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SUMMARY

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The Global Oil Tanker Market: An Overview as It Relates to Sanctions

Sanctions on oil transport from Russia, Iran, and Venezuela have drawn attention to the global oil tanker market and how it functions. The oil tanker market can be considered a resilient global industry. This is in part because ship operators are global firms with global customers. It can adapt to world events, such as wars and other conflicts, piracy, canal closures and restrictions, and extreme weather, because oil generally is a fungible commodity. Based on any number of world circumstances, oil shippers generally can find another buyer or seller for which a deal is likely to be considered beneficial for all parties, and the prominence of intermediaries in this market (i.e., shipbrokers and oil traders) facilitates rapid market adjustments. Many in Congress have expressed interest in how sanctions are affecting the world oil market and how to possibly further restrict sanctioned countries' oil revenues.

There are almost 7,500 oil tankers in the global fleet, of which over 1,600 are estimated to have participated in carrying sanctioned oil (at least from January 2021 to mid-November 2023, according to one estimate). The sanctions discussed in this report have led to longer average voyages, according to U.N. data. Voyage distance determines the most economically sized tanker to use. Sanctions have raised the premium on large Aframax-sized tankers, which is the preferred size for moving Russian oil, as well as for Suezmax tankers that move oil across the Atlantic Ocean. Tankers moving crude oil versus refined petroleum products can be identified and distinguished at sea by size and deck equipment.

Sanctions have increased the value of older tankers. Traders of sanctioned oil may prefer older tankers because the longevity of the sanctioned market is uncertain. One shipbroker reported that in 2022, there were over 600 secondhand tanker sales—a record amount—with many vintage tankers bought at elevated prices. One analysis finds that 43% of the global fleet (697 tankers) identified as carrying sanctioned oil is between 16 and 20 years old. Tankers typically have an economic life of 20-25 years, at which point they are sold for their steel scrap value. Those who track the buying and selling of secondhand tankers have not been able to identify the buyer in many cases and can often only speculate on the buyer's nationality. Clarksons 2023 tanker registry lists about 250 tankers for which it cannot identify the owners.

Tanker ownership can make sanctions enforcement more complex, as ownership is more scattered and diverse now than in the past. Independent tanker operators, rather than the major Western oil companies, own the vast majority of tankers. The oil producers that still own large tanker fleets are mainly foreign government-owned oil companies. Multiple firms are typically involved in a tanker's ownership and control. For example, tanker owners could be hands-off investors with no day-to-day involvement in their fleet's operations, or a fleet nominally owned by one company could technically and/or legally be divided, for liability reasons, into individual one-ship firms.

For a ship to be legitimately recognized, it must be registered in a country. The laws of that country apply to that ship, and the ship must display that country's flag; the ship otherwise can be assumed to be stateless and suspected of smuggling. The majority of ships, including tankers, are registered in "open registry" countries under what are sometimes referred to as "flags of convenience." These countries do not require their registered ships to be owned or crewed by their citizens and typically assess lower taxes and fees. Although the diversification of flag states muddles sanctions enforcement, the United States may have some leverage over leading flag states. In fact, the two largest flag registries for tankers (Liberia and the Marshall Islands) are run by U.S. firms headquartered in New York City and Reston, VA (a Washington, DC, suburb), respectively.

International standards for ship safety and security, including tankers, are intended to eliminate substandard ships and can facilitate sanctions enforcement in some respects. For example, the International Maritime Organization recently adopted a resolution calling on flag states to enforce prohibitions and regulations concerning the mid-ocean transfer of oil from one tanker to another and calling on port states to enhance inspections for tankers known to have switched off their transponders or otherwise tried to conceal their identity. Financial institutions are another means by which sanctions can be enforced, as tanker owners rely heavily on insurers and bank loans. Some concerns associated with the sanctioned oil market include the increased risk of oil spills and the uncertain, long-term ramifications of the establishment of a parallel global shipping system.

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Introduction

Sanctions on oil transport from Russia, Iran, and Venezuela that are enforced by the Department of the Treasury's Office of Foreign Assets Control (OFAC) have drawn attention to the global oil tanker market and how it functions. The terms *shadow*, *ghost*, and *dark fleet* have been used to characterize the challenges in identifying and tracking tankers carrying oil from those countries.[1] Many in Congress have expressed interest in how the sanctions are working and how to possibly restrict the flow of oil revenues further from those countries.[2] An overview of the institutions and features of the oil tanker market may be helpful to understand both obstacles and opportunities for enforcing sanctions.

A number of CRS reports provide details on the sanctions regimes and their policy goals.[3] The sanctions impose financial costs on entities or firms that support the shipping of sanctioned oil so as to discourage them from providing those services. U.S. firms that participate in sanctioned oil shipping are subject to civil or criminal penalties for violating sanctions. Foreign firms could have their U.S.-based assets seized or be prohibited from dealing with U.S. businesses or the U.S. financial market. Being unable to serve the U.S. market could harm maritime service providers because, other than China, the United States imports and exports far more cargo by sea than any other country. In addition, the U.S. dollar serves as the preferred currency for international transactions.

Sanctions are imposed on the transport of Russian, Venezuelan, and Iranian oil, with distinct purposes for sanctions relating to each country. Sanctions on Iran seek to eliminate its oil exports entirely.[4] Sanctions on Venezuela seek to severely restrict its oil exports; these sanctions were suspended in October 2023 for six months.[5] Regarding Russia, the United States and other G7 countries, the European Union, and Australia have banned the importation of Russian seaborne oil; for other countries importing Russian oil, sanctions seek to cap the price of that oil so as to reduce Russian oil revenue.[6] Russia accounts for about 12% of the world's crude oil exports and about 12% of refined product exports. For worldwide crude oil production, Russia produces about

[1] Except where specified, the word "oil" in this report is used to mean both crude oil and refined petroleum products (e.g., gasoline, diesel).

[2] House Financial Services Committee, Subcommittee on National Security, Illicit Finance, and International Financial Institutions, *Restricting Rogue-State Revenue: Strengthening Energy Sanctions on Russia, Iran, and Venezuela*, hearing, 118th Cong., 1st sess., December 12, 2023. Bills introduced related to this topic include S. 3053, H.R. 3774/S. 1829, H.R. 5923, H.R. 4825, and H.R. 6201/S. 3197.

[3] CRS In Focus IF10715, *Venezuela: Overview of U.S. Sanctions Policy*, by Clare Ribando Seelke; CRS Insight IN12267, *Iran's Petroleum Exports to China and U.S. Sanctions*, coordinated by Clayton Thomas; CRS In Focus IF12452, *U.S. Sanctions on Iran*, by Clayton Thomas; CRS Insight IN11869, *Russia's War Against Ukraine: Overview of U.S. Assistance and Sanctions*, by Cory Welt; and CRS Report R46213, *Oil Market Effects from U.S. Economic Sanctions: Iran, Russia, Venezuela*, by Phillip Brown.

