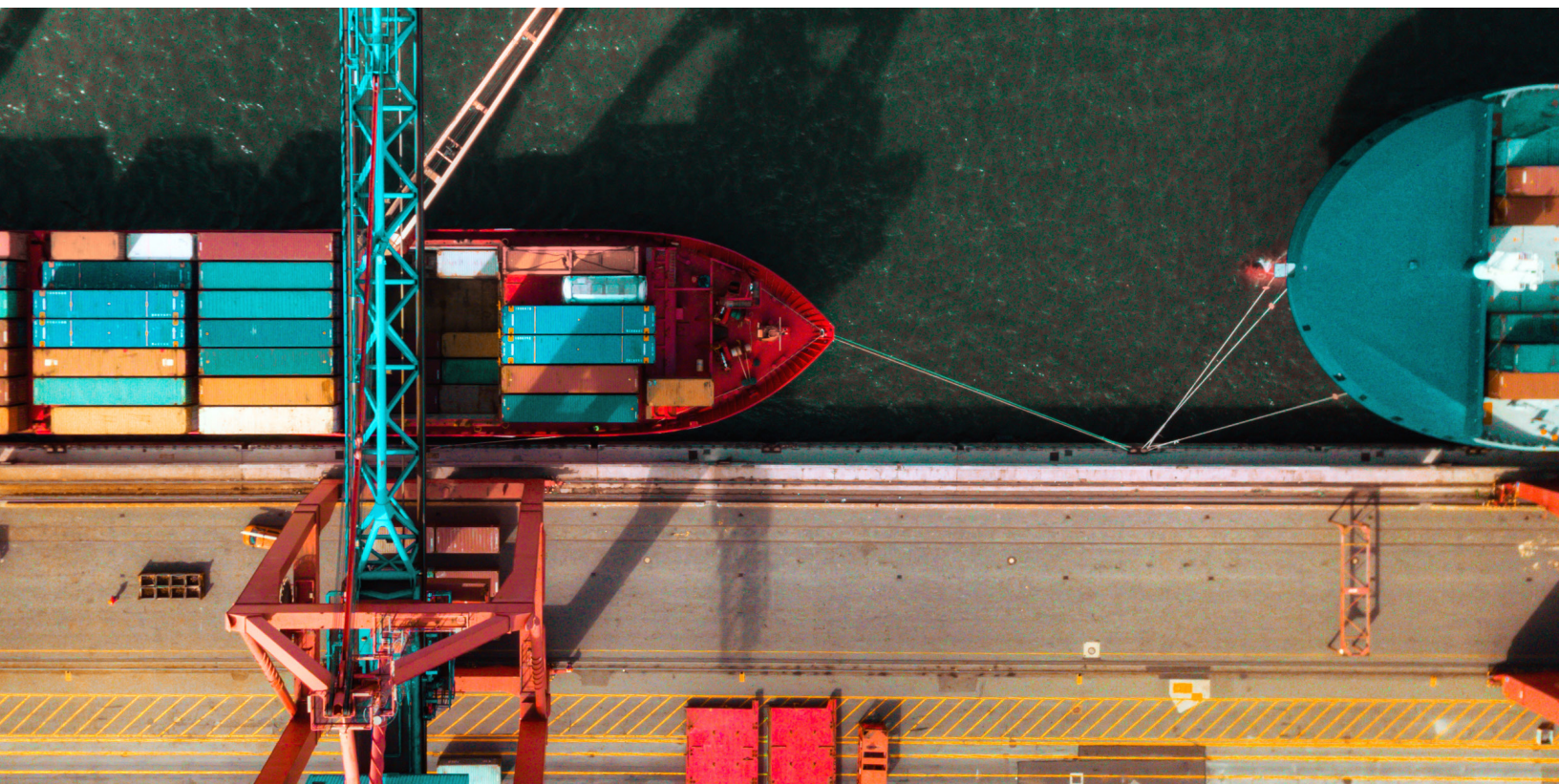




Sanctions advisories for the maritime industry

Practical challenges and recommendations for financial institutions regarding the monitoring of AIS outages and suspicious vessel activity

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Executive summary

The U.S. Treasury Office of Foreign Assets Control (OFAC) and the United Kingdom's Office of Financial Sanctions Implementation (OFSI) advisories on shipping published in May and December 2020¹, respectively, contained a number of new recommendations for financial institutions (FIs) to recognise and implement. Many of the risk factors that FIs are encouraged to appreciate include specialist maritime information not readily available or widely known within the banking or insurance sector. For example, identifying commodities and trade corridors where transshipment and ship-to-ship (STS) transfers take place.

Additionally, the advisories place an increasing emphasis on Automatic Identification System (AIS) technology, used to track and monitor vessels in near real-time, as a potential due diligence risk factor. AIS sends information on the ships movement, speed, direction and other particulars via satellite and terrestrial stations. While AIS offers the ability to pinpoint the routes and patterns of a ship's travel, it does have a core weakness in that the AIS service can be disabled by the ship's crew, thus, preventing the tracking of the vessel. While there are legitimate reasons for AIS to be switched off, AIS manipulation and disablement can be performed by those seeking to bypass global economic sanctions. For example, vessels may turn off AIS when they approach sanctioned countries or conduct illicit STS transfers in high-risk locations.

The encouragement by OFAC and OFSI to investigate a vessel's historical AIS outages prior to business engagement, coupled with real-time monitoring of individual, risky transactions will potentially increase the burden of trade operations and risk/compliance teams as they perform day to day tasks.

In this context, this paper will offer an overview of the shipping industry and how it relates directly to FIs in light of the OFAC and OFSI advisories. We will cover the key aspects of AIS and discuss the main elements and steps in a typical STS operation. Furthermore, practical measures and recommendations will be highlighted for potential implementation as part of a sanctions compliance programme dealing specifically with shipping.

1. Department of the Treasury, 'Sanctions Advisory for the Maritime Industry, Energy and Metals Sectors, and Related Communities', *Department of the Treasury*, [website], [14 May 2020], https://home.treasury.gov/system/files/126/05142020_global_advisory_v1.pdf (as accessed November 2021); HM Treasury Office of Financial Sanctions Implementation, 'Financial sanctions guidance for entities and individuals operating within the maritime shipping sector', *HM Treasury Office of Financial Sanctions Implementation*, [website], [December 2020], https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/948299/OFSI_Guidance_-_Maritime_.pdf (as accessed November 2021)

The complexity of implementing a sanctions compliance programme that conforms to the latest advisories regarding AIS and suspicious vessel activity in general has increased. Equally, the advisories do not provide detailed practical advice on a range of prescribed risk factors, for example, what period or timescale of AIS outages warrant further investigation by an FI and how and to who should they be reported.

Further, intentional AIS manipulation for sanctions evasion purposes is usually accompanied by a port call or an STS transfer. OFAC has stressed the need to understand STS in terms of commodities and trade routes where transshipment risk is susceptible. In this regard, to instigate a due diligence process by an FI to manage STS risk would require better understanding of certain maritime procedures.

In this context, a Working Group has been convened of trade finance experts in the banking, shipping and regulatory industries in order to answer and clarify the following points for compliance officers in FIs:

1. An understanding of AIS
2. How can data transmitted by AIS be manipulated
3. What are the items of information broadcast over AIS and how confidently can they be incorporated into a sanctions compliance programme

Answers to these questions can potentially allow FIs to make sense of maritime advisories on a practical level and help to reduce the intensive data mining required to interrogate AIS outages, STS transfers and other OFAC and OFSI recommended actions. The Working Group also aims to provide an overview of what FIs have implemented both prior and in reaction to the OFAC and OFSI advisories, allowing those within the industry to learn from their peers. A variety of different sized banks, shipping companies and other organisations were approached for interviews. Information was collected on internal sanctions risk assessments and due diligence related to shipping and maritime customers.

This paper recommends the following as major factors for discussion and consideration:

- AIS outages and STS operations should be examined in closer detail if they occur for lengthy time periods of 10 hours or more. This would be a calculated average time taken to potentially conduct a port call or an at-sea cargo transfer. AIS outages below the 10-hour cut-off would potentially be insignificant from a risk and compliance perspective with the caveat that some DPRK ship-to-ship operations for petroleum products have been conducted in slightly less time
- AIS outages are only important if the vessel could engage with another vessel of the same type or perform a port call in the time it was 'dark'. If this is not possible then a potential red flag becomes downgraded

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Association of Certified Sanctions Specialists (ACSS)

The Association of Certified Sanctions Specialists (ACSS)⁴ is a professional membership body for sanctions professionals worldwide. It was formed to advance sanctions compliance by supporting the professional development of the individuals who lead those efforts. The goal of ACSS is to serve the professional interests of its members by delivering high quality services and promoting the interests of the profession, provide professional qualifications and set standards for sanctions practitioners, be an authoritative and respected voice promoting sanctions compliance and enhance the careers of sanctions professionals worldwide.

The Association of Certified Sanctions Specialists offers an international Certification Programme (Certified Sanctions Specialist -CSS) with an examination that addresses knowledge and skills common to all sanctions professionals in varied employment settings, including FIs, international corporations, law firms, consulting companies, government, and other trades and businesses.

2. See <https://ihsmarkit.com/industry/maritime.html>

3. See <https://iiblp.org/>

4. See www.sanctionsassociation.org

Methodology

To illustrate the need for suitable vessel screening tools and procedures, this paper examines the current operational processes used within the trade finance and financial services industries in the broader context of maritime risk.

To do so, a series of informal telephone interviews were conducted with various banks, shipping organisations and intergovernmental organisations highlighting the processes and frameworks FIs have implemented in light of the current OFAC and OFSI advisories.

For the purposes of collection and analysis of information, a number of small, medium and large sized banks were approached by the Working Group. Having approached banks of all sizes, the Working Group also looked at different geographies, with a focus on the U.S., Asian and European markets.

Prior to the bank interviews, consultation with a range of service providers, consultants and thought leaders in the shipping industry were conducted in order to outline the overlap between the maritime industry and banking. In this regard, there is also an educational aspect to this paper, which aims to provide an understanding on the practices of AIS, how it is used, its core features, the type of data items it broadcasts and its meaning for bank compliance officers who are monitoring and managing shipping risk.

It is in this light that a set of recommendations has been created to help FIs manage their current maritime obligations for sanctions compliance purposes more effectively. The recommendations are designed to offer practical help to banks with different resource availability, budgets of varying size and technical aptitude.

Beyond the present paper, a set of training guides will be produced to help individuals at FIs further their knowledge of the OFAC and OFSI advisories, in regard to their expectations and its practical application. Finally, an important role of the Working Group will be to continue monitoring shipping and its regulatory impact on a regular basis. This will allow the present paper to be updated, account for future advisories both in the U.S. and elsewhere and consider new threats and technological advances which would be of interest to other FIs. The intention will be to produce an annual regular update to the original paper so that findings remain relevant and best practice is widely shared.

The Working Group will progress through the above phases, incorporating questions and concerns from FIs into a coherent and actionable set of recommendations to ensure frontline trade professionals can quickly identify shipping problems as ‘red or green flags’.

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Chapter 1: Introduction

Summary: Sanctions risk and compliance expectations covering maritime due diligence has grown considerably in the last few years. Recent efforts led by regulators such as the U.S. Treasury Office of Foreign Assets Control (OFAC), the United Kingdom Office of Financial Sanctions Implementation (OFSI) and others have sought to curtail sanctions avoidance practices such as disabling or tampering with Automated Identification Systems (AIS) or illegal ship-to-ship (STS) transfers allowing goods to enter a sanctioned country.

What are sanctions?

Sanctions can include any measures short of military force that countries and multilateral organisations use to combat certain types of activities, such as terrorism, narcotics trafficking, and weapons proliferation. Sanctions typically take the form of restrictions or prohibitions on certain types of transactions with the individuals, entities, vessels, or countries that are the target of the sanctions.

The illicit trade and sanctions evasion techniques used by North Korea, Iran and others to export and import coal, oil and other cargoes have become more pronounced and more sophisticated over time. In this context, the burden of capturing suspicious shipping activity at its source has fallen onto the many businesses and organisations directly involved in the shipping industry. In particular, FIs who process payments, finance trade and the movement of goods have been required by regulators to address this risk within their book of business. Trade finance and supply chain industry practitioners such as forwarders, shippers, insurers, banks, traders and brokers are at the sharp end of implementing and managing complex compliance procedures to ensure proscribed maritime activity is highlighted and dealt with appropriately.

Enforcement actions, notably led by OFAC, have resulted in high value fines for banks and other companies who have failed in their maritime compliance obligations. These compliance missteps have occurred, for example, due to the financing of shipments via sanctioned vessels, the financing of transactions with vessels that have a nexus to a sanctioned owner or management structure or processing payments involving sanctioned vessels, entities, or persons. These monetary fines have come at a time when regulation has become more extensive in both scope and expectation. In addition to monetary fines, maritime shipping companies or vessels have been placed on the OFAC sanctions list as a result of engaging in prohibited transactions under U.S. sanctions laws. One such example, the *Asia Bridge I* (IMO: 9010022), was placed on OFAC's SDN in December 2020 for the transportation of North Korean coal and entering a North Korean port.

In May 2020, OFAC published the 'Sanctions Advisory for the Maritime Industry, Energy and Metals Sectors and Related Communities'⁵. This document expanded on a series of previous publications by the same regulator covering shipping risk in relation to Syria, Iran and North Korea.⁶ Additionally, OFSI,

5. Department of the Treasury, 'Sanctions Advisory for the Maritime Industry, Energy and Metals Sectors, and Related Communities', *Department of the Treasury*, [website], [14 May 2020], https://home.treasury.gov/system/files/126/05142020_global_advisory_v1.pdf (as accessed November 2021)

6. Department of the Treasury, 'Enforcement Information', *Department of the Treasury*, [website], [15 April 2019], https://home.treasury.gov/system/files/126/20190415_uni_webpost.pdf, (as accessed November 2021); Department of the Treasury, 'Enforcement Information', *Department of the Treasury*, [website], [2 May. 2019], https://home.treasury.gov/system/files/126/20190502_midship.pdf (as accessed November 2021)

has also published a similar advisory on maritime guidance in December 2020.⁷ Comparable to the OFAC guidelines, OFSI measures highlight suspicious shipping practices.

Both OFAC and OFSI emphasize a series of emerging patterns used to evade maritime and trading sanctions, such as:

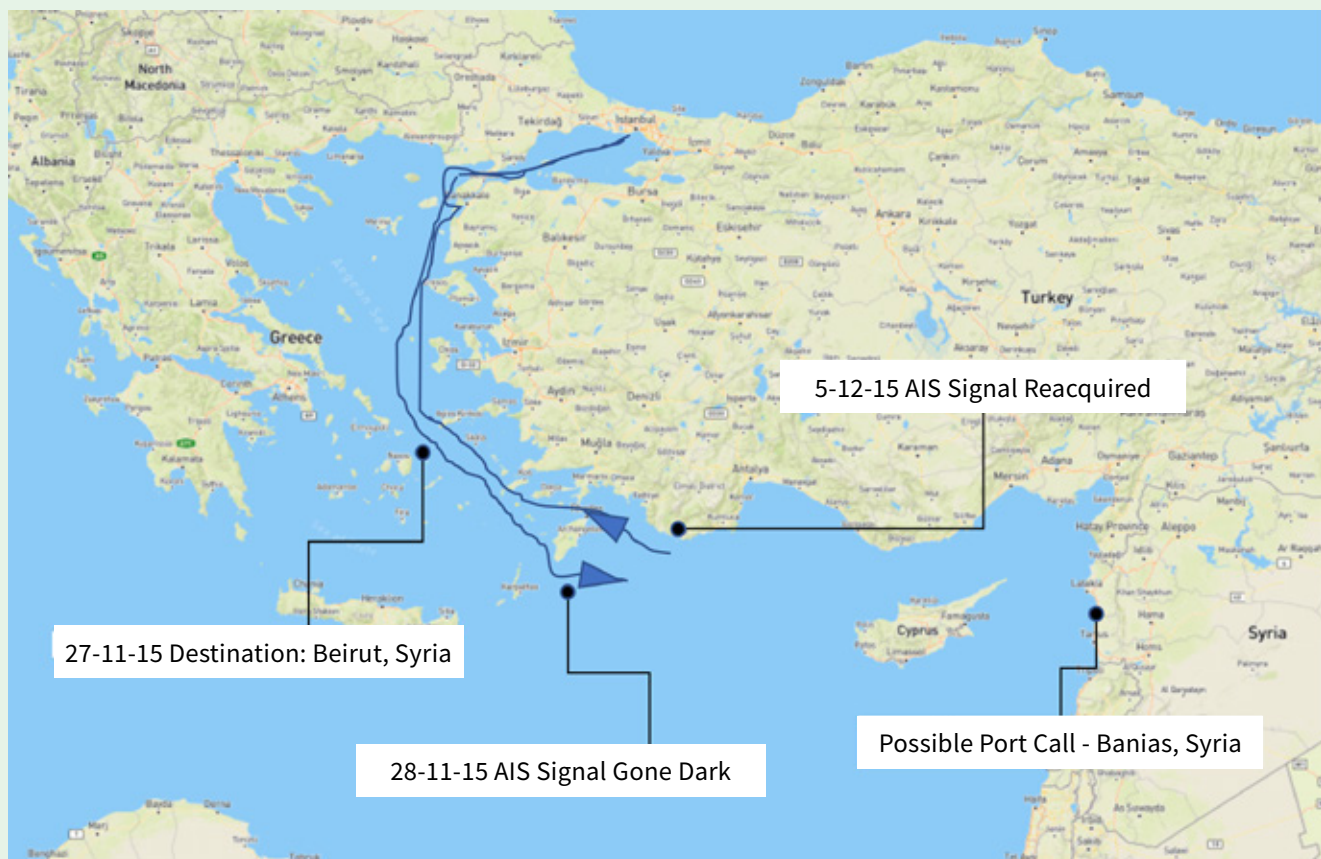
- Flag hopping
- AIS outages
- Ship-to-ship cargo transfers
- Falsified documents
- High-risk trading routes
- Complex ownership structures

7. HM Treasury Office of Financial Sanctions Implementation, 'Maritime Guidance', *HM Treasury Office of Financial Sanctions*, [website], [December 2020], [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/948299/OFSI_Guidance_-_Maritime_.pdf] (as accessed November 2021)

Example of deceptive practices in international maritime trade

An example of deceptive practices has been witnessed in a recent Danish court case involving a bunkering firm and Russian oil tankers allegedly violating sanctions by delivering jet fuel to Syria and resulting in fines and penalties of almost DKK 50 million (\$7.5 million) plus a four-month suspended prison sentence for the CEO.⁸ A Russian oil tanker, *Yaz* (IMO: 9735323), was confirmed to have loaded oil cargoes from Greece, Turkey, Russia and Cyprus and delivered the commodity to the port of Banias in Syria. The vessel did not have a port call for the cargo but its route through the Aegean Sea, coupled with a nearly six-day AIS outage suggested to investigators that a port call in Syria could have occurred. The prosecution presented records via the port inspection and authority team at Banias, Syria that the *Yaz* had indeed visited. Indeed, these ‘sanctioned runs’ allegedly occurred 33 times. Such action underlines the commitment by U.S. authorities and others to counter sanctions evasion in shipping. In this respect, the OFAC guidelines highlight specific checks for port authorities, commodity brokers, flag states, ship owners, vessel crews and FIs.

Illustration 1: Yaz: Syria sanctions case



Source: IHS Markit

8. Ship and Bunker, ‘Dan-Bunkering Prosecution Alleges AIS Tampering in Syria Sanctions Case’, *Ship and Bunker*, [website], [27 October 2021], <https://shipandbunker.com/news/world/876424-dan-bunkering-prosecution-alleges-ais-tampering-in-syria-sanctions-case> (as accessed November 2021); Ship and Bunker, ‘Four Months’ Suspended Prison Sentence for Demant Over Dan-Bunkering Sanctions Breaches’, *Ship and Bunker*, [website], [14 December 2021], <https://shipandbunker.com/news/world/381571-four-months-suspended-prison-sentence-for-keld-demant-over-dan-bunkering-syria-sanctions-breaches> (as accessed December 2021)

For FIs in particular, the OFAC advisories encompass screening and monitoring checks which offer considerable challenges when applied to the day-to-day tasks of a trade finance operations team. The current guidelines on AIS outages and the need for banks and others to monitor for disablement is one such area. OFAC refers to the illicit STS transshipment of cargo or sanctioned port calls usually being undertaken by vessels when they have switched off their AIS signal.

Port calls and anchorages

Port calls, also referred to as ship movements, are recorded for all IMO carrying vessels visiting international ports and covers not only port callings but also anchorage calls and transits. A port call is complete when the vessel can be tracked or seen stationary inside a geofenced area of a port and subsequently outside it or has been demolished whilst inside the geofenced area.

The monitoring of AIS has therefore become a particular red flag check where instances of outages in a vessel's historical track can be identified. This use of AIS within a compliance setting is discussed in the present paper, how it can be employed in this context, its strengths and weaknesses, industry insights and its possible application into a compliance screening programme.

Challenge

AIS was designed for the avoidance of vessel collision, as outlined in the Safety of Life at Sea (SOLAS) Convention. Therefore, there are difficulties when attempting to use AIS for compliance purposes. Shipping companies, banks and others have raised concerns with the tracking of AIS outages, where they happen and the period of time they occur due to AIS not being a fail-safe option for this type of user case.

While FIs are fully aware of sanctions policy, including the need for robust compliance programmes and frameworks, the latest OFAC shipping advisory has introduced new challenges and expectations on how these should be met when managing vessel risk. Such new standards offer considerable challenges for banks, both big and small. It is in this light that the present paper seeks to offer a series of recommendations on how KYC/AML checks, risk assessments, due diligence programmes, AIS monitoring and contractual details can be managed effectively.

Chapter 2: The Office of Foreign Assets Control (OFAC) advisories on maritime shipping

Summary: The U.S. Office of Foreign Assets Control (OFAC) is charged with regulating and enforcing sanctions programs, their June 2020 advisory on illicit shipping practices identified a number of ways that bad actors can and do avoid being detected when violating sanctions. The advisory highlights to FIs the expectation that banks will implement systems to monitor such sanctions avoidance practices.

