The Phantom Fleet
North Korea’s Smugglers in Chinese Waters

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Methodology

For this paper, Project Sandstone relied on a variety of data sources, including Automatic Identification System (AIS) data, high- and low-resolution electro-optical and Synthetic Aperture Radar (SAR) satellite imagery, commercial vessel-build information and photographs of vessels from a variety of platforms.

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RUSI and Project Sandstone would like to thank its partners, without which this work would not have been possible. Windward’s platform greatly enhanced our ability to filter and detect anomalous AIS signals, enabling us to extract, database and analyse these signals. The IHS SeaWeb platform allowed us to cross-reference vessel details and identities against satellite imagery. Maxar Technologies helped Project Sandstone source high-resolution satellite imagery, while Planet Labs also helped us find and extract high- and low-resolution images of various vessels and locations of interest. As always, Polestar Space Applications provided assistance and additional AIS data. We would also like to thank IntSight Global and a number of others for comments, help and advice on this paper, including Tom Plant, Catherine Dill, Leo Byrne and Malcolm Chalmers.
Executive Summary

A NEW INVESTIGATION reveals that a large fleet of North Korean cargo ships continues to deliver coal to China in contravention of UN Security Council (UNSC) resolutions, in what appears to be a large-scale, coordinated effort to evade sanctions imposed on North Korea over its nuclear weapons and ballistic missile programmes.

Starting in January 2019, just days before the fourth Kim Jong-un and Xi Jinping summit in Beijing, North Korean cargo ships began visiting waters around the Chinese islands of Zhoushan, often while transmitting fake details over their Automatic Identification System (AIS) transponders, in violation of international regulations designed to avoid accidents at sea.

The trend was first identified and made public in the UN Panel of Experts (PoE) 2019 interim report, which identified several North Korean vessels in satellite imagery in the waters off Zhoushan during March and May 2019.

While China rejected these findings, stating that the evidence lacked ‘timeliness’ and suffered from ambiguity, information collected and analysed for this report confirms that, not only do North Korean vessels continue to visit this specific region, but they are doing so in unprecedented numbers.

Satellite imagery collected over North Korean ports and islands around Zhoushan confirms that these vessels are loading coal and other resources, before sailing into Chinese waters where a combination of lighters, barges and floating transloading platforms are likely offloading this coal for onward shipment to Chinese terminals.

This large-scale effort to evade UNSC resolutions is occurring only kilometres from one of China’s most important naval facilities and the home of the East Sea Fleet, where a variety of destroyers, frigates, corvettes and electronic surveillance ships are based. In addition, the islands are also home to a number of facilities operated by the Chinese Coast Guard (CCG), the China Maritime Safety Administration (MSA)

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3. Ibid., Annex 1, p. 38.
4. Imagery provided by Planet Labs and Maxar Technologies.
5. Satellite imagery provided by Planet Labs and Maxar Technologies for this report shows lighters close to North Korean vessels loaded with coal. Media reports indicate similar findings made by the UN Panel of Experts (PoE) in excerpts of an unreleased report according to Japan Times, ‘Illicit Imports to North Korea Continues, U.N. Experts Say’, 15 February 2020.
6. Satellite imagery shows a constant military presence close to where North Korean ships loiter – in some cases, Chinese military vessels appear as close as 20 km to the areas where North Korean ships can be found. See Figures 24.
and the Zhoushan Port Authority – institutions tasked with enforcing various aspects of China’s maritime law and which conduct regular patrols in the region.\(^7\)

Despite this, North Korean vessels loaded with coal and other resources continue to sail to the area without being stopped or detained by Chinese authorities,\(^8\) thereby likely enabling them to raise revenue for North Korea’s nuclear and ballistic missile programmes in violation of UNSC resolutions.\(^9\)

\(^{7}\) AIS data provided by Windward shows regular patrols of vessels classified as ‘military’ or ‘law enforcement’ in the Zhoushan area.

\(^{8}\) Satellite imagery acquired by the authors shows vessels loading coal, while their corresponding AIS signals then travel to Zhoushan.

\(^{9}\) Coal is a commodity banned for export by UNSC resolutions. Other reports have shown how coal can be used to fund the North Korean nuclear and ballistic missile programme. See James Byrne et al., ‘Down and Out in Pyongyang and London: North Korea’s Coal Smuggling Networks Using UK Companies’, RUSI, Project Sandstone, Report 4, 26 September 2019.
Introduction

In 2016, the UN Security Council (UNSC) restricted North Korea’s exports of coal and other resources following Pyongyang’s nuclear and ballistic missile tests. Following additional weapons tests conducted by North Korea in 2017, the UNSC adopted Resolutions 2371 and 2397, which applied blanket bans on all coal and iron ore exports from the country. UNSC Resolution 2397 also placed caps on the amount of crude oil and petroleum products permitted for export to North Korea. Coal was one of the first commodities subject to these measures as revenue generated from its export is used to fund North Korea’s WMD programme.

Despite these resolutions, North Korea continues to export coal, iron ore and other resources to foreign countries, employing a number of deceptive shipping practices to disguise these activities. For example, after several North Korean vessels were identified visiting Chinese coal facilities in 2016 and 2017, most of the merchant fleet stopped openly transmitting identity and positional information over its Automatic Identification Systems (AIS) transponders, making its trading patterns harder to track.

Despite these tactics, satellite photographs published in the 2019 UN Panel of Experts (PoE) report showed that some North Korean cargo ships had abandoned their old trade routes and were conducting ship-to-ship (STS) transfers with unidentified barges in Vietnamese waters. A report by the James Martin Center for Nonproliferation Studies and RUSI detailed how one of these vessels – the 146-metre-long North Korean-flagged Tae Yang – was using sophisticated AIS spoofing mechanisms to disguise its identity while appearing on tracking platforms as a different, Singaporean-flagged vessel.

However, the detention of the Wise Honest – a North Korean-flagged bulk carrier carrying coal – in Indonesian waters in 2018, and its subsequent seizure by the US government, highlighted the risks that North Korean vessels now faced as they sailed outside of the country’s territorial waters to deliver cargo.

12. In their 2019 submission to the 1718 Committee, the UN PoE reported that ‘[t]he nuclear and ballistic missile programmes of the Democratic People’s Republic of Korea remain intact and the country continues to defy Security Council resolutions through a massive increase in illegal ship-to-ship transfers of petroleum products and coal. These violations render the latest United Nations sanctions ineffective by flouting the caps on the import of petroleum products and crude oil by the Democratic People’s Republic of Korea as well as the coal ban, imposed in 2017 by the Security Council in response to the country’s unprecedented nuclear and ballistic missile testing’. See UNSC, ‘Report of the Panel of Experts Established Pursuant to Resolution 1874 (2009)’, S/2019/171, 5 March 2019, p. 4.
In 2019, North Korea’s evasion patterns changed again, as the country appeared to abandon the long, extensive journeys to the Gulf of Tonkin for the seemingly relative safety of Chinese waters south of Shanghai near the port of Zhoushan. In fact, multiple North Korean-flagged vessels previously identified as having conducted STS transfers in the Gulf of Tonkin were observed by the authors in Zhoushan throughout 2019, indicating a shift in the fleet’s area of operation. These include the Ho Chon Gang, Tae Yang, Ka Rim Chon, Oriental Treasure, Jang Un and Asia Honor. The first evidence of North Korean ships visiting this area en masse was made public in the interim 2019 UN PoE Report, which released satellite images showing several vessels here conducting STS transfers.