[4] CRS In Focus IF12452, *U.S. Sanctions on Iran*, by Clayton Thomas.

[5] CRS In Focus IF10715, *Venezuela: Overview of U.S. Sanctions Policy*, by Clare Ribando Seelke.

[6] The price cap is $60 per barrel for crude oil, $100 per barrel for high-value petroleum products (e.g., diesel), and $45 per barrel for low-value petroleum products (e.g., fuel oil). Elizabeth Rosenberg and Eric Van Nostrand, "The Price Cap on Russian Oil: A Progress Report," Department of the Treasury (Treasury), May 18, 2023, https://home.treasury.gov/news/featured-stories/the-price-cap-on-russian-oil-a-progress-report.

13%, Iran about 4%, and Venezuela under 1%.[7] According to a 2015 estimate, about 61% of world oil production is carried by ship.[8]

Historically, the oil tanker market has adapted to world events, such as wars and other conflicts, piracy, canal closures and restrictions, extreme weather, technological revolutions (fracking), and regulation (double hull tankers, emissions). Ship operators are global firms because their customers are global and while there are grades of oil preferred by refineries, the commodity is generally fungible. Based on any given set of world circumstances, which can change continuously along with the price of oil, oil shippers can find another buyer or seller for which a deal is likely to be considered beneficial for all parties. The prominence of intermediaries in this market—that is, non-asset owning shipbrokers and oil traders (discussed below)—facilitates rapid market adjustments.

The Global Tanker Fleet

As of 2023, there were almost 7,500 oil tankers in the global fleet, of which over 1,600 had participated in carrying sanctioned oil (at least from January 2021 to mid-November 2023, according to one source).[9] Tankers at sea can be identified in two ways: by the type of oil products they are designed to carry and by their size range, which limits their practical sailing distance.

Crude Oil Versus Product Tankers

Tankers generally can be divided into two types: (1) those that carry crude oil, which tend to be the largest tankers, and (2) those that carry refined products, which tend to be smaller. All tankers have several different holds in the hull rather than one large tank for carrying product, but the two types of tankers have some distinguishable features and functions. Product tanker holds, for example, have coatings because they are washed between voyages to avoid contamination that can result from carrying a variety of refined products. For this reason, the distinction between the two types of oil tankers is also referred to as "dirty" (crude oil tankers) and "clean" (refined product tankers). Some smaller crude oil tankers can carry fuel oil, while product tankers can carry chemicals (chemical tankers are similar to product tankers but usually are smaller). Product tankers have more elaborate piping on their deck than crude oil tankers, which, along with their relative size, can help distinguish them at sea (e.g., in a satellite image).

Tanker Sizes

Voyage distance determines which size tanker would be more economical to use. On long voyages, a tanker spends a greater portion of total voyage time at sea as opposed to loading or unloading in port, so larger tankers that can carry more cargo would be more economical. Since shorter voyages entail a greater portion of total voyage time in port, smaller vessels that can load and unload more quickly are often more economical.

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[7] BP, *BP Statistical Review of World Energy*, 71st ed., 2022, https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2022-full-report.pdf. Data are for 2021.

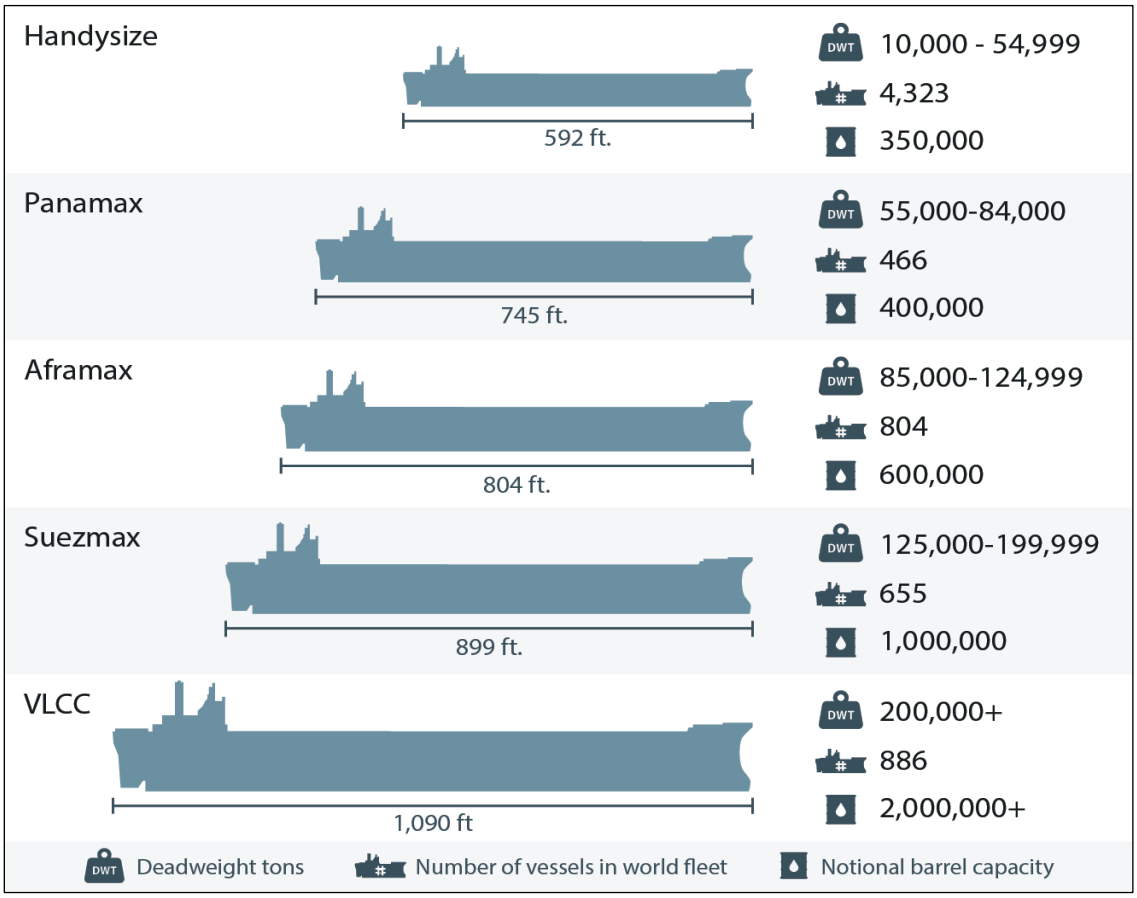
[8] U.S. Energy Information Administration, "World Oil Transit Chokepoints," October 15, 2019, https://www.eia.gov/international/analysis/special-topics/World_Oil_Transit_Chokepoints.

