Flags of Convenience

Below the surface of the global shipping industry

MARK PIETH | KATHRIN BETZ

CONTENTS

ACRONYMS AND ABBREVIATIONS

AIS	Automatic Identification System
BSU	Bundesstelle für Seeunfalluntersuchung
DSB	Dutch Safety Board (Onderzoeksrad voor Veiligheid)
dwt	deadweight tonnage / ton
ECHR	European Convention on Human Rights
FAO	Food and Agriculture Organization
GHG	greenhouse gas
GISIS	Global Integrated Shipping Information System
ILO	International Labour Organization
IMO	International Maritime Organization
ITF	International Transport Workers' Federation
ITLOS	International Tribunal for the Law of the Sea
ITOPF	International Tanker Owners Pollution Federation
LNG	liquefied natural gas
LPG	liquefied petroleum gas
lwt	lightweight tonnage/ton
MARPOL	International Convention for the Prevention of Pollution from Ships
MEPC	Marine Environment Protection Committee
MLC	Maritime Labour Convention
NGO	non-governmental organisation
OECD	Organisation for Economic Co-operation and Development
P&I	Protection and Indemnity
PMA	Panama Maritime Authority
SOLAS	International Convention for the Safety of Life at Sea
STCW	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
TEU	twenty-foot equivalent unit
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea

FOREWORD: FLAGGING OUT RESPONSIBILITY

Why would two lawyers, who have never worked as mariners, write a book about shipping? We have for many years been involved in developing methods to implement international regulations on a worldwide basis and have an interest in global supply chains. Merchant shipping is a hugely relevant, but not so much researched piece in a global supply chain. One of the key challenges of shipping is that there is generally no lack of regulation, but a blatant deficit in implementation and enforcement.

For this book, beyond desk research, we have visited challenging places and interviewed key operators. We have gone to accident sites, like the Netherlands or Mauritius, we have participated in spot checks by trade unions and have visited the ship recycling yards in Alang, India.

In a first round, we have authored a book on the role of Switzerland in managing merchant and cruise ships. Frequently, it is overseen that this landlocked country hosts companies managing, according to current calculations, up to 3,600 ships. Official Switzerland is not concerned by this industry since the vast majority of these ships is flagged out to a flag of convenience. If you want, these companies are flying under the radar.

We will discuss in this book that flags of convenience are a crucial dimension of the deficiencies in shipping. However, there is more to it. The way in which global shipping is regulated today seems outdated in many respects. Some of the current core principles of maritime regulation were invented at a time when shipping was still a profession performed by brave explorers and adventurers. Regulation and control is at times insufficient, and often too slow and too weak to respond for example to the speed that container shipping has grown since the turn

of the millennium. It is difficult to monitor, let alone enforce, the law on the high seas.

Therefore is seemed logical to discuss the major challenges of shipping: preservation of the ocean, environmental protection and labour conditions on board from a global perspective.

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01

MV *WAKASHIO* CRASHES HEAD ON INTO A PRISTINE NATURE RESERVE

If you are wondering how shipping and ecology are getting on, just consider the accident of MV *Wakashio* in Mauritius: a giant cargo ship, 300 m long and 50 m wide aimed head on at the island, instead of sailing around the Cape of Good Hope, over 1,000 km further south. It smashed at full speed into a reef protecting some of the world's most precious lagoon landscapes. How was this possible?

THE SHIP

The registered owner of MV *Wakashio* was the Panama shell corporation Okiyo Maritime Corporation, which was itself owned by another shell company, Nagashiki Shipping Company Ltd, based in a private home in the town of Okayama, Japan.[1] MOL (Mitsui O.S.K. Lines) was, according to their own declarations, time charterer of the ship.[2] MOL is the second biggest shipping company in the world. The crew manager, responsible for training, certifying and supplying the crew, was Anglo-Eastern from Hong Kong.[3] The ship sailed under a Panamanian flag and was inspected by the Japanese classification society NK.[4]

THE ACCIDENT

The vessel had offloaded in China and Singapore and was on its way to Brazil to load iron ore. It was understaffed by 17%, with 20 crew instead of 24.[5] It is unknown who signed a "Certificate of Emergency Exception", allowing the ship to leave harbour in such an understaffed state. Besides, several of the seafarers on board had been on the vessel far beyond their contract as a consequence of the Covid crisis.[6] Understaffing is a serious matter. It is a major way for shipping companies to cut costs.[7] Observers of the industry claim that such certificates granting exceptions are easy to come by in Singapore.