2.1 OFAC's evolving policy

In maritime compliance, OFAC has evolved policy over a number of years. A U.S. government commitment to work with the private sector to prevent sanctions evasion, smuggling, criminal activity, facilitation of terrorist activities, and proliferation of weapons of mass destruction (WMD), with a focus on Iran, North Korea, and Syria has led to a sharper focus on the underlying areas of the maritime industry such as the routes vessels take, ports they visit and who they do business with. FIs can be at risk if engaging with entities on OFAC's Specially Designated Nationals and Persons (SDN) lists, which contain vessels classified as sanctioned by the U.S. government.

OFAC policy regarding shipping and maritime risk now goes beyond general watch-list screening and the identification of erroneous port call history to focus heavily on key ship tracking technology to understand the movement of vessels.

Example of requirement to go beyond watch list screening

The U.S. expanded in 2017 the level of sanction measures to cover, in relation to North Korea, a requirement prohibiting a ship from calling at a United States port, if that 'vessel has foreign person interest that has called at a port in North Korea in the previous 180 days⁹, and vessels in which a foreign person has an interest that have engaged in a ship-to-ship (STS) transfer with such a vessel in the previous 180 days.'

The importance of maritime compliance also aligns with a 2019 document published by OFAC, 'A Framework for OFAC Compliance Commitments',¹⁰ providing guidance and advice on how to conduct and manage risk assessments for sanctions compliance. The guidance outlines a series of steps that can be managed by organisations for operational effectiveness.

The steps include:

- The design and implementation of procedural policies that outline the sanctions compliance programme for the organisation
- Ensure that there is management commitment within the organisation to support the implemented compliance programme
- Conduct risk assessment on an ongoing basis through the implementation of a risk-based approach to identifying certain compliance issues
- Define internal controls regarding decisions made, record keeping and periodic auditing

9. The Daily Journal of the United States Government, *Imposing Additional Sanctions With Respect to North Korea*, <https://www.federalregister.gov/documents/2017/09/25/2017-20647/imposing-additional-sanctions-with-respect-to-north-korea> [as accessed November 2021]

10. U.S. Department of the Treasury, 'A Framework for OFAC Compliance Commitments', *Department of the Treasury*, [website], [no date], https://home.treasury.gov/system/files/126/framework_ofac_cc.pdf (as accessed November 2021)

- Testing and checking for inconsistencies and weaknesses within the organisations compliance programme
- Training of staff to ensure that the compliance programme can be implemented effectively on a day-to-day basis

OFAC recommends that any organisation which is subject to U.S. jurisdiction, including any foreign entity that conducts business in or with the U.S., a U.S. person, or using U.S. origin or patented goods or services, to undertake a risk assessment as part of their sanctions compliance programme.¹¹

In this context, the latest OFAC shipping advisory of May 2020 offers a new set of challenges for managing risk assessment. The advisory recommends that ship owners, operators, brokers, FIs, charterers, and others maintain an ‘adequate and appropriate’ compliance policy in regard to maritime risk, which includes:

- An institutionalised compliance programme
- Ability to identify and manage AIS outages both contractually and operationally
- Monitoring vessels throughout the full transactional lifecycle
- Understand customer business and counterparty risks
- Due diligence on shipping practices such as cargo transfers of petroleum products for example
- Utilise best practice in contractual language and documents, and
- Sharing of industry information to better understand risk, challenges, and other issues

All risk assessment frameworks, therefore, need to consider the individual challenges posed by counterparties when determining the likelihood that a sufficient compliance policy is adopted and in place for the course of the transaction and business relationship. The OFAC advisory, whilst offering advice and general recommendations, contains several new items which are likely to increase the time taken to perform the aforementioned due diligence practices.

One of the key areas of OFAC’s recommendation is found in the area of suspicious vessel activity. The advisory picks out items requiring special attention to be:

- False flags and flag hopping
- AIS disablement and signal spoofing
- Falsification of transportation and other documents
- Obscured or manipulated International Maritime Organisation (IMO) numbers
- STS transfers of cargo at sea
- Irregular voyage movements such as detours and indirect routes
- Ownership and management structures of vessels which are unnecessarily complex

11. Rietbroek, S., ‘New US Government Advisory Raises the Bar for Sanctions Compliance in Relation to Ship Owners and Their Insurers’, ACSS, [website], [15 May 2020], <https://sanctionsassociation.org/new-us-government-advisory-raises-the-bar-for-sanctions-compliance-in-relation-to-ship-owners-and-their-insurers/> (as accessed November 2021)



The advisory sets out a clear expectation that those involved in trade finance and supply chain business operations monitor AIS signals in both real-time and historically for any suspicious movements. Trade practitioners are expected to promote the continuous broadcasting of AIS especially in high-risk areas with their shipping partners. Additionally, FIs and others are encouraged to investigate and report AIS signal manipulation before entering into new business contracts involving suspicious vessels. Service providers are encouraged to publish contracts making the disablement of AIS for illegitimate reasons ‘grounds for termination of contracts or investigation, which could lead to termination of services or contracts if illicit or sanctionable activity is identified’.¹² AIS is a predominant feature across the majority of sector specific guidance in the OFAC shipping advisory, with a focus on fully monitoring, investigating, assessing outage history and introducing contractual language and provisions concerning AIS.

12. U.S. Department of the Treasury, ‘Sanctions Advisory for the Maritime Industry, Energy and Metals Sectors, and Related Communities’, U.S. Department of the Treasury, [website], [14 May 2020], [05142020_global_advisory_v1.pdf \(treasury.gov\)](#) (as accessed November 2021)

Chapter 3: Understanding shipping

Summary: Understanding the intricacies of shipping, including how AIS works, its relative strengths and weaknesses, as well as a recognition of the varying types of STS transfers are the cornerstones for the implementation of a successful compliance programme conforming to regulatory expectations.

3.1 AIS

AIS is an automated ship tracking system and ship traffic service for the identification and tracking of vessels by electronic data exchange with other nearby vessels, AIS base stations and satellites. The term S-AIS refers to the use of satellites in Low Earth Orbit fitted with AIS receivers to pick up the standard AIS messages. AIS forms part of the Global Maritime Distress and Safety System (GMDSS) and is a major addition to marine electronics and safety at sea.¹³

Historically, the primary function of AIS was as a Navigational Safety Aid, to ensure safety and efficiency of navigation, safety of life at sea and maritime environmental protection. Localised vessel tracking was a secondary function. Global tracking was never considered when formulating the original standards. This is a key factor to understand as it has technical consequences for the ability to track vessels using S-AIS in particular. The transmitted information by AIS meant that its adoption could be used for vessel collision avoidance.¹⁴

Which vessels should be equipped with AIS?

According to the International Convention for the Safety of Life at Sea (SOLAS), under the revised SOLAS 1974 Chapter V (as amended) – Safety of Navigation, section 19.2.4¹⁵, carriage requirements for shipborne navigational systems and equipment, all ships of net tonnage of at least 300 Gross Register Tonnage (GRT) performing international voyages, all cargo ships of at least 500 GRT not performing international voyages and all passenger ships, regardless of size, should be equipped with AIS.

This allows a vessel to automatically transfer ship data to other accompanying ships and to relevant port authorities. With specific information transmitted through AIS, the system also contributes to conflict resolution decisions and Search and Rescue (SAR) operations. The requirement for deployed AIS on vessels became effective on December 31, 2004.¹⁶ It is also worth noting that as a legally mandated Navigational Safety Aid there is every reason for ships' masters, crews and owners to want to ensure that the system is operative at all times. The legal and insurance consequences of a navigational incident where the master has knowingly switched off the AIS safety system could be unfortunate to all. The AIS system must be updated before each voyage or during the voyage, by the ship's crew, with voyage details and navigation status. Checking of the AIS signal must be completed periodically during the voyage as well as the information transmitted from the various sensors to confirm their accuracy.

13. IMO, 'International Convention for the Safety of Life at Sea (SOLAS), 1974', IMO, [website], [no date], [https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Safety-of-Life-at-Sea-\(SOLAS\)-1974.aspx](https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Safety-of-Life-at-Sea-(SOLAS)-1974.aspx) (as accessed November 2021)

14. IMO Resolution MSC.74(69) Annex 3

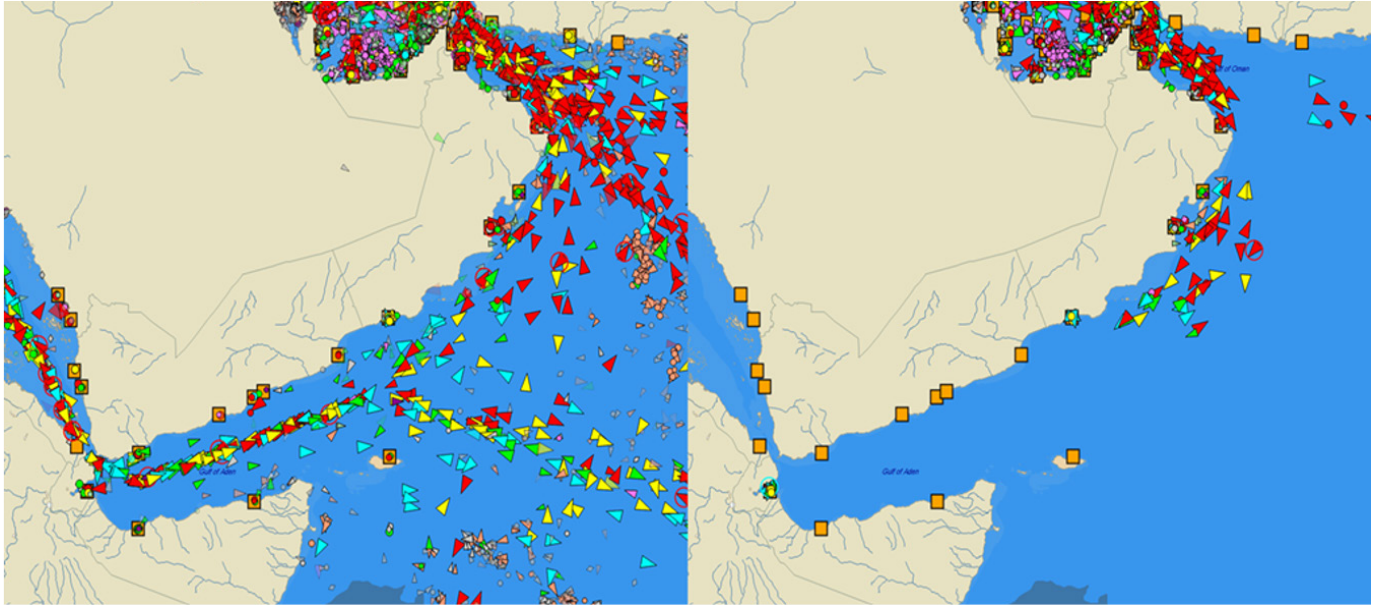
15. SOLAS 74 Regulation V/19 – Carriage Requirements for Shipborne Navigational Systems and Equipment

16. IMO, 'International Convention for the Safety of Life at Sea (SOLAS), 1974', IMO, [website], [no date], [https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Safety-of-Life-at-Sea-\(SOLAS\)-1974.aspx](https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Safety-of-Life-at-Sea-(SOLAS)-1974.aspx) (as accessed November 2021); IMO, 'International Conference on Safety of Life at Sea, 1974', IMO, [website], [no date], <https://www.imo.org/en/KnowledgeCentre/ConferencesMeetings/Pages/SOLAS-CONF-1974-default.aspx> (as accessed November 2021); IMO, 'Treaties and International Agreements', IMO, [website], [no date], <https://treaties.un.org/doc/Publication/UNTS/Volume%201184/volume-1184-I-18961-English.pdf> (as accessed November 2021)

AIS can provide vessel identification information, geographical location accuracy (latitude and longitude), time display, the vessel's MMSI number, navigation, course, speed status and more. Data derived from AIS information can be presented in various formats for analysis in a variety of methods and industries, with one such example in the risk and compliance space, used for an understanding of suspicious movements or non-compliant sanctioned port calls. Vessels augmented by AIS transceivers and transponders can also be monitored by AIS base stations located along shorelines which can provide an additional means of AIS broadcast ability. Terrestrial AIS receivers are predominantly shore based and can reliably receive signals 24/7 out to their Radio Line of Sight range, typically 30nm for the largest vessels. Satellite AIS can be used to extend coverage beyond this range and into the deep oceans across the globe but there are limitations in coverage caused by their orbits, and also in high density traffic areas by technical issues contained in the original system specification as drawn up by the ITU/IMO. Recent advances have seen the introduction into the S-AIS standards of a new Long Range Tracking Message (Message 27). This format has been specifically designed to overcome the issues experienced by satellites in receiving AIS messages in high density traffic areas and makes true global tracking possible. It does however require the fitment of new dedicated AIS transponders which are not currently mandatory, fitments are therefore only on a proportion of the global fleet. A second advance is the ability to now obtain in real time from vessels the AIS messages received from other vessels in their vicinity. Each vessel effectively becoming a mobile terrestrial AIS receiver with a range of 20-30nm. This vessel AIS (V-AIS) data is now being received from over 3400 vessels navigating all the major shipping routes of the globe.

Terrestrial AIS offers enhanced coverage for the receiving of a ship's signal when the vessel is within 30 nautical miles of the coastline. Ports which are located in busy waterways or have a large concentration of ships can cause issues in the sending and receiving of AIS signal via satellite. In this instance, terrestrial antennas offer secondary facilities to ensure that vessels can be tracked in busy zones both for collision avoidance and for the monitoring of risk and compliance factors. Outside of the 30nm zone, the receiving terrestrial signal is weak and a reliance on satellite AIS technology to capture the signal is required.

Illustration 2: Gulf of Aden data comparison: terrestrial based AIS vs satellite AIS



Source: Sea-Web, IHS Markit¹⁷

The illustration above (Illustration 2) highlights the different ranges of coverage offered by different AIS technologies. On the right-hand side graphic, terrestrial coverage fails to capture deep ocean movements, underlining the need for satellite technology. On the left-hand side graphic, to assist in the surveillance of any vessel not operating near the shoreline, satellite AIS provides greater coverage. Both terrestrial and satellite coverage are complimentary, with the benefits of both pertaining to the current location of the vessel.

3.1.1 MMSI number

The Maritime Mobile Service Identity (MMSI) is a nine-digit number used to identify a vessel or a coastal radio station. All vessels using VHF radio equipment and equipped with an AIS transponder must have an MMSI number allocated by their national marine radio licensing authority. The allocated number will remain unique while the vessel remains under the same flag and the AIS transponder device on the vessel remains the same. MMSI numbers can be re-allocated and recycled, as a result, compared to the IMO number, the MMSI although related to the vessel's identity, is not recommended to be solely trusted as a unique identifier. The best means for identifying a vessel remains the IMO number although the MMSI offers a backup option and can be referenced to a database of information about the vessel and its owners.

The format of the MMSI numbers is MIDXXX000.¹⁸ The first three digits are assigned as the national identifier and represent the Maritime Identification Digits (MID) and the next three are assigned by the relevant flag state under which the vessel is registered and can vary from 001 to 999.¹⁹ For example MIDs allocated to the United Kingdom are 232, 233, 234 and 235, MIDs allocated to Panama are 351,

17. IHS Markit, 'Sea-Web: The ultimate marine online database', *IHS Markit*, [website], [no date], <https://ihsmarkit.com/products/sea-web-maritime-reference.html> (as accessed November 2021)

18. For example, MID 319 is allocated to the Cayman Islands followed by the numbers the flag has assigned to the vessel for its identification. A full list of Maritime Identification Digits can be found on the ITU website [here](#).

19. ITU, 'M. 585: Assignment and use of identities in the maritime mobile service', *ITU*, [website], [October 2019], [RECOMMENDATION ITU-R M.2134-0 - Receiver characteristics and protection criteria for systems in the mobile service in the frequency range 27.5-29.5 GHz for use in sharing and compatibility studies](#) (as accessed November 2021)

352, 353, 354, 355, 356, 357, 370, 371, 372, 373, and 374 and MIDs allocated to Greece are 237, 239, 240 and 241. The table below shows a list of vessels and their flag, two of the examples matched to Greece and Panama are a mismatch and therefore a red flag.

Table 1: MMSI numbers

Vessel Name	Flag	MMSI Number	True Match
<i>Queen Mary 2</i>	Bermuda	310627000	Yes
<i>Erato</i>	Greece	354097000	No
<i>Erato</i>	Panama	241324000	No

3.1.2 AIS technology

The technical requirements for AIS are specified by the International Telecommunications Union (ITU) Recommendation ITU-R M.1371-5(02/2014).²⁰ Only two channels are used for conventional AIS message 1-26. Two additional channels are used specifically for the long-range tracking message 27 but require non-mandatory dedicated equipment, very few shore receivers and only a proportion of satellites are able to receive them. To accommodate the transmission of AIS data the support of a further system known as Time Division Multiple Access (TDMA) exists, which gives allocated time slots to transponders to submit their signal. However, the range depends on how high the antenna picking up AIS signals is positioned on the vessel and for smaller vessels this can be problematic. For the exchange of navigational information, suitably equipped vessels and shore stations use messages on two marine VHF radio frequencies. The system is designed to be self-organising with the individual transmitters synchronizing themselves with each other in order to avoid overlapping transmissions. Each message is then sent using one or two of the 2250 time slots established every minute on each channel.

Reception is affected by various factors such as line of sight and transmitter power. Line of sight is affected by the transmitting aerial and receiving aerial heights, as a result the higher the better, the presence of blocking terrain (i.e., headlands, hills, port buildings etc), and other obstructions such as ship structure (i.e., masts, funnels, accommodation, container stack etc.). Transmitter power for Class A is by design more powerful than class B.

Traffic congestion only becomes a problem with satellite AIS reception and then only because the original AIS technical specifications never considered the possibility of the signals being monitored in this way.

Required availability for the application on the time slot map can also be an issue.²¹ However, small AIS outages through a missed time slot in extremely busy areas should not be looked at or be the focus of internal compliance screening programmes due to their infrequent nature and short outage period. AIS is also very reliable as the 2250 available time slots which identify individual vessel signals, is considerably sufficient for ensuring AIS signals are captured. The best coverage is available from terrestrial AIS (shoreline antennas) which are dependent on both the height of the transmitting and receiving AIS aeris. Satellite and terrestrial transponders work on Self Organised Time Division

20. ITU, 'Technical characteristics for an automatic identification system using time division multiple access in the VHF maritime mobile frequency band', ITU, R M.1371-5(02/2014), [website], [February 2014], https://www.itu.int/dms_pubrec/itu-r/rec/m/R-REC-M.1371-5-201402-1!!PDF-E.pdf (as accessed November 2021)

21. IALA, *Guideline 1082 An Overview of AIS*, Edition 2.0, IALA, (Saint Germain, 2016), p 18

Multiple Access (SOTDMA) which allows Class A transponders to reserve their own slot on the map. Again, a significant attribute that provides further assurance of the workings of the overall AIS system.

For maritime domain awareness and safety purposes the use of real-time, online AIS data makes it possible to monitor restricted areas, routes, generate shore-based alerts, provide useful information to authorities (i.e. Port Authorities, Coast Guard) and allow owners and users in general to monitor particular vessels of interest.²² In order to receive AIS information and track vessels globally this can be achieved by satellite without the need for advanced technical AIS knowledge or technology. Satellite-based AIS receivers offer coverage outside the land-based antennas' range by covering the whole globe from pole-to-pole. Many online services and providers allow users to move around the globe and track down vessels of interest and other information related to the vessel, such as recent positions, vessel position history, vessel details, voyage information and much more. Satellite AIS coverage can extend to the entire Exclusive Economic Zone (EEZ) or globally, including remote coastal areas.²³

However, in busy areas the high volume of traffic may lead to message collisions making individual AIS messages unreadable. This technical limitation in the design of the original AIS transmitters and receivers, as formulated by the IMO/ITU, occurs because it was not initially designed to be monitored by satellite technology. As a result, in high traffic areas such as the South China Sea, the Eastern Mediterranean, North-West Europe and the US Gulf, reliable continuous 24/7 tracking can only be successfully carried out when in direct line of sight of terrestrial AIS stations. Resolving the problem of long-range tracking can be done by installing the new, non-mandatory (for now) AIS transmitters and receivers specifically designed for satellite AIS tracking equipped with two extra VHF frequencies allocated exclusively to Message 27, an additional long-range tracking message.

AIS transmits the following information, input directly by the crew, from the ship as raw data²⁴:

Static messages (set on installation):

- Vessel name²⁵
- MMSI (Maritime Mobile Service Identity)²⁶
- IMO number (where available)
- Radio call sign²⁷
- Vessel type²⁸
- Overall dimension/ reference for position
- Type of Electronic Position Fixing System (EPFS) antenna²⁹

22. IALA, *Guideline 1050 – The Management and Monitoring of AIS information*, Edition 1.0, IALA, (Saint Germain, 2005)

23. IALA, *Guideline 1082 An Overview of AIS*, Edition 2.0, IALA, (Saint Germain, 2016), p 19

24. FIs should apply a level of skepticism to the static information sent over AIS as it can be manipulated or falsified.

25. This might need changing in case the ownership changes

26. This might need changing in case the ownership changes

27. This information might be amended if the ownership changes

28. This is selected from a pre-installed list

29. This information might be changed for bi-directional vessels or those fitted with multiple antennas

Dynamic messages:

- Ship's exact position with accuracy indication and integrity status³⁰
- Time stamp in UTC
- Rate of turn
- Speed over ground (SOG)³¹
- Heading
- Navigational status³²
- Course Over Ground (COG)³³
- Speed

Voyage-related:

- Maximum present static draught³⁴
- Hazardous cargo (type): Dangerous Goods (DG), Harmful Substances (HS), Marine Pollutants (MP)
- Destination and ETA
- Route plan (waypoints)

Safety-related:

- Short safety message³⁵

3.1.3 Different types of AIS equipment: Class A AIS vs Class B AIS

There are three variations of AIS equipment: Class A, Class B, and the new Class B+. Class A equipment is the primary class specified as mandatory fitment for ships under SOLAS Ch V and is the most powerful and capable version (12.5W). However, SOLAS is not the only mandatory reason for fitting and using AIS equipment. Individual states are free to mandate fitment in their own waters to any craft they wish. Often this will be in the form of requiring small or river vessels to use class B equipment. In China, a significant number of non SOLAS merchant vessels are used for 'internal trade', using class B equipment.