[9] Vortexa, *Exclusive Report: The Fleet Operating in Opaque Markets – One Year Since the EU Import Ban*, December 2023, https://marketinfo.vortexa.com/rs/837-MZE-578/images/Vortexa-Exclusive-Report-Opaque-Markets-Dec2023.pdf (hereinafter Vortexa, *Exclusive Report: The Fleet Operating in Opaque Markets*).

Figure 1 shows the various oil tanker size ranges of the world fleet as of 2023. The very large crude carrier (VLCC) was born out of the Suez Canal closure from 1967 to 1975, when larger tankers were needed to sail around the southern tip of Africa (the Cape of Good Hope). Sanctioned oil is usually tracked on tankers ranging from the size of the Panamax to other larger-sized tankers rather than the smallest "handysize" tankers, which, as **Figure 1** indicates, reduces that portion of the fleet by over 4,000 tankers.

Figure 1. Oil Tanker Size Ranges

World fleet as of 2023



Source: Clarksons Tanker Register, 2023.

Notes: VLCC = very large crude carrier; Afra = average freight rate assessment. Because of different densities, crude oil and refined products will yield different barrel capacities. Deadweight (dwt.) tons is a measure of a ship's cargo capacity.

Sanctions on Venezuela, Iran, and Russia have led to longer average voyages for seaborne oil. From 2002 to 2022, the average distance for one ton of seaborne oil increased from 3,993 nautical miles to 4,350 nautical miles and is expected to have increased to a record 4,578 nautical miles in 2023.[10] Previously, some Russian oil sailed from St. Petersburg-area loading ports to northern European ports; this oil is now sailing to India. Europe has replaced Russian oil with more distant oil from West Africa, the U.S. Gulf, and Latin America. Russian far east ports are loading oil destined for China. The change in Russian oil destinations has put a premium on Aframax tankers

[10] U.N. Conference on Trade and Development (UNCTAD), *Review of Maritime Transport 2023*, September 2023, p. 5.

and secondarily on Suezmax tankers for the Atlantic basin trading market. The preferred size for the Russian shadow fleet is Aframax; in 2022, the average daily charter rates for these tankers were three times higher than the yearly average for the previous three years.[11]

Newbuilding and Scrapping

Although sanctioned oil shippers often increase their fleet by purchasing secondhand tankers (see "Secondhand Sales," below), Russia and Iran are constructing new tankers. As of 2023, the Russian shipyard Zvezda had 14 Aframax tankers under construction, in addition to four smaller tankers.[12] Russian oil shipper Rosneft has six tankers on order, and Russian shipping company SCF Group (Sovcomflot) has ordered five tankers. SADRA Shipyard of Iran had one Aframax tanker under construction, reportedly for delivery to Venezuela in 2024. This would be the fourth tanker the Iranian shipyard has built for Venezuela in recent years.[13] (Venezuela and Iran have been shipping oil between themselves.)

It takes roughly two years from order to delivery of a tanker (with 9-15 months of actual construction). Thus, in the short term, the supply of tankers is fixed, which results in a spike in freight rates for tankers when demand for oil increases relatively suddenly or when longer voyages are required suddenly (due to war, canal closures, and/or sanctions). In recent years, between 150 and 250 new oceangoing tankers have been delivered annually, with almost all new tankers built in China, South Korea, and Japan.[14] At the end of 2022, the world price was around $60 million for a newbuild Aframax tanker, $75 million for a newbuild Suezmax tanker, and $120 million for a newbuild VLCC.[15] Despite the heightened demand for tankers, the total number of oil tankers currently under construction is at a 40-year low because the major shipyards in China, Korea, and Japan are oversubscribed with building containerships and liquefied natural gas carriers.[16]

Tankers typically have an economic life of 20-25 years and then are sold and demolished for their steel scrap value. In recent years, between 25 and 140 tankers have been scrapped per year.[17] However, reflecting the increase in demand for tankers as a result of sanctions, in 2023, a record low of seven product tankers were scrapped.[18] For the first 15 years of its economic life, a tanker undergoes drydock inspection every five years; subsequently, this inspection takes place every 2.5 years, and the inspections become more expensive. Tankers have shorter lives than other heavy steel vehicles, such as railroad cars (typically 50 years), because of the constant exposure to the

[11] BRS Shipbrokers, *Annual Review 2023*, p. 78, https://cdn.brsshipbrokers.skreycloud.com/annualreview2023_34a4abaf04.html.

[12] Clarksons Tanker Register, 2023.

[13] Marianna Parraga and Mircely Guanipa, "Tanker Built by Iran for Venezuela to Carry Fuel Components in First Trip," Reuters, June 15, 2022, https://www.reuters.com/business/energy/tanker-built-by-iran-venezuela-carry-fuel-components-first-trip-sources-2022-06-15/.

[14] BRS Shipbrokers, *Annual Review 2023*, p. 75, https://cdn.brsshipbrokers.skreycloud.com/annualreview2023_34a4abaf04.html.

[15] BRS Shipbrokers, *Annual Review 2023*.

[16] Asad Zulfiqar and Alex Longley, "Russia's Shadow Oil Tanker Fleet Becomes Everyone Else's Problem," *American Journal of Transportation*, February 18, 2023, https://www.ajot.com/news/article/russiaas-shadow-oil-tanker-fleet-becomes-everyone-elseas-problem.

[17] BRS Shipbrokers, *Annual Review 2023*, p. 75, https://cdn.brsshipbrokers.skreycloud.com/annualreview2023_34a4abaf04.html.

[18] "BIMCO Shipping Number of the Week," *Tanker Operator*, January 10, 2024.

marine environment, which causes rust and corrosion. Inspections in later years look for deterioration in the thickness of the steel plates and fittings in a tanker's cargo holds.

Secondhand Sales

Shipowners have been scrapping fewer older tankers, having found that effects of sanctions appear to increase their value. Older tankers may be preferred for sanctioned oil traders because the longevity of the sanctioned market is uncertain. One shipbroker reports that in 2022, there were over 600 secondhand tanker sales—a record amount—with many "vintage tankers bought at elevated prices."[19] Another source that tracks the tanker fleet recorded about 900 name changes to tankers from 2022 to 2023, indicative of substantial secondhand sales.[20] As of summer 2023, prices for 15-year-old Aframaxes in the secondhand market had more than doubled, according to one observer.[21] Aframax tankers built before 2010 were selling for over $30 million (versus a newbuild price of about $60 million in 2022 as mentioned above).[22] Overall, prices for secondhand tankers rose 17% in 2023 and to their highest level since 2008, according to one source.[23]