Analysis conducted for this report shows that a significant portion of North Korea’s cargo ships and bulk handlers continues to visit the area, where it is most likely delivering coal and other resources in contravention of UNSC resolutions.

18. See Figures 5, 8, 9 and 22.
The Zhoushan Game Plan

On 3 January 2019, only days before the fourth Xi Jinping and Kim Jong-un summit in Beijing, a North Korean vessel named the Ryon Hwa 2 – a ship once stopped by the US Navy en route to Myanmar suspected of carrying North Korean ballistic missile components – transmitted positional AIS signals in the waters off Zhoushan.

While it was unclear what the Ryon Hwa 2 was doing in Chinese waters, the vessel loitered in the area for six days before disappearing from AIS tracking platforms until nearly a year later in December 2019. Following this visit, a steady stream of North Korean vessels began visiting the area without calling into local ports or bulk-handling facilities where they might have offloaded or taken on cargo.

Imagery first released by the UN PoE in 2019 showed that some of these North Korean vessels were visiting the area to unload coal – and potentially other sanctioned commodities – to Chinese barges and lighters at sea in violation of UNSC resolutions. As in the case of North Korea’s efforts to import oil, transfers of cargo at sea are harder to detect, making sanctions enforcement more difficult.

However, AIS data and satellite imagery collected for this report since early 2019 indicates that at least 30 North Korean-flagged, and North Korean-linked, vessels have conducted around 175 separate trips to the area, often visiting the same regions and anchorages next to major bulk-handling facilities where barges and other vessels designed to transfer cargo between vessels operate. According to information published in August 2019 by the UN PoE, 127 shipments of North Korean coal were made in the first four months of 2019 alone, indicating that the data collected for this report has captured just a fraction of the total deliveries.

The evidence presented here also suggests that the North Korean operation is well coordinated and centrally directed, with vessels collectively visiting and loading commodities at North Korean ports before sailing in convoy to the same areas in Zhoushan. In some instances, clusters of North Korean vessels were captured on satellite imagery in Chinese territorial waters with their cargo bays open, indicating that they had delivered commodities previously loaded in North Korean ports.

These activities constitute a comprehensive breach of UNSC provisions designed to limit the country’s nuclear weapons and ballistic missile programmes and appear to provide an open channel through which...

21. AIS data provided by Polestar Space Applications.
22. AIS data shows no records of these vessels calling into local Chinese ports or bulk-handling facilities, while port inspection records show that no North Korean vessels have been inspected in the area since 2016. This indicates that these bulk carriers and cargo ships were offloading cargo at sea, likely in STS transfers to other vessels.
24. Evidence compiled from AIS data, satellite imagery and openly available port records.
26. Imagery provided by Planet Labs and Maxar Technologies.
North Korea can export sanctioned commodities and potentially other illicit goods, thereby raising the revenue necessary to continue with its nuclear and ballistic missile programmes.
Isolating Anomalous AIS Signals

In order to identify possible North Korean vessels visiting the waters off Zhoushan, the authors first looked for anomalous AIS signals in the area that had either also transmitted in North Korean waters or appeared on a course into North Korean ports. Using this technique, dozens of separate signals were identified and catalogued. In many instances, these transmissions included false or abbreviated vessel names, fake International Maritime Organization (IMO) numbers and Maritime Mobile Service Identity (MMSI) numbers associated with flag registries other than that of North Korea. In others, the reported names and IMO numbers varied only slightly from their IMO-registered identities.

Figure 1: Example of AIS overlaid with imagery identifying the Oriental Treasure and the Tian Tong transmitting fraudulent MMSI numbers and names

Source: Project Sandstone.

While dozens of North Korean vessels – and ships that transmitted AIS signals both in North Korea and Zhoushan – visited these areas in China’s territorial waters, a heatmap generated from all their collated AIS signals

27. The International Maritime Organization (IMO) assigns vessels a unique identification number known as their IMO number. Flag states, meanwhile, assign the vessel’s unique Maritime Mobile Service Identity (MMSI), which acts as the number for the ship’s radio station. Vessels should transmit their correct IMO and MMSI numbers over AIS transmissions, thereby identifying themselves and the flag under which they are sailing. In many of the cases studied for this report, vessels were transmitting fake MMSI numbers and, sometimes, also fake IMO numbers.
data shows that most visible traffic clustered in a number of regions and anchorages off the Nandingxing and Sankuai islands.²⁸

The authors classified these into coordinate-bounded Areas of Interest (AOI) and assigned each a name derived from nearby geographical areas and features.

- AOI 1 – SOUTH PORT.
- AOI 2 – DUCK HEAD.
- AOI 3 – YELLOW MOUNTAIN.
- AOI 4 – BACK ALLEY.
- AOI 5 – DONGYU HARBOUR.
- AOI 6 – CROWN POINT.

²⁸ The heatmap was generated in GIS software and assigns intensity values to areas where the most AIS signals were transmitted. It was created by collating all AIS data from North Korean-flagged vessels which had visited Zhoushan, as well as spoofed AIS tracks which visited both North Korea and the Zhoushan area in 2019 and 2020.
High- and low-resolution electro-optical and Synthetic Aperture Radar (SAR) imagery was then collected over these AOIs to identify ships visiting the region after loading coal or other cargo in North Korea. Vessels identified in these images were then compared against Project Sandstone’s vessel image library, open source and commercially available photos of North Korean vessels and ship build information from the IHS SeaWeb.
platform. Using this technique, it was possible to match anomalous AIS tracks to vessels and then verify the identity of these vessels.

In the majority of cases assessed for this report, these were ultimately North Korean-flagged cargo ships or bulk carriers that appeared to sail to the region after visiting North Korea’s largest port of Nampo, or other cargo berths along the Taedong River, designed for loading coal or other commodities. In some instances, the vessels identified in other areas were oil tankers that had no registered flag on official databases, but which appeared to visit North Korean ports and oil terminals after loitering in Chinese waters. In a number of instances, the authors were unable to identify the vessels owing to a lack of distinguishing features or an absence of commercial or historical satellite imagery, or a combination of these factors. In a subset of these, however, vessels observed in Chinese waters transmitting on fake AIS profiles were also observed in North Korea, indicating these were either North Korean vessels or others that loaded cargo in North Korea.

In total, over 30 different North Korean vessels were identified visiting the region, including a number of UNSC designated vessels and some of the country’s largest bulk carriers and cargo vessels.