30. The position is automatically updated from the position sensor connected to AIS. The accuracy indication is approximately 10m.

31. Automatically updated from the sensor connected to AIS

32. This information is manually entered by the OOW and changed according to the status, i.e. underway by engines, at anchor, not under command, restricted in ability to manoeuvre, moored, constrained by draught, aground, engaged in fishing, underway by sail.

33. Automatically updated from the sensor connected to AIS

34. Draught refers to the vertical distance between the waterline and the lowest point of the vessel. Port Authorities require that vessels update the draught before entry and exit from the port indicating whether cargo has been loaded or offloaded onto the vessel. Since this data is manually inserted at the start of the voyage using the maximum draft for the voyage, it is possible for the crew to forget to update the draught especially if they make frequent port calls (e.g., result of de-ballasting prior to port entry)

35. Free format message entered manually by the crew addressed either to a specific addressee or broadcast to all ships and shore stations

Class B (CS) is the original low power version designed for voluntary use by small commercial and private users (2W). Class B+ (SOTDMA) is a recent development falling in power between Class A and B systems (6W) and using the same transmission time slot sharing system as the Class A units, making their transmissions more visible particularly in high traffic areas. The main differences are in the power of their transmission and the priority accorded to their messages, with class A being paramount, followed by class B+, and finally Class B. There is no difference in the reception performance between the three groups.

In detail, Class A is operated by using Self-Organizing Time Division Multiple Access (SOTDMA) broadcast mode and transmits dynamic information every two to ten seconds while underway and every three minutes while at anchor. Static data is transmitted every six minutes. AIS transmission of variable data requires the use of external instruments such as a DSC (156.525 MHz) receiver, external GPS (course over the ground and speed over the ground) heading and rate of turn indicator. Class A transmitter also allows for the manual entry of vessels status messages such as underway, at anchor, alongside etc. and safety related text messages.

Class B AIS transponder uses a lower power level of 2W and can operate by using Carrier-Sense Time Division Multiple Access (CSTDMA) broadcast mode. Class B transmits dynamic data every 30 to 180 seconds and static data every six minutes. Class B does not require a DSC receiver and heading, they are optional. The transmission of safety related messages is also optional and only pre-configured. Vessel details (name, call sign, MMSI number) are entered when the device is installed on board.

A latency period between the vessel transmitting raw AIS data and the end-user receiving it can vary. For example, terrestrial AIS receivers connected to the internet can transmit data in almost real time. Satellite AIS receivers may require storing the data onboard until they are delivered via the downloading of the data to an earth station. As a result, latency may vary from microseconds to several minutes.

3.1.4 Guidelines for the onboard use of AIS

Ships fitted with AIS shall maintain a signal in operation at all times except where international agreements, rules or standards apply for the protection of navigational information. According to the Revised Guidelines for the Onboard Use of Shipborne Automatic Identification Systems,³⁶ AIS on a required ship should be in operation when they are in motion or moored. It is also stated that only when the captain considers the continuous operation of the AIS could endanger the safety of the ship or when the ship is in immediate danger, they can deactivate the AIS manually.

Piracy and deactivation of AIS

At times, the AIS is deactivated in order to hide the identity, location, course and other elements of the ship to avoid detection by pirates, especially when sailing in sea areas known for pirate attacks. Pirate attacks generally occur in specific areas such as Latin America, South-east Asia, and West Africa.

The International Maritime Bureau (IMB) manages a location position report for all reported piracy activity,³⁷ outside of these known areas the risks of piracy and the need to manually switch off a vessel's AIS signal are significantly reduced. If the ship's captain decides to deactivate the AIS, the nearest competent authorities must be informed, record the event and the causes of the above action added to

36. SOLAS 74 Regulation V/19; In 2000, the IMO adopted the new requirement (as part of the revised Chapter V)

37. ICC, 'IMB Piracy & Armed Robbery Map 2021', ICC, [website], [no date] <https://www.icc-ccs.org/piracy-reporting-centre/live-piracy-map> (as accessed November 2021)

the ship's logbook and finally proceeding with re-activating the AIS as soon as the risk is eliminated.³⁸

Referring to the advisory guidelines of recognised organisations in the field of shipping such as the Global Counter Piracy Guidance for Companies, the guidelines expect ships to maintain the operation of the AIS when sailing in sea areas hit by piracy attacks. It is also proposed that ships maintain the AIS in continuous operation, but only transmit the necessary information, thus enabling international coordination centres to monitor the movements of ships in dangerous areas in order to offer all possible assistance as soon as possible. It should be noted that improper manipulation of the operation of the AIS may raise suspicions of 'illegal activities', especially in areas where there is increased surveillance.

On the issue of AIS switch-off, the Baltic and International Maritime Council (BIMCO) has created a charter clause "BIMCO switch-off"³⁹, which aims to address the mismanagement of AIS operations by ships that do not comply with SOLAS regulations, thus giving the possibility for shipowners, charterers, and ship managers to cease cooperation with them. The aim of the clause is not only to address AIS manipulation during the contract period but also prior to the contract and in light of the May 2020 OFAC shipping advisory recommending the development of contractual provisions in the form of an AIS switch off clause.

2021 Charter clause "BIMCO switch-off"

"[...] The owners provide a warranty about their AIS activity in the six months prior to the arrival of the ship at the first or sole loading port and during the charter. In short, the [vessel] owners will only be in breach of the warranty if they intentionally switch the AIS off for reasons which are not permitted by SOLAS and the guidelines [...]. If the AIS is not transmitting, this does not mean that owners are in breach of the warranty. Charterers need to establish that it was "knowingly" switched off in violation of the SOLAS Guidelines and for the purpose of sanctions' evasion. Since the warranty is tied in to the SOLAS Guidelines, this means that there will be no breach of the warranty if the non-transmission of AIS is excused under SOLAS. Situations where AIS is switched off for safety purposes, or to protect the ship against a potential piracy attack, will not constitute a breach of the warranty. It will not constitute a breach of the warranty if owners switch off the AIS in accordance with the SOLAS Guidelines but forget to switch it back on when, for example, they leave a piracy area [...]"⁴⁰

Switching off the AIS signal, thereby, allowing the vessel to 'go dark' can ultimately be viewed as a compliance red flag, especially in areas where the coverage is generally good and other AIS signals are not disrupted. When a vessel has gone dark it is important to analyse the amount of time it is in this state and to question if during these gaps it is possible to call at a sanctioned port and complete a cargo operation. Normally, when a vessel goes dark there is a pattern in the number of times the AIS is switched off, the regularity and the period of time that it remains off.

38. IMO, 'AIS Transponders', *IMO*, [website], [no date], <https://www.imo.org/en/OurWork/Safety/Pages/AIS.aspx> (as accessed November 2021)

39. BIMCO, 'AIS Switch Off Clause 2021', *BIMCO*, [website], [no date], [AIS Switch Off Clause 2021 \(bimco.org\)](https://www.bimco.org/AIS-Switch-Off-Clause-2021) (as accessed November 2021)

40. *Ibid.*

Other typical AIS human failures may include an omission to update or change information, intentionally enter erroneous information, cause an error in the static information entered during installation, incompetent use of the equipment by mariners or poor design or quality of the Class A device. In terms of the level of these failures they may vary (i.e., installation failure, forgetfulness, incompetence, design failure, training failure etc.) and as a result have an impact on how they can be resolved (i.e., compulsory checks, certified technicians to install the device, shipping companies to be held accountable, proper training to be provided). AIS human error and failures can be related to the frontline operator, installation and design failures, poor training, and management of mariners in using equipment properly and, regulatory failure which may result in lack of standardization for equipment design or violations which result in inaccurate entries.

Examples of AIS human failures:

- MMSI number: some vessels may transmit the incorrect default number as it has been keyed incorrectly during the system installation
- Vessel type: a misleading vessel type that does not depict the type entered into the AIS equipment
- Ship's name: there can be instances when the ship's name might be spelled wrongly or abbreviated or even left blank
- Call sign: wrongly typed or left blank
- Navigational status: incorrect or out of date status information might be displayed
- Other data that might be incorrect are length and beam, draught, Estimated Time of Arrival (ETA), Course Over Ground (COG), Speed Over Ground (SOG), position

Solutions:

- Check list to be filled by navigating officers in different phases (before, during and end of each voyage)
- Only certified and competent technicians to install the equipment
- The equipment to be tested after installation
- Theory and practical training of mariners and operators
- Requirement of certification on how to handle the equipment properly
- On board supervision to confirm the AIS data integrity
- Shipping companies to be held accountable on training their mariners
- Port State Control to inspect vessels regularly and examine the accuracy of the data

3.2 When is *going dark* not a red flag?

It is important when reviewing the movements of a vessel and its historical data to also take other parameters into consideration. It does not mean that in every instance of an AIS outage that a breach of international sanctions has taken place.

3.2.1 The transponder has been deliberately switched off

In areas where elevated piracy risk exists the Master might switch off AIS or specific messages transmitted by AIS. However, it is advised to keep the AIS on so that law enforcement authorities are able to respond to reported pirate attacks.

3.2.2 Problematic reception

Vessels disappear when passing beyond the maximum visual range of a shore based AIS receiver. AIS transmissions are strictly line of sight and in some instances terrain can block the signal. The same applies to satellite coverage which has a set footprint and can only receive a set number of incoming signals. Atmospheric conditions can also cause problematic reception, such as dust clouds in the Middle East.

3.2.3 High traffic density areas

In areas where a vast number of messages are being broadcast, the system might fail leading to multiple messages broadcasting at once. Chinese ports for example can often provide conflicting AIS messages and outages due to the number of vessels operating in a single location. This is an issue primarily with satellite AIS reception where the ground footprint over China can encompass the location of over 40000 vessels. A conventional AIS satellite only picture of China will virtually show no vessels within approximately 150nm of its shore. If the satellite is equipped to receive message 27 transmission, then only the minority of vessels able to send this message will be seen. Terrestrial data due to its limited line of sight do not suffer from this issue even in China.

3.2.4 Weather conditions

During the summer months when the temperature is higher, tropospheric ducting can be quite common making more vessels noticeable than in cooler months. Tropospheric ducting can distort or prevent reception and as a result cause a variation in port traffic. In places like the Persian Gulf excellent tropospheric ducting conditions can be experienced through much of the summer months and it is these that enable stations situated in the Arab states to monitor Iranian anchorages and ports. These conditions fade to zero in the autumn, normally around November, and do not resume until spring, which leads to the coverage of Iran being lost. This is a primary reason why so many news stories regarding Iranian vessels 'going dark' are posted each year in November. The reality is that they are still transmitting.

3.2.5 Anomalous positions

Anomalous positions happen when a vessel is seen to 'jump' significantly away from its track. One cause of anomalous activity could be switching the AIS on and off. Alternatively, cases of poor or incorrect data inputted to the transponder and instances of an MMSI number used simultaneously by two or more vessels at the same time can cause issues. Also, the AIS system might fail when the vessel is underway. In the occasion of conflicting positions delivered by a single MMSI it is common to see duplicate ships. A ship that once had an MMSI number under a previous flag, can continue to transmit the same MMSI number under the new flag months after the change has occurred. It is common for MMSI numbers to be recycled and re-issued by flag states which can further compound the problem.

A second hand AIS transponder from a scrapped vessel is tested shoreside or sold to a new vessel owner before the old MMSI number is removed. In these case position data incorporated the last MMSI number allocated to the scrapped vessel can be transmitted causing problems if the MMSI number has been reallocated to a new vessel.

3.3 Can I trust the data from AIS and how do I know if it is accurate?

AIS should be trusted. It is technology which has been in operation for a number of years and works well. Class A, AIS transponders are mandatory for ships under SOLAS, therefore, they are of high

standard and as accurate as possible. It is an internationally mandated Navigation Safety System, therefore ships' crews and Owners of class A fitted vessels have strong safety and legal reasons to ensure that the system is operating and up to date at all times. For the management of risk and compliance issues AIS offers the following benefits:

- Tracking of multiple ships at both shoreline and deep ocean spaces
- Installed shipping technology, available over VHF and broadcast in raw data format
- Outages of AIS for nefarious purposes can be identified fairly easily with other contextual factors and details such as satellite imagery or port authority information
- The weaknesses of AIS are well known and accounted for but do not necessarily negate the role AIS plays in suspicious activity monitoring

While AIS has known weaknesses, which can affect its transmission reception and quality, it remains the only solution currently available as a maritime sanctions and compliance tracking tool. There are other potential solutions available which have specific uses in the maritime industry today. One of the alternative or complimentary sources for ship tracking is LRIT (Long Range Identification Tracking). LRIT is a solution incorporated by the IMO and its data are primarily shared with flag states, maritime rescue agencies, coastguards and others involved in the maritime industry. LRIT's key difference to AIS is its satellite tracking ability rather than the use of radio frequency broadcasts of a ship's movement. LRIT reports vessel movements on a default 6-hour frequency and is only shared with security, safety and environmental agencies. It is not provided to any commercial entity at present and is used as an additional source alongside AIS, not a substitute.

Additionally, the option of using data collected from an Inmarsat ship tracking device has been offered as a complimentary service to AIS. Inmarsat has been in existence since 1979 and was setup with the assistance of the IMO. It is designed to aid in the communication process between vessels offering a satellite safety tool for vessels in distress or when transmitting SOS calls. The positional location report from an Inmarsat device is designed to offer reliability in such scenarios.

One of the main weaknesses of Inmarsat in relation to sanction compliance tracking is that the devices are not mandatory within the maritime industry and there is no requirement for them to be fitted. Therefore, vessels likely to be engaged in sanctions evasion or vessels currently on the OFAC SDN list will not be using Inmarsat. Additionally, Inmarsat data is collected for the purpose only for safety of life at sea, under the SOLAS IMO convention. It does not have any other mandatory use or requirement in ship tracking. Using Inmarsat's GMDSS data for trade risk and compliance purposes would likely fail due to a lack of authorisation or approval for this type of activity. Within GMDSS standards, vessels may only provide position reports once a day and that would provide enough time between position reports to perform a potential STS or port call whilst 'unseen' which is why a regulator such as OFAC would require a higher frequency service like AIS.

Finally, GMDSS info is only provided to authorised service providers and is not broadcast publicly. Therefore, an FI looking at a portfolio of vessels on a real-time basis will not be able to see the information as they wouldn't be authorised. A broadcast system like AIS allows for the full track and trace of a single or series of vessels without prior authorisation.

3.4 STS transfers

STS is the process of cargo transshipment at open sea or at Outer Port Limit (OPL), either at anchor,

underway, mooring underway and then at anchor, or at drift, or within port limits, at anchor. The plan to transfer oil from one ship to another was first put into action in the late 1960s in the Gulf of Mexico. The process would take place by transferring oil from super tankers (Very Large Crude Carriers, VLCC and Ultra Large Crude Carriers, ULCC) to smaller tankers which were contracted to cross shallow waters at the handling terminals. This process is also called lightering due to the relief caused to the delivery or mother vessel. The opposite procedure is called reverse relief. In more recent times, these procedures can also help minimize transport costs and maximize profits from fuel handling. Therefore, the process has been extended to other types of cargo such as liquefied petroleum and natural gas (LPG and LNG).

STS types and cargo

Delivery windows in STS transfers are extremely narrow, the key element is time and in particular, given the nature of the operation, speed. STS has become a very common operation and is mostly preferred for liquid cargos but also applies to dry cargo. There are different types of STS based on the ship type (i.e., cargo, fishing, bunkering, drifting, anchoring, or mooring).

3.4.1 Why is STS necessary?

STS can simplify logistics and provide relief to port terminals and shore storage, helping to reduce port congestion, minimize delays and lower the burden on port infrastructure. STS is also beneficial where high-sink ships cannot reach certain ports. A majority of ports in the U.S. are unable to accept very large or ultra large crude carriers. This class of ship will have a capacity of 360,000 DWT and be around 450 metres in length. Due to the large draft and size of such a vessel, in addition to its manoeuvrability, U.S. ports will generally require lightering operations to discharge oil and oil products.

3.4.2 What are the different stages of an STS operation?

STS operations consist mostly of the initial design phase where a communication plan is required to ensure safety. Some of the main elements performed in an STS operation include, fender positioning, manoeuvring, cargo hose connection, cargo transfer and casting off operations.

In detail:

- Pre-arrival which allows for preparation, obtaining permission, agreeing a Joint Plan of Operation, risk assessment, ballasting and de-ballasting operations planning
- Approach and mooring takes into consideration the calculations and arrangements during the pre-arrival stage, at this point a careful step-by-step approach will allow the two vessels to connect
- Cargo transfer is the heart of the actual STS operation during which the cargo (liquid or dry) will be transferred whilst the operation is continuously monitored
- Post transfer stage is the moment when the two vessels will be disconnected, and mooring lines are released

3.4.3 What are the components that define STS operations?

An STS operation is a complex and challenging process which must be carried out with the correct observance and adherence to proper procedures. Factors such as weather and sea conditions can increase the risk of lightering making it a potentially dangerous operation. The main requirements of an STS operation cover the following:

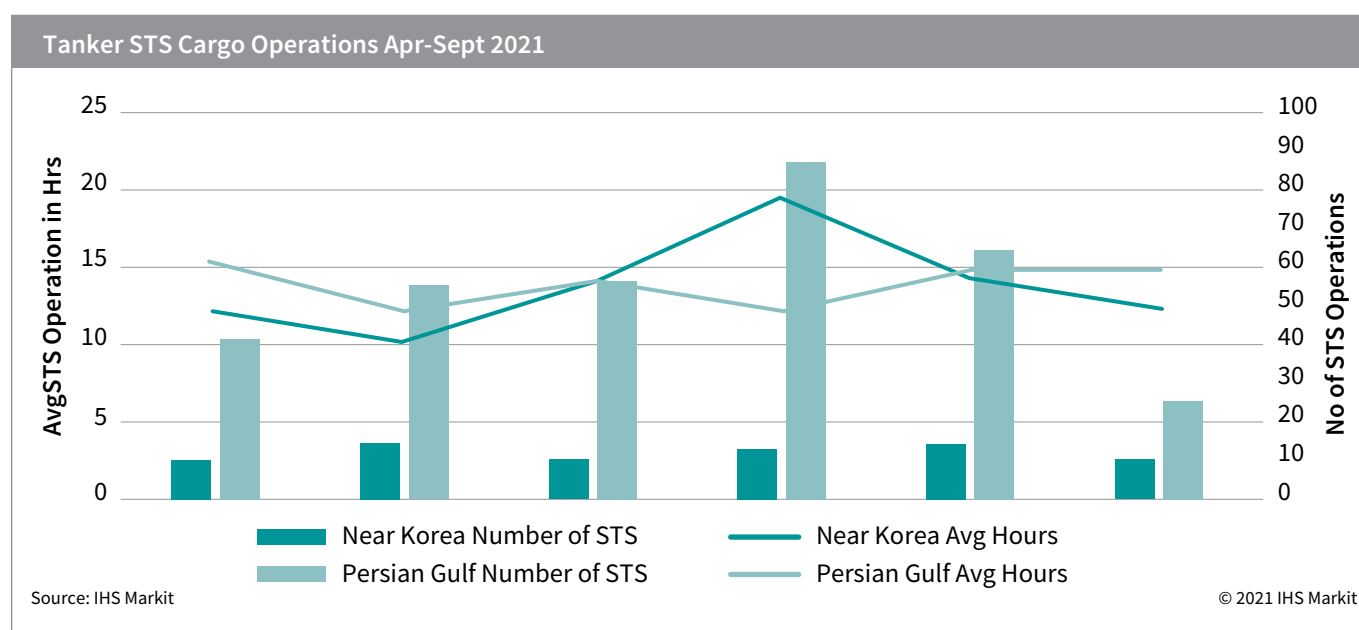
- Involved stakeholders: service provider, receiving ship, discharging ship, technical operators, underwriters

- Hardware: primary fenders, cargo hoses, service boat, secondary fenders, tugs, oil booms, transfer baskets, cargo hose cranes
- Operational criteria: vessel compliance, availability of procedure, crew competency, weather, vessel compatibility, competent Person in Overall Advisory Control (POAC), service provider, feasibility analysis, location assessment, port authority requirements, commercial requirements
- Statutory requirements: IMO⁴¹ conventions and regulations to consider (MARPOL, SOLAS, STCW, Oil Pollutions, ISM code), Classification societies (ABS, Lloyds Register, DNV GL, BV)
- Industry guidelines as laid out by port authorities, vessel owners and flag registries
- Due diligence actions as per the SOLAS requirements, the shipowner must ensure safety with respect to the involved vessels, the location, etc.
- Skilful crew on board⁴² and ashore

3.4.4 STS operations duration

It is impossible to give a fully accurate description in terms of how long it takes for an STS operation to complete. However, AIS data allows for the capture of these operations and an estimation of their length for particular ship and operation types. The table below (Table 2) shows that an STS operation takes an average of 10 to 15 hours in the Persian Gulf and in Korean waters and this particular insight can be extrapolated for other high-risk seas and zones. In terms of DPRK petroleum smuggling, this time limit can be lower as an STS operation conducted by North Korea and its proxies does not always observe the usual safety procedures thereby reducing the time to complete the task. The illustrations below (Illustration 3 and 4) show an example of the duration in which an STS operation could last. This particular example shows two vessels in proximity to Khalij-E-Fars, Iran taking 11 hours to conduct a full cargo STS.