The result of these secondhand sales is that much of the sanctioned oil is moving in older tankers, which creates a safety risk.[24] One analysis finds that 43% of the fleet (697 tankers) identified as carrying sanctioned oil from January 2021 through November 2023 was between 16-20 years in age.[25] Of the 20 tankers under Venezuelan flag in 2023, 11 were built in the 1990s, and 23 of the 53 tankers in the National Iranian Tanker Company fleet in 2023 were 20 or more years old.[26]

Tracking Secondhand Sales

One aspect of the dark fleet is the obscurity of the owners. Those who track the buying and selling of secondhand tankers often can only speculate on the nationality of the buyer. Clarksons 2023 tanker registry, a customary source of fleet information, lists about 250 tankers for which it cannot identify the owners. A firm that tracks the value of secondhand ships has identified Gatik Ship Management of India as a new buyer that has been actively acquiring secondhand tankers, for example.[27] Similarly, BEKS Ship Management and Trading of Turkey has acquired tankers to transport sanctioned oil. In January 2024, OFAC sanctioned Hennesea Holdings, a UAE-based firm established in late 2022 with a fleet of 18 tankers, for transporting Russian oil above the price cap. Thus, Russian entities may not be directly involved in acquiring the majority of the

[19] BRS Shipbrokers, *Annual Review 2023*, pp. 74 and 85, https://cdn.brsshipbrokers.skreycloud.com/annualreview2023_34a4abaf04.html.

[20] Clarksons Tanker Register, 2023.

[21] See Figure 7 in Craig Kennedy, "Measuring the Shadows," August 23, 2023, https://navigatingrussia.substack.com/p/measuring-the-shadows.

[22] Elizabeth Braw, "Greece is Making a Killing Selling Ships to Russia," *Foreign Policy*, September 11, 2023, https://foreignpolicy.com/2023/09/11/greece-russia-tankers-oil-sanctions/ (hereinafter Braw, "Greece is Making a Killing"). The author cites data from VesselsValue Ltd. that tracks the value of maritime assets.

[23] "BIMCO Shipping Number of the Week," *Tanker Operator*, January 10, 2024.

[24] Reuters, "Insight: Oil Spills and Near Misses: More Ghost Tankers Ship Sanctioned Fuel," March 23, 2023; https://www.reuters.com/business/autos-transportation/oil-spills-near-misses-more-ghost-tankers-ship-sanctioned-fuel-2023-03-23/.

[25] Vortexa, *Exclusive Report: The Fleet Operating in Opaque Markets*.

[26] Clarksons Tanker Register, 2023.

[27] Braw, "Greece is Making a Killing."

fleet carrying Russian oil; rather, non-Russian shipping firms and oil traders, some perhaps newly established for this purpose, are supplying the shipping.[28]

While the buying and selling of secondhand tankers can be difficult to track, two international regulatory requirements by the International Maritime Organization (IMO) provide some means of tracking the vessels themselves. Somewhat similar to a VIN (vehicle identification number) on an automobile, an IMO number is used to identify a vessel throughout its life. The IMO number does not change with the sale, renaming, or reflagging of a vessel, and it is to never be used for another ship (even after a ship is scrapped). The IMO number must be displayed on the ship and is usually done so on its stern. A continuous synopsis record, which documents all the administrative and regulatory activity related to the ship, is also required to be kept with every ship. OFAC's guidance for avoiding Russian oil price cap sanctions alludes to this continuous synopsis record when it states that "enhanced due diligence may be appropriate for ships that have undergone numerous administrative changes."[29]

Tanker Owners and Operators

In the past, Western oil company vessels (such as the *Exxon Valdez*) were commonplace in the oil tanker market, but these companies no longer own the majority of tankers in the global fleet. Even before the infamous 1989 Alaskan oil spill, the Western oil majors were getting out of the tanker owning business.[30] Today, the vast majority of tankers are owned by independent tanker operators.[31] This can make sanctions enforcement more complex, as ownership is less concentrated than in the past. As **Table 1** indicates, the top five owners account for less than 13% of the total fleet, and the top 15 owners for less than 28% of the fleet.

Table 1. Top 15 Tanker Owners

Ranked by deadweight tonnage of fleet, in the thousands

Owner	Home Base	Ownership Type	Number of Tankers (deadweight tons, x1,000)	Percent of World Fleet
China COSCO Shipping	China	State-owned shipping line	155 (21,742)	3.2%
China Merchants	China	State-owned shipping line	109 (18,862)	2.8%
Euronav NV	Belgium	Independent tanker owner	60 (15,386)	2.3%
Fredriksen Group/Frontline	Norway	Independent tanker owner	86 (15,182)	2.2%
Bahri	Saudi Arabia	National oil company	81 (13,963)	2.1%

[28] See, for example, Joe Wallace, Anna Hirtenstein, and Costas Paris, "The Secret Oil-Trading Ring that Fund's Russia's War," *Wall Street Journal*, February 19, 2024.

[29] Treasury, Office of Foreign Assets Control (OFAC), Price Cap Coalition, "Oil Price Cap Compliance and Enforcement Alert," February 1, 2024, p. 2.

[30] The five leading Western oil majors are BP, Chevron, ExxonMobil, Shell, and TotalEnergies.

[31] Intertanko is an association of independent tanker owners, https://www.intertanko.com/.

Owner	Home Base	Ownership Type	Number of Tankers (deadweight tons, x1,000)	Percent of World Fleet
Angelicoussis Group	Greece	Independent tanker owner	51 (13,749)	2.0%
National Iranian Tanker Company	Iran	National oil company	53 (13,495)	2.0%
Dyanacom	Greece	Independent tanker owner	70 (11,933)	1.8%
Mitsui OSK Lines	Japan	Privately held shipping line	119 (10,982)	1.6%
Sinokor Merchant	South Korea	Privately held shipping line	89 (10,055)	1.5%
SCF Group (Sovcomflot)	Russia	State-owned shipping line	95 (8,729)	1.3%
Petronas	Malaysia	National oil company	56 (8,700)	1.3%
International Seaways	USA (New York City)	Independent tanker owner	74 (8,220)	1.2%
Thenamaris	Greece	Independent tanker owner	56 (8,174)	1.2%
SK Shipping	South Korea	Independent tanker owner	29 (7,867)	1.2%

Source: Clarksons Tanker Register, 2023.

Note: Deadweight tons is a measure of the cargo carrying capacity of a ship.

The oil producers that own large tanker fleets are mainly non-Western, state-owned national oil companies: Bahri of Saudi Arabia; the National Iranian Tanker Company; Petronas (a Malaysia nationalized oil company); Kuwait Petroleum; and ADNOC (Abu Dhabi National Oil Company). Underlying the exit of Western oil majors in tanker ownership is a liability for oil spills and increased specialization among tanker owners and operators.