30. Vessels captured in high-resolution imagery were measured in GIS software for length, breadth and other structural features such as length and width of cargo bays, hatches and other measurements contained in build information published by IHS SeaWeb. The authors also checked whether identified ships had sister ships which could confound identification, eliminating these as candidates with other open-source data such as AIS tracks.
31. Satellite imagery provided by Planet Labs and Maxar Technologies.
32. Together, these ships accounted for a significant proportion of the country’s bulk carrier and cargo fleet, a fact which demonstrates the importance of this trade for North Korea’s economy and ability to generate revenue from the sale of resources abroad.
Figure 3: Collated AIS Data, North Korea and Zhoushan, China, 2019–20

Source: Project Sandstone.
The Shanghai Express

Located just southeast of Shanghai, the Zhoushan islands in Zhejiang province are some of China’s busiest waterways and are home to a wide variety of commercial and military facilities. To sail here from Nampo, North Korean vessels must enter some of the world’s busiest shipping lanes off the Chinese coast, where sailing without AIS can be dangerous. This is particularly true in the waters off Zhoushan, where fog and adverse weather conditions can make sailing perilous. As a result, North Korean vessels sailing past Shanghai to the region often appear to transmit AIS signals, likely as a safety measure to avoid accidents and collisions.

In several instances assessed for this report, AIS data and imagery collected over North Korea and Zhoushan showed clusters of ships appearing to travel in concert after loading coal in North Korean ports.

October 2019: AOI 3 (Yellow Mountain)

On 3 and 6 October 2019, high-resolution imagery collected by Planet Labs shows over a dozen bulk carriers and cargo vessels at berths in Taean and Songnim, both North Korean ports along the Taedong River. Several of these vessels appear to be loading coal and other resources, while others have their cargo bays open after having taken on coal.


35. There are a number of ports, berths and terminals along the Taedong River, which runs through Pyongyang, through Nampo and out into the Yellow Sea.
Figure 4: Cluster of North Korean ships in Taean with some vessels loading coal, 3 October 2019

Source: Imagery by Planet Labs. Annotated by Project Sandstone.
Figure 5: The Oriental Treasure in Taean, North Korea, 3 October 2019

Source: Imagery by Planet Labs. Annotated by Project Sandstone.
Figure 6: The *Tae Yang* loading coal in Songnim, 5 October 2019

Source: Imagery by Planet Labs. Annotated by Project Sandstone.

On 5 October, SAR data collected by the EU’s Sentinel 1 satellites shows a large clustering of over 20 vessels outside Nampo’s West Sea Barrage (WSB).
Figure 7: SAR image taken over Nampo, North Korea, 5 October, showing large cluster of vessels possibly ready to sail together

Source: Imagery by Copernicus Open Access Hub. Annotated by Project Sandstone.

Less than 10 days later, imagery shot over AOI 3 (YELLOW MOUNTAIN) shows six bulk carriers and cargo vessels anchored in the area, in the proximity of a 55-metre long floating transfer terminal – a piece of equipment designed for transloading ore and minerals between vessels. Within the satellite imagery obtained, four of these vessels are sitting low in the water and appear fully laden, while two are sitting higher in the water and may already have unloaded.

An analysis of the lengths, breadths, superstructures, configurations and paint schemes of these vessels confirms these are the New Dawn, Tae Yang, Oriental Treasure, Tian Tong, Kum Gang San 2 and the Ka Rim Chon. All of these ships are North Korean-flagged, while a number have previously been identified as involved in North Korea’s efforts to export coal in violation of UNSC resolutions. As highlighted in figures

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37. New Dawn, IMO: 9135494; Tae Yang, IMO: 8306929; Oriental Treasure, IMO: 9115028; Tian Tong, IMO: 8712348; Kum Gang San 2, IMO: 9050967; and Ka Rim Chon, IMO: 8314811.
38. UNSC, ‘Final Report of the Panel of Experts Submitted Pursuant to Resolution 2407 (2018)’, 5 March 2019, p. 121. The Oriental Treasure was imaged as a vessel loading coal in Nampo and then conducting STS transfers.
above, several of these ships were captured on satellite imagery loading coal in North Korea immediately prior to their arrival in Zhoushan.

**Figure 8:** Cluster of North Korean vessels at AOI 3 (YELLOW MOUNTAIN), 14 October 2019, 02:56 UTC

January 2020 – AOI 1 (SOUTH PORT)

On 31 January 2020, high-resolution satellite imagery taken over AOI 1 (SOUTH PORT) at 10:57 local time (UTC+8) shows a large concentration of North Korean vessels anchored in close proximity to one another. On this day, eight vessels in this area were transmitting on fake AIS profiles, likely in an attempt to obscure their identity.

Source: Imagery by Maxar Technologies. Annotated by Project Sandstone.
Figure 9: Cluster of North Korean vessels at AOI 1 (SOUTH PORT), 31 January 2020

Source: Imagery by Maxar Technologies. Annotated by Project Sandstone.
Six of these vessels present in the image (Figure 9) are officially North Korean-flagged and include the *Ever Glory*, *Tian Tong*, *Jisong 15*, *New Dawn*, *Ho Chon Gang* and *Un Ha*.\(^{39}\) One of these, the *Yildirimlar 1*, operates out of Nampo but is listed in official records as flying an unknown flag.\(^{40}\) Two unidentified vessels in the same image have also been captured on satellite imagery in Nampo, indicating they are likely also North Korean vessels. In addition to this group, an unidentified lighter can be seen in the image in close proximity to these vessels.

At 17:54 local time (UTC+8), seven hours after this high-resolution image was taken, the Copernicus Sentinel-1 satellite captured a low-resolution SAR image\(^{41}\) of the area that shows the same number of ships in the same configuration, with the exception of one noteworthy anomaly.

By comparing the high-resolution and SAR images, it is apparent that the unidentified lighter has moved and is no longer in the same position. What is also apparent in the SAR image is that in the position previously occupied by the *Jisong 15*, there now appear to be two vessels seen side-by-side in a configuration consistent with an STS. While Sentinel 1 SAR imagery cannot be used to identify the vessel ostensibly next to the *Jisong 15*, it does indicate there is a similarly sized ship at its side.

**Figure 10:** High-resolution satellite imagery taken at 02:57 UTC compared with SAR imagery taken 7 hours later at 09:54 UTC showing a possible STS transfer taking place

High-resolution optical images are typically taken by sun-synchronous satellites between 10:00 and 14:00 locally (UTC+8), in order to take advantage of optimal light conditions. Throughout the course of this research, it became apparent that North Korean-flagged vessels were potentially offloading coal and other

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resources outside of these hours to avoid being captured on imagery. However, the SAR image – taken hours after the high-resolution satellites had passed – potentially shows how this offloading may be taking place.

All six of the aforementioned vessels continued to transmit false AIS data the day after, on 1 February 2020.42

On this date, a Chinese Coast Guard (CCG) vessel – the HAI XUN 0743 – conducted a patrol through the anchorage, passing within hundreds of metres of the vessels transmitting on fraudulent AIS identifiers.43

Despite UNSC resolutions – as well as Chinese directives on AIS transmissions – the vessels do not appear to have been stopped, inspected or detained.44

Two hours after the patrol, the track of another North Korean vessel – the E Morning – transmitting on a fake AIS signal sailed into the anchorage.45

**September 2019 – AOI 2 (DUCK HEAD)**

On 25 September 2019, high-resolution satellite imagery taken over AOI 2 (DUCK HEAD) shows the North Korean-flagged Oriental Treasure and Yon Moo46 anchored and potentially laden.47 The Yon Moo has its cargo bays open with what appears to be coal in the hold. At a nearby anchorage to the northeast, an unidentified lighter can be seen, also with its cargo bays open.

