Inland Marine | Towboat and Barge Financing Trends

TOWBOAT DESIGN

The design of traditional, front-squared towboats—also commonly referred to as pushboats—which push freight barges along America’s waterways, hasn’t changed in more than 50 years. This towboat design includes two engines that power matching gear boxes that, in turn, drive two propellers hanging below the back of the towboat. The design also includes main and flanking rudders. The main rudders allow the captain to steer the towboat and its attached barges, or tow, through the waterway. The flanking rudders are used to steer the tow while reversing, which allows the tow to transit the meandering bends of the river system. A typical tow is powered by a 6,000-horsepower towboat and consists of over thirty 300-foot by 35-foot barges; therefore, adeptly backing a tow safely is very important. For the tank barge segment, typically 2,000-horsepower towboats propel two 300-foot by 100-foot barges that carry 30,000 barrels of petroleum products, which utilizes the same two-engine design and allows for easy navigation.

The heavily built towboats are constructed to allow for a very long useful life, as the majority of vessels in use today were built since the 1960s. Many of these vessels are being rebuilt with new, efficient and environmentally upgraded engines, which have allowed towboat operators to run them more efficiently. With the introduction of Azimuthing towboat propulsion, certain segments of the towboat industry are facing a possible redesign. Azimuthing drive propulsion, or a Z-drive, is expected to replace the engine, gear, propeller and rudder design of many current towboats. A Z-drive is a componentized engine and propeller system that allows the vessel’s propellers to swivel 360 degrees underneath the towboat.

Though new to the industry, Z-drives have been used for decades in other marine environments and are expected to be most suitable for transport use in deep rivers, including towing petroleum tank barges between refineries, storage or customer locations and fleeting—moving barges around a “fleet yard” or barge parking lot. For these uses, the majority of Z-drive towboats are less than 100 feet in length, with generally 2,000-2,400 horsepower, which is relatively small when compared to the size of the average existing towboat. There are, however, a few Z-drive towboats of longer length and higher horsepower, with the capability to perform long-distance, or line-haul, towing. And while the advantages and disadvantages of Z-drives are still being explored by the majority of the industry, operators who have adopted the Z-drive technology report better maneuverability, increased speed and safety, and significant fuel-cost savings.

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Z-drive towboats were first manufactured in 2008, and as of March 2015, 22 Z-drive towboats have been built, delivered and are in operation. Another 10 Z-drive towboats are expected to be delivered in the near future. Two of the largest towboat operators, Marquette Transportation and AEP River Operations, each took delivery of three Z-drive towboats in 2014. While their Z-drive towboat fleet represents only a small portion of the hundreds of towboats they operate today, the sizeable capital investment for these operators shows their commitment to seriously evaluating Z-drives. The inland marine industry is closely watching and waiting to determine the lasting effect the new vessels will have on the industry.

**BENEFITS OF THE Z-DRIVE INCLUDE:**

- Better and quicker maneuverability  
- Increased speed, resulting in straight running around river bends  
- Lower costs/increased revenue  
- Less fuel use, leading to lower operating costs  
- Smaller engines, requiring less capital  
- Less maintenance, reducing personnel cost  
- Quicker propulsion system change-outs, with less down time and increased revenue-generating utilization  
- In-the-water propulsion system change-outs, eliminating drydocking costs  
- Safety from increased maneuverability, with fewer collisions

**DISADVANTAGES OF THE Z-DRIVE:**

- Cost – the net capital acquisition cost of a Z-drive towboat has yet to be proven  
- Reliability – unknown long-term robustness to river drift and groundings  
- A Z-drive towboat cannot economically be converted back to a traditional towboat, and vice versa  
- Unproven reliability in shallow and narrow channels

**NEW TOWBOAT AMENITIES**

Compared to vessels built within the past 10 or 15 years, new towboat interiors are seeing significant upgrades. Today, it's not uncommon to see vessels with hardwood or travertine floors, stainless steel appliances, granite counter tops, satellite-based entertainment systems, workout equipment and on-board training software. Many owners believe that crews who are well-rested and living in comfortable conditions will be happier and more productive. Some operators see the upgraded living quarters as a captain-retention program.