Satellite tracking shows that the ship followed a very unusual route: it was apparently already off course when it entered the Indian Ocean.[8]

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1 Forbes, 30 October 2020: "Wakashio, the ghost ship: Mystery of who was in control of MOL-chartered vessel".

2 Ibid.

3 Ibid.

4 Reuters, 14 August 2020: "Explainer: Who pays for Mauritius oil spill and how much?"; Wikipedia, "MV Wakashio oil spill".

5 Forbes, 11 October 2020: "Wakashio's skeleton crew: Mauritius oil spill ship was 17 % understaffed"; cf. also ITF 2020.

6 GCaptain, 10 November 2020: "Challenging assumptions around the MV Wakashio grounding".

7 Critical: Splash247, 24 November 2020: "Michael Grey slams 'beancounters' and authorities for permitting reduced numbers of crew onboard".

8 Forbes, 19 October 2020: "Latest satellite analysis reveals new theory for deadly Wakashio oil spill in Mauritius".

Four days prior to the accident, it corrected its course significantly (with a 13-degree turn). From then on, it continued for four days straight on a collision course with the island of Mauritius.[9] On the way, it crossed through busy shipping lanes. Apparently, this strange routing was not realised on board, nor by operations control in Japan.

On 25 July 2020 at 7.15 p.m. Mauritius time, the MV *Wakashio* hit a coral reef right in front of the coastline, apparently at next to full travelling speed.[10] The place of the accident could not have been worse. The reef is the barrier of a pristine lagoon landscape with UNESCO (Ramsar) protected[11] nature reserves: the Ile aux Aigrettes Nature Reserve and the Blue Bay Marine Park, hosting over 40 kinds of corals and 70 species of fish. What is more, many of the creatures in the lagoon and the mangrove park are unique and endangered.[12]

CONFUSION OVER THE CAUSE

The Mauritian Coast Guard claimed that it had in vain attempted to call the ship when it realised it was heading directly for shore.[13] However, people living along the coast claim that they were the first ones to alert the Coast Guard to the accident.[14]

That the crew did not see land approaching (visible for at least the last two hours) and did not pick up the radio signals has led various commentators, amongst them retired sea captains,[15] to suspect that the bridge was not manned at the time[16] – a serious breach of basic rules of

9 Ibid.

10 GCaptain, 10 November 2020: "Challenging assumptions around the MV Wakashio grounding".

11 New York Times, 14 August 2020: "This is unforgivable: Anger mounts over Mauritius oil spill".

12 Oceanographic Magazine, "Blackened waters"; The Marine Executive, 17 November 2020: "Wakashio scuttled off Mauritius as clean-up continues".

13 Splash247, 5 November 2020: "Wakashio stern to be removed from reef in complex process taking months" (cf. comments).

14 Interviews with Alain Malherbes of 21 October 2021 and with Sébastien Sauvage from Ecosud of 22 October 2021.

15 Ibid.; Splash247, 14 August 2020: "Birthday party and quest for Wi-Fi revealed in lead up to Wakashio grounding off Mauritius" (comments).

16 Splash247, 5 November 2020: "Wakashio stern to be removed from reef in complex process taking months" (comments by Captain Colin Smith).

seamanship.[17] MOL claimed it was merely a time charterer and that it had no responsibility for the selection of the crew. Nevertheless, MOL attributed the accident to human error. The crew lacked – according to MOL – basic maritime know-how.[18]

In fact, crew members were quoted saying that they were celebrating the birthday of a seaman at the time[19] and that they were trying to come close to the island to pick up a 4G mobile signal.[20] This second explanation is unlikely, as it would imply that the ship was deliberately coming closer to land than the official shipping lanes allowed. Furthermore, local experts claim that internet signals from the island can be received up to five kilometres from shore, but the accident occurred only one kilometre from shore.[21] On top of this, the shipping company MOL claimed that its fleet had free and unlimited access to the internet via Inmarsat.[22]