42. See Annex 1.
43. For more information on this, see this report’s section on ‘Hiding in Plain Sight’, pp. 40–45.
45. AIS data provided by Polestar Space applications shows the E Morning transmitting on the false AIS identity with the name ‘548433000’. This AIS track was matched by satellite imagery to the E Morning. On 1 February 2020, this AIS track enters AOI 1 (SOUTH PORT), then appears to turn off its AIS transponder.
46. Oriental Treasure, IMO: 9115028; Yon Moo, IMO: 9003653.
47. The Yon Moo was previously named the Forever Lucky and was imaged loading coal in Nampo in December 2017. This imagery was released by the UN PoE in 2019. See UNSC, ‘Report of the Panel of Experts Established Pursuant to Resolution 1874 (2009)’, S/2019/171, 3 March 2019, p. 20.
Figure 11: *Oriental Treasure* and *Yon Moo* at AOI 2 (DUCK HEAD), 25 September 2019

One day later, on 26 September 2019, high-resolution satellite imagery taken over the same area shows that both the *Oriental Treasure* and *Yon Moo* have departed and been replaced by the North Korean-flagged *E Morning.*

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November 2019 – AOI 2 (DUCK HEAD)

On 11 November 2019, imagery over AOI 2 (DUCK HEAD) shows the North Korean-flagged *Jang Un* at the same anchorage as previously visited by the *Oriental Treasure* and *Yon Moo*. Anchored nearby is a lighter and four large floating cranes designed to move cargo between vessels. The ship was also identified in a March 2019 advisory issued by the US Treasury as a vessel believed to have conducted STS transfers of coal.

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50. UNSC, ‘Final Report of the Panel of Experts Submitted Pursuant to Resolution 2407 (2018)’, 5 March 2019, p. 120.
December 2019 – AOI 2 (DUCK HEAD)

A month later, on 14 December 2019, several North Korean vessels can be seen in high-resolution imagery of DUCK HEAD, including the North Korean-flagged So Baek Su,$^{52}$ the Yon Moo and an unidentified vessel that has transmitted AIS in North Korea. Immediately nearby is a collection of lighters and floating cranes.

52. So Baek So, IMO: 8817289.
Figure 14: The So Baek Su and the Yon Moo at AOI 2 (Duck Head), 14 December 2019

Source: Imagery by Maxar Technologies. Annotated by Project Sandstone.
July 2019 – AOI 4 (BACK ALLEY)

On 24 July 2019, high-resolution imagery shows two of North Korea’s largest bulk carriers, the UNSC-designated Ryong Rim and the North Korean-flagged Myong Sin, anchored at AOI 4 (BACK ALLEY).

The Ryong Rim was designated by the UNSC in 2016 as an economic resource of Ocean Maritime Management (OMM) – itself a UNSC designated entity. OMM vessels were designated under Resolution 2270 in 2016 pursuant to Paragraph 8(d) of Resolution 1718, thereby identifying them as assets that are owned or controlled by actors within North Korea’s programmes relating to nuclear weapons, other weapons of mass destruction and ballistic missiles.

The second vessel at AOI 4 on 24 July was the North-Korean flagged Myong Sin, a vessel previously identified by the UN PoE as having moved coal on behalf of the North Korean military in 2016. The shipments were linked to the UNSC-sanctioned company Korea Kangbong Trading Corporation, an entity subordinate to the Ministry of People’s Armed Forces. In addition to this, the UN PoE revealed in its 2017 report that the Myong Sin – formerly called the Bright Star – has ties to OMM-linked networks.

In the image taken on 24 July 2019, both vessels are anchored in close proximity to a bulk-handling facility, which appears to handle iron ore. The Ryong Rim is sitting high in the water and has its cargo bays open, indicating it has unloaded cargo.

Other UNSC-designated vessels have transmitted AIS signals in the region. For example, the UNSC-designated OMM vessels – the Ryo Myong and the Chong Bong – broadcast their AIS signals within Chinese waters in the Zhoushan area in 2019. The Ryo Myong broadcast its signal in Zhoushan in September 2019, while the Chong Bong broadcast its AIS signal on 8 August 2019, just 19 days after being captured in satellite imagery.

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53. Ryong Rim, IMO: 8018912.
54. Myong Sin, IMO: 9045182.
55. For vessel identification methodology, see Annex 1.
57. Ibid.
62. Ryo Myong, IMO Number: 8987333.
63. Chong Bong, IMO Number: 8909575.
64. AIS data provided by Polestar Space Applications.
loading coal at the North Korean port of Chongjin on 20 July 2019.\textsuperscript{65} Both vessels are also designated pursuant to Paragraph 8(d) of Resolution 1718.\textsuperscript{66}

Paragraph 9 of UNSC Resolution 2397 requires member states to ‘seize, inspect, and freeze (impound) any vessel in their ports’ and empowers them to ‘seize, inspect, and freeze (impound) any vessel’ in their territorial waters provided there are reasonable grounds to believe the vessel was engaged in illicit activity prohibited by all UNSC resolutions.\textsuperscript{67} Paragraph 15 of the same resolution also decides that member states with information regarding vessels designated under Paragraph 8(d) of UNSC Resolution 1718 within its waters should notify the 1718 Committee of this information and the measures it took to inspect, freeze and impound the vessel or ‘other appropriate actions’ per all UNSC resolutions pertaining to North Korea.\textsuperscript{68}

\textbf{Figure 15:} \textit{Ryong Rim} and \textit{Myong Sin} at AOI 4 (BACK ALLEY), 24 July 2019

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\textsuperscript{65} Planet Labs imagery taken on 20 July 2019.
\textsuperscript{66} UNSC, Resolution 1718 (2006).
\textsuperscript{67} UNSC, Resolution 2397 (2017).
\textsuperscript{68} \textit{Ibid.}
Imagery released by the UN PoE in 2019 shows another North Korean ship, the Jang Jin Gang, preparing for an STS at these same coordinates in May that year. This confirms this is a region where North Korean vessels have unloaded cargo.69

Satellite imagery collected a month earlier on 23 June 2019 shows the Ryong Rim anchored in Songnim, North Korea close to a coal berth with its cargo bays open.70 Two days later, low-resolution imagery collected by Planet Labs shows the Ryong Rim loading cargo at the Songnim coal berth.71

Figure 16: (Left) Ryong Rim empty in North Korea, 23 June 2019; (right) the Ryong Rim loading coal at Songnim Terminal, 25 June 2019

Source: Imagery by Planet Labs. Annotated by Project Sandstone.