Some tankers are owned by shipping lines that also own other types of cargo ships (e.g., Mitsui OSK Lines and Nippon Yusen Kaisha). The two largest tanker owners are Chinese state-owned enterprises that own a variety of ships. Sovcomflot of Russia is a state-owned tanker shipping line. Fourteen of its tankers have been sanctioned by OFAC.[32] Ship owning in Greece is considered prestigious, and Greeks are well represented in the ownership of different kinds of ships, including tankers (Angelicoussis Group, Dynacom, Thenamaris; see **Table 1**).

Multiple firms typically are involved in a tanker's ownership and control. The owners could be hands-off investors with no day-to-day involvement in a fleet's operations. A fleet nominally owned by one company could technically and/or legally be divided, for liability reasons, into individual one-ship firms. Often, tanker owners hire a ship management company to handle the technical upkeep of a vessel, including maintenance, repairs and dry dockings, and required inspections.[33] This firm may handle, or could outsource to a third firm, the vessel's day-to-day

[32] Treasury, OFAC, "U.S. Treasury Designates Russian State-Owned Sovcomflot, Russia's Largest Shipping Company," February 23, 2024.

[33] Michael D. Tusiani, *The Petroleum Shipping Industry*, (Tulsa, OK: PennWell Publishing Co., 1996).

commercial operation, such as finding cargo for the vessel, fueling it (bunkers), and handling other voyage details. The existence of these specialized firms that handle tanker operations makes it relatively easy for investors to enter and exit the market. OFAC has sanctioned UAE-based SUN Ship Management for managing Sovcomflot tankers.[34]

Tanker Crewing

The typical number of crew on a tanker is 22 sailors. Crewing could be outsourced to a "manning agent" that provides a pool of crew for the vessel. The most common nationalities for ship crews in the world fleet are Filipino, Russian, Chinese, Indian, Indonesian, Ukrainian, and Polish.[35] A vessel's crew is likely to have knowledge about sanctions evasion tactics, such as ship-to-ship (STS) transfers or Automatic Identification System (AIS) spoofing (discussed in "International Standards"). OFAC and the U.S. Coast Guard have encouraged manning agents to ensure ship crews are informed of monetary awards available to them for confidentially reporting illicit activity.[36]

Flag Registration

Seldom is there any single national identity to participants operating a tanker. The crew of the ship is likely to represent different nationalities among the captain, the officers, and deckhands. Lack of a single national identity is evident by the multitude of national flags that ships are registered under and the ease at which they reflag to another country.

The regulatory framework for tankers is somewhat analogous to private automobiles on public roads (i.e., requiring registration, a license plate, a safety inspection, and insurance). For a ship to be legitimately recognized, it must likewise be registered in a country. The laws of that country apply to that ship, and the ship must display that flag; otherwise, it can be assumed to be stateless and suspected of smuggling. The overwhelming majority of ships, including tankers, are registered in "open registry" countries, sometimes referred to as "flags of convenience." These countries do not require their registered ships to be owned or crewed by their citizens and typically assess lower taxes and fees. **Table 2** displays the top 15 countries of registration for oil tankers.

Table 2. Top 15 Countries of Registration for Oil Tankers

Ranked by deadweight tons (dwt)

Flag State	Number of Tankers	Dwt. (000s)	Average Age
Liberia	1,211	125,720	11.5
Marshall Islands	1,286	114,367	10.1
Panama	908	87,573	14.2
Hong Kong	344	45,522	10.5
Greece	233	37,969	9.7

[34] Treasury, OFAC, "Treasury Tightens the Price Cap with New Sanctions and Updated Guidance," December 20, 2023.

[35] UNCTAD Statistics, Maritime Transport, Seafarer Supply, https://unctadstat.unctad.org/datacentre/.

[36] Treasury, OFAC, *Guidance to Address Illicit Shipping and Sanctions Evasion Practices*, May 14, 2020, p. 23, https://ofac.treasury.gov/media/37751/download?inline.

Flag State	Number of Tankers	Dwt. (000s)	Average Age
Malta	403	33,404	11.2
Singapore	426	29,163	8.7
Bahamas	192	23,305	11.3
China	310	16,555	9.5
Iran	76	15,771	18.6
Saudi Arabia	78	12,195	12.6
Norwegian – Int'l.[a]	162	10,004	10.9
India	100	9,090	17.1
Japan	35	8,608	8.5
Danish – Int'l.[a]	150	7,733	10.8

Source: Clarksons Tanker Register, 2023.

Note: Dwt. (deadweight tons) is a measure of the cargo capacity of a ship.

a. The Norwegian and Danish international (Int'l.) registries are second registries in those countries designed to compete with flags of convenience (FOCs). They offer some of the same tax and fee advantages of FOC countries but may require that at least some of the crew (the captain or officers) be national citizens or are paid at prevailing wages of the flag state. See Richard Coles and Edward Watt, *Ship Registration: Law and Practice*, 2nd ed. (London: Informa Law from Routledge, 2009).

Although the multitude of foreign countries under which tankers are registered frustrates sanctions enforcement, the United States may have some leverage over the leading flag states for historical reasons. The two largest flag states for tankers (Liberia and the Marshall Islands) are run by U.S. firms that are headquartered in New York City and Reston, VA (a Washington, DC, suburb), respectively.[37] Open registries emerged in the 1920s when U.S.-flag passenger liners sought to avoid prohibition laws by reflagging their ships in Panama. Then, in the years prior to the United States entering World War II, when the nation was seeking to remain neutral,[38] reflagging ships supplying Britain under the neutral Panama flag was a means to avoid entanglement in the war due to enemy fire on U.S.-flag ships.

U.S. interests largely encouraged the concept of flags of convenience; the three largest flag states by deadweight tons (Liberia, Marshall Islands, and Panama; see **Table 2**) all have a historical affiliation with the United States. Though U.S. shipowners may flag their ships in foreign countries, they can still be effectively under U.S. control in case of war or national emergency because they remain under U.S. ownership. This was widely perceived to be a better alternative to the sale of U.S.-based shipping lines to foreign control, as the more expensive U.S. crews required under U.S.-flag registration were not cost competitive. Thus, some shipowners have called these types of flag registries (i.e., ships registered in one country but owned and controlled by a different country, namely the United States) "flags of necessity." The Marshall Islands flag was established in the early 1990s when the United States became concerned, due to diverging interests, with the reliability of Panama- and Liberia-flag ships that were U.S.-owned.[39] The Liberian, Marshall Islands, Panamanian, Bahamian, and Honduran registries are the only foreign

[37] The Vanuatu ship registry is also administered by a firm located in New York City.

[38] Shipping Neutrality Act of 1935, 49 Stat. 1081; and the Neutrality Act of 1939, 54 Stat. 4.