It is possible that an understaffed, fatigued crew, many of whom had been on board for longer than the 11 months maximum foreseen by international law,[23] made a series of dramatic mistakes. Typically in such cases, though, shipping companies and also flag states would want to put all the blame on the crew. Instead, the flag state Panama rushed to give a series of confused explanations. Panama claimed – against all evidence[24] – that bad weather had motivated the unexplained change

17 The internal investigation by MOL ends up with suggesting that a multitude of established rules of risk management should be better observed on its ships; GCaptain, 18 December 2020: "MOL releases internal investigation report on MV Wakashio accident".

18 GCaptain, 22 December 2021: "Wakashio's captain, chief mate plead guilty over grounding"; Sumikai, 20 December 2020: "Menschliches Versagen auf japanischem Frachter ist Schuld an Ölpest in Mauritius".

19 Splash247, 14 August 2020: "Birthday party and quest for Wi-Fi revealed in lead up to Wakashio grounding off Mauritius".

20 Ibid.; Splash247, 17 February 2021: "Wakashio captain takes aim at his chief officer".

21 Inverwiew with Alain Malherbes of 21 October 2021.

22 Forbes, 30 October 2020: "Wakashio, the ghost ship: Mystery of who was in control of MOL-chartered vessel"; Forbes, 19 October 2020: "Latest satellite analysis reveals new theory for deadly Wakashio oil spill in Mauritius"; GCaptain, 10 November 2020: "Challenging assumptions around the MV Wakashio grounding"; L'express, 8 June 2021: "Naufrage du Wakashio: Mono Bunwaree évoque un acte délibéré".

23 Hellenic Shipping News, 2 November 2020: "Australia clamps down on Japan ship crew abuse".

24 Forbes, 19 October 2020: "Latest satellite analysis reveals new theory for deadly Wakashio oil spill in Mauritius"; Splash247, 14 August 2020: "Birthday party and quest for Wi-Fi revealed in lead up to Wakashio grounding off Mauritius".

of course. The flag state went on to claim that the captain and the first officer were in fact on the bridge at the time of the accident.[25] In court, the captain admitted that he was under the influence of alcohol.[26] He was sentenced to 20 months in prison.[27] It is unclear whether a thorough investigation by marine safety authorities has in fact taken place.[28]

Obviously, one needs to dig deeper: frequently (as in the accidents involving the *Herald of Free Enterprise* or the *Costa Concordia*) grave negligence or even recklessness of the crew is an expression of the lack of a sufficient safety culture of the shipping company. MOL still fails to answer how its supposedly modern "Safety Operations Support Center" could miss that one of their biggest ships was seriously off course for four entire days.[29] Besides, it apparently did not realise for an entire four and a half hours that their ship was grounded.[30] Several expert observers interviewed by us in Mauritius have doubts as to whether this is the real explanation. Alain Malherbes,[31] like the US journal Forbes,[32] is of the opinion that the use of an experimental fuel could have led to engine malfunctioning.

SLOW REACTION ON ALL FRONTS

The real drama for Mauritius, however, is that the disaster only began after the grounding. Various commentators claim that vital days were

25 Splash247, 5 November 2020: "Wakashio stern to be removed from reef in complex process taking months" (comments Captain Colin Smith contradicting the preliminary report of Panama of 7 September 2020).

26 GCaptain, 22 February 2021: "Wakashio Captain confirms he navigated close to shore to pick up cell signal, but blames chief officer for grounding"; Splash247, 19 February 2021: "Wakashio master: 'I was under the influence of alcohol'".

27 GCaptain, 22 December 2021: "Wakashio's Captain, Chief Mate plead guilty over grounding"; The Japan Times, 27 December 2021: "Ship captain sentenced to 20 months over MV Wakashio oil spill off Mauritius".

28 Cf. below on the report by the Panama Maritime Authority.

29 Forbes, 30 October 2020: "Wakashio, the ghost ship: Mystery of who was in control of MOL-chartered vessel"; Forbes, 19 October 2020: "Latest satellite analysis reveals new theory for deadly Wakashio oil spill in Mauritius".