August 2019 – AOI 6 (CROWN POINT)

On 2 July 2019, the North Korean-flagged cargo vessels Kum Song 372 and Ever Glory73 were observed on high-resolution imagery leaving North Korea as they exited the WSB outside Nampo on the same day. In this instance, the Ever Glory was transmitting on a fake AIS signal and using a Nigerian MMSI number,74 while the Kum Song 3 was ostensibly not transmitting an AIS signal.

70. Imagery provided by Maxar Technologies.
71. Imagery provided by Planet Labs.
73. Ever Glory, IMO: 8909915.
74. AIS data provided by Polestar Space Applications.
On 1 August 2019, west of AOI 6 (CROWN POINT), both the *Kum Song 3* and *Ever Glory* were captured on high-resolution imagery while anchored in Chinese waters with their cargo bays open and what appears to be coal in their holds.
Eleven days later, on 12 August 2019, another two North Korean-flagged vessels, the *K Morning*[^75] and the *Ho Chon Gang*[^76], were captured on high-resolution imagery anchored in the same area near AOI 6 (CROWN POINT). Although both the *K Morning* and *Ho Chon Gang* were not transmitting on AIS at this time, the *K Morning* transmitted its IMO-registered identity over its AIS transponder at these exact same coordinates in October 2019.

[^75]: *K Morning*, IMO: 9021576.
[^76]: *Ho Chon Gang*, IMO: 8415287.
Figure 19: K Morning and Ho Chon Gang near AOI 6 (CROWN POINT), 12 August 2019

Source: Imagery by Maxar Technologies. Annotated by Project Sandstone.
New Ships on the Block

Research for this report also reveals that North Korea appears to have acquired two large new bulk carriers, potentially filling a capacity gap created following the interdiction of the Wise Honest by Indonesia in May 2018.  

Despite UNSC resolutions prohibiting the practice, one of the ships – previously called the Great Wenshan – appears to have been acquired and re-flagged by North Korea and later renamed the Tae Pyong in 2020. The now-renamed Tae Pyong broadcast its AIS from North Korean waters in Nampo on 6 January 2020.

A high-resolution image captured by Maxar Technologies on 24 January 2020 over Nampo, North Korea, confirms this is the formerly named Great Wenshan.

79. Now named the Tae Pyong, IMO: 9018751.
81. Polestar Space Applications.
In addition to this, at some point in 2019, a ship called the *Fu Xing* had its name changed to the *Pu Zhou*. While it did not re-flag to North Korea, the *Pu Zhou* did exhibit other traits common to North Korean vessels engaged in illicit activity.

The *Pu Zhou* broadcast AIS transmissions at a dry dock in Zhoushan on 19 June 2019, when it also changed its MMSI number. Following that, on 4 August 2019, the vessel left the dry dock and loitered in Zhoushan until 14 August when it dropped its AIS signal. It was next seen on 18 August in North Korean waters heading on a course towards the WSB and Nampo.

On 1 September 2019, maritime databases show the *Pu Zhou* leaving the Sierra Leone flag registry without obtaining a replacement flag of convenience. In October 2019, the *Pu Zhou* transmitted AIS signals from Nampo on a different MMSI number. Low-resolution

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84. Windward platform indicates MMSI change.
imagery from Planet Labs confirms the vessel was present in Nampo at this time.\textsuperscript{88} In addition, the ship was observed loading coal at the North Korean port of Songnim on 4 November 2019.\textsuperscript{89} The vessel then left North Korea on 9 November 2019 and travelled down the Chinese coast past Zhoushan. On 12 November, the \textit{Pu Zhou} began transmitting under a different and non-existent IMO number,\textsuperscript{90} before turning round and returning to Zhoushan at AOI 2 (DUCK HEAD), where it stayed from 15 to 25 of November 2019.\textsuperscript{91} Subsequent to this visit to AOI 2, the \textit{Pu Zhou} returned to Nampo on 1 December 2019.\textsuperscript{92}

\textbf{Figure 21:} The \textit{Pu Zhou} loading coal in Nampo and sailing to AOI 2 (DUCK HEAD), 16 November 2019

\begin{center}
\includegraphics[width=\textwidth]{source.png}
\end{center}

\textit{Source: Imagery by Planet Labs, Google Earth and Maxar Technologies. Annotated by Project Sandstone.}

\textsuperscript{88} Windward platform indicates MMSI change; Planet Labs provided imagery of Nampo.

\textsuperscript{89} High-resolution 0.8-metre satellite imagery provided by Planet Labs.

\textsuperscript{90} Windward.

\textsuperscript{91} 3-metre satellite imagery provided by Planet Labs shows the \textit{Pu Zhou} at DUCK HEAD in Zhoushan with its cargo bays open.

\textsuperscript{92} AIS tracked with Windward supported by imagery from Planet Labs.
VIDENCE PRESENTED by the UN PoE in 2019 showed that a number of North Korean vessels were conducting STS transfer operations with lighters and barges in the region in contravention of UNSC resolutions. The Panel recommended that port authorities should engage in higher scrutiny of lighters given their use in conducting STS transfers of coal with North Korean-linked vessels as established by Paragraph 9 of UNSC Resolution 2397.93

However, as highlighted above, several satellite images collected for this report show floating transloading platforms, cranes and lighters anchored and active in several of the AOIs where North Korean ships were visiting after loading coal in berths along the Taedong River. Some of the images collected and presented in this report also show North Korean vessels in the region with their cargo bays open and what appears to be coal in their holds. The region is also home to several large bulk-handling facilities that appear to be used specifically for processing coal and iron ore. In some instances, these are even visible in the vicinity of North Korean ships presented in this report.

In one instance, a high-resolution image taken on 10 May 2019 north of AOI 1 (SOUTH PORT) shows the North Korean-flagged Asia Honor94 flanked by two unidentified lighters or barges with a floating transloading platform also nearby. The Asia Honor was previously pictured conducting an STS with unidentified lighters in the Gulf of Tonkin in February 2019.95

94. Asia Honor, IMO: 8405220.
However, evidence collected during the course of this report suggests that multiple barges and lighters continue to be observed in the immediate vicinity of North Korean vessels. In some of these instances, barges could be observed sailing towards North Korean vessels before dropping AIS signals, only to appear back on tracking systems days later before sailing back to bulk-handling facilities along the Yangtze River.

For example, in one instance on 14 October 2019 – the same day during which multiple North Korean vessels were anchored at AOI 3 (YELLOW MOUNTAIN) – a Chinese-flagged vessel named the *Wei Ji 9* sailed to the area before dropping its AIS signal.96 The vessel returned transmitting on 17 October before heading to AOI2 (DUCK HEAD) on 18 October where a day before at least three vessels associated with North Korea were transmitting false identities. The ship did not transmit for three days, before it began its return journey upriver to a coal-handling facility in Sanzhewei.97

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96. AIS data provided by Windward.
97. Maritime intelligence provided by Windward.
On 26 December 2019, the *Wei Ji 9* once again sailed down to AOI 2 (DUCK HEAD), where it dropped AIS signal for nearly two days. At this time, several North Korean ships were visiting the same AOI.
Hiding in Plain Sight

THESE ILLICIT activities are occurring only kilometres away from one of China’s largest naval bases and the home of the East Sea Fleet of the People’s Liberation Army Navy (PLAN), a fact which raises significant questions about both Beijing’s implementation of UNSC resolutions and its response to investigations conducted by the UN PoE.