Table 2: Tanker STS Cargo Operations April – September 2021

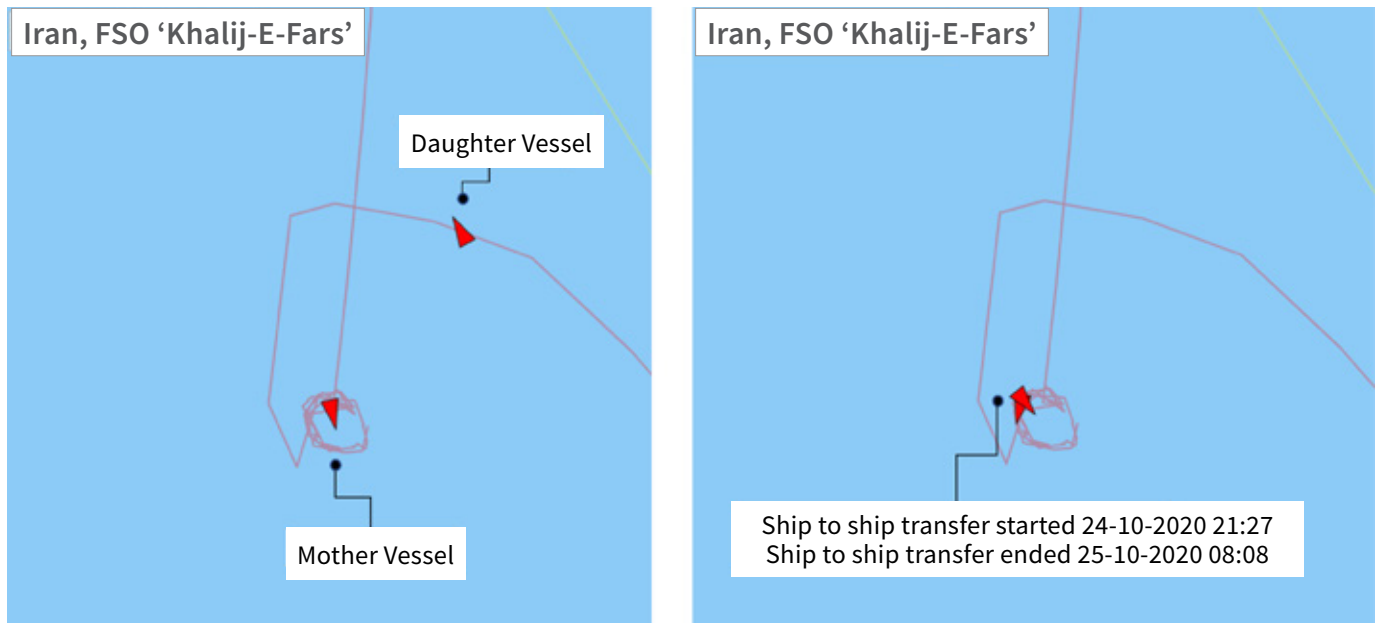


Source: IHS Markit

41. IMO MEPC 186(59): MARPOL Annex I – Ch 8: No connections with bunkering operations, POAC qualifications, 3 years of STS record keeping is required, particular notification procedures are in place for coastal authorities.

42. STCW does not require the specifically trained seafarers to carry out STS operations. As a result, management companies must make sure that the crew on board has received appropriate training.

Illustration 3 and 4: STS Operation



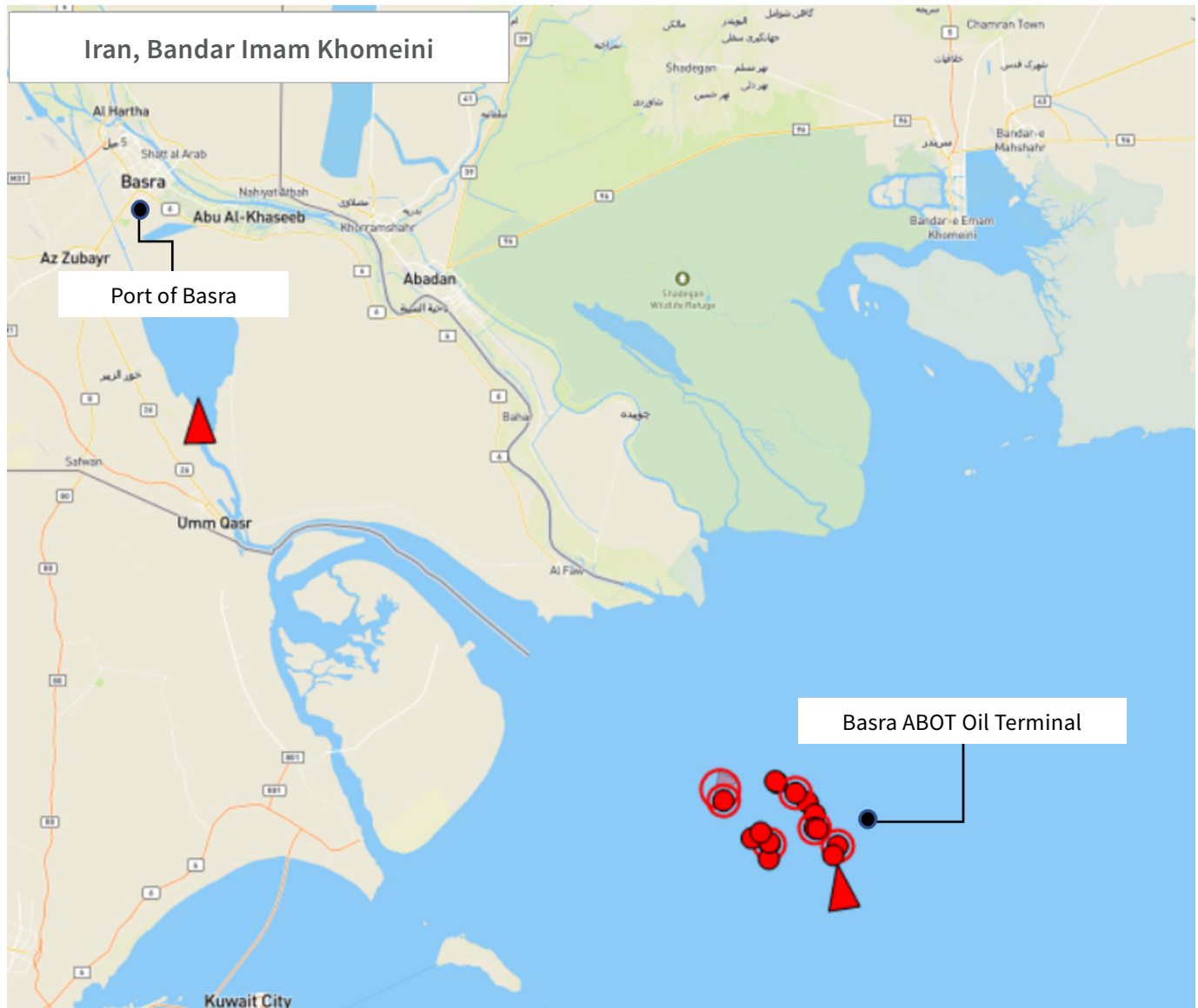
Source: IHS Markit

The illustrations above visually highlight the complexity in the movement of cargo from one vessel to another. In the example of the tanker vessel in Illustrations 3 and 4, the STS was also conducted at night. This would make the operation considerably challenging and prevents satellite imagery from potentially identifying the operation, further highlighting the possible illicit activity in this case.

One of the challenges with STS and offshore terminals is their potential proximity to high-risk jurisdictions. One such example is the port of Basra, Iraq which is a strategically important crude oil hub for international trade with near immediacy to Iran and the Iranian liquid bulk port of Abadan.

The port of Basra does not have the physical capacity to accept ultra large crude carriers (ULCC) due to narrow inland waterways and lack of facilities. To facilitate the export of Basra heavy crude oil, there exists in the Persian Gulf, about 60nm south of the port of Basra, the Al Basra Oil Terminal (ABOT) (Illustration 5). This terminal is a deep-sea offshore facility designed to extract oil from the Iraqi oilfield overland to Al Faw and then continue subsea to ABOT. From the ABOT facility, tankers are able to conduct terminal visits and STS engagements for the shipment of crude oil.

Illustration 5: Al Basra Oil Terminal (ABOT)



Source: IHS Markit

In the location of the ABOT facility there are multiple and continuous movements of Iranian flagged vessels, occasions when tankers in the area will conduct STS operations and instances of vessels AIS signal going dark. These scenarios all pose a challenge to FIs when deciding an action is suspicious or normal in the context of global compliance recommendations.

3.5 Other illicit activities

There are several common maritime practices that ships are engaged in when undertaking illicit activity.⁴³

3.5.1 Altering a vessel's IMO number

Altering a vessel's IMO number is a common practice that is intended to create confusion with the

43. Domballe, J., 'An introduction to AIS within the realm of Risk & Compliance', *IHS Markit*, [website], [20 January 2021], <https://ihsmarkit.com/research-analysis/an-introduction-to-ais-within-the-realm-of-risk-compliance.html> (as accessed November 2021)

vessel's official name. The IMO number can be physically painted and changed on the ship's hull. If the vessel's name and IMO number do not match, this would constitute a clear red flag. The example of the *Clyde Noble* and *Atalandi* in the table below (Table 3) pinpoint both vessels with the same IMO and MMSI number. Furthermore, both vessels share very similar particulars in regard to length, breadth and ship type. A case of potential spoofing such as this would require further investigation to ascertain the vessel with fraudulent characteristics.

Table 3: Altering a vessel's IMO number

AIS Message					
Name	CLYDE NOBLE	Destination	KHOR FAKKAN	Length	248m
IMO Number	9282792		UAE 15 Nov 2021	Breadth	43m
MMSI	352898733	Last Seen at (UTC)	17:00:00	Draught	8.5m
Callsign	3E2027		15 Nov 2021		
Vessel Type	Tanker	Status	16:47:20		
Ship Details					
Name	ATALANDI	Last Port	Janmagar	LOA	248.000
IMO Number	9282792		Terminal SPM	Breadth	43.000
MMSI	352898733		No 3	Draught	14.319
Callsign	3E2027		01 Oct 2021	DWT	105,306
Ship Type	Tanker		17:41:50	GT	59,781
				Class	AB
				Date of Build	2004-11
				System	New System (International 1969)

Source: IHS Markit

3.5.2 Document falsification

Each vessel is required to carry various certificates and documents on board which allow the vessel to navigate nationally and internationally on a free basis. It is common for those conducting illegal acts and sanctions evasion to falsify documents or use impersonation techniques.

Documents that need to be validated for their authenticity include but are not limited to:

1. Bills of Lading (BL)
2. Insurance certificates and further documentation
3. Invoices
4. Ship Registration Certificate and further documentation issued by the Flag State
5. Paperwork that reveals information on vessel's origin and destination
6. Paperwork on parties involved and their details

It is suggested that each FI reviews and makes sure all documents are authentic and the information contained within them is correct. If inaccuracies occur, then further investigation needs to be conducted.

3.5.3 Route inconsistencies

Another very common practice allowing sanctions evaders to camouflage illicit trade is to deliberately amend the origin or destination port or even include indirect routes, detours, transit, and transshipment through low-risk countries in areas determined to be high-risk for sanctions evasion (similar to dark activity). These unscheduled routes could potentially be a red flag when the vessel has been seen consistently lingering for a prolonged period of time in high-risk areas.

3.5.4 Flag hopping and false flags

Registering a ship in a particular State provides proof of nationality and also regulates shipping for maritime safety and security purposes. In international law, every ship is protected by the State under which it is registered. Bad actors, however, very often use false flags, or hop between flags. As a result, they can either create a fake identity by transmitting false flag data on the AIS transponder or they can spoof another vessel by stealing its identity. These two practices can also be identified and classified as red flags when there is a history of frequent changes, previous flag history reveals choices among Flags of Convenience (FoCs), or the vessel's flag is registered in public registries as unknown.

However, the Registry Information Sharing Compact (RISC) agreement signed by the “largest ship registries, including Panama [the Marshall Islands, Liberia, St Kitts and Nevis, the Comoros, Honduras and Palau], has the potential to make it [...] difficult for vessels to change their registration and easier for those in the maritime space to conduct due diligence”.⁴⁴ According to ACSS “the reason why this type of information sharing is so important is that illicit shipping companies have often engaged in ‘flag hopping’ to evade scrutiny, re-registering the same vessel under different registries to continue to engage in sanction evasion activity”.⁴⁵

3.5.5 Complex ownership structures

In cases where complex ownership structures exist OFAC has stated that U.S. companies and individuals should not conduct business with entities that are owned 50%+ by a sanctioned party, or on the SDN or SSI lists.⁴⁶

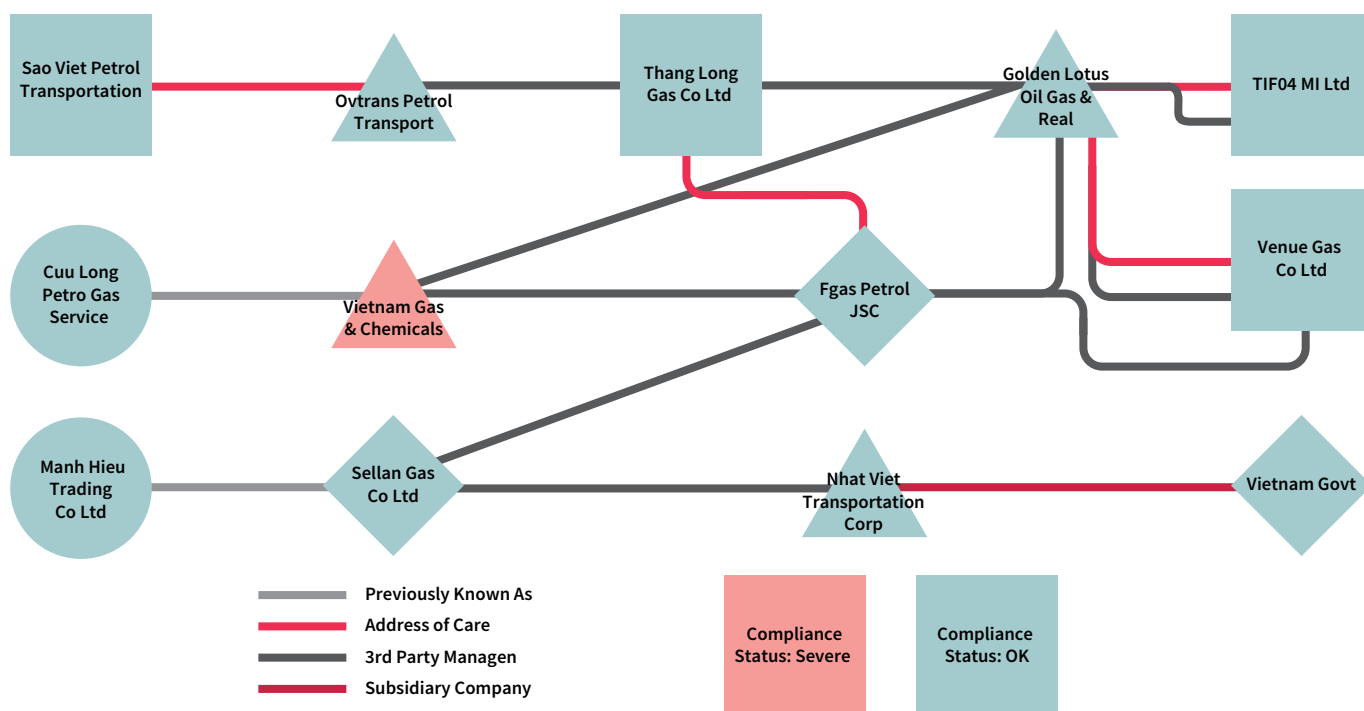
The example of Vietnam Gas and Chemicals, a major operator of vessels, displays illustratively the 3rd parties and others often found in maritime ownership structures (Table 4). In many instances, a subsidiary company of a sanctioned entity will not always be captured on maritime watch-lists.

44. Bright, N., ‘Ship Registries Agree to Information Pact to Avoid Sanctions Evasion’, ACSS, [website], [01 June 2020], [Ship Registries Agree to Information Pact to Help | Association of Certified Sanctions Specialists \(sanctionsassociation.org\)](https://www.acss.org/ship-registries-agree-to-information-pact-to-help-association-of-certified-sanctions-specialists) (as accessed November 2021)

45. *Ibid.*

46. U.S. Department of the Treasury, ‘Financial Sanctions’, *U.S. Department of the Treasury*, [website], [no date], <https://home.treasury.gov/policy-issues/financial-sanctions/faqs#398> (as accessed November 2021)

Table 4: Maritime ownership structures



Source: IHS Markit

Chapter 4: Case studies

Summary: In order to comprehend instances of illicit activities, it is important to analyse different examples of real-life vessels that have engaged in criminal practices such as the *Courageous* and the *Wise Honest*, in addition to vessels that have been monitored because they raised suspicious red flags. *M/T Courageous* (IMO 8617524),⁴⁷ an oil products tanker, was seized on April 23, 2021 after being found to have made illicit deliveries of petroleum products through STS transfers with North Korean vessels and direct shipments to the North Korean port of Nampo. *M/V Wise Honest* (IMO 8905490),⁴⁸ a North Korean bulk carrier, was used to illicitly ship coal from North Korea and to deliver heavy machinery to the DPRK. It was seized by the U.S. government on May 9, 2019. Both the *Courageous* and the *Wise Honest* displayed similar behaviours and movement patterns before they were both seized for their involvement in illegal activities ranging from STS cargo transfers, AIS outages and falsifying documentation.

4.1 Case studies: *Courageous* and *Wise Honest*

4.1.1 *Courageous*

The *Courageous*,⁴⁹ by switching off its AIS for a prolonged period of time and displaying minimal AIS coverage between August 2019 and December 2019, transferred oil cargo worth \$1.5m to a North Korean vessel named *Saebyol* (IMO 8916293). The cargo was later discharged in Nampo, North Korea. In the period leading up to the STS cargo transfer the movement activity of the *Courageous* placed it at the port of Kaohsiung throughout 2019. She idled in the anchorage of the Taiwanese port for considerable periods of time both before and after the STS with the *Saebyol*. After her prolonged period of not transmitting an AIS signal, the *Courageous* remerged back on the radar in February 2020 at Kaohsiung and departed for Cambodia. On reaching the port of Kompong Som, in Cambodia in March, the vessel was held by Cambodian authorities and subsequently seized by the U.S. As part of the STS operation with the *Saebyol*, the *Courageous* was also noted to have falsely identified itself as another vessel. She has previously operated under the name *Sea Prima* with the flag of St Kitts and Nevis.⁵⁰

Looking into the *Courageous* case it is important to notice the red flags. The *Courageous* had little port call history and minimal coverage under AIS, these alone are two cases of engaging in abnormal shipping practices. In the two-year period from 2019 to 2020 the *Courageous* changed flags three times and was registered all times under an FoC. Going further back to 2016 it was noted that the vessel changed names as well; from *Blue Sea* it was renamed *Sea Prima* and finally *Courageous*. However, changing names or flags does not constitute alone a red flag but in combination with the AIS outages and the overall activity, flag hopping can be a sign of suspicious intention. The vessel had not been inspected since 2004, it was dis-classed from Nippon Kaiji Kyokai and account for its age (built in 1987) these are all red flags. It is more common for older vessels to engage with illegal activity. Finally, between 2017 and 2020 four different corporate entity changes occurred within the ownership structure. As a result, it is important to understand and analyse vessel activities and behaviours in order to avoid transactional risk.

47. Department of Justice, 'U.S Government Seized Oil Tanker Used to Violate U.S. And Y.N. Sanctions Against North Korea', *Department of Justice*, [website], [23 April 2021], <https://www.justice.gov/usao-sdny/pr/us-government-seizes-oil-tanker-used-violate-us-and-un-sanctions-against-north-korea> (as accessed November 2021)

48. Department of Justice, Office of Public Affairs, 'North Korean Cargo Vessel Connected to Sanctions Violations Seized by U.S. Government', *Department of Justice*, [website], [9 May 2019], <https://www.justice.gov/opa/pr/north-korean-cargo-vessel-connected-sanctions-violations-seized-us-government> (as accessed November 2021)

49. McKinney, B., 'Oil Tanker Seized by U.S. Authorities for Illegal North Korean Trade', *IHS Markit*, [website], [27 April 2021], <https://ihsmarkit.com/research-analysis/tanker-seized-by-us-authorities-for-illegal-north-korean-trade.html> (as accessed November 2021)

50. *Ibid.*

4.1.2 *Wise Honest*

The seizure of the North Korean vessel *Wise Honest*⁵¹ took place in Indonesia on May 9, 2019. The vessel was connected to sanctions violations for illicitly shipping coal and heavy machinery to North Korea. The U.S. government seized the vessel, which also became known as one of North Korea's largest sanctions evading vessels, after being held in Indonesia following counter-intelligence investigations. The *Wise Honest* had numerous red flag warning signs such as a complete lack of AIS detection activity from August 2017 right up until its seizure in March 2019. To evade sanctions, North Korea has used vessels such as the *Wise Honest* in a fleet of 'ghost ships' which use false names, false identification numbers and always engage in ship-to-ship transfers to discharge their cargo away from prying eyes based at ports and berths.⁵² The *Wise Honest* displayed numerous red flags including STS transfers, flag hopping, dark activity and sanctioned owners and operators.

4.2 Dark activity

Understanding the primary purpose of AIS and how it works can help identify a vessel's suspected dark activity. AIS can be used to understand navigation and voyage related details, as well as identify a vessel's present and historical operations that may ultimately suggest a pattern of anomalies or suspicious activity.

The illustration below (Illustration 6) with behaviour markers shows how draught change and suspected dark activity are indicators of illicit shipping practices.