30 Forbes, 30 October 2020: "Wakashio, the ghost ship: Mystery of who was in control of MOL-chartered vessel".

31 Interview with Alain Malherbes, 21 October 2021.

32 Forbes, 19 October 2020: "Latest satellite analysis reveals new theory for deadly Wakashio oil spill in Mauritius".

Mangroves

lost.[33] Again, satellite pictures show that only after four days did the first coast guard boat bother to inspect the wreck. The next boat approached only on day six.[34] Maybe a quick reaction would have made it possible to refloat the ship before it began to leak oil on 6 August, 11 days after the grounding, and before it broke apart on 15 August.[35] Arne Fayd'herbe, a salvage expert present on the spot, however, claims that the ship was taking in water right from the first day.[36]

It fits the pattern that Mauritius did not manage to obtain oil booms in those 11 days, nor did the country have a sufficient amount ready, even though up to 2,000 ships pass the island per month. Maybe a salvage company or the owner could have provided them in an emergency flight? The international airport is just a few kilometres from the accident site. Instead, residents watched helplessly as 1,000 tonnes of heavy, poisonous oil leaked into the protected lagoon. Only then did salvage companies arrive to syphon off the remaining oil.

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33 franceinfo, 31 May 2021: "Maurice: le naufrage du Wakashio pouvait être évité"; New York Times, 14 August 2020: "This is unforgivable: Anger mounts over Mauritius oil spill".

34 Forbes, 10 August 2020: "How satellites tracked the fateful journey of the ship that led to Mauritius' worst oil spill disaster".

35 Forbes, 30 October 2020: "Wakashio, the ghost ship: Mystery of who was in control of MOL-chartered vessel".

36 Interview with Arne Fayd'herbe, 23 October 2021.

This slow reaction is difficult to explain as a salvage agreement (Lloyd's Open Form) was signed already on 26 July, the day after the grounding.[37] According to critical voices on the island, the Government was not prepared for such an accident, and remained inactive even after the disaster.[38]

The local people were left to deal with the looming oil spill: activists of the NGO Rezistans ek Alternativ used social media to call the population to help.[39] Together they constructed improvised oil booms made of sugar cane straw, building materials and empty plastic bottles to fend off the oil.[40]

Many months after the accident, though, scientists and NGOs still wondered about the composition of the engine fuel.[41] Rumours grew that MV *Wakashio* may have been using an experimental fuel made of heavy oil, plastic garbage and chemicals to dissolve the plastic.[42] Fears were growing that the "oil fingerprints" were being deliberately withheld by the International Maritime Organization (IMO) – the UN agency responsible for the safety and security of shipping and the prevention of pollution by ships – on behalf of the oil and shipping companies to obscure how toxic the fuel was.[43] The bunker station in Singapore or BP would have been able to supply fresh probes of the fuel (not diluted by weeks in seawater).[44]

It is astonishing that the IMO together with the charterers and the oil company collectively maintained a veil of secrecy on the experimental Very Low Sulphur Fuel Oil (VLSFO) and its toxicity.

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37 Forbes, 10 September 2020: "IMO in hot water following Mauritius oil spill and botched Wakashio salvage operation".

38 Interviews with Anne-Sophie Jullienne, Sanjeev Teeluckdaree and Alain Malherbes of 21 October 2021 and Sébastien Sauvage of 22 October 2021.

39 Interview with David Sauvage and Stephan Gua of 26 October 2021.

40 CADTM, 20 October 2020: "Oil, protest and mass solidarity in Mauritius".

41 The Independent, 7 November 2020: "Mauritius oil spill: fears for island's marine life after initial tests failed to resolve oil mystery".

42 Forbes, 5 November 2020: "Singapore drawn into growing international controversies surrounding Mauritius oil spill".

43 Ibid.; Forbes, 30 October 2020: "Wakashio, the ghost ship: Mystery of who was in control of MOL-chartered vessel".

44 Forbes, 5 November 2020: "Singapore drawn into growing international controversies surrounding Mauritius oil spill"; Oceanographic Magazine, "Blackened waters".

