Size Matters

New winches from both ends of the spectrum respond to market needs.

Markey project manager Ben Jordan alongside the company's new all-above-deck hawser winch.

Markey Machinery

By Michael Crowley, Correspondent

Winches come in all sizes and types and fill a variety of needs on modern workboats. Robust electric or hydraulic motors power massive models, while some of the small ones are still hand operated.

Good examples of this diversity are new winches from **Markey Machinery** in Seattle and **Patterson Manufacturing** in Pittsburgh.

Markey's entry is a new render-recover hawser winch model for shipdocking tugs. The customer, who was building LNG tanker-escort tugs, liked other Markey hawser winch models, but there was a problem.

"The customer was saying, 'We love your winch, but we don't want to sacrifice that space,' " said Markey's Mark Jessup.

The customer was referring to below deck space where the winch's 200-hp electric drive would be housed, not the on-deck area for the winch itself.

"Our challenge was to get it to go on the deck. This had to be an all-above-the-deck solution. That was our biggest challenge," said Jessup.

All of Markey's previous asymmetric render-recover winches had drive packages that went below the deck. For the tug owner's boats, the problem with this arrangement is that the electric drive would cut into the crew accommodations area.

"They like to use the room below decks for crew quarters. It was a real issue for the naval architects," acknowledged Ben Jordan, Markey's project manager.

And an electric motor below deck not only took up space, but it meant more noise. "A 200-horsepower electric motor is not something guys wanted to sleep around," Jordan said.

But how do you move everything to the deck without taking up the entire bow area? It's not easy, but when Markey came up with plans for a different winch (the DESDF-48-200 electric class III hawser winch with automatic render-recover) a key element to the new design was shifting the location of the gears. Part of the gear train would be moved to the winch's base and part to the back of the winch.

"In the optimization of the gears we had to fold the gear train into a different configuration," said Jordan, who was the head engineer on the project. Along with relocating the gear train, a different type of gear was used, one that also reduced vibration and noise.

Another space saver was a modular pneumatic system operated by an onboard controller. It's more compact than pneumatic layouts where individual components are plumbed on a panel.

A benefit of the new winch is that it's much easier to monitor its systems. Instead of checking individual gauges, there's digital feedback throughout, and "you can see the air pressures of all the clutches and brakes on the control system," Jordan said.

Readings appear on a wheelhouse screen. If there's a problem, Markey engineers can "log in to see readings from all the sensors," said Jordan. "Before we'd have to send someone down, and it could be something as simple as 'the air compressor isn't turned up to over 100 psi, so it can't take off the emergency parking brake.' "

Markey's above deck design also made things easier for both the naval architect and the boatyard. When installing winches with below-deck power drives, a boatyard has to put a temporary plate over the hole where the winch would be mounted, and then when the unit arrived, "they might not get some bolt-on flanges right because the ship structure was in the way," Jordan said.

"Now we tell them where the loading points are and what the loads will be. We tell them where we want the water systems and the electrical controls. The winch shows up, is put on deck, welded down, systems are hooked up and it's good to go."

The 200-hp winch has a pair of drums, each able to carry about 700' of 72-mm (3") synthetic line. It's rated for 202 metric tons of continuous line pull with a maximum light-line speed of 925' per minute. Its water-cooled slip brake has a holding capacity of 308 metric tons.

Markey shipped the first DESDF-48-200 in July, and the second in August. The winches were installed on a pair of 100' **Robert Allan**-designed RAstar 3100 ASD escort tugs for **Signet Maritime** Corp., Pascagoula, Miss.

Patterson Manufacturing

Patterson's Yo-Yo winch solves bird's-nesting safety issues.

BYE-BYE BIRD'S NEST

Markey's winch weighs about 80,000 lbs. At the other end of the scale is a 442-lb. unit from Patterson that's used for making up inland barge tows. Called the YoYo winch, its dimensions are 22" wide, 35" long and 25" high.

The name is appropriate when you consider the winch's drum. It is only 1¼" wide, which is enough to handle a 1"-dia. wire rope. "It has a single-stack design where the wire rope spools on top of itself, much like a yo-yo string winds on top of itself," explained Patterson's Joseph Sluka.

The genesis of the YoYo winch came about when **AEP River Operations**, St. Louis, approached Patterson to develop a connecting winch that was safer than those currently available.

"On the drum on the standard winch, the wire winds onto it however it wants to," said Sluka. This can result in a "bird's nest" of wire wraps that must be unsnarled, which can lead to injury.

Straightening that mess out is when deckhands can get hurt. "Strain and pull injuries with the lower back occur when someone is trying to get the wire rope out of a drum that's all bird's nested. So AEP asked us to eliminate the bird's nesting," Sluka said.

Design and development took about three years. The first winch Patterson offered to solve the safety issue was a strap winch that used a 6"-wide nylon strap. AEP liked the design, but at that point "nylon and synthetic wires were still not looked upon as a feasible solution for barges," Sluka remembered.

The YoYo winch with its 1" wire rope solved the problem. "It's impossible to bird's nest," said Sluka.

It didn't take long to realize other benefits besides the safety angle. On a traditional barge winch, the wire "will continue to settle as 90 tons of coal starts to pull on the wire that's wrapped around the drum," Sluka said. That means someone has to tighten the wire. But since the wire on the YoYo winch's drum wraps on top of itself, there's no slack and thus very little tightening required while the barge is underway.

And without wire snarls, the YoYo's wire pays out smoothly and quickly, "so the speed of making and breaking tows has been increased," said Sluka. "There are no similar winches. Nothing is even close."

WB