51. McKinney, B., 'OFAC Related Notices April and May 2019', *IHS Markit*, [website], [28 May 2019], <https://ihsmarkit.com/research-analysis/ofac-related-notices-april-and-may-2019.html> (as accessed November 2021)

52. *Ibid.*

Illustration 6: Dark activity



Source: IHS Markit

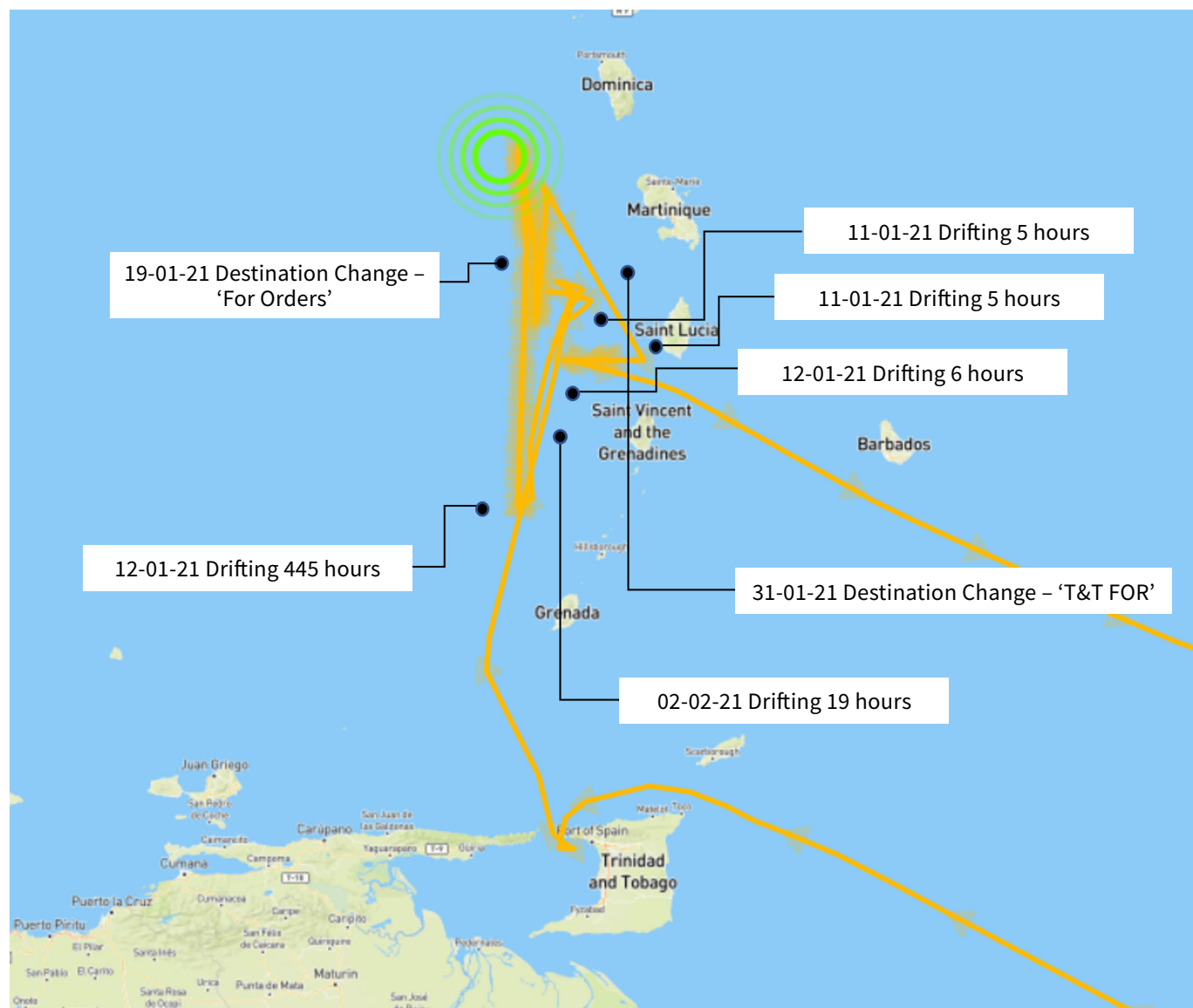
Recorded on November 23, 2020, the vessel, as seen on the illustration above, went dark for a total of almost 28 days only to reappear off the coast of Brazil on January 17, 2021. At the time of going dark, the vessel had a draught of 8.3m (ballast), with its destination indicated as Barranquilla, Colombia. Considering the heading, speed, and proximity at the time to the port of Barranquilla (30nm out), this seems somewhat suspect. The vessel is then seen again 30nm from Fortaleza, Brazil where its destination changed to Malaysia, and its draught updated to 13.8m (laden), suggesting a potential loading of cargo while not seen on AIS. While passing through the Strait of Malacca on January 20, 2021, the destination changed to Shanghai, North China suggesting it was the discharge destination. The overall behaviour of this vessel is highly suspicious and in line with evasion techniques previously seen for vessels operating in this area. The likelihood of this vessel loading cargo at a Venezuelan port was high.

4.3 Voyage irregularities

A very common deceptive practice for sanction evaders aiming to disguise a cargo's origin, is for the destination or the recipient to use indirect routes, to detour from the proposed schedule, or use third countries in order to transit or tranship the cargo.

The illustration below (Illustration 7) shows how a vessel's voyage irregularities could raise a red flag during a compliance screening review. The track view shows that this vessel spent an hour in proximity to Trinidad and Tobago during which there was no port call or STS. No STS was observed during drifting, but the draught changed while clearing the zone. Interestingly, a draught change occurred in the area surrounding Venezuela. Further to this observation, the DOC company and flag changed three times in three years and the vessel had not been inspected in over a year.

Illustration 7: Voyage Irregularities



Source: Maritime Intelligence Risk Suite (MIRS), IHS Markit

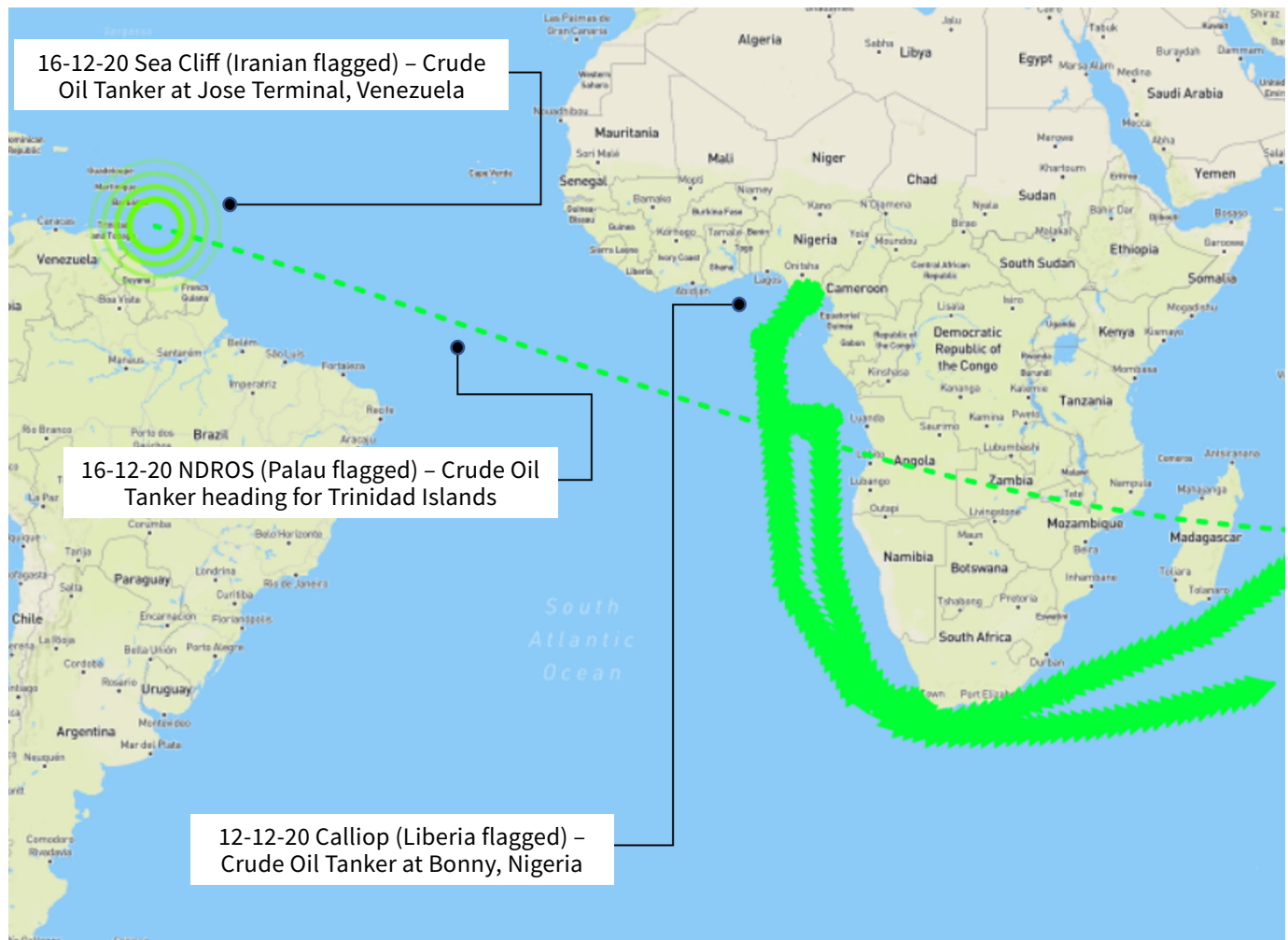
4.4 Spoofing

The suspected Liberian vessel in the illustration below (Illustration 8) was seen during its voyage to Venezuela using a fraudulent AIS signal and changing names under the Palau and Iranian flags. The vessel (Liberia) was seen at first sailing in proximity to the Bonny Offshore Terminal in Nigeria and at the same time in December another vessel appears on the same track (Palau), with the same draught and speed but later separated with different directions and destinations. The suspected vessel kept its destination to the Bonny Offshore Terminal and eventually arrived on December 1, 2020, remaining

there for 15 days, the second vessel after its departure appeared with a destination of Trinidad. At this point it is suspected that the Liberian flagged vessel took the place of the Palau flagged vessel and a separate ship ventured towards Nigeria covering the Liberian flagged vessel's tracks.

When the Palau flagged vessel approached Venezuela on December 17, 2020 its speed dropped to 0 just 56nm away from the Jose Terminal, Venezuela and at this point another vessel is seen, the Iranian flagged vessel, with the same draught as the previous two vessels and with the destination of Trinidad. In proximity to Venezuela all AIS signals for the ships involved are lost and there is no visibility for three days.

Illustration 8: Suspected dark activity and STS



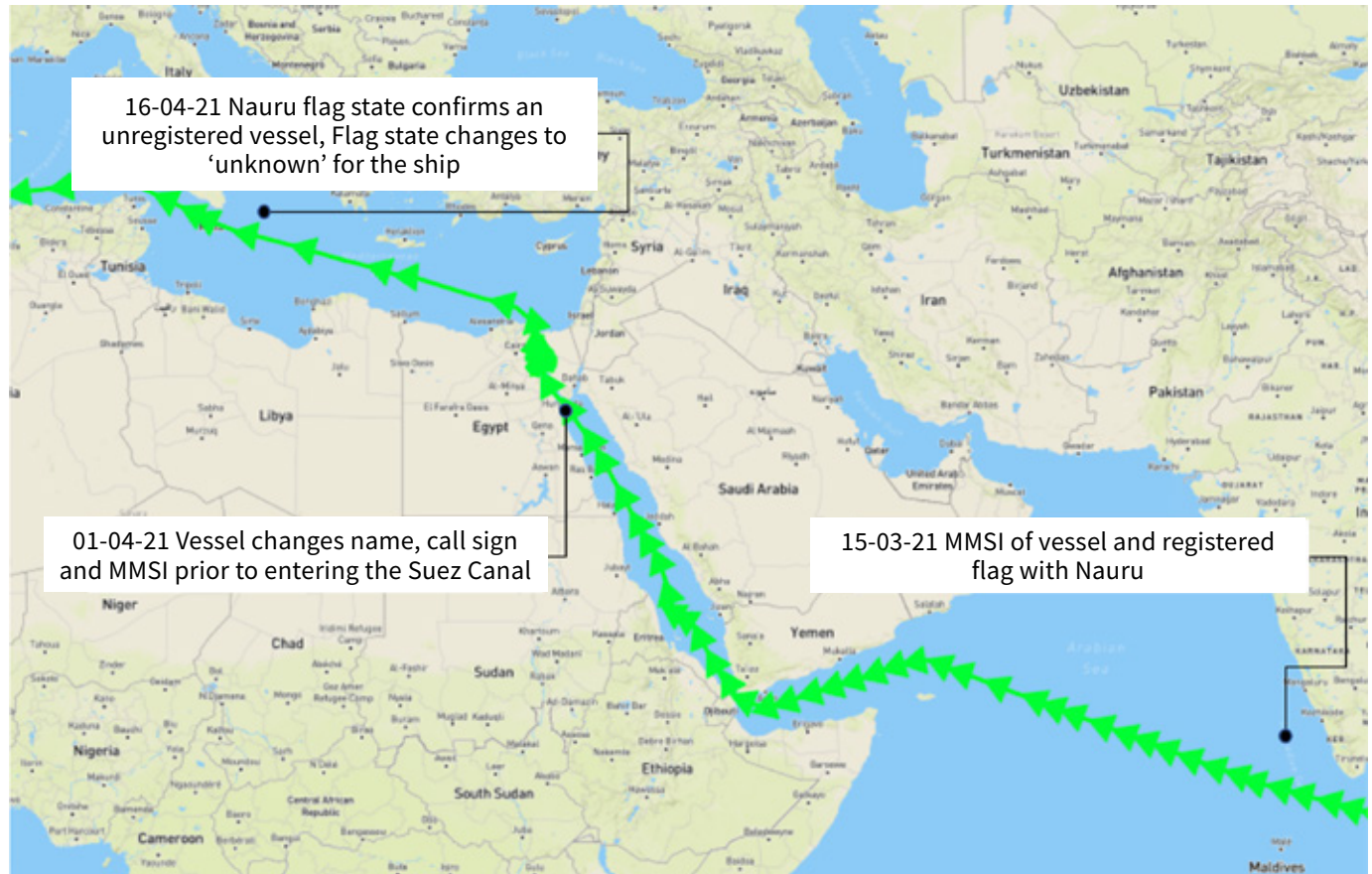
Source: IHS Markit

4.5 Flag hopping

The practice of multiple flag changes can suggest suspicious behaviour especially when it is connected to other practices. The illustration (Illustration 9) below shows a suspected vessel which after confirmation of an unregistered status with its flag authority, changes its name, callsign and MMSI number. It is important to note that the suspected vessel changed flags twice in twelve months and a total of three times in three years suggesting flag hopping; each change coincided with a change in name and registered owner.

When not seen on AIS the vessel is suspected to have been loaded with Venezuelan crude oil between November 23, 2020 and December 12, 2020 (draught at 13.8m). The vessel went dark between March 13, 2021 and March 19, 2021 while off the Malaysian coast. The destination at the time was Longkou, China. The vessel subsequently updated its draught to 7.7m suggesting an STS cargo transfer or port call while not seen on AIS. When waiting to transit through the Suez Canal, it updated its name, MMSI, callsign as well as ownership, it then transited through the Mediterranean back towards South America.

Illustration 9: Flag hopping and data manipulation



Source: IHS Markit

Chapter 5: Identifying deceptive shipping practices: vessel due diligence and compliance screening

Summary: FIs are required to validate customers, entities and parties involved in trade finance business transactions. Furthermore, maritime screening has become an integral part of such a compliance validation programme. In order to understand potential illegal maritime practices, FIs must be in a position to detect red flags via a thorough understanding of AIS and the different levels of exposure as regards vessel type. The advisory, issued by OFAC in 2020, stated an exercising of ‘heightened due diligence with respect to shipments that transit areas they determine to present high risk’. In this context it is important to determine the compliance cases that require regular due diligence approval and those that necessitate an enhanced due diligence process.

5.1 Set of principles for regular risk-based due diligence

It is necessary to develop a good understanding of the important role of AIS transmission, the assignment of MMSI numbers by flag states, the intricacies of an STS operation, and other issues that OFAC expect banks to tackle and recognise as red flags. “Similar to the compliance environment with all sectors, a risk assessment includes answering the who, where, when, why, what and how questions. However, with shipping, the answers to those questions are not easily captured in a single dimension”.⁵³ For risk and compliance staff in trade finance, they should adhere to basic rules and escalate matters with senior management when they are in doubt.

The key items to manage maritime risk, from a basic operational perspective:

- Any sanctioned port call and/or high-risk port calls (within a twelve month period at least)
- Any sanctioned watch-list check
- A sanctioned ownership check (all documented owners for the full set of vessel ownership)
- A flag and historical flag check (sanctioned flag)
- Transportation route of the vessel including its port of load and discharge
- Cargo type and its potential end-usage

Answers to this information gathering exercise will identify if the transaction warrants an enhanced due diligence process or not. For example, a vessel which conducts the majority of its business between the U.S. east coast and northwest Europe, with cargoes ranging from coal, iron ore and agricultural grains and a history of single name use and flag nationality that aligns with its ownership location, would not require any enhanced due diligence. On the other hand, a similar vessel that handles bulk cargo such as coal and iron ore but its regional routes pass through or are mainly conducted in a high-risk zone could be a candidate for a more thorough, compliance screening check. Equally, if the vessel’s flag was seen to have been changed regularly over the last three years and was conducted in parallel with ownership changes, this again might necessitate enhanced due diligence.

The maritime industry is fully diverse covering many different sub-industries that undertake certain practices within the global supply chain. The OFAC Shipping Advisory of May 2020 included a section titled ‘Annex A’ which covered the various agencies involved in shipping, ranging from brokers, port

53. Bright, N., ‘The Complexities of Sanctions Compliance Risk in the Shipping Industry’, ACSS [website], [1 August 2019] <https://sanctionsassociation.org/the-complexities-of-sanctions-compliance-risk-in-the-shipping-industry/> (as accessed November 2021)

authorities, flag registries, ship captains, vessel owners, crewing organisations, and others. OFAC guidelines for each of these industries differ in range and scope.

A number of the organisations within each of these maritime sub-industries will manage or collect data which could ultimately be of use to FIs. Understanding who owns a particular item of information or can make such information accessible can help ease the burden of compliance screening and prevent low-level due diligence checks escalating into time-consuming enhanced investigations. It is, therefore, crucial for FIs to understand when enhanced due diligence should be deployed and when it should not. One of the common assumptions in regard to container ships is the set routes they take, and the lower level of risk involved in understanding such an AIS course or route.

A liner service is a fleet of container ships which provide a service, at regular and fixed intervals, between predefined ports. They provide seaborne transportation to goods from such ports at a particular sailing date and time. These regularly serviced shipping routes load goods at the port of origin and discharge at the port of arrival. The routing will work on the basis of a network of ports and various routes in-between. In some cases, these will be direct routes but in others, to reserve capacity or to take advantage of low packing costs at certain ports, transshipment will be used to get to the ultimate destination.

Total container trade volumes equalled to 152 million twenty-foot equivalent units (TEUs) in 2019. World container port throughput was estimated at 811 million TEUs for the same period.⁵⁴ These numbers imply that on average, a container was transhipped 3 times (the throughput data for ports also includes empty containers).⁵⁵ In this context, the transshipment of containers is a common practice. It is important to remember that container traffic is low-risk in terms of sanctions evasion but it does have certain features which can increase its compliance risk. Recent historical examples of the port of Dubai being used by Iranian businesses as a transshipment hub underline this issue as well.⁵⁶

In respect to containers, it is helpful to understand the most important transshipment hubs which can be part of the 'hub and spoke' network for container shipment. Deepsea container services running from Yantian, China to Rotterdam, Netherlands may have a number of feeder services in certain locations such as the Straits of Malacca (diverting containers to Port Klang, Malaysia or Singapore) and the Mediterranean or Suez for feeding into southern and eastern Europe. While AIS tracking of the container vessel could be of low importance, the container carrying the goods would incur a higher compliance weighting.

54. UNCTAD, 'Review of the Maritime Transport', UNCTAD, [website], [2020], https://unctad.org/system/files/official-document/rmt2020_en.pdf (as accessed November 2021)

55. Methodology is calculated, thus, $811 - 2 \times 152 / 152 = 3$ transshipments per container; Wang, S., Qu, X., Wang, T., Wen, Y., 'Optimal Container Routing in Liner Shipping Networks Considering Repacking 20 ft Containers Into 40 ft Containers', *Journal of Advanced Transportation*, [website], [31 January 2017], <https://www.ft.com/content/c3edcca4-3378-11e9-bd3a-8b2a211d90d5> (as accessed November 2021)

56. Financial Times, 'Iranian business devise creative ways to evade Trump sanctions', *Financial Times*, <https://www.ft.com/content/c3edcca4-3378-11e9-bd3a-8b2a211d90d5> (as accessed November 2021)

Illustration 10: Map graphic of a vessel route from Yantian to Rotterdam with potential feeder routes in Suez, Singapore and Southern Europe



Source: IHS Markit

Non-container ships such as bulkers and tankers do not operate on a designated route basis, instead working to regional or international trade patterns. This type of activity, makes it difficult to track and identify suspicious activity. In such cases, a due diligence activity list might require investigation into the following:

- Flag: historical flag screening and changes in nationality
- Owner: current and historical ownership and operational entities with an emphasis on identifying the ultimate owner
- Sanctioned movements: voyage screening in the last 12 months
- AIS gap indicator: investigate behaviour using tracking tools especially in proximity to sanctioned countries
- Potential STS transfer indicator: voyage screening in the last 6 months and understanding different types of suspected activity
- Disguised ownership risk indicator: draw relationships between ships and related companies
- Change in draught in high-risk or sanctioned territories: screen for port calls and catalogue draught changes especially against sanctioned ports

Other areas of interest to pay attention to and check:

- Areas of risk: constant changes in a short period of time; flag, name, ownership or unknown status

- Dark and STS activity in areas of high risk and sanctioned countries: this should always be provided by a third-party software solution and not be done manually by trade operations staff as the foundational work to implement and investigate it is too high
- AIS or MMSI spoofing both in real-time and historically: this should also be provided by a software solution provider. A key screening check would seek to identify if the current vessel is sailing under its correct name, if the MMSI number is visible and correct, are there any anomalies with the current MMSI or IMO number being broadcast
- Loss of AIS: apply a risk-based approach to signal loss using maritime judgement based on the location the vessel loses its signal and potential activity when in a dark state of either a port call or STS operation
- Outage period for loss of AIS: It is important to have a parameter or variable for the length of time an AIS outage occurs and when this would 'kick-off' further due diligence. Small outages will not identify risk or suspicious activity, but greater periods of outage will. A determining factor in finding this parameter will be the vessel type and the cargo involved

For understanding and managing STS operations a check list of items should be followed by FIs when evaluating if the STS is legitimate:

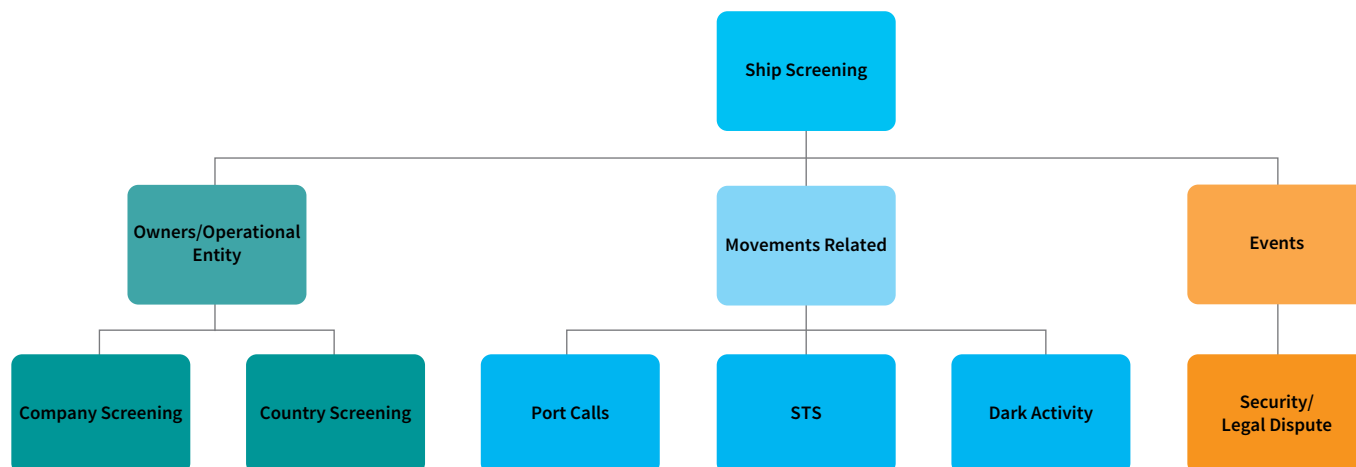
- What is the vessel's nationality?
- What is the goods' origin?
- Where do the goods originate from?
- What is the goods' destination?
- What is the route the vessel is following?