[39] Rodney Carlisle, "Second Registers: Maritime Nations Respond to Flags of Convenience, 1984-1998," *The Northern Mariner*, July 2009, pp. 319-340.

flag ships that receive special eligibility for U.S. government-provided war risk insurance coverage.[40]

Flag registration fees could be a significant revenue source for the governments of foreign flag states. Thus, these countries face an issue with the wholesale de-flagging of tankers involved in sanctioned oil movements. For instance, the Department of State notes that Liberia's ship registration fees are among the country's primary sources of revenue, along with its exports of rubber and iron ore.[41]

Reflagging

Oil sanctions have resulted in an increase of countries switching ship registrations from one country to another. According to U.N. data, oil tankers registered under the Iranian flag increased from 17 vessels in 2019 to 83 vessels in 2020, multiplying the flag's fleet cargo capacity by nearly 50 times.[42] This data point coincides with reports that Panama has withdrawn its flag registration for 136 ships linked to Iran's state oil company.[43] The Russian flagged tanker fleet and the Venezuela flagged fleet have held steady over recent years at around 400 tankers and about 20 tankers, respectively. Liberia, Panama, and the Marshall Islands have formed an information sharing compact where they advise each other if they de-flag a tanker or suspect a tanker is participating in sanctioned oil trading to prevent these tankers from "flag shopping" among them.[44]

Port state authorities compile and share their inspection results in annual reports, such as the "Paris MOU" or the "Tokyo MOU," identifying flag registries with low- and high-risk safety records.[45] For example, Gabon, Palau, and the Cook Islands, which reportedly are the flags of tankers recently carrying sanctioned oil,[46] are newer registries with less reputable safety records. Reputable shipowners might be discouraged from flagging their ships in countries such as these because their ships are more prone to inspection delays in port. Generally, newer flag states may accept inferior ships because more established flags can afford to reject them. Over the long term, substandard ships do not represent a strong business case; substandard ships are a niche market.

International Standards

International standards for the safety and security of ships, including tankers, are intended to weed out substandard ships and can facilitate sanctions enforcement in some respects. Flag states remain primarily responsible for enforcing international standards related to safety, pollution prevention, and security, but much of that burden has shifted from the flag state to the "port

[40] 33 C.F.R. §308.2(a).

[41] Department of State, "U.S. Relations with Liberia," August 2, 2019, https://www.state.gov/u-s-relations-with-liberia/ ; and CRS In Focus IF12493, *Liberia*, by Tomás F. Husted.

[42] UNCTAD Statistics, Maritime Transport, Merchant fleet by flag of registration and by type of ship, https://unctadstat.unctad.org/datacentre/.

[43] Elida Moreno, "Panama Has Canceled Registry to 136 Iran-linked Vessels," Reuters, January 18, 2023.

[44] *Hellenic Shipping News*, "The Registry Information Sharing Compact is a Major Step Forward in Sanctions Enforcement," April 22, 2020.

[45] Paris MOU, "White, Grey and Black List," https://parismou.org/Statistics%26Current-Lists/white-grey-and-black-list; and Tokyo MOU, "Annual Report," https://www.tokyo-mou.org/publications/annual_report.php. The International Chamber of Shipping (ICS) also reports on flag-state performance (see ICS, *Shipping Industry Flag State Performance Table: 2023/224*, https://www.ics-shipping.org/wp-content/uploads/2024/01/Shipping-Industry-Flag-State-Performance-Table-2023-2024.pdf).

[46] Vortexa, *Exclusive Report: The Fleet Operating in Opaque Markets*.

state." In other words, countries enforce these standards when ships arrive or as a condition for entering their coastal waters and ports.

International standards are established by treaties and conventions agreed to by seafaring nations. These agreements are arrived at via the London-based U.N. agency, the IMO.[47] The U.S. Coast Guard is the primary U.S. representative to the IMO.

The institution and practice of international conventions for ship safety can be traced to the response to the *Titanic* disaster in 1912. The standards are enforced by both flag states and port states. For instance, the U.S. Coast Guard's inspection checklist when boarding ships in U.S. ports is based on these standards. Enforcement is as effective as the flag states and port states are willing and have the resources to put toward that effort.

Three of the key standards are often referred to by their acronyms—SOLAS, MARPOL, and STCW—which stand for the following:

- International Convention for the Safety of Life at Sea (SOLAS, 1974), as amended;
- International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto and by the Protocol of 1997 (MARPOL, an acronym for marine pollution); and
- International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) as amended, including the 1995 and 2010 Manila Amendments.

The IMO recently adopted a resolution calling on flag states to enforce prohibitions and regulations concerning the mid-ocean transfer of oil from one ship to another (i.e., STS transfer). The same IMO resolution called on port states to enhance inspections for ships known to have switched off their AIS or otherwise tried to conceal their identity.[48] Ship crews are required to keep a detailed logbook of all activities related to navigating the vessel and all incidents while on a voyage; port state authorities can use this record as a means to detect suspicious or fraudulent activity (by comparing the logbook to AIS tracking history, for instance).[49]

The Role of Insurance and Classification Societies

Financial institutions are means by which sanctions have been enforced, as tanker owners rely heavily on insurers and bank loans. In addition to the age of a tanker and its chosen flag, the choice of insurance carrier and classification society can help port state control authorities identify suspicious ships. Ship insurers play a role in maintaining shipping standards for their own financial reasons—that is, charging an adequate premium based on their assessed risk. To assess a vessel's seaworthiness and therefore its risks, the insurance industry relies on independent marine engineers and surveyors employed by classification societies. These firms regularly inspect ships to ensure that they meet and maintain "class," which are specification criteria for ship construction and maintenance.

A distinction between the Iranian and Russian sanctions is that classification societies can be sanctioned for providing their services to tankers carrying Iranian oil but are exempt in the case of

[47] International Maritime Organization (IMO), https://www.imo.org/.

[48] *MarineLog*, "IMO Assembly Seeks to Crack Down on Dark Fleet," December 7, 2023.

[49] IMO, Resolution A.916(22), *Guidelines for the Recording of Events Related to Navigation*, adopted November 29, 2001, https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/AssemblyDocuments/A.916(22).pdf.

tankers carrying Russian oil.[50] Russia has its own classification society, but the organization has been expelled from the industry's self-policing group, the International Association of Classification Societies.[51] Just as the Paris MOU and Tokyo MOU rank flag states based on their safety record, so too do they rank classification societies (which are referred to as "recognized organizations").

