these tugs will be to provide ship-assist service, towing, fire fighting, man-overboard assistance, and provide general service for a vessel on standby," explained Skinner, while conducting a tour of the partially completed *Independence* at the Derecktor shipyard. "We also need to be ready to assist in preventing other vessels from entering the Coast Guard-established security zone," he added.

The need for firefighting capability drove one of the major design decisions, which was to equip the tug with controllable pitch propellers. Since a CP prop can be partially feathered, thus reducing required engine power, a fire pump can run directly off the front end of the engine after being engaged by an electro-hydraulic clutch. At the same time, the partial-feathered propeller can still be used to maneuver and drive the tug.

Independence will make use of Nijhuis fire pumps, one connected to each engine, thus eliminating two pump engines, with a considerable gain in engine room space. But for Boston Towing, the gain is also potentially lower total fuel consumption and maintenance costs.

The main engines are two 16v4000 M-61 MTU Detroit Diesels connected by carbon fiber shafts to Rolls-Royce US-255-CP drives.

"We chose MTUs because of our mission," said Skinner. "Their bid was competitive and we liked the electronic fuel cut back, the low maintenance, and the multi-stage turbo chargers. The MTU and Rolls-Royce z-drives communicate via computer to balance load requirements."

The use of carbon fiber shafts is on the

increase in workboats, and, with *Independence*, they are consistent with a bias towards decreasing maintenance and down time. According to Skinner, carbon fiber shafts decrease the number of required pedestal bearings. "Two or less bearings may be used as opposed to typically five in an installation of this size. And two men can remove and carry a drive shaft in and out of the boat.

"Part of the mission is to take general supplies out to the terminal for our customer," said Skinner. To that end, he noted, the aft deck area is large enough to carry three 20-foot containers. An Effer hydraulic deck crane rated at 10-tons, with 25-foot extension, will handle container and cargo movements and deployment of the rescue boat.

Under the deck and in the forward bulwarks, 3,500 feet of pipe and channel were installed for a deck heating system. This was an easy decision according to Skinner, given the focus year-round operation off the Massachusetts coast. "Boat decks will ice up a lot in our region, and with a boat this size you'd need a snow blower or an extra four crewmembers to clear the snow and ice."

The pilothouse has 21 heated windows plus a row of three lower windows to view the aft deck area. In addition there are seven upper windows forward and at the sides to enhance the visibility for the operator when working close to higher ships.

The shipyard obtained cut steel plates for the hull from Delta Steel of Morgan City, La.

The hull on *Independence* includes sponsons that flare out just below deck level, thus allowing the tug to be built with a narrower hull in way of the waterline and further below. "The sponsons give a larger deck area without the extra displacement," said Skinner. "The tug retains its waterline length and great beam without the drag and fuel consumption."

Designer Robert Allan explained that the sponsons, with their inherent buoyancy, were designed initially to provide enhanced escort capability, but they also function as a very effective roll dampening device.

Designer and operator also agreed on installation of a box cooler system rather than the more common keel cooler. Skinner explained that the box cooler is less vulnerable in ice conditions and in shallow water. "The box coolers can be serviced from the inside of the hull. You don't have to take the boat out of the water to remove the coolers."

The smaller tug, *Justice*, is also expected to be delivered from its West Coast shipyard later this summer. *Justice* will be based in Boston with the regular Boston Towing fleet, and will be used as a back-up vessel to *Independence* on the Neptune project. In Boston, *Justice* will carry out normal ship assist duties including handling the LNG tankers that visit the Distrigas LNG terminal on the Mystic River in Everett, Mass.

Boston Towing has operated in East Boston since it was founded in 1932. The company is a wholly owned subsidiary of Reinauer Transportation Companies of Staten Island, N.Y. When *Independence* and *Justice* join the fleet, Boston Towing will have 10 conventional tugs and four ASD tugs specifically designed to support LNG operations. •

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