For those involved in the physical transfer of cargo, other elements should be managed and checked prior to proceeding with the action:

- What type of assurance have I received that a sanctionable party is not involved with the operation?
- Can I access the parties' certificates and relevant documentation?
- Have I been provided with all shipping and export documents?
- Has the plan been approved by the administration?
- Has the relevant coastal authority been informed of the operation to be carried out?

Monitoring transactions means that re-screening vessels and their owners is important to identify AIS outages and STS transfers especially in high-risk areas in terms of sanctions violations. Screening is however broken into three areas of interest: the ship, the related entities, and movements (Illustration 11). When transaction structures seem complex or look unusual, in relation to regular business activities or the background of the companies involved, this is a high financial crime risk indicator which needs to be assessed for risk mitigation by trade processing staff. Whether or not a transaction initially presents high risk or not, it should always be monitored during all different stages from when documents are received to when the transaction is complete, and payment has taken place.

Illustration 11: Compliance screening areas



Source: IHS Markit

Chapter 6: Findings from the Working Group interviews

Summary: This chapter aims to provide an overview of what FIs have implemented both prior and in reaction to the OFAC and OFSI advisories. This will allow those within the industry to learn from their peers. A variety of different sized banks and other organisations were interviewed. Information was collected on internal sanctions risk assessments and due diligence related to shipping and maritime customers.

6.1 Theme 1: Assessing risk

The background to how banks and other FIs manage risk assessment on a day-to-day basis for trade finance and other transactions involving maritime sector customers is important.

6.1.1 Risk assessment

6.1.1.a *Do you perform a sanctions risk assessment for maritime customers (payments, trade finance, vessel finance)? Do you have a risk profile that determines the level of risk and monitoring?*

A majority of banks confirmed that conducting a risk assessment is part of their general compliance practices, including for clients in the maritime sector. One bank said that it considers “all maritime customers, including large global shipping companies, as high risk for sanctions.” This means that the bank employs specific, industry related, KYC questions at onboarding of the customer plus enhanced ongoing screening for the duration of the relationship.

The bank said that risk assessment is done with the support of the bank’s KYC team where they provide a prospective client with a sanctions’ specific questionnaire for maritime related risk which can later be assessed and evaluated. The KYC team also works closely with anti-bribery and fraud units. This particular bank has a set of restricted customer categories in place based on questions asked by the KYC team from a specific trade finance perspective. Certain triggers in the applicant’s responses can determine a higher-risk status for that client. At this particular bank, due to their perceived high-risk status, new customers in the maritime sector can only be approved by a special committee. In order to avoid a cookie cutter approach, the bank is currently building a risk profile with more graduations of risk for the sector.

Other banks confirmed an enterprise-wide risk assessment on a variety of topics with sanctions and shipping forming a major component. The checking and screening of vessels against sanctions lists is a key element across banks interviewed. Watch-lists screened range from OFAC, United Nations, UK HMT Treasury, Swiss Sanctions and others.

One interviewed bank confirmed the importance of conducting rigorous due diligence and KYC screening of all aspects of a vessel’s ownership and management. This bank also underlined the need for sanction checks on the vessel crew where information is available. Published guidelines from BAFT which include recommendations to screen vessel names, vessel types, and ownership structures are included by the bank. If the risk evaluation from the initial compliance check is high, then the bank proceeds with enhanced due diligence, looking at vessel routes, regions, and areas where vessel business activity takes place.

One of the participating banks stated that no risk profiling is conducted separately for shipping or any maritime related aspect for compliance purposes. Their risk assessments are conducted based on OFAC reviews and OFAC’s SDN lists only, with the help of a scoring system that allows them to review and evaluate a customer’s risk profile based on the nature of their business and the countries in which

they engage.

A number of other banks employ a first level due diligence check on potential suspicious activity but do not have a set threshold in place for dark activity, AIS issues or potential cargo transfers between vessels. A minority of interviewed banks conduct a post-transactional vessel search to identify any potential risk or suspicious activity with AIS in order to identify any possible insight to be reworked back into their compliance programme.

One bank performs a risk assessment score using a grading system of A to E (in descending order) for their customers. These scores are periodically reviewed for various maritime related compliance issues such as vessel name changes, type of business involvement and potential sanctioned ownership structures.

6.1.2 Vessel type, age, and size

6.1.2.a *Do you have different risk weights depending on type, size or age of the ship?*

Most banks interviewed specified that there is nothing in place to differentiate between vessel sizes, types or age when conducting due diligence checks. Only one bank includes the age of a ship in its risk classification processing.

One bank reported “the risk we [bank] have noted is almost exclusively with tanker vessels – either crude oil, product or chemical tankers. This is not to say finished goods are not shipped in violation of sanctions or nefarious purposes, it’s just that this can be accomplished without the need to alter the behaviour of an entire vessel. For example, a container may be shipped by a large mainstream ocean carrier to a port like Jebel Ali and subsequently transhipped to Iran via a separate Bill of Lading (BL) on a smaller feeder vessel. The size of tanker vessels engaged in high-risk behaviour has varied greatly plus product and chemical tankers are generally smaller than crude oil tankers.”

In terms of size, a separate bank also mentioned that tankers and commodities like coal or oil both pose higher risk due to the potential divergence of routes taken and the possibilities of cargo transfers at sea. The same bank also raised concerns with charter party BL and their consideration as higher risk due to links with the oil industry. This type of BL, which allows a vessel to be hired on a time basis, has further implications with ownership risk. The Uniform Customs and Practice for Documentary Credits (UCP) is a set of rules on the issuance and use of letters of credit. Under the UCP rules, if a LC calls for a marine bill of lading, then banks typically don’t accept a charter party bill of lading instead of a marine bill of lading.

This is because there are some key differences⁵⁷ between these transport documents as shown on the table below (Table 5).

57. Eker, U., “What are the Differences Between a Bill of Lading and a Charter Party Bill of Lading?”, *Letter of Credit*, [website], [2 December 2018], <https://www.letterofcredit.biz/index.php/2018/12/02/what-are-the-differences-between-a-bill-of-lading-and-a-charter-party-bill-of-lading/> (as accessed November 2021)

Table 5: Key differences in transport documents

	Marine Bill of Lading	Charter Party Bill of Lading
Usage	Mostly used for containerized cargo that is transported by regular liner container vessels	Chartering is an agreement where a shipowner agrees to rent out his ship to a cargo owner to move cargoes from one point to another. So, the Charter BL will be used for these agreements, mainly for bulk shipments from one port to another
Characteristics	Does not contain a clause stating that it is subject to a charter party	Contains a clause stating that it is subject to a charter party. Example clauses: <ul style="list-style-type: none">• “Prepayable freight paid as per charter party dd [...]”• “Freight payable as per charter party dd [...]”• “Freight as agreed”• “Bill of lading to be used with charter parties”
Signatures	Can be signed by <ul style="list-style-type: none">• the carrier or a named agent for or on behalf of the carrier, or• the master or a named agent for or on behalf of the master	Can be signed by: <ul style="list-style-type: none">• the master or a named agent for or on behalf of the master, or• the owner or a named agent for or on behalf of the owner, or• the charterer or a named agent for or on behalf of the charterer

A particular check conducted by multiple interviewed banks ensured that the cargo could be carried by the actual vessel stated on the transportation document. For example, iron ore shipped on a bulk vessel and not on a products tanker, or industrial machinery transported on general cargo vessels and not on a Roll on/ Roll off (Ro-Ro) ship, designed to carry wheeled cargo. This check is viewed as quick to manage by an operations analyst at the bank but also a good indicator for detecting any business sense irregularities.

For one of the large banks, they confirmed that 50% or more of their transactions are with the same liners, using the same routes. Large, general liners with many vessels in their fleet do not pose a risk in the same way independent ship owners do. Feeder vessels which move goods from main liners are a potential risk as visibility can be lost but can be rectified by tracking the individual container carrying the goods.

6.1.3 The four steps in internal risk assessment

6.1.3.a The 2020 OFAC Advisory identified four steps for FIs in regard to conducting an internal risk

assessment related to maritime customers. What do you currently do to comply with this and how do you do this?

- *Identifying commodities and trade corridors susceptible to transshipment and STS transfers and the extent of their use by an institution's maritime industry customer*
- *Results from an assessment of the nature of each client's business, including the type of service(s) offered and geographical presence*
- *Client activity for transactions inconsistent with the client's typical business practices, to include when clients acquire new vessels*
- *Client acquisition or sale of vessels to determine that the client's assets do not include blocked property*

One interviewed bank commented that the internal risk assessment outlined by OFAC is too high-level and not as prescriptive as it could be. Also, a number of key items that could be useful are missing and the 'OFAC 2020 Shipping Advisory Annex for FIs', lacks detail when compared with other industries such as brokers, traders, and flag states in the same publication. Additionally, one of the banks said that the guidelines to assess risk in the OFAC advisory can offer a false sense of security.

One bank concluded that it is hard to detect risk in trade finance and that open account transactions is where most risk is based due to a lack of required licenses and goods being sent to locations which might not be appropriate. The conclusion was that open account should be under more scrutiny than documentary trade finance instruments.

One bank stated that "frequent ownership changes on a vessel trading in the vicinity of a high-risk area does not equal a 'No' at the bank." Other factors would also be considered and taken into consideration in classifying the level of risk in such a transaction. One common item of feedback was the avoidance of a cookie cutter approach to sanctions management in maritime trade. The use of a cut-out model was thought to introduce scaling problems when applied across all bank trade transactions. The risks posed by tankers and bulkers are very different to those emanating from the container shipping lines.

A number of banks have processes in place that understand their clients' business, where it takes place and any deviations from such patterns. Certain banks also use a series of questionnaires for the preliminary screening of new customers in order to understand their nature of business. One bank utilises third party data to understand trade product intelligence to the level of what the traded goods will be used for and the history of exports to the country they are being shipped.

In a number of cases, bank customers who are traders or brokers for oil and coal cargoes undergo enhanced due diligence as a matter of course. Recent fraud cases, especially in Asia and the Hin Leong scandal, have increased sanctions exposure leading to reviews of historical customer data. Where goods are deemed high risk (coal, oil, potential dual-use materials) and are being routed through areas of potential transit then one bank always implements their enhanced due diligence procedures to cover sanctions risk.

Theme 2: Current OFAC guidelines: is it business as usual for the banking sector?

In relation to the advisory and the constant changes in regulation, what future compliance screening plans are banks contemplating? How can financial institutions be more proactive in regard to regulatory change in the future? Furthermore, have financial institutions detected any gaps in their compliance programme as a result of the publication of the shipping advisories? If so, what are the plans to plug these gaps.

6.2.a *What else have you done around the current OFAC/OFSI advisories? Can you give examples of new policies, or work processes that have been implemented?*

One interviewee said that the current OFAC and OFSI advisories initiated a discussion among shipping and FIs on how to deal with the new guidelines and bring stakeholders together for better knowledge sharing. There was some concern in the maritime shipping industry from carriers and container shipping lines, on how the banks and insurers would react to new regulatory advice on AIS and STS operations. One key concern was that the OFAC advisory would push FIs to ask a range of questions that would complicate their relationship with shippers and carriers. This would lead the shippers into discussions on subjects which banks do not have clear line of sight or they are lacking the appropriate level of technical knowledge. The shipping companies interviewed for this paper have expressed a willingness to help overcome such knowledge gaps so that time and resource for both parties in areas of sanction compliance can be reduced.

The most common response from banks to the OFAC and OFSI advisories was that due to the lack of extensive detail in the documents, no major changes could be implemented as a result. We found that one of the participating banks, a small size bank, reviewed the information in the advisory but it did not prompt them to change the outlook of the checks or discussions on their vessel monitoring platform. Being a small size bank, they understand how leasing and financing vessels works and the risks involved.

At most, the majority of banks had performed a gap analysis of their existing procedures in regard to shipping compliance risk and the advisory. A large section of interviewed banks stated this was the most they could do, due to the lack of actionable data within the published advisory.

6.2.b *What other steps do you still wish to implement? What do you do for vessel monitoring and tracking?*

Among the areas of interest during onboarding, banks focus on historic data and items such as previous vessel destinations, flags, owners and overall AIS data during the last 12 months. Counterparties are also being checked for sanctions compliance, including bulk providers, or bunker companies.

A range of different software is used for vessel tracking with some instances of sophisticated vendors and others employing free-to-air-services from the internet. The majority of banks are not tracking vessels in all transactions, instead, ships are identified by risk to determine if they should be tracked or monitored more closely.

One of the banks mentioned that they identified issues when implementing maritime compliance checks at scale using behavioral analysis of ships, especially when applied to individual transactions. Issues were found relating to an increased length of time spent on false positives and greater deep-dive investigations, therefore, the project has been put on hold.

As a result of the OFAC advisory, one of the large banks mandated a lookback review of their current setup. They immediately realised that new controls might be required. One of the bank's core implementation features has been a machine learning model of live ships data. This model seeks to remove noise from sanctions watch-list vessel checks by only gathering the most suitable items for screening.

Another bank performed no ship movement checks by their Level 1 (L1) team. The underlying reason is because it is too costly and does not fit with an automated approach. Detection is deemed to be better when based on the lookback of a vessel's historical activity, and not real time activity. This helps to build a realistic picture of a vessel with its associated movements and trading patterns and can be

further expanded upon with defence intelligence reports that are used to input data into the bank's automated platform. On the other hand, a separate bank noted that their L1 team did perform vessel tracking checks on cases where the overall transaction size is large.

A regional U.S. bank's compliance team has not implemented vessel tracking software for real-time AIS monitoring, preferring to concentrate on watch-list checks due to the low transactional volumes financed by the firm. On the other hand, a similar sized bank's operational team does perform vessel tracking, through a mixture of free, on-line tools mostly used for IMO numbers, name checks and ownership due diligence through a third-party vendor application.

6.2.c *Dealing with red flags: e.g., how long is a ship dark before you do anything about it, and what is it that you do? What constitutes a concern? Do you file a Suspicious Activity Report (SAR)/Suspicious Transaction Report (STR)?*

The maritime sector contains different functions and therefore the risks are complex depending on the type of shipment. Bulker and tanker vessels have the operational capacity to be engaged in STS transfers at sea, but container vessels do not. AIS outages, for example, on a container ship are not always considered to be a red flag due to the location they occur in. If a container ship is 'dark' and has the ability to make a port call, then the risk for the vessel and its activity becomes higher. Equally, if the AIS goes offline in deep sea waters with no ability to make a port call in the time period the ship is dark, then the risk would be lower. The table below (Table 6), is used by a number of banks to determine the different levels of concern for various vessel types and how this can aid in the difference between low level screening checks and enhanced due diligence.

Table 6: Different levels of concern for various vessel types

Type of vessel	AIS concerns	STS concerns	Cargo concerns
Container ship	LOW	LOW	HIGH (for port transshipment reasons)
Bulk carrier	HIGH	HIGH	HIGH
Oil tanker	HIGH	HIGH	HIGH

One large Asian bank, in terms of AIS dark periods, mentioned that while it is not necessarily a red flag by itself, a port call before and after the AIS gap within the same location adds substantial weight to the risk involved. Similarly, while STS transfers are not red flags in and of themselves, STS activity paired with extended AIS gaps in the vessels history increases the risk weighting of the overall transaction.

Another large bank mentioned that STS oil transfers in proximity to Malaysia are rising in prominence and can sometimes cause concern. Evidently, small instances of illicit activity can take place with these routes and types of trade. The bank has implemented checks on oil transactions passing through Malaysian waters to ensure there are no suspicious AIS outages or STS operations. This type of check is enforced due to the increasing level of reports in the media relating to STS oil transfers to Venezuela, Iran and China in the South China Sea and the Strait of Malacca.⁵⁸

One interviewed bank also noted that the screening checks for shipping, in regard to suspicious activity, is not performed by Level 1 (L1) staff but handled upstream with the Level 2 (L2) team who conduct more involved and investigative checks. The principle here is that the potential weight of

58. Argus, 'Bohai spill shipowner says it follows sanctions', Argus, [website], [29 April 2021], <https://www.argusmedia.com/en/news/2210688-bohai-spill-shipowner-says-it-follows-sanctions> (as accessed November 2021)

an investigation concerning AIS and STS slows down the operations team. The L1 operations team conducts the ‘no-brainer’ shipping risk elements. This particular finding was also confirmed by a separate bank who check dark and STS activity as an investigative control only and not as part of a L1 check as “it is too complex for L1, so done by investigations team in L2 and L3 only.”

On the other hand, an Asia-Pacific bank also analysed transmission gaps in AIS allowing its staff to use their expertise to determine cases where it should be investigated and where it should not. At the L1 stage, data is checked and red flags raised on an automated service which assigns a percentage risk score to a vessel. An alert is raised if the percentage score is breached.

Furthermore, dark activity is regarded as a contextual screening check by the majority of banks, where it is viewed from the perspective of other attributes such as location, type of vessel, cargo and length of AIS outage.

Only in one instance did a bank mention a fully manual AIS outage check. This occurred when internal operations staff could see AIS dark activity for a considerable time (more than 4 hours) and cross referenced this with the relevant BL information to determine if it affected the shipment of goods when under the bank’s presentation. There were no guidelines in place at the bank to understand AIS outages in full, but experienced L2 and L3 staff would make decisions based on the information available.

6.2.d *Does transshipment change your risk weight?*

A major European bank confirmed that transshipment does not automatically lead to the suspicion of sanctions evasion. “Transshipment may occur for a number of legitimate reasons. For instance, there may be no direct air, land or sea link between the consignor and consignee countries. Transshipment can therefore resolve an obvious logistical issue in sending goods from country A to country B. Where uncovered through available resources, the following indicators may be viewed as potential sanctions-related red flags when reviewing transshipment transactions that have been stopped for L2 alert reviews. A single indicator in and of itself may not represent a red flag, but a combination of such indicators should be viewed as carrying heightened sanctions risk.”

These indicators expressed by the bank are:

- Involvement of a party (individual, entity, vessel, etc.) listed on an internal bank watch list due to previous involvement in transshipment activity involving a sanctioned jurisdiction
- Shipments to landlocked countries or locations that border sanctioned jurisdictions
- Voyage irregularities such as indirect routing, unscheduled detours, or shipments through one or more jurisdiction(s) for no feasible economic reason
- Involvement of sensitive locations like free trade zones (FTZs) and offshore financial centres (OFCs)

One bank mentioned that some trade routes where transshipment could occur are deemed as higher risk. Some of these routes were India to the UAE and India to China. The bank has marked such routes as high risk due to the identification of false documents from India in the past after particular International Maritime Bureau (IMB) checks that raised goods being shipped from India to Jebel Ali, UAE but in actuality the goods were to be discharged in Iran. The effect of this falsification has led the bank to setup internal profiles based on individual carriers and products being shipped.

In other bank examples, container tracking or IMB checks were conducted in order to obtain certain information in cases handled by L2 or L3 operators. Container tracking was cross-checked against the BL or IMB to ascertain if the route was adhered to and the goods were discharged at the intended port.

6.2.e Risky ship profile: *Have you created, or do you use a profile of a vessel or owner that is more likely to be engaged in sanctions violations? For example, ships that change owner often, older ships, independent owners, smaller size, flag of convenience, ownership location, regularly serviced or any involvement in collisions?*

It was stated by one of the banks that an overall awareness of a transaction enables them to disposition each escalation on its merits, rather than a boilerplate risk profile approach. Another bank mentioned that applying thresholds to cover certain risk typologies, like STS operations and dark activity, is difficult due to the inflexibility of a parameter and lack of understanding across all areas of maritime activity. The bank had tried to apply a risk definition for a vessel when the AIS signal was offline. However, the logistics to manage this for a variety of ship types, understanding time periods and the underlying real-time factors of a vessel's heading direction and speed made the process too difficult to implement.

One interesting item of feedback from a major international bank was that risk profiling does not make much sense due to the nature of different customers and the variety of transactions the bank finances. On the other hand, it was recommended for smaller banks, often operating with repeat business, closer customer working relationships and persistent vessel routes and trading areas, where a risk profile would work better. With smaller budget and resource, a risk profile approach could be more effective as opposed to an analytical approach based on the merits of each and every transaction.

One large oil company revealed that Iranian companies tend to name their vessels similar to large reputable companies in an effort to stay under the radar, something that compliance teams need to be aware of. Another example provided by the oil firm noted that a vessel called 'Miranda' would instantly be blocked by the firm's compliance check because it contains the word 'Iran'. "These matters should be investigated properly during the screening process", the company points out.

One organisation mentioned that changes occurring in trading areas (where the operator does most of its business) in combination with new ownership is a major red flag. Evasion techniques keep evolving. A lot of vessels involved in sanctions evasion do not always go into port due to the risk of being seized. However, AIS being switched off does not always indicate sanctions evasion. Instead, it needs to be researched further to determine what this behavior indicates. One of the evasion methods not talked about widely is the purchase of vessels which were initially sold for scrap. Once a vessel has been put up for scrap it cannot be identified by its IMO number and therefore it does not appear as a live ship. Another issue that has arisen is beneficial ownership information, there is no online footprint of this kind of information and therefore no way for banks to collect it.