Figure 24: Locations of Chinese military and other patrol facilities in Zhoushan

Source: Imagery by CNES, Maxar and Google Earth. Annotated by Sandstone.

Analysis of open source imagery confirms that a wide range of military vessels are present at these bases, including destroyers, frigates, corvettes and electronic surveillance ships as well as smaller vessels which regularly patrol the waters of Zhoushan.98

98. Imagery provided by Digital Globe, SentinelHub through Google Earth.
Given the region’s strategic importance, the area and its surrounding islands are also host to a number of possible coastal surveillance and radar facilities, likely designed to provide detection capabilities to the PLAN and the authorities.

**Figure 25:** Possible radar and communication facilities in Zhoushan, China

Source: Imagery by Google Earth. Annotated by Project Sandstone.

In addition to the PLAN, other maritime enforcement agencies present in the Zhoushan area include the CCG, China Maritime Safety Administration (MSA) and the Zhoushan Harbour and Port Administration. These agencies conduct patrols in the region and are responsible for enforcing China’s maritime laws.

Regulations published by China’s Ministry of Transportation state that, in accordance with the International Convention for the Safety of Life at Sea (SOLAS Convention) and the International Ship and Port Facility Security Code (ISPS), ships in Chinese territorial waters must transmit their identity and positional data over their AIS transponders.  

The port of Zhoushan administers a large area of territory that encompasses several of the AOIs identified above, including AOI 1, AOI 2, AOI 3 and AOI 6. Vessels entering the port must notify the authorities prior to arrival and submit a number of different documents such as general and cargo declarations, crew lists, passports, ship certificates, previous port visits and a variety of other different forms. Ships are also tracked by Zhoushan Vessel Traffic Services (VTS) on radar and AIS, which also provides services to vessels such as the provision of traffic, weather and navigational information.

Furthermore, according to Chinese maritime safety regulations, a ship in China’s territorial waters is liable to be inspected by the MSA to check the validity of its International Ship Security Certificate, ensure the implementation of the ship’s safety measures, verify that it is keeping a ‘continuous summary record’ and confirm the ship’s permanent identification number and its AIS. Inspections are compulsory for foreign-flagged ships entering Chinese ports.

Despite this, North Korean vessels transmitting false AIS data or sailing in the region without transmitting AIS signals do not appear to have been stopped or detained by the Chinese authorities. Port inspection records for Zhoushan do not record any inspections or detentions of the vessels identified in the region, or any North Korean-flagged vessels since 2016.

According to port state control inspection data, the number of North Korean vessels being inspected by port authorities in mainland China has decreased sharply since June 2017. Before 2018, North Korean-flagged ships were reportedly inspected in a variety of ports in China, but since then all but seven reported inspections were carried out in Dalian out of a total of 74 inspections. In fact, since 2015, only two North Korean-flagged vessels have been reportedly inspected by the Zhoushan port authorities, taking place in 2015 and 2016. This is despite the notable presence of North Korean-flagged ships appearing in Zhoushan throughout 2019 and 2020.

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101. Ibid.
102. Ibid.
103. Ibid.
105. Ibid.
106. Ibid.
107. Ibid.
AIS information analysed for this report shows that CCG vessels regularly patrol the waters of Zhoushan, often in the very same AOIs in which North Korean vessels are anchored.\textsuperscript{108}

In one instance on 1 February 2020, satellite imagery places at least eight North Korean-linked vessels at an anchorage in AOI 1 (SOUTH PORT).\textsuperscript{109} Over this 24-hour period, six North Korean vessels transmitted their locations on fake AIS identities.\textsuperscript{110} On the same day, the Chinese maritime patrol vessel \textit{HAI XUN 0743} passed through AOI 1 (SOUTH PORT), sailing through a cluster of North Korean vessels at 03:40 UTC.\textsuperscript{111}

\begin{figure}
\centering
\includegraphics[width=\textwidth]{figure26.png}
\caption{Graph showing North Korean inspections in Chinese waters}
\label{fig:figure26}
\end{figure}

\textit{Source: Data by Tokyo MoU. Processing and adaptation by Project Sandstone.}

\begin{flushright}
\textsuperscript{108} AIS data provided by Polestar Space Applications.
\textsuperscript{109} 0.3-metre-high resolution satellite imagery from 31 January 2020 provided by Maxar Technologies. See Figure 9.
\textsuperscript{110} Polestar Space Applications showed six vessels were transmitting on false identifiers on 1 February 2020. The day before, high-resolution satellite imagery matched with AIS tracks showed these tracks to be attributed to North Korean-flagged vessels.
\textsuperscript{111} AIS data provided by Polestar Space Applications.
\end{flushright}
In another instance, in January 2020, the MSA patrol vessels HAI XUN 0735 and HAI XUN 0732 appear to have sailed past and anchored within the vicinity of the Chong Bong – a North Korean-flagged vessel sanctioned by the UNSC – at AOI 2 (DUCK HEAD). On 15 January at AOI 2 (DUCK HEAD) the Chong Bong was anchored off Benboshan Island. The vessel’s AIS was switched off for around 52 hours before being switched back on approximately four kilometres away from its last reported position. Approximately seven hours after the Chong Bong arrived at its anchoring position on 15 January, the two MSA patrol vessels sailed past the Chong Bong’s last reported position and anchored within the vicinity for 10 hours before sailing away.

A third instance occurred over two days from 19 to 20 January 2020, also at AOI 1 (SOUTH PORT). Over these two days, five vessels transmitted false identities associated with North Korean-linked vessels. Over these dates, the Chinese maritime patrol vessel HAI XUN 0743 conducted two patrols, one on 19 January and another on 20 January, appearing to sail directly through this cluster of vessels.

113. AIS data provided by Polestar Space Applications.
114. Ibid. AIS transmissions were linked to North Korean-affiliated vessels through satellite imagery.
115. AIS data provided by Polestar Space Applications.
Figure 28: Chinese patrol passes through cluster, 18–20 January 2020

Source: Data by Polestar Space Applications. Annotated by Project Sandstone.
Oilers in Ningde

Faced with UNSC resolutions restricting the country’s ability to legally import oil and petroleum products, North Korea’s tanker fleet has developed several mechanisms to evade international sanctions to keep energy flowing into the country.116 These techniques have centred on STS with foreign-flagged tankers conducted in the open ocean, sometimes in the middle of the night.117

While a number of the foreign-flagged tankers supplying oil to the North Koreans have been identified and sanctioned by the UNSC and the US Treasury, North Korea continues to import oil from abroad in violation of UNSC resolutions.118 To do so, North Korea’s tanker fleet has had to adapt to mounting international pressure while attempting to confound maritime surveillance efforts undertaken by countries such as Japan, the US, Canada, Australia, New Zealand and the UK.

Evidence uncovered over the course of this research indicates that a number of UNSC-designated tankers, and others which make direct deliveries to North Korea, often anchor in Chinese territorial waters roughly 400 kilometres down the cost from Zhoushan, before travelling to North Korea.