While ship insurers typically provide hull insurance, shipowners have formed mutual insurance clubs to provide themselves with protection and indemnity (liability) insurance, such as for an oil spill. Liability insurance is mandatory for tankers under the IMO International Convention on Civil Liability for Oil Pollution Damage, 1992. London, Switzerland, and New York are the traditional headquarters of marine insurers. However, given sanction restrictions, Russia and India have reportedly formed or contemplated forming their own insurance clubs.[52]

The development of flags of convenience created an important change for classification societies. Prior to flags of convenience, a classification society generally had a monopoly on its home country's fleet. For example, the American Bureau of Shipping inspected all U.S.-flag ships; the Lloyd's Register inspected all U.K.-flag ships. With the development of flags of convenience, the flag could choose among classification societies, resulting in competition among the classification societies. This development has affected classification society inspections, causing tension between upholding standards and the accounting for the possibility that a client could shop around for another classification society if the client's ships do not pass inspection.[53]

The Role of Banks

Banks provide loans for ship operators to acquire new vessels, and banks exchange the funds between oil buyers and sellers. As with the insurers, before providing a loan for vessel acquisition, banks are to confirm that the ship meets classification standards. The chosen flag state also would likely factor into the borrower's risk profile. This could create an obstacle for the sanctioned oil market in acquiring secondhand vessels, as the banks would be sanctioned for providing loans to ship operators in the sanctioned oil market.

For individual oil transactions, the oil buyer's bank guarantees payment to the seller's bank through a "letter of credit" document. The banks are used as a means to ensure payment for international transactions, particularly between buyers and sellers that do not have a long-standing, trustworthy relationship with one another. This might create a dilemma for sanctioned oil buyers and sellers that are new to one another, as banks would be sanctioned for participating in the transaction.

CIF Versus FOB Transactions

Sanctions enforcement involves a review of the standard documentation used in ocean shipping. This documentation indicates which party is paying for the ocean transportation. If the seller arranges and pays for the ocean transportation, it would be a CIF transaction (cost, insurance, and

[50] Treasury, OFAC, *OFAC Guidance on the Implementation of the Price Cap Policy for Crude Oil and Petroleum Products of Russian Federation Origin*, revised on December 20, 2023, https://ofac.treasury.gov/media/931036/download?inline (hereinafter *OFAC Guidance*, revised December 20, 2023); and Treasury, OFAC, *Sanctions Risks Related to Shipping Petroleum and Petroleum Products from Iran*, September 4, 2019, https://ofac.treasury.gov/media/46006/download?inline.

[51] International Association of Classification Societies, https://iacs.org.uk/.

[52] *BusinessLine* (*Chennai)*, "India Planning Own P&I Entity to Safeguard Shipowners," January 5, 2024.

[53] Jack Devanney, *The Tankship Tromedy: The Impending Disasters in Tankers*, 2nd ed., 2006, p. 23.

freight). In this case, the oil buyer does not take title (ownership) of the oil until it is delivered to the final destination port. Thus, the price of the oil is the delivered price that includes the cost of insuring the shipment and the cost of shipping it. The FOB option (free on board) means the seller is responsible only for the cost of loading the oil on the tanker at the exporting port. The oil buyer at this point takes title of the goods and pays for the cost of the ocean transportation and insuring the cargo.

Whether CIF or FOB, in the case of Russian oil price cap sanctions, parties involved in a transaction are to maintain itemized costs delineating the price of the oil versus the cost of other services, such as insurance, freight, and customs services. Parties involved in trading Russian oil are also to keep an attestation on file that the oil is being sold below the price cap.[54]

Standard Shipping Documents

A letter of credit, along with other standard shipping forms, can be the basis of evidence in sanctions enforcement. For evidence of delivery, the oil buyer's bank looks to the "ocean bill of lading" before transmitting the funds to the seller's bank. An ocean bill of lading is an international standard contract between the ocean carrier and the party paying the freight (the ocean carrier's customer). It states the port of loading and discharge; the amount and nature of cargo being shipped; the freight charges, among other shipment particulars; and boilerplate contract language between the cargo owner and tanker owner. It is also the document of title of the goods shown.

Before the oil can enter the importing nation's commerce, it must "clear" through customs (in the same way international travelers clear customs in airports). A standard customs entry form provides the particulars of a shipment and generally the most precise information on the nature, quantity, and weight of the cargo being imported.[55] The importer will typically employ a "custom house broker" that is licensed to handle the clearance of the import product through the importing nation's customs agency. Customs brokering services are included among the maritime services that can be sanctioned if a shipment violates the Russian oil price cap. The customs entry form, the bill of lading and an invoice from the seller to the buyer, and a bank's letter of credit form the key documents that typically comprise an international transaction. These documents can be used by sanction enforcers to verify details on an oil shipment, spot evidence of forgery, or both. They also can be used to discover inflated rates to disguise Russian price cap violations.

Tanker Trading Routes

Tankers are hired (chartered) for time periods generally divided into three categories: voyage charter, time charter, and contract of affreightment (COA). A voyage charter (also known as a "spot" charter) means the tanker has been hired for a particular voyage from origin to destination port. Consecutive voyage charters involve more than one voyage. Tanker operators may bid on a particular shipment through a broker hired by the oil seller or buyer. A time charter is for an identified time period, usually between 2 and 10 years, that an oil shipper rents the tanker. In a COA, the oil shipper and carrier commit to a specified amount of oil being delivered over a specified duration at a specified shipping rate, without specifying any particular vessel or exact dates of delivery. This type of contract gives flexibility to the carrier to provide the tankers in the

[54] For OFAC's suggestion on what an attestation would consist of, see *OFAC Guidance*, revised December 20, 2023, p. 12.

[55] The World Customs Organization works toward harmonizing and standardizing customs processes worldwide, https://www.wcoomd.org/.

most efficient manner possible. COAs are often used by tanker owners participating in tanker pools where the pool operator has flexibility to deploy the pooled ships so as to reduce the amount of empty sailing days to the greatest extent possible. The pool of ships is specific to tankers of similar design that are appropriate for serving a particular market.

To try for maximum efficiency, tankers generally seek to be deployed on triangular routes where two of the three legs carry payloads, and the third (and shortest) leg sails empty.[56] The empty leg is referred to as ballast because tankers need to carry seawater when not carrying cargo for the stability of the ship. The Russia sanctions have upset the normal trade routes and may have precluded the possibility of some triangular routing. With more limited destination markets, it is more probable that oil tankers from Russia, Iran, and Venezuela are sailing in pendulum routes with the return voyage in ballast. This can significantly increase the cost of shipping, which may reduce the profit margins for the sanctioned oil producers. It has also upset the usual sailing patterns for non-sanctioned oil, increasing those shipping costs as well.