**FEDERAL TOWBOAT REGULATIONS | SUBCHAPTER M**

The Coast Guard’s long-coming Subchapter M regulations, which are expected in 2015, are another factor affecting future towboat utilization and profitability.

Subchapter M regulations are a detailed set of government standards created to address a number of issues within the inland towing industry. Although not completely clear at this time, the regulations are expected to affect towboat inspection requirements and conditions, possibly leading to earlier towboat retirements and reduced profitability of towboats.

Currently, it is known that the regulations will include a mandatory towboat inspection program. To ease operators into the new inspection program, the industry and the Coast Guard have worked to implement an inspection bridging program prior to Subchapter M coming into effect. Although Subchapter M has been on the horizon for many years and the bridging program is currently in place, the ultimate effect the regulations will have on the economic usefulness of individual towboats is still relatively unknown. It is expected that Subchapter M will require a towboat to maintain a certain level of condition, which may not be economically viable for the continued use of a towboat. If this is the case, certain towboats will likely be retired, and new capital investment will be required for replacement. The towboat replacement cost of $5 million to $15 million can be substantial, and the towing and finance industries are closely watching these developments.

**BARGES**

**Petroleum-Product Tank Barging**

The substantial growth of America’s crude oil production has directly affected the demand for barge transportation throughout the United States’ inland water ways. Over the past six years, America’s petroleum-producing regions have increased production from 3.8 million barrels a day to 9 million barrels a day. That boost in production has led to an increase in demand for barge transportation of crude oil, both before and after it has been refined.

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To provide transportation for this increased petroleum product, the towing industry has made significant investments in manufacturing new petroleum tank barges. The tank barge fleet saw growth of approximately 10 percent between 2010 and 2013. Since 2010, barge manufacturing has grown even more, while their requirements have become stricter. In addition, many of the major oil producers require younger fleets to secure a charter and ensure the safe transport of petroleum products.

As a result of the increased demand for tank barges—which is necessary to meet the current needs of the petroleum industry—new and existing towing operators have dedicated additional capital resources to the sector. This high demand for tank petroleum barges is expected to continue to rise, but it's unclear the exact impact this demand will have on the overall barge industry.

**Coal Hopper Barging**

Due to stricter coal-fired generated electricity EPA regulations, coal barging—and coal usage in general—has decreased in recent years. Over the past seven years, the EPA regulations have resulted in the closure of between 10 and 15 percent of coal-fired generating plants. Approximately a quarter of all coal currently mined in the United States is transported by barge, but that will likely decrease, as coal use is expected to decline by about 1 percent a year for the next several years. The reduction in America’s coal barge needs is expected to lead to a decrease in demand for coal barges and, therefore, a decrease in valuation and collateral value for these assets.

**CONCLUSION**

The inland marine industry is currently facing more changes, regulations and challenges than any other time in its century-long history. Undoubtedly, the introduction of Z-drive propulsion systems, stricter towboat standards, requirements for newer fleets and the recent shift in energy sources will directly affect the demand for new inland marine vessels and the value of existing towboats. Before making any final purchasing or repair decisions, it’s imperative for vessel operators to understand the costs associated with new vessels compared to the expected savings of upgrading existing fleets.

While the demand for new and existing vessels is still unclear, it’s becoming evident that, in order to adapt to new technology, regulatory standards and a transition in energy sources, inland marine vessels and the industry will continue to evolve in the coming years.

**CHASE EQUIPMENT FINANCE | INLAND TOWING MARINE INDUSTRY**

CEF has been financing marine vessels for more than 40 years and has gained extensive experience in the marine industry during this time. CEF follows market trends and other factors affecting the marine industry on both a short- and long-term basis. CEF maintains strong relationships with marine appraisal and consulting companies, which aids in market trends analysis and marine vessel valuation. CEF’s experience, expertise and access to external sources allow a greater success rate in structuring marine deals and predicting long-term asset values necessary to guard against loss.