For example, the UNSC-designated *New Regent*, *Shang Yuan Bao* and *Yuk Tung*119 have been observed anchored in Sansha Bay, near the Chinese city of Ningde, several times in 2019.120 In one satellite image, the tankers can be observed anchored only kilometres away from each other near what appears to be a Chinese maritime patrol vessel. Subsequent to this, the *New Regent* made several direct oil deliveries to North Korean ports, with recent imagery suggesting the vessel is still active.121

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120. Satellite imagery provided by Maxar Technologies.
121. Several deliveries of oil by the *New Regent* were reported by the UN PoE in 2019. Previous imagery published by Project Sandstone shows this activity still continued with deliveries in May and July 2019. Yet the *New Regent* was still active in the Ningde area as late as September 2019. The most recent delivery to North Korea was January 2020. See UNSC, ‘Report of the Panel of Experts Established Pursuant to Resolution 1874 (2009)’, S/2019/691, 30 August 2019, p. 5; James Byrne et al., ‘Kaohsiung Cowboys: The Taiwanese Network Facilitating North Korea’s Illicit Activities’, 12 December 2019; see Figure 31.
In one case, on 24 April 2019, the *Shang Yuan Bao* and *New Regent* can be seen in high-resolution imagery very close to a possible Chinese patrol vessel (see Figure 30). At the time, the *New Regent* and *Shang Yuan Bao* were both designated by the UNSC.\(^\text{122}\)

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A number of other oil tankers, such as the *New Konk* and *VIFINE*, observed at this anchorage in 2019, have also been captured on satellite imagery making direct deliveries to North Korea or while anchored in North Korean waters. Analysis of the owner and management networks of these vessels reveals links to several other tankers that also appear to have made direct deliveries to North Korea throughout the year, including the *Xin Yuan 18* and the *Ho Kong*.

Figure 31: Deliveries to North Korea, 2019–20

Source: Imagery by Maxar Technologies and Planet Labs. Annotation by Project Sandstone.
Conclusion

A large fleet of North Korean-flagged cargo ships and bulk carriers continues to visit Chinese waters around Zhoushan in what appears to be a large-scale, coordinated attempt to evade UNSC resolutions imposed on the country following repeated nuclear and ballistic missile tests.

Evidence collected for this report shows that, far from being isolated cases of sanctions evasion, the effort to move resources from North Korea’s ports to China is happening on an industrial scale. This is occurring along one of the most heavily patrolled and militarised areas of China’s extensive coastline, where destroyers, frigates and even electronic surveillance vessels are based, in addition to several facilities operated by China’s other maritime enforcement agencies.

Satellite imagery collected for this report confirms that various vessels visiting the area are transmitting fake AIS details, and sometimes ostensibly not transmitting at all, in contravention of international and domestic Chinese regulations. Open source AIS evidence shows that a variety of vessels from China’s maritime enforcement agencies regularly patrol these areas, and sometimes even appear to sail right past North Korean vessels transmitting on fraudulent identities.

Sometimes the vessels observed in these waters are themselves UNSC-designated ships, which member states either have an obligation to detain when in their ports or the powers to inspect on reasonable grounds. In some instances, they are vessels the UN PoE has linked to North Korea’s military. In many cases, the vessels appear to have visited North Korean coal or iron ore loading facilities where they likely took on UNSC-sanctioned commodities for delivery to China.

Despite this, and despite the poor condition of North Korea’s fleet, Chinese inspection records from the region show that no North Korean vessel has either been inspected or detained in the region since 2015 and 2016. That dozens of vessels are regularly visiting the region while transmitting fake AIS details, likely delivering sanctioned commodities, without being identified, inspected or detained, raises very serious concerns either about China’s ability to effectively patrol the waters around one of its most important naval bases, or that it has no appetite to enforce UNSC resolutions it has itself supported in response to North Korea’s ongoing nuclear weapons and ballistic missile programmes.

Furthermore, the failure to prevent North Korea’s smuggling fleet from entering its ports and territorial waters to deliver sanctioned commodities is even more egregious after the UN PoE identified these activities in 2019. At the time, China responded that the evidence presented by the UN PoE was ‘ambiguous’ and not enough to ‘constitute a full evidence chain or basis for further investigation’.\(^{125}\) If that evidence, in addition to that presented here, is insufficient to induce China to act, then it is difficult to imagine what body of facts would prompt the country to meet its UNSC obligations.

About the Authors

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Annex 1

Annex 1.1: Ryong Rim

The Ryong Rim is a UNSC-designated vessel identified as an asset of the Ocean Maritime Management (OMM) fleet. It is linked to North Korea's WMD entities and assets.

Annex 1.2: Shang Yuan Bao

SHANG YUAN BAO

IMO: 8126070
Flag: Unknown
Length: 100
Breadth: 16

24 April 2019
Ningde, China
Co-ordinates: 26°42.9002, 119°24.639

Matched with Ais, 24 April 2019

100m
16m

SAME PROW
SAME CENTRAL CRANE
SAME BRIDGE, FUNNEL AND SUPERSTRUCTURE

Hoses connecting SHANG YUAN BAO and MYONG RYU 1 for ship-to-ship transfer

Conducted STS with North Korean vessel Paek Ma in 2018

The Shang Yuan Bao was sanctioned by the UNSC in October 2018 for conducting an STS transfer of petroleum with the North Korean-flagged tanker Paek Ma.

Source: Imagery by Maxar Technologies and US State Department. Annotated by Project Sandstone.
Annex 1.3: New Regent

NEW REGENT

IMO: 8312497
Flag: Unknown
Length: 103.5
Breadth: 19

13 September 2019
Ningde, China
Co-ordinates: 26.420902, 119.924639

© 2020 Maxar Technologies

SAME FOREMAST
SAME VENT AND MAST CONFIGURATION
SAME BRIDGE, LIFEBOAT, FUNNEL AND PROW CONFIGURATION

Nampo, North Korea
24 January 2020

© 2020 Maxar Technologies

The New Regent is a UNSC-designated oil tanker that has been observed making direct deliveries to North Korea in 2019 and 2020.

Annex 1.4: Pu Zhou

Pu Zhou
IMO: 9665737
Flag: North Korea
Length: 174
Breadth: 27.5

16 November 2019
Zhoushan, China
Co-ordinates: 30.232712, 122.434902

Nampo, 9 November 2019

© 2020 Maxar Technologies, Google Earth

- 4 DERRICKS & SAME CONFIGURATION
- 4 CARGO BAYS
- SAME BRIDGE & SUPERSTRUCTURE

The Pu Zhou is a 26,863 DWT bulk carrier that has transmitted AIS in North Korea in 2019 and also sailed to AOI 2 (DUCK HEAD).

Annex 1.5: Myong Sin

The Myong Sin is one of North Korea’s largest bulk carriers and was identified by the UN PoE as having moved coal on behalf of the North Korean military in 2016.