Brokers Facilitate Fluidity

Most seaborne oil shipments are arranged through brokers—a broker for the oil company and a broker for the tanker owner. In many cases, an oil broker (trader) rather than an oil company is a negotiating party. These so-called "middlemen" contribute to the fluidity of the oil market and are one of the reasons why the market as a whole has quickly adapted to the changes brought about by sanctions. According to one report, numerous newly formed oil traders have been selling much of Russia's oil, replacing the larger traditional commodity houses that consider price cap trading too risky.[57]

Vessel Tracking

Automatic Identification System Equipment

OFAC considers a vessel's tracking history generated by AIS to be a due diligence check before firms provide maritime services to a vessel. AIS is a vessel transponder that is primarily intended to help ship captains avoid collisions at sea. The system displays a vessel's heading and speed, as well as the identity of the vessel to other vessels in an area. It was designed to augment radio communication between ship captains. The system can be turned off, for instance, in known pirate infested waters. Since it was designed as a voluntary safety device, it has shortcomings in trying to track vessels. In addition to turning AIS off, false information can be entered into the system, such as about the identity and location of the vessel. These tactics are believed to be regularly occurring with sanctioned oil shipments. OFAC guidance includes establishing a "soft lock" on AIS equipment so it can be turned off in emergencies but would involve classification societies in checking the change log of a vessel.[58] Ships can also be tracked by satellite images, but this can be thwarted by disguising the identifying equipment on the deck of a tanker or by repainting the vessel.

[56] *Bunker Ports News Worldwide*, "Triangulate This! MR Tanker Atlantic Trade Patterns," June 29, 2013, https://www.bunkerportsnews.com/News.aspx?ElementId=31f48eb3-31ba-49ff-9b5a-5d7b09c4ac5c.

[57] Dmitry Zhdannikov and Nidhi Verma, "Insight: Obscure Traders Ship Half Russia's Oil Exports to India, China after Sanctions," Reuters, July 27, 2023, https://www.reuters.com/business/energy/obscure-traders-ship-half-russias-oil-exports-india-china-after-sanctions-2023-07-27/.

[58] Treasury, OFAC, Department of State, and U.S. Coast Guard, *Guidance to Address Illicit Shipping and Sanctions Evasion Practices*, May 14, 2020, p. 12, https://ofac.treasury.gov/media/37751/download?inline.

Transfers and Transshipments

Oil tankers may use STS transfers and transshipment hubs to try to disguise their movement of sanctioned oil. STS transfers of sanctioned oil need to be distinguished from more common "lightering" operations. Lightering is the process by which a tanker too large or with a draft too deep to enter port (such as a VLCC) unloads or loads some of its oil to a smaller tanker offshore from the harbor. At some ports, VLCCs unload or load by hooking up to an offshore pipeline. Tanker trackers are now sometimes observing STS transfers between two tankers positioned side-by-side at sea or along coastal areas not traditionally associated with lightering areas, which is believed to be a method of sanctions avoidance so as to disguise the origin of the shipment, for instance. STS transfers must follow a pre-approved operations plan by the flag state of each vessel, and the coastal state must be notified two days prior.[59] These and other requirements can help identify illicit transfer operations. Tanker trackers have also observed an uptick in deliveries to and shipments from oil storage hubs, such as the transshipment ports of Singapore and Fujairah. These storage hubs store and blend oil from different sources for economic reasons, but their increase in activity might be due to shippers seeking to obscure sanctioned oil movements.

Floating Storage

It appears that much of Iran's tanker fleet is being used to store its crude oil for long periods, either off its coast or off the Malaysian coast in the Malacca Strait.[60] *Floating storage units* are tankers that are built specifically to store oil rather than transport it, but they are usually associated with an offshore oil production platform. A transport tanker can also be used to store oil, and Iran appears to use this strategy to move oil into an anticipated market before actually having a buyer. Thus, floating storage represents another possible activity that a tanker may be engaging in and thus something else to decipher for those tracking and identifying tankers at sea.

Free Passage Through Straits

Much of the world's seaborne oil passes through several narrow straits or canals. For example, Russian oil exported from terminals around the St. Petersburg region must pass through the Danish Straits, and Russian oil exported from Black Sea ports must pass through the Turkish Straits (the Bosporus and Dardanelles waterways). The Suez Canal, the Strait of Hormuz, the Bab el-Mandeb Strait, and the Straits of Malacca are also significant chokepoints for ships, as they all involve passage through the territorial waters of coastal states. These passageways might make logical points to screen or restrict sanctioned oil shipments.

Because of the added dangers for ships sailing through restricted waterways, such as narrow straits and canals, the home country of some of these waterways requires that ships seeking passage hire a local pilot that has expertise regarding the local conditions of the waterway to navigate the vessel through the waterway. An escort by a tugboat may also be required. Although some have speculated that pilot services could be refused for sanctioned oil shipments,[61] most of these waterways are governed by long-standing treaties that guarantee the right of passage for

[59] Skuld, "Ship to Ship Transfer Safety," November 13, 2020, https://www.skuld.com/topics/cargo/liquid-bulk/ship-to-ship-transfer-safety/.

[60] Armen Azizian, *Exclusive Report: Iran's Crude/Condensate Flows and Fleet – 2023 Review,* Vortexa, January 18, 2024, https://www.vortexa.com/insights/crude/exclusive-report/irans-crude-condensate-flows-and-fleet-2023-review/.

[61] *Safety4Sea*, "Denmark Concerned Over Tanker Pilots Due to Russia Sanctions," September 27, 2022.

merchant ships. Customary international law regarding the right of innocent passage may also apply.[62]

Whether or not the home country of a restricted waterway could require proof of adequate insurance before allowing ships to pass through is an issue that has been raised. In cases where hiring a local pilot is required, the captain is still absolutely responsible for the ship, and the shipowner is still liable for any damages stemming from an incident. Turkey caused a backup of ships through its straits in December 2022 by requiring independent confirmation from insurers that the ships were covered. In November 2023, there were reports about whether Danish authorities would be similarly checking on insurance for vessels transiting the Danish straits.[63] A coastal state can expect to pay for oil spill cleanup if ships do not carry adequate insurance coverage.

Policy Considerations

Sanction evasion tactics could arguably increase the risk of an oil spill because they circumvent various practices that support safety. Turning off AIS transponders for long periods, conducting STS transfer operations without knowledge and approval of the coastal state, and use of older tankers that otherwise might be scrapped may raise safety concerns. Sanctioned oil carriers are also engaging with less reputable flag states and classification societies for their approval to operate. Some are also circumventing traditional insurers and financing mechanisms that, as explained above, provide an independent check on ship seaworthiness.

The establishment and use of nontraditional maritime service providers is essentially creating a second, parallel global shipping network. It is uncertain what the long-term ramifications of this development might be.

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[62] The *right of innocent passage* is the right of ships to pass through the coastal waters of a country unobstructed when the ship is destined to another country and not visiting a port of the coastal country. See appendix to nondistributable CRS Report R42335, *Iran's Threat to the Strait of Hormuz*, coordinated by Kenneth Katzman and Neelesh Nerurkar (available to congressional clients on request).

[63] Maritime Executive, "Denmark May Begin Checking Russian Tankers' Insurance in Baltic," November 15, 2023, https://maritime-executive.com/article/denmark-may-begin-checking-russian-tankers-insurance-in-baltic.

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