Self-constructed oil booms

The charterer MOL did get active, at least symbolically: their President and CEO apologised to the people of Mauritius.[45] After the damage had been done, the island was flooded with foreign experts, in particular from the IMO, ITOPF,[46] Panama, France (since Réunion is nearby) and Japan. International salvage companies from the Netherlands (SMIT Salvage, belonging to Royal Boskalis[47]) and Nippon Salvage from Japan arrived.[48]

Unluckily, the international advisors and the salvage operators were a mixed blessing to the island. After the vessel broke into two, the international advisors suggested to deliberately sink or "scuttle" the front part (the loading area), rather than to send it off for recycling.[49] Since the salvors were able to tug the front off the reef and into the sea, it must be assumed that it was able to float. According to the salvage expert Arne Fayd'herbe, the front part was already sold to a shipbreaking yard in Pakistan.[50] Nevertheless, the Government with the salvage company and representatives of the shipowner decided for cheap disposal.

It is unclear what role the IMO played in this decision, since its representative in Mauritius publicly defended the scuttling.[51] It remained obscure for two months where exactly the wreck was sunk, as authorities kept the location secret. Again Forbes, with the help of satellite analysis, found the location. The magazine claims that the scuttling took place at the worst possible place: directly in the line of the currents for the east coast of Mauritius and for Réunion.[52] This is particularly problematic since the front part seems to contain not only the heavy metals built into

45 Forbes, 30 October 2020: "Wakashio, the ghost ship: Mystery of who was in control of MOL-chartered vessel".

46 Forbes, 5 November 2020: "Singapore drawn into growing international controversies surrounding Mauritius oil spill".

47 Splash247, 5 November 2020: "Wakashio stern to be removed from reef in complex process taking months" (with comments by Spark and Smith).

48 Forbes, 10 September 2020: "IMO in hot water following Mauritius oil spill and botched Wakashio salvage operation".

49 Forbes, 23 October 2020: "Secret location of sunken Mauritius oil ship Wakashio found … what a disaster".

50 Interview with Arne Fayd'herbe, 23 October 2021.

51 Forbes, 10 September 2020: "IMO in hot water following Mauritius oil spill and botched Wakashio salvage operation"; imo.org, "Responding to MV Wakashio oil spill".

52 Forbes, 23 October 2020: "Secret location of sunken Mauritius oil ship Wakashio found … what a disaster".

Scuttling of the front part of MV Wakashio

the hull, but possibly further toxic materials. Shortly after the scuttling, 50 dead whales and dolphins were found on the beaches of Mauritius (18 in 24 hours).[53] What kind of highly toxic substances could have been in it?

SOCIAL UNREST

As mentioned, the immediate response to the oil spill had to rely almost entirely on local mobilisation.[54] Citizens showed an impressive solidarity.[55]

At the same time, protests against the Government were staged in Mauritius (with up to 100,000 participants in the capital)[56] and abroad.[57]

The Government, which had already been in turmoil after a manipulated election in 2019,[58] reacted by suspending Parliament and arresting environmental activists and journalists.[59]

INVESTIGATIONS UNDERMINED?

Apart from the lingering doubts about the real reasons leading to the grounding and the haste and secrecy around the scuttling of the front part of the ship, there are apparently further peculiarities impeding an open and unambiguous investigation of the accident. The lack of fresh samples of the engine fuel has been mentioned. Other sources claim that the log of the Mauritius Coast Guard could have been tampered with.[60] Astonishingly, information contained in official records was apparently altered after the grounding, like insurance details removed three months after the accident from maritime databases.[61]

53 Ibid.

54 Forbes, 30 October 2020: "Wakashio, the ghost ship: Mystery of who was in control of MOL-chartered vessel".

55 CADTM, 20 October 2020: "Oil, protest and mass solidarity in Mauritius".

56 Ibid.

57 Forbes, 23 October 2020: "Secret location of sunken Mauritius oil ship Wakashio found … what a disaster".

58 Ibid.

59 Ibid.

60 Forbes, 19 October 2020: "Latest satellite analysis reveals new theory for deadly Wakashio oil spill in Mauritius"; Splash247, 5 November 2020: "Wakashio stern to be removed from reef in complex process taking months" (comment Spark).