Annex 1.6: Jang Un

IMO: 8822260
Flag: North Korea
Length: 197.6
Breadth: 25

11 November 2019
Zhoushan, China
Co-ordinates: 30.230866, 122.458276

The Jang Un has repeatedly been caught by the PoE exporting North Korean coal via prohibited STS transfers in 2018. Named in US government North Korea Sanctions Advisory.

Source: Imagery by Maxar Technologies, IHS SeaWeb and UN PoE. Annotated by Project Sandstone.
Annex 1.7: Asia Honor

The Asia Honor has been documented by the PoE in its 2019 interim report as being involved in an illicit STS transfer of coal in the Gulf of Tonkin.

Source: Imagery by Maxar Technologies, IHS SeaWeb and UN PoE. Annotated by Project Sandstone.
Annex 1.8: Tae Yang

Annex 1.9: Ka Rim Chon

The Ka Rim Chon is a North Korean-flagged vessel and a sister ship of the Tae Yang. It was identified by the UN PoE conducting an STS transfer of coal with a vessel in the Gulf of Tonkin in 2018.

Source: Imagery by Maxar Technologies, IHS SeaWeb and UN PoE. Annotated by Project Sandstone.
Annex 1.10: Oriental Treasure

IMAO: 9115028
Flag: North Korea
Length: 114.3
Breadth: 19.6

14 October 2019
Zhoushan, China
Co-ordinates: 30.08055, 122.32864

©2020 Maxar Technologies
- 1 BACK-TO-BACK DERRICK
- 1 H-DERRICK
- 12 CARGO BAYS
- SAME SUPERSTRUCTURE

© Imagery by Maxar Technologies, Marine Traffic and UN PoE. Annotated by Project Sandstone.

The Oriental Treasure is a vessel designated by the US for engaging in illicit coal shipments. The UN PoE 2019 report also corroborates this sanctions-breaching activity.

Source: Imagery by Maxar Technologies, Marine Traffic and UN PoE. Annotated by Project Sandstone.
Annex 1.11: Ho Chon Gang

The Ho Chon Gang was identified in the PoE 2019 interim report as a vessel that had conducted illicit STS transfers of coal in the Gulf of Tonkin in 2018.

Source: Imagery by Maxar Technologies and Windward. Annotated by Project Sandstone.
Annex 1.12: Ever Glory

IMO: 8905915
Flag: North Korea
Length: 105.4
Breadth: 18

The Ever Glory is a US-designated vessel that was sanctioned along with a slew of other vessels and companies by the Department of the Treasury in January 2018.

Annex 1.13: *New Dawn*

The New Dawn has been observed in Zhoushan transmitting false AIS data. It was also spotted in close proximity to a number of other North Korean ships in the area in January 2020.

*Source: Imagery by Maxar Technologies and Windward. Annotated by Project Sandstone.*
Annex 1.14: Yon Moo

The Yon Moo was formerly called the Forever Lucky and was identified in the PoE 2019 report as a vessel aiding and abetting illicit North Korean coal exports.

Source: Imagery by Maxar Technologies, Windward and UN PoE. Annotated by Project Sandstone.
Annex 1.15: K Morning

The K Morning was observed making repeat journeys from North Korea to Zhoushan in 2019/2020 while broadcasting both genuine and fake AIS data.

Source: Maxar Technologies and Windward. Annotated by Project Sandstone.
Annex 1.16: Yuk Tung

The Yuk Tung was sanctioned by the UNSC in March 2018 for conducting an STS transfer of petroleum with the North Korean tanker Rye Song Gang 1.

Source: Imagery by Maxar Technology, Marine Traffic and UN PoE. Annotated by Project Sandstone.
Annex 1.17: Yildirimlar 1

YILDIRIMLAR 1

IMO: 8031407
Flag: Unknown
Length: 82
Breadth: 11.8

31 January 2020
Zhoushan, China
Co-ordinates: 30.650181, 122.635236

Annex 1.18: Ji Song 15

The Ji Song 15 has been identified by the US Treasury as a vessel that delivered coal in contravention of UNSC resolutions after 5 August 2017.

Source: Imagery by Maxar Technologies and Windward. Annotated by Project Sandstone.
Annex 1.19: Un Ha

IMO: 8310281
Flag: North Korea
Length: 87.5
Breadth: 14.5

31 January 2020
Zhoushan, China
Co-ordinates: 30.08055, 122.32864

The Un Ha has changed names and MMSI number several times in recent years, and maritime tracking platforms place it as a visitor to the Zhoushan area in 2017 and 2018.

Annex 1.20: Tian Tong

TIAN TONG
IMO: 8713348
Flag: North Korea
Length: 89.5
Breadth: 13.2

14 October 2019
Zhoushan, China
Co-ordinates: 30.07671, 122.33957

The Tian Tong is a North Korean-flagged cargo ship that previously flew a false Fiji flag and listed Baill Shipping & Trading Ltd as its Document of Compliance holder.

Source: Imagery by Maxar Technologies, Marine Traffic, Planet Labs and Google Earth. Annotated by Project Sandstone.
Annex 1.21: Xin Yuan 18

The Xin Yuan 18 was observed in February 2018 conducting an STS with the North Korean-flagged Chon Ma San. Since then, it has made direct deliveries to North Korea.

Source: Imagery by Planet Labs, Marine Traffic and Japanese Ministry of Foreign Affairs. Annotated by Project Sandstone.
Annex 1.22: *New Konk*

The NEW KONK forms part of a larger corporate network linked to several other foreign-flagged vessels which conducted direct deliveries to North Korea in 2019.

*Source: Imagery by Maxar Technologies and Marine Traffic. Annotated by Project Sandstone.*
Anex 1.23: Vifine

The VIFINE forms part of a larger corporate network linked to several other foreign-flagged vessels which conducted direct deliveries to North Korea in 2019.

Annex 1.24: Ho Kong

The HO KONG forms part of a larger corporate network linked to several other foreign-flagged vessels which conducted direct deliveries to North Korea in 2019.

Annex 1.25: So Baek Su

The So Baek Su, while in Zhoushan in late 2019, was observed in close proximity to another North Korean-flagged ship and a series of offloading lighters and cranes.

Annex 1.26: Kum Gang San 2

Source: Imagery by Maxar Technologies, Marine Traffic and Planet Labs. Annotated by Project Sandstone.
Annex 1.27: \textit{E Morning}

\begin{center}
\textbf{E MORNING}
\end{center}

IMO: 8717910
Flag: North Korea
Length: 101.6
Breadth: 16

26 September 2019
Zhoushan, China
Co-ordinates: 30.215852, 122.484682

\begin{center}
\textbf{RAISED FORECASTLE}
\end{center}

\begin{itemize}
\item 2 CARGO BAYS, CORRECT DIMENSIONS
\item SAME BRIDGE AND SUPERSTRUCTURE
\end{itemize}

\begin{center}
\textbf{AIS track 2019}
\end{center}

\textit{Source: Imagery by Maxar Technologies and Marine Traffic. Annotated by Project Sandstone.}
Annex 1.28: Unidentified Vessel

UNIDENTIFIED VESSEL

Source Caption: Imagery by Maxar Technologies and Planet Labs. Annotated by Project Sandstone.