One Asia-Pacific bank utilises reports from the United Nations DPRK Panel of Experts to understand vessels with problematic sanctions histories, vessels under investigation and shipping companies and individuals tied to North Korea. The information from the UN report is used to back-test on the bank's book of business to ensure there are no instances of DPRK-linked vessels, companies or individuals in the bank's customer list.

Theme 3: The use of specific contractual language

6.3.a *In contracts with your maritime customers, do you include any of the following language?*

- *The promotion of the continuous broadcasting of AIS throughout the life of the transaction, consistent with SOLAS, especially in areas determined to pose a high-risk for sanctions evasion?*
- *The prohibition of transfers of cargo to client vessels that are not broadcasting AIS in accordance with SOLAS or that have AIS history that indicates manipulation or termination for illegitimate reasons.*

There is limited evidence that banks use any such language in their contracts with their maritime or other industry customers. All banks interviewed stated they do not use specific contractual language in their documentation or conversations with partners on the topic of AIS.

Theme 4: Risks for shipping

6.3.a *What do you see as the biggest risks for shipping? Examples include:*

- *Route (e.g., EU to China which might go through the Persian Gulf)*
- *Travelling near sanctioned countries within 'sanctioned run' distance*
- *Illegal ship to ship transfers*
- *Management of AIS dark positions*

For one of the interviewed banks, it was mentioned that trade-based money laundering red flags include:

- Under- and over-invoicing
- Falsely described goods and services
- Multiple invoicing
- Phantom shipments

In this context, shipping and the risks associated within it were part of a wider series of financial crime screening checks and were not considered to be more problematic than the others. Also, when evaluating risk associated with vessel behaviour, a majority of interviewed banks confirmed that they rely on tools allowing them to track potentially suspicious shipping behaviour, beyond just checking sanctions lists. Tools and software are common in trade finance operations teams.

One noted area of concern in regard to shipping is with independent ship owners. These vessel owners are deemed higher risk as their behaviour does not always follow a set pattern in the way that the major carriers do. Feeder vessels moving goods from a main freight line might involve unusual activity or unwarranted changes to predetermined schedules.

STS monitoring was a common area of concern due to the high-risk nature of oil and bulk cargo shipments. Many banks believe the identification of STS operations, especially those for cargo transfers, are difficult to uncover. One bank had tried to incorporate a model into their compliance screening programme to handle STS activity, but the large number of false positives resulted in this being withdrawn.

The overall theme from banks in the trade finance space was that STS and dark activity in general is not checked on a transactional basis due to a combination of it not being required in certain cases such as container ships and also the inaccurate results it can produce in cases where it is more applicable. One bank also noted that it is not a single check or aspect of shipping which requires attention but a more contextual approach which looks at specific parameters for suspicious activity. For example, important checks to watch-lists, port call history and the vessel's route making logical sense are key foundational checks which all banks can do. The latest OFAC recommendations on AIS and STS require a more sophisticated approach looking at wider details. This is where training courses and continuous learning were thought by interviewees to make a greater impact. Being aware of the secondary aspects of suspicious shipping like the age of a vessel, its current flag nationality or missing identifiers such as the IMO, MMSI or call sign are important to be aware of when seeking to uncover certainty in

deeper sanctions investigations. Instances of MMSI spoofing were found in media reports and defence articles which helped in the educational understanding of the maritime industry. This continuous learning process was also highlighted by another U.S. based bank that added a check to its compliance programme for scrapped or dead vessels having read a news story concerning a vessel that was reported broken up but had ‘come back to life’ in proximity to a Turkish port.

Theme 5: Senior management commitment

6.5.a *Do you have buy-in from senior management when operating or seeking funding for a maritime compliance programme?*

One of the most common issues for banks is manual processes within trade and how this impacts efficiency. One bank mentioned that buy-in from senior leadership is widely available but often funding for software to make the process easier and to help meet OFAC expectations is difficult to achieve. A reliance on free tools or the expertise of trade operations staff with many years of experience was often the go to resource for smaller sized banks.

Elsewhere it was mentioned that outside of management buy-in there has to be a culture of constant learning regarding suspicious vessel activity. Keeping up to date with articles, investigative journalism, thought-leadership pieces, and other reading material on how maritime sanctions can be evaded is an important part of the trade compliance team. Platforms for general trade management are used for back-office purposes ensuring best practice with a variety of datasets.

However, it can be understood that a bank’s exposure on the shipping side could lead potentially to issues faced by the banking sector as a whole in the future. For a number of banks there are gaps in their compliance procedures when closely aligned with the recommendations in the latest OFAC advisories. One small size bank revealed that although the compliance team has been informed of the gaps, no movement was made on supporting and filling those gaps. For banks with low trade volumes and repeat customers the risk is deemed to be low, hence the main reason for continuing as is. For smaller banks, the platforms and specific shipping tracking software and datasets, via third party vendors, are considered to be very expensive in terms of their cost outlay. Every transaction per dollar for managing ship screening checks would probably not make sense in terms of cost from the bank’s side. Equally, the risk of exposure is high due to a reliance on analysts and operators to spot-check issues and instances of fraud.

One message which a number of interviewed banks raised was for there to be more effective use of the ship’s IMO number as an identification tool in compliance screening practices. The addition of the IMO number in SWIFT messaging and screening services was raised as a potential benefit, therefore, removing some of the reliance on vessel name screening. It was further noted that vessel names on the OFAC SDN watch-list are no longer valid due to name changes, the vessel *Dawn Light* stated on the SDN list has been changed to *Ko San*. Ensuring this name change is effectively picked up by screening operators who might be using free, online tools is more difficult without recourse to sophisticated shipping software or a wider roll-out of the IMO number as a primary data identifier.

Recommendations

Understanding the intricacies of shipping, will ensure sanctions compliance frameworks at banks are driven by facts. A better cross-sector understanding across maritime, finance, freight and other areas will arm trade professionals with practical knowledge they can use to ensure FI risk resources are utilised when needed, and false red flags, e.g., with respect to AIS outages are properly assessed and acted on. Knowing that, for example, a ULCC ship can transfer 1 gallon of crude in a minimum of 3 hours will tell you that an AIS outage of four hours is a flag to investigate. Knowing where the vessel is, who owns it, its historical activity, and, importantly, what is the AIS status at that moment will provide a well-educated trade professional with the tools to assess whether a red flag requires further investigation.

There is a number of free resources that can be used online (OFAC SDN list⁵⁹, UN sanctions list⁶⁰ and port authorities' websites for scheduled arrivals⁶¹).

As already mentioned, AIS outages should not always constitute a reason for further investigation. If the outage of AIS is less than an average of ten hours, it should not be considered a red flag. However, other parameters should be taken into account, for example, the vessel's overall behaviour, its history, possible complex ownership and the port visit history. Port visit history allows for the sourcing of port of load and discharge information. Via the world port source website⁶² it is possible to find the relevant port authority's details that will provide you with a short history of the vessel's movement at the port.

It is important for every bank to make sure its staff have awareness of the shipping industry in relation to trade finance, such as what ships carry which goods, the understanding of AIS in regard to the data it transmits and how they can be manipulated, understand the route/ journey planning of individual vessel types, for instance, containers which generally sail a scheduled journey whereas an oil tanker can change midcourse.

Performing these checks can be done in a relatively short space of time and in a number of cases can be managed using free websites. However, AIS outages and identifying suspicious STS operations requires more sophisticated third-party data vendors for analysis. Such platforms can provide answers in this regard in a matter of seconds. Free resources on the internet are helpful in terms of giving operations staff general pointers but won't allow them to do screening checks at speed and with the best accuracy.

The following table (Table 7) offers a series of recommended base-line checks that can be conducted using widely available maritime data.

59. OFAC, 'Sanctions List Search', OFAC, [website/ search engine], <https://sanctionssearch.ofac.treas.gov/> (as accessed November 2021)

60. United Nations Security Council, '1718 Designated Vessels List', United Nations Security Council, [website], <https://www.un.org/securitycouncil/sanctions/1718/materials/1718-Designated-Vessels-List> (as accessed November 2021)

61. Port of Rotterdam Arrival and Departures, see <https://www.portofrotterdam.com/en/operational-information/arrival-and-departures> (as accessed November 2021)

62. World Port Source, see <http://www.worldportsource.com/ports/region.php> (as accessed November 2021)

Table 7: Recommendations for base-line checks for sanctions compliance using maritime and other data

Resources and Examples	Considerations
Watch Lists	
<ul style="list-style-type: none"> • Vessel name and IMO number on local and global sanctions lists • United Nations Panel of Experts Reports for DPRK and other countries • Think-tank ‘long reads’ • Pseudo-designations: OFAC advisories on sanctions risks related to shipping petroleum to sanctioned countries, including non-exhaustive lists of vessels that delivered oil to sanctioned countries 	<p>For those with limited budgets and resources the detail and level of data around sanctioned watch-lists such as OFAC’s SDN list provides an opportunity to maximise basic intelligence within a compliance programme.</p> <p>UN annual reports⁶³ from the DPRK Panel of Experts provide a wealth of information on vessels that have been involved or continue to be involved with sanctions evasion activity. These vessels can be used to create an internal list for screening purposes, ensuring they are captured appropriately if appearing in customer transactions. Many of the vessels identified by the UN are not necessarily sanctioned by OFAC.</p> <p>Those ships which are designated appear on many government websites such as OFAC’s SDN list and can be checked directly.</p> <p>The IMO number is a key determinant of vessel tracking and maritime sanctions management. While the IMO number is rarely available on a transportation document, it makes sense where possible to use it. The IMO number will prevent instances where multiple vessels with the same name such as Emma lead to the tracking of the wrong ship. Existing IMO numbers can be found on the IMO website.⁶⁴</p> <p>Think-tank resources also provide insightful thought pieces on ship tracking and actors involved in direct trade with North Korea, Iran, and Venezuela. C4ADS⁶⁵ based in the U.S. released ‘long read’ documents in 2021 with numerous examples of vessels with related suspicious activity. Again, this style of document can act as a resource for the extraction of vessels and owners for a curated, internal grey or blacklist of ships.</p> <p>OFAC advisories⁶⁶ which contain lists of vessels that delivered products to sanctioned countries, such as Syria or Iran, are another factor to determine a vessel’s risk. Examples are the 2018 and 2019 OFAC advisories to the Maritime Petroleum Shipping Community. While these advisories are not legally binding, they include a list of vessels, some of which are included in OFAC’s SDN list – leaving the other non-designated vessels in legal ambiguity. From a risk perspective, these advisories have been viewed by some in the market as having effectively issued pseudo-designations for activity that was not definitively sanctionable. Although the advisories state that inclusion of a vessel in its annex “does not constitute a determination by OFAC that the vessel has been identified as property in which a blocked person has an interest”, the parallel inclusion of previously sanctioned vessels and vessels owned by blocked entities perhaps sends a conflicting message. It appears to confer a special degree of risk upon the entire list of vessels without fully clarifying whether firms should continue to conduct business with such suspect entities.⁶⁷</p>

63. United Nations Security Council, ‘S/2021/777’, *United Nations Security Council*, [website], [8 September 2021] <https://undocs.org/S/2021/777> (as accessed November 2021)

64. IMO, ‘IMO Ship Identification Number Scheme’, *IMO*, [website], [no date], Circular letter No.1886/Rev.5, <https://www.imo.org/en/OurWork/MSAS/Pages/IMO-identification-number-scheme.aspx> (as accessed November 2021)

65. Boling, A., Kuo, L., Snyder L., Sung L., ‘Unmasked Vessel Identity Laundering and North Korea’s Maritime Sanctions Evasion’, *C4ADS*, [website], [no date] <https://c4ads.org/unmasked> (as accessed November 2021)

66. https://home.treasury.gov/system/files/126/syria_shipping_advisory_11202018.pdf and https://home.treasury.gov/system/files/126/iran_advisory_09032019.pdf

67. Beaulieu, B., ‘Compliance on the High Seas: Disserting OFAC’s Maritime Shipping Advisories To-Date’, *ACSS*, [website], [22 February 2020], <https://sanctionsassociation.org/compliance-on-the-high-seas-dissecting-ofacs-maritime-shipping-advisories-to-date/> (as accessed November 2021)

Resources and Examples	Considerations
Visibility	
<ul style="list-style-type: none"> • AIS outages and gaps • Areas and seas with more risk than others • Understanding the time factor of an AIS outage and calculating sufficient time for the vessel to undertake sanctions evasion activity in the time it is 'dark' • Patterns of 'dark' activity in the ship's history? In other words, is it a one-off or something with more regularity? 	<p>AIS outages are an issue when aligned with high-risk areas such as the Persian Gulf, the South China Sea, the Yellow Sea, the Gulf of Tonkin, and the Caribbean Sea (Venezuela). As AIS outages usually align with a port call or STS operation, seas, and zones such as the North Sea, the Baltic Sea, the Gulf of Mexico, and the Timor Sea, which are out of proximity to sanctioned countries and their satellites are potentially areas and zones of lower risk.</p> <p>The number of days a vessel is 'on' AIS in a twelve-month period can offer a significant insight into activity patterns. Vessels often produce patterns and significant segments of 'dark' activity which can highlight non-compliant ship movements. Individual instances of short periods of AIS outage are common and do not necessarily provide insight as a standalone parameter.</p> <p>Dark activity must be viewed within the wider lens of a port call or STS. The time period for a port call or an STS by an oil tanker or bulk vessel is considerable. A single STS operation can take on average between 10 to 15 hours. Therefore, AIS outages of more than 10 hours may require enhanced due diligence as smaller time gaps would not allow for a vessel to enter and leave port or transfer cargo to another.</p> <p>Deviations on 'dark periods' based on a ship type average – there will be an average time-period that, for example, an oil tanker will have an active AIS signal. As a calculation a complete understanding of the global oil tanker fleet will provide a figure for the average number of days per twelve-month period such a vessel type is visible on AIS. This number could be 330 days per annum, a vessel of a similar type that is short of this number could be deemed higher risk.</p>
Route	
<ul style="list-style-type: none"> • Load and discharge port locations • Port authority websites • Irregular voyage movements such as detours and indirect routes • Certain locations and jurisdictions have more risk than others. For example, routes from North West Europe to North America could be concluded to be low-risk. A route from Yantian, China to Long Beach, U.S. might constitute a higher degree of risk • Change in draught in high-risk or sanctioned territories: screen for port calls and catalogue draught changes especially against sanctioned ports 	<p>A number of major terminals with importance to the global economy are in high-risk areas. Basra, Iraq is an example of an oil terminal in the Persian Gulf with close proximity to similar Iranian ports. Understanding port location and the risks associated with it and the route to get there is an important risk attribute.</p> <p>Which trading areas does the vessel conduct the majority of its movements and business. Are there any instances of the vessel 'stepping out' of this pattern? A vessel's movement history can offer insight into areas and zones where most of her activity takes place.</p> <p>Vessels carrying cargo from China to Europe will navigate through areas of concern such as the South China Sea, strait of Malacca and the Persian Gulf for instance with many opportunities for transshipment or STS.</p> <p>For the management of ship tracking and port calls, port authority websites are a good resource as they offer scheduled visit times and a short history of movements within their boundaries.</p>

Resources and Examples	Considerations
Owners & Operators	
<ul style="list-style-type: none"> Changes to ownership structures and complex layers For example, a vessel has 7 separate levels of ownership – in many cases there can be a disparate number of companies with a circuitous ownership linkage to the original ship 	<p>The full list of vessel owners should be known and screened for compliance purposes. Free, on-line resources to manage this area of compliance are hard to come by, therefore, sophisticated vessel software or screening tools are needed to analyse this risk factor.</p> <p>Areas of risk include the following:</p> <ul style="list-style-type: none"> Multiple ownership changes in a short space of time, Owners with single vessel fleets Non-commercial addresses used by corporates Hidden sanctions risk through subsidiary and distant business relationships and potential breaches of the OFAC 50% rule
Vessel Name	
<ul style="list-style-type: none"> Frequent name changes 	<p>Periodic and frequent name change activity should be a cause for concern when screening vessels. While this would not constitute a serious red flag as a stand-alone attribute, when considered with others it can add weight to a compliance case. A change in the vessel's name primarily happens due to a change of ownership. A change in name and flag only might indicate other activities which FIs would have to observe and examine carefully.</p>
Registered Flag	
<ul style="list-style-type: none"> Unknown and Flags of Convenience 	<p>A vessel's nationality can be found online through the use of internet search engines.</p> <p>Flags of convenience are not high-risk attributes but can be a factor when assessed with other elements such as AIS outages or long periods of drifting in high-risk jurisdictions.⁶⁸</p> <p>An unregistered vessel should be viewed as high-risk.</p> <p>The swapping of flags in quick succession can be viewed as high-risk especially if these are flags of convenience or if completed at the time of a vessel name change or ownership change.</p>

68. ITF, 'Flags of Convenience', ITF, [website], [no date], <https://www.itfglobal.org/en/sector/seafarers/flags-of-convenience> (as accessed November 2020)

Resources and Examples	Considerations
Cargo Analysis	
<ul style="list-style-type: none"> Understanding the goods being shipped 	<p>Economic sense checks can be conducted on ships and cargo. This type of check does require specific datasets and the introduction of models and algorithms to conduct this output. Some examples of checks would be based on the following questions:</p> <ul style="list-style-type: none"> Does the vessel have the capacity to carry the stated cargo? Is the vessel of an acceptable size for the intended cargo? Does the port of call have the facilities to handle such a cargo discharge? Ensure that the cargo could be carried by the actual vessel stated on the transportation document. For example, iron ore shipped on a bulk vessel and not on a products tanker or industrial machinery transported on general cargo vessels and not on a Ro-Ro (Roll on/Roll off) ship, designed to carry wheeled cargo
IMO Number & Other Vessel Characteristics	
<ul style="list-style-type: none"> Type and age of vessel Obscured or manipulated International Maritime Organisation (IMO) numbers 	<p>Older vessels especially those in the tanker and bulk fleets, have been commonly witnessed to be more likely to engage in sanctions activity. North Korea has often purchased older vessels and used these as feeder ships for the purpose of transferring coal and oil in STS operations.</p> <p>Compared to oil tankers the containership fleet is lower risk in terms of sanctions evasion.</p>
Business partners and other players in the supply chain	
<ul style="list-style-type: none"> Forwarders, charterers, insurers, banks, traders and brokers 	<p>The maritime industry is diverse covering many different sub-industries that undertake certain practices within the global supply chain. The OFAC Shipping advisory of May 2020 included a section titled 'Annex A' which covers the various agencies involved in shipping, ranging from brokers, port authorities, flag registries, ship captains, vessel owners, crewing organisations, and others. OFAC guidelines for each of these industries differs in range and scope.</p> <p>A number of organisations within each of these maritime sub-industries will manage or collect data which could ultimately be of use to FIs.</p> <p>Understanding who owns a particular item of information can make such information accessible or help ease the burden of compliance screening and prevent low-level due diligence checks escalating into time-consuming enhanced investigations.</p>



Resources and Examples	Considerations
Shipping Documentation	<p data-bbox="532 714 1489 785">A commonly used approach to sanctions evasion is the falsifying of documentation which could accompany maritime transactions. These include:</p> <ul data-bbox="532 802 792 936" style="list-style-type: none"> <li data-bbox="532 802 581 831">• BL <li data-bbox="532 848 646 877">• Invoices <li data-bbox="532 894 792 936">• Insurance paperwork <p data-bbox="532 953 1489 1054">By providing falsified documentation, the aim of the illicit actor is to seek to obscure the origin of a vessel, its goods, its destination and even the legitimacy of the vessel itself.</p> <p data-bbox="532 1071 1489 1239">Suspected fraudulent LCs, BLs, loans and other types of financial instruments should always be checked with the relevant institution for validity. Clauses within the letter of credit, loan and other types of financial instrument should also be assessed prior to agreement, as should the validity of insurance documents, bills of lading and cargo lists.</p> <p data-bbox="532 1255 1489 1327">A particular type of BL, namely a ‘charter party BL’ may, at times, raise a red flag, in particular in combination with links with the higher risk oil industry.</p> <p data-bbox="532 1344 1489 1415">A red flag that you are dealing with a Charter Party BL instead of a marine BL, are clauses such as:</p> <ul data-bbox="532 1432 1143 1598" style="list-style-type: none"> <li data-bbox="532 1432 1143 1461">• “Prepayable freight paid as per charter party dd [...]” <li data-bbox="532 1478 1055 1507">• “Freight payable as per charter party dd [...]” <li data-bbox="532 1524 769 1554">• “Freight as agreed” <li data-bbox="532 1570 1065 1598">• “Bill of lading to be used with charter parties”



Conclusion

In commercial shipping, AIS has become an ubiquitous tool used in a number of multiple scenarios. Although initially intended to enhance maritime safety it has now become a solution with many advantages not only for the shipping industry and its ecosystem but also other industries. In the risk and compliance scenario, AIS has become a major tool advocated by various agencies such as the United Nations and OFAC as a monitoring application with which to identify or classify vessels of risk. As this paper has outlined, AIS possesses a number of weaknesses such as the ability to manually disable it and the effect certain weather patterns can have on its accuracy but these do not necessarily minimise its effectiveness as a risk management tool. Despite these weaknesses AIS retains a positive component and a key element in identifying sanctions evasion. Many vessels and ship owners who have been added to sanction watch-lists have been included due to the use of AIS as a mechanism to understand historical profiles and to ‘catch in the act’ these ships who have engaged with illicit trade patterns.

The advisories published by OFAC and OFSI place greater emphasis on the need to investigate ship movements and activities in high-risk areas through the use of AIS. The advisories are not only sector specific but also predominately AIS focused urging FIs to focus on vessel and movement monitoring, investigate AIS outages, assess historical AIS data and as a result introduce to their maritime customer contractual language and provisions in regard to AIS. In order to comprehend the advisory recommendations and the challenges around managing vessel risk, a full understanding of AIS technology, the kind of data it transmits, and the subsequent manipulation of such data are key requirements.