61 Forbes, 5 November 2020: "Singapore drawn into growing international controversies surrounding Mauritius oil spill".

Other reports suggest that the Voyage Data Recorder could have disappeared or was not readable.[62] Furthermore, the Inventory of Hazardous Materials apparently has not surfaced. In other respects it is doubtful if the owner, operator and charterer have been as cooperative as required.[63] The report by the Panama Maritime Authority was held up for at least two years because vital information was apparently missing.[64]

WHO PAYS?

To understand the compensation structure of such an accident, one needs to consult the so-called Bunker Convention[65] together with the Limitation of Liability Convention (LLMC).[66] The LLMC allows owners, charterers, operators, salvors and insurers to limit their liability to a certain threshold. The convention has – as it is openly admitted – been drawn up to protect the economic interests of shipping companies. The LLMC applies to bunker oil spills, i.e. spills of ships' fuel oil, but not to tanker accidents, where a separate convention applies.[67] The limits of the LLMC have been raised by a Protocol of 1996 ratified by Japan, but not by Mauritius.

Rapidly, as suggested by the IMO representative,[68] Mauritius claimed USD 34 million in compensation from Japan.[69] MOL as the

62 Forbes, 30 October 2020: "Wakashio, the ghost ship: Mystery of who was in control of MOL-chartered vessel"; Forbes, 26 October 2020: "Could Oil Ship Wakashio Been Hacked Before Mauritius Spill".

63 Forbes, 30 October 2020: "Wakashio, the ghost ship: Mystery of who was in control of MOL-chartered vessel".

64 IIMS, 21 July 2023: "Wakashio report by the Panama Maritime Authority issued 3 years after Mauritius grounding"; Splash247, 20 July 2023: "Official Wakashio accident report made public"; Lloyd's List, 26 July 2021: "Final Wakashio report held up one year after disaster"; GCaptain, 18 December 2020: "MOL Releases Internal Investigation Report on MV Wakashio Accident".

65 The Bunker Convention (International Convention on Civil Liability for Bunker Oil Pollution Damage of 2001) deals with spills of ships' fuel oil.

66 Convention on Limitation of Liability for Maritime Claims (LLMC) of 1976.

67 International Convention on Civil Liability for Oil Pollution Damage (CLC) of 1969.

68 Forbes, 10 September 2020: "IMO in hot water following Mauritius oil spill and botched Wakashio salvage operation".

69 DW, 2 September 2020: "Mauritius oil spill: Japan asked to pay $34 million, support local fishermen".

charterer volunteered to pay USD 9.4 million.[70] So far MOL has made USD 7.25 million available in a "MOL Charitable Trust".[71] MOL – though claiming that as a mere charterer, they were not responsible for the accident – opened a local office. According to Goro Yamashita, the local representative of MOL, the company was supporting local fishermen financially.[72]

The way marine insurance works, the actual insurance does not pick up third-party damages. Against such indemnities, the companies "insure" themselves mutually in a trust, a Protection and Indemnity Club or P&I Club – here the Japan P&I Club. It will be noted that MOL itself has a direct and important interest in the Japan P&I Club.[73] Therefore, MOL has a double motivation in keeping the compensation low and the LLMC helps them in this endeavour. In November 2021, the registered owner of MV *Wakashio* applied to the Supreme Court of Mauritius to limit the claims arising from the accident to 719.6 million Mauritian rupees (approx. USD 16.6 million).[74]

The Japan P&I Club has an office in Mauritius; however, it is unclear to what extent it contributes to damage recovery. Even after several inquiries, it was not willing to talk to us about its activities.[75] Apparently, it agreed to pay hundreds of affected fishermen and fishmongers compensation of 112,000 Mauritian rupees (approx. USD 2,580) each.[76]

In early 2022, the stern or back end of MV *Wakashio*, still stuck on the reef, was completely dismantled. After removal of all the remains,

70 Offshore-Energy, 11 September 2020: "MOL pledges $9.4 million for damage recovery from Wakashio spill".

71 International Transport Journal, 23 June 2021: "MOL's Mauritius fund ready for action".

72 Interview with Goro Yamashita, 22 October 2021.

73 Forbes, 5 November 2020: "Singapore drawn into growing international controversies surrounding Mauritius oil spill".

74 GCaptain, 22 November 2021: "Wakashio's Owner Limits Liