

January 2010

## **Demise of the single-hull tanker**

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Production of petroleum (literally “rock-oil”) commenced in 1859 with the drilling of the first oil well by Edwin Drake in western Pennsylvania. By 1861, kerosene was being exported from the United States to Europe. Shipments were generally in wooden barrels, holding 42 US gallons – which has remained a standard measure of oil volumes, even though oil barrels quickly passed into history. The first purpose-built tankers were constructed in 1863. The cargo tanks were separate from the hull, meaning that these ships were effectively double-hulled. Unfortunately, due to the materials available and the construction techniques, they tended to leak small amounts of their kerosene cargoes into the void spaces below and required regular ventilation.

The modern single-hull tanker burst on the scene in 1886 with the construction of the *Glückauf*, a 300-foot long petroleum steamer. Propulsion was provided by a triple-expansion steam engine, but the ship was also barquentine-rigged. The engine was located aft, but the bridge was amidships, a design feature that remained in use until the 1960s. Transverse and longitudinal bulkheads separated the cargo areas into sixteen cargo tanks. The *Glückauf* had a cargo capacity of 3,020 tons and continued in service until it grounded off Fire Island, New York in 1893.

Tanker size has increased regularly. In 1900, the average tanker was about 4,000 dwt. By 1921, this had grown to over 22,000 dwt. By 1960, tankers were exceeding 100,000 dwt and 300,000 dwt tankers were in service by 1970.

For commercial purposes, modern oil tankers are generally divided into five types or sizes. The Panamax tanker ranges from 55,000 to 70,000 dwt. These tankers are built to not exceed the maximum dimensions allowed for ships to transit the current locks of the Panama Canal. Aframax tankers range from 70,000 to 120,000 dwt. Due to water depth and related limitations, this size is the largest tanker that can call at a US onshore port. The Suezmax tanker ranges from 120,000 to 200,000 dwt. When the name was initially utilized, this designation was restricted to tankers not exceeding 150,000 dwt, as these were the largest tankers that could transit the Suez Canal. As the Canal has been deepened, the definition of Suezmax has expanded. Very large crude carriers (VLCCs) range from 200,000 to 320,000 dwt. These

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tankers came to the fore during the closure of the Suez Canal in 1967. The Ultra Large Crude Carrier (ULCC) is any tanker exceeding 320,000 dwt. Most such tankers were constructed in the 1970s. Due to the limited number of ports and facilities that can accommodate such large ships, they are no longer in vogue. The largest tanker (and largest ship) ever constructed is the *Jahre Viking*, at 564,763 dwt (built 1979).

Until 1990, the vast majority of tankers were single-hulled. A small number were constructed with double sides or double bottoms and an even smaller number were constructed with full double-hulls, providing void space between the cargo areas and the skin of the ship.

Some environmental advocacy groups lobbied for double-hulls for all tankers, but to little effect. The US Coast Guard took up the double-hull battle at IMO, but was regularly and overwhelmingly defeated. This situation changed dramatically following the grounding of the tanker *Exxon Valdez* on March 24, 1989 and the resulting oil spill in Prince William Sound, Alaska. Without a single dissenting vote, Congress adopted the Oil Pollution Act of 1990 (OPA 90). Among its numerous provisions was one requiring that all new tankers be constructed with double hulls and establishing a staggered phase-out schedule for all single-hull tankers. Because this unilateral requirement applied to all tankers calling in US ports, foreign nations strongly and vocally expressed opposition, but to no effect. Ironically, after Europe suffered a series of oil spills from older single-hull tankers, their governments pushed a measure through IMO adopting a worldwide phase-out schedule for single-hull tankers that closely resembles that established by OPA 90.

The phase-out schedule for single-hull tankers under OPA 90 is fairly direct, but includes a few twists. The phase-out commenced on January 1, 1995 for tankers 28 years or older and of at least 30,000 gross tons. Tankers were given an additional five years of operational life if they were equipped with either double sides or double bottoms. Phase-out for smaller tankers started at 40 years of age, rather than 28. The permissible age decreased every year through 2005. Single-hull tank vessels of 5,000 gross tons or greater are largely banned from operation in waters subject to the jurisdiction of the United States as of January 1, 2010 (or January 1, 2015, if the tanker is equipped with either double sides or a double bottom). An exception is provided through January 1, 2015 for single-hull tankers offloading either at the Louisiana Offshore Oil Port (LOOP) or at one of the four designated lightering zones in the Gulf of Mexico located at least 60 miles offshore.

As befits a self-respecting international bureaucracy, the International Maritime Organization (IMO) developed a more complicated scheme for the phase-out of single-hull oil tankers. Initially, it approved a gentle phase-out system that would allow most such tankers to remain in operation until reaching 30 years of age. After the *Erika* oil spill off France in 1999 (followed in 2002 by the *Prestige* oil spill off Spain), European nations led a revolt and forced the IMO to adopt an accelerated phase-out scheme that more closely resembled that of OPA 90. For almost all single-hull oil tankers engaged in international trade, the revised scheme requires phase-out by the date in 2010 that is the anniversary of the tanker's original delivery date. A single-hull oil tanker may be eligible for an extension of up to five years if three conditions are

met: (1) the ship must satisfactorily undergo a survey in accordance with the Condition Assessment Scheme (CAS); (2) the flag state must approve the extension of service life and communicate that approval to the IMO; and (3) the port state at which the tanker intends to call must not have exercised its option to ban entry by tankers operating under such an extension of service life. Single-hull tankers fitted with either double sides or a double bottom may be allowed to continue in operation until reaching 25 years of age.

Whereas OPA 90 required single-hull oil tankers to cease calling in the United States by January 1, 2010 (with limited exceptions noted above), the change in IMO regulations effectively sounds the death knell for these venerable ships. As of several months ago, there were approximately 500 single-hull oil tankers engaged in international trade. It is expected that fewer than 100 will remain in operation by January 1, 2011. There are various reasons why many owners will take their single-hull tankers out of service. Passing a CAS survey is not easy and may require expenditure of significant amounts of money for necessary upgrades and repairs (during which time the tanker will not be earning freight). Charter rates are low and not expected to rebound in the near term. A number of nations have already announced or indicated that they plan to announce a ban on entries by single-hull tankers operating under a CAS extension, thus limiting available markets for these ships.

The result is that, during 2010, on average one single-hull tanker will be taken out of service each and every day. Some will be converted to other service (such as a floating production, storage, and offloading [FPSO] vessel or as a bulk carrier). Most, though, will be recycled. The maritime industry has never witnessed such a rapid regulatory-induced change. The cost of taking so many vessels out of service before the end of their usual operational lives is relatively clear. The benefits are less certain. While there is little denying that the double-hull tanker is an environmental improvement over the single-hull tanker, the extent of that improvement is not readily quantifiable.