Financial institutions are being asked to comply and manage better their obligations towards maritime customers. Through the interviewing of banks and discussing their current operational processes used within the trade finance sector, the Working Group has concluded that, the interrogation of AIS outages and STS transfers, is indeed a time consuming and intensive process that banks are asked to perform. Equally, there are specific ways to help minimise this with the grading of transactions with maritime risk into standard due diligence or enhanced due diligence screening checks. Many banks already employ such strategies to help them concentrate on the ‘real’ issues as part of a contextual risk scoring process to help them filter out transactions or entities of low concern.

AIS outages do not always constitute a red flag. One of the key recommendations from this paper is that small and infrequent AIS outages do not necessarily require further enhanced investigation. AIS outages of short time periods could be affected by the antenna design, traffic congestion and the height and distance from the monitoring area. Infrequent short outage periods should not be the

concern of internal screening processes or an implication that a breach of international sanctions has taken place. One of the main recommendations from this paper is for FIs and others to be cognisant of the time taken to perform a full STS or to make a port call. Both operations are not swift actions as they require certain administrative functions to be performed before they can be carried out. For example, a port call requires a likely anchorage wait, piloting into the berth and terminal and the load or discharge of goods. The time required to undertake such an activity implies that conducting this in breach of international sanctions, while AIS is disabled, would require a significant number of hours for full completion. This is an important factor to consider when analysing AIS outages or STS activity for sanctions risk purposes.

The overall screening process can be supported by a number of benefits AIS provides. The tracking of multiple vessels at both shoreline and deep ocean, data availability in raw, real time, consumable format and in relation to outages when taken into consideration with other data and information, AIS is fairly effective and efficient to determine a red flag or a justified outage.

Most importantly it is beneficial to understand and interpret the various vessel activities in the correct way in order to avoid transactional risks. There is only one way of implementing this process, and this is by considering a series of different steps. At first it is crucial to check for available resources. There are a number of free resources but also specialist data providers that provide the option of using an IMO number or vessel name to generate a compliance fact-sheet. A range of different vessel tracking software has become available in the market for real-time AIS monitoring with some instances of sophisticated vendors or free-to-air services online. These paid for solutions could be extremely helpful for banks with high transactional volumes that require a more automated approach to screening. The free online tools and websites can only offer limited information in relation to the vessel's identity, name and ownership due diligence checks. It is important to remember, that the free online resources cannot assist with an enhanced due diligence programme with respect to shipments especially in areas that present high risk.

It is also advised that all banks review thoroughly all documents, check their authenticity and check the information contained within them is correct. Foundational checks on the client and the vessel are easy to do by all banks. In terms of more sophisticated checks that allow for further investigation it is important that staff are trained accordingly and in line with current OFAC recommendations in order to effectively implement on a day-to-day basis the bank's compliance programme.

Management commitment and internal auditing will allow for the right procedural processes to be put in place, ensure staff are competent when carrying out their tasks, there are no inconsistencies or weaknesses within the organisation's compliance programme, and there is good and orderly record keeping.

Definitions & Abbreviations

AIS	The Automatic Identification System (AIS) is an automatic tracking system that allows the transmission of a ship's position. The 2002 IMO SOLAS Agreement mandates the use of an AIS transceiver in vessels larger than 300GT engaging in international voyages.
BL	The Bill of Lading (BL) is a legal document issued by a carrier to a shipper in order to acknowledge receipt of cargo for shipment.
COLREG	The Convention on the International Regulations for Preventing Collisions at Sea (COLREG) was adopted in October 20, 1972 by the IMO and was entered into force in July 15, 1977.
DWT	Deadweight tonnage (also known as deadweight; abbreviated to D.W.T., d.w.t., or dwt) or tons deadweight (DWT) is a measure used since 1969 of how much weight a ship can carry, not its weight empty or with any sort of load. It is the sum of the weights of cargo, fuel, fresh water, ballast water, provisions, passengers and crew.
FoC(s)	International law requires that every ships is registered in a country, called its flag state. Flag(s) of Convenience (FoCs) are known as flags of certain countries under which a ship is registered with the intention of avoiding financial charges or restrictive regulations in the owner's country.
GMDSS	The Global Maritime Distress and Safety System (GMDSS) was established in 1988 by the IMO and establishes the radiocommunications systems that ships are required to carry on board and how to use and maintain it. In addition, it establishes the shore-based facilities in support of GMDSS communications.
GRT	Gross Registered Tonnage is a vessel's total internal capacity.
GT	Gross tonnage (GT, G.T. or gt), used since 1969, is a nonlinear measure of a ship's overall internal volume. Not to be confused with measures of mass or weight of the ship such as deadweight tonnage or displacement.
IMO Number	The International Maritime Organisation (IMO) number is a unique seven-digit number used for vessel reference and identification, and also registered ship-owners and management companies. The identification system was introduced by the IMO in 1987 and each number is assigned by IHS Markit.
ISM	The International Safety Management Code (ISM) was adopted by the IMO and integrated as a part of the SOLAS Convention in 1994. Th purpose of the ISM Code is to ensure safety for seafarers and promote pollution-free practices in shipping.
LNG	A Liquefied Natural Gas (LNG) carrier is a tank ship designed for the transportation of liquefied natural gas.
LPG	A Liquefied Petroleum Gas carrier is a gas carrier (or gas tanker) vessel designed for the transportation of liquefied petroleum gas in bulk.
LRIT	The Long Range Identification and Tracking (LRIT) system is designated by the IMO as an international system in May 2006 in order to collect vessel position information. Member states should ensure that a minimum of four position messages per ship per day are sent.

MARPOL	The International Convention for the Prevention of Pollution from Ships (MARPOL) was adopted in November 1973 and covers pollution prevention of the marine environment by ships from operation and accidental causes.
MEPC	The Marine Environment Protection Committee (MEPC) is a subsidiary body of the IMO and consists of all member states. The MEPC undertakes all environmental issues that affect under water ecosystems, ashore and air.
MMSI	The Maritime Mobile Service Identity number (MMSI) is a unique nine-digit identification number assigned to all AIS systems and VHF electronics on board a vessel. The first three letters of the number represent the vessel's nationality, in cases where the vessel changes flag or is being sold the vessel will be allocated a new MMSI number.
MSC	The Maritime Safety Committee (MSC) is the highest technical body of the IMO and deals with all matters related to maritime safety and security that fall within the scope of the IMO.
Nt	Net Tons (NT, N.T., or nt) replaced the earlier adopted Nrt, is a unitless system used to calculate port duties by measuring a ship's internal volume.
RISC	Registry Information Sharing Compact (RISC) is an agreement between the largest ship registries, including Panama and has the potential to make it difficult for vessels to change their registration and easier for those in the maritime space to conduct due diligence.
SAR	The International Convention on Maritime Search and Rescue (SAR) was adopted in 1979 by the IMO. The main purpose of the convention is that no matter where an accident takes place in the world, the rescue of person(s) in distress at sea will be coordinated by a SAR organisation (or multiple) according to the international SAR plan.
SDN List	The Specially Designated Nationals [and blocked persons] list is a list of individuals and companies owned and controlled by, or acting on behalf of targeted countries, published and regularly updated by OFAC.
Ship Type	<p>Based primarily on the vessel's trading purpose, size and type of cargo, ships are mainly classified into Container Ships, Bulk Carriers, Tanker Ships, Passenger Ships, Naval Ships, Offshore and Special Purpose Ships.</p> <p>Bulkers or Bulk Carriers are ships specially designed to transport unpackaged bulk cargo, such as grain, coal, ore, steel coils and cement.</p> <p>Container ships are designed to carry cargo in truck-size intermodal containers. Some of the main types based on their size are Panamax, Suezmax, Post-Panamax, Post-Suezmax, Post-Malaccamax.</p> <p>Feeder vessels are medium-size freight ships with an average capacity of 300 to 100 TEUs.</p>
SOLAS	The International Convention for the Safety of Life at Sea (SOLAS) was adopted by the IMO initially in 1914 in response to the <i>Titanic</i> disaster. The SOLAS Convention and its successive forms, nowadays broadly known as SOLAS 1974 (as amended) is regarded as the most important international treaties concerning the safety of merchant ships.

STS	Ship-to-ship (STS) transfer is the process of transferring cargo between two seagoing vessels positioned next to each other with most common cargoes being crude oil, bulk and petroleum products.
Tanker Ships	Tanker ships are designed to carry liquid cargo (such as crude oil, petroleum, alcoholic beverages etc) and are sub-divided into different types based on the type of cargo they carry. Tanker ships are mainly classified into Suezmax, Panamax, Aframax, VLCC, ULCC, Handymax, Capesize. Further types include Oil Tankers, LPG, LNG, Chemical and Product Carriers.
TEU	Twenty-foot equivalent unit; the standard maritime container with external measurements 20 feet (6.1 m) long, eight feet (2.4 m) wide and eight-and-a-half feet (2.6 m) high; Mega Container Ship is container ship able to carry more than 18,000 TEUs. Giga Container Ship is a container ship carrying more than 20,000 TEU containers.
ULCC	Ultra Large Crude Carrier
VLCC	Very Large Crude Carrier

Chronology

Detailed timeline of relevant landmark events

23/04/2021	<i>M/T Courageous</i> (IMO: 8617254) an oil products tanker, found to have made illicit deliveries of petroleum products through ship-to-ship transfers with North Korean vessels and direct shipments to the North Korean port of Nampo. ⁶⁹
01/12/2020	UK's Office of Financial Sanctions Implementation (OFSI) release a guidance document on 'Financial sanctions guidance for entities and individuals operating within the maritime shipping sector'. ⁷⁰
14/05/2020	Joint advisory publication from OFAC, the Department of State and the U.S. coastguard - Sanctions Advisory for the Maritime Industry, Energy and Metals Sectors, and Related Communities, entitled 'Guidance to Address Illicit Shipping and Sanctions Evasion Practices'. This advisory provides recommendations to FIs, commodity traders, flag states, port authorities and others with an emphasis on the monitoring of AIS transmission outages as a key shipping practice used to evade sanctions. ⁷¹
27/01/2020	Eagle Shipping International (USA) LLC, agreed to pay \$1,250,000 settlement in relation to a cargo consignment with a shipper listed on OFACs SDN list. ⁷²
04/09/2019	OFAC Advisory to the Maritime Petroleum Shipping Community relating to 'Sanctions Risks Related to Shipping Petroleum and Petroleum Products from Iran'. Lists deceptive shipping practices undertaken by Iranian tanker vessels along with mitigation measures. ⁷³
04/07/2019	UK Navy seizure of the Iranian flagged vessel <i>Grace I</i> on suspicion of illegally transporting crude oil to Syria. ⁷⁴
09/05/2019	The <i>Wise Honest</i> (IMO 8905490) a North Korean bulk, was used to illicitly ship coal from North Korea and to deliver heavy machinery to the DPRK. ⁷⁵

69. Department of Justice, U.S. Attorney's Office, 'U.S. Government Seizes Oil Tanker Used To Violate U.S. And U.N. Sanctions Against North Korea', *Department of Justice, U.S. Attorney's Office*, [website], [April 23, 2021], <https://www.justice.gov/usao-sdny/pr/us-government-seizes-oil-tanker-used-violate-us-and-un-sanctions-against-north-korea> (as accessed November 2021)

70. HM Treasury Office of Financial Sanctions Implementation, 'Maritime Guidance Financial sanctions guidance for entities and individuals operating within the maritime shipping sector', *OFSI*, [website], [December 2020], https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/948299/OFSI_Guidance_-_Maritime_.pdf (as accessed November 2021)

71. U.S. Department of the Treasury, 'Sanctions Advisory for the Maritime Industry, Energy and Metals Sectors, and Related Communities', *U.S. Department of the Treasury*, [website], [May 2020], https://home.treasury.gov/system/files/126/05142020_global_advisory_v1.pdf (as accessed November 2021)

72. U.S. Department of the Treasury, 'Enforcement information for January 27, 2020', *U.S. Department of the Treasury*, [website], [January 2020], https://home.treasury.gov/system/files/126/20200127_eagle.pdf (as accessed November 2021)

73. U.S. Department of the Treasury, 'OFAC Advisory to the Maritime Petroleum Shipping Community', *U.S. Department of the Treasury*, [website], [September 2019], https://home.treasury.gov/system/files/126/iran_advisory_09032019.pdf (as accessed November 2021)

74. Gupte, E., Jumaat, N., 'Iranian tanker released by Gibraltar sailing towards Greece: cFlow', *S&P Global*, [website], [19 August 2019], <https://www.spglobal.com/platts/ko/market-insights/latest-news/shipping/081919-iranian-tanker-released-by-gibraltar-sailing-towards-greece-cflow> (as accessed November 2021)

75. Department of Justice, U.S. Attorney's Office, 'North Korean Cargo Vessel Connected to Sanctions Violations Seized by U.S. Government', *Department of Justice, U.S. Attorney's Office*, [website], [9 May 2021], <https://www.justice.gov/opa/pr/north-korean-cargo-vessel-connected-sanctions-violations-seized-us-government#:~:text=The%20Wise%20Honest%2C%20one%20of,heavy%20machinery%20to%20the%20DPRK.&text=%E2%80%9CToday's%20civil%20action%20is%20the,%2C%E2%80%9D%20said%20U.S.%20Attorney%20Berman> (as accessed November 2021)

02/05/2019	Mid-Ship Group, negotiated charter party agreements with a number of organisations which moved goods on nominated ships owned by Islamic Republic of Iran Shipping Line (IRISL) vessels. All vessels were listed on OFAC's SDN watch-list, a subsequent fine was issued for \$871, 837. ⁷⁶
15/04/2019	UniCredit Bank AG agreed to pay a settlement amount of \$611,023,421 for managing accounts on behalf of the Islamic Republic of Iran Shipping Lines (IRISL) and affiliated companies; Ashtead Shipping and Fairway Shipping. ⁷⁷
25/03/2019	OFAC Advisory to the Maritime Petroleum Shipping Community, 'Sanctions Risks Related to Petroleum Shipments involving Iran and Syria'. Lists a non-exhaustive set of vessels that delivered petroleum products to Syrian ports or engaged in STS activity of oil cargo destined for Syria. ⁷⁸
21/03/2019	OFAC's second North Korea shipping advisory, 'Updated Guidance on Addressing North Korea's Illicit Shipping Practices'. ⁷⁹
12/12/2018	Yantai Jereh Oilfield Services Group Co., Ltd., agreed to pay \$2,774,972 for the transportation and shipment of oilfield supplies and equipment to Iran via China ⁸⁰
23/02/2018	OFAC's North Korea sanctions advisory notice 'Sanctions Risks Related to North Korea's Shipping Practices' released.. ⁸¹
20/09/2017	No vessel in which a foreign person has an interest that has called at a port in North Korea within the previous 180 days, and no vessel in which a foreign person has an interest that has engaged in a ship-to-ship transfer with such a vessel within the previous 180 days, may call at a port in the United States. ⁸²
February 2017	As per the BAFT/ TCH Sanctions working group: [...] no violation of ITSR, other comprehensive sanctions regimes, or blocking requirements for port or shipment infrastructure owned by a blocked person in any scenario involving cargo onboard a vessel that transits through territorial waters or even calls on a port in a sanctioned territory unless there is some sort of Customs Entry into the sanctioned country. If the goods have never entered the sanctioned country's commerce, there should be no violation of OFAC regulations, even if the vessel on which the goods are shipped stops in a sanctioned port, and even if the goods are moved from one vessel to another while in that port, but did not otherwise come in "contact with" the sanctioned country. ⁸³

76. U.S. Department of the Treasury, 'Enforcement information for May 2, 2019', *U.S. Department of the Treasury*, [website], [2 May 2019] https://home.treasury.gov/system/files/126/20190502_midship.pdf (as accessed November 2021)

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22/02/2016	CGG Services S.A., formerly known as CGGVeritas S.A. (“CGG France”), has agreed to pay \$614,250 for shipping various items and goods on three vessels that operated in Cuban territorial waters. ⁸⁴
24/07/2015	Great Plains Stainless Co. (GPS) of Tulsa, Oklahoma, has agreed to pay \$214,000 for the shipment of goods onboard a blocked property vessel, the <i>M/V Sahand</i> . ⁸⁵
19/06/2015	John Bean Technologies Corporation (“JBT”), of Chicago, Illinois, has agreed to pay \$391,950 for transporting goods that sold to a Chinese company on a vessel owned and operated by Islamic Republic of Iran Shipping Lines (IRISL) from Spain to China. ⁸⁶
31/03/2014	GAC Shipping (USA), Inc., of Philadelphia, Pennsylvania, on behalf of GAC Bunker Fuels (USA) LLC (“GAC”), of Houston, Texas, has paid \$157,500 to settle a case where GAC supplied bunker fuel to an Iranian vessel. ⁸⁷
21/03/2013	Maritech Commercial Inc. (“Maritech”), Kenner, LA, agreed to pay \$20,800 for providing inspection services to Iranian vessels that were operating under false names. Maritech did not investigate and screen the IMO numbers which would have given information as to the real identity of the vessel. ⁸⁸
01/11/1974	Adoption of the International Convention for the Safety of Life at Sea (SOLAS 1974 as amended). ⁸⁹
02/11/1973	Adoption of The International Convention for the Prevention of Pollutions from Ships (MARPOL). The 1973 MARPOL Convention was modified by the Protocol of 1978. The combined MARPOL 73/78 entered into force in October 2, 1983. ⁹⁰
07/07/1978	Adoption of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW). The convention entered into force in April 28, 1984. ⁹¹

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Appendix 1: Holders of Unique Maritime Information

There are several organisations and agencies that manage and maintain ‘sources of truth’ within the maritime space. Understanding the different roles played in shipping will help in the formulation of a sanctions’ compliance programme allowing it to be effective and potentially reduce the overheads of future complexity and questioning.

Organisation	Overview
ACSS	The Association of Certified Sanctions Specialists (ACSS) is a professional membership body for sanctions professionals worldwide. It was formed to advance sanctions compliance by supporting the professional development of the individuals who lead those efforts.
BAFT	Bankers Association for Finance and Trade.
BIMCO	The Baltic and International Maritime Council Organisation (BIMCO) is one of the largest international shipping associations representing shipowners. BIMCO is a non-governmental organisation which was founded in 1905.
CDI	The Chemical Distribution Institute (CDI) is responsible for the inspection and audit of the global supply chain for the transport and storage of bulk and packaged chemicals.
IACS	The International Association of Classification Societies (IACS) was founded in 1968 that consist of twelve member classification societies; American Bureau of Shipping (ABS), Bureau Veritas (BV), China Classification Society (CCS), Det Norske Veritas (DNV), Germanischer Lloyd (GL), Indian Register of Shipping (IRS), Korean Register of Shipping (KRS), Lloyd’s Register of Shipping (LRS), Nippon Kaiji Kyokai (NKK), Registro Italiano Navale (RINA), Russian Maritime Register of Shipping (RMRS). Their mission is to assist international regulatory bodies and standard organisations to develop, implement and interpret statutory regulations and industry standards in ship design, construction and maintenance with a view to improving safety at sea and prevention of marine pollution.
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
ICS	The International Chamber of Shipping (ICS), London, UK was founded in 1921 and its purpose is to represent national shipowners’ associations and advise on international policies.
IGP&I	Protections and Indemnity insurance (P&I) is a form of mutual maritime insurance offered by P&I Clubs. The International Group of P&I Clubs (IGP&I) is a club that allows all member clubs, even though individually competitive, to share knowledge and expertise. Clubs provide a wide range of liabilities and services to their members.
IHO	The International Hydrographic Organisation (IHO) was founded in 1921. The IHO’s aim is to create a global environment in which States provide adequate, standardized, and timely hydrographic data, products and services and ensure their widest possible use.
IHS Markit	IHS Markit was formed in 2016 with the merger of IHS Inc. and Markit Ltd. IHS Markit is responsible for assigning vessels’ IMO number for those in excess of 100GT, manage the network of company registrations for a vessel and conduct an annual hull and flag assessment for all ships.

ILO	The International Labour Organisation (ILO) is a United Nations agency promoting social justice and decent work. The ILO was formed in 1919.
IMO	The International Maritime Organisation (IMO), London, UK is a UN agency responsible for regulating shipping. The IMO was established in 1948 and has currently 174 member states and three associate members.
INMARSAT	Inmarsat, a British satellite telecommunications company, was set up in 1979 by the IMO to enable ships to stay in constant touch with the shore or to call for help in an emergency. The present company originates from the International Maritime Satellite Organisation, a non-profit intergovernmental body of the IMO.
INTERCARGO	The International Association of Dry Cargo Shipowners (INTERCARGO) provides the forum where dry bulk shipowners, managers and operators are informed about, discuss and share concerns on key topics and regulatory challenges, especially in relation to safety, the environment and operational excellence. The Association takes forward its Members' positions to the IMO, as well as to other shipping and international industry.
IMB	The International Maritime Bureau (IMB) was established in 1981 and its main goal is to protect the integrity of international trade by monitoring and fighting shipping malpractice. One of IMB's core responsibilities is the authentication of trade finance documentation.
INTERTANKO	The International Association of Independent Tanker Owners (INTERTANKO) is a forum where the industry meets, policies are discussed, and best practices developed. INTERTANKO has been the voice of independent tanker owners since 1970.
OCIMF	The Oil Companies International Marine Forum was formed in 1970 in response to oil pollution. OCIMF produces industry guidance for oil tankers and oil terminals (see International Safety Guide for Tankers and Terminals).
OFAC	The Office of Foreign Assets Control of the US Department of the Treasury administers and enforces economic and trade sanctions based on US foreign policy and national security goals against targeted foreign countries and regimes, terrorists, international narcotics traffickers, those engaged in activities related to the proliferation of weapons of mass destruction, and other threats to the national security, foreign policy or economy of the United States.
OFSI	The Office of Financial Sanctions Implementation (OFSI) was established within the HM Treasury in March 2016 and is responsible for the implementation and administration of international sanctions for the UK.
UNCTAD	The United Nations Conference on Trade and Development (UNCTAD) was established in 1964. UNCTAD aims to strengthen the capacity of developing countries and countries with economies in transition to manage their debt in an effective and sustainable way, in support of poverty reduction, development and good governance.
WCO	The World Customs Organisation (WCO) was founded in 1952 and the main purpose is to provide fair and compliant trade opportunities for country and organisation members.
WTO	The World Trade Organisation (WTO) was founded in 1995 and its main purpose is to regulate and facilitate international trade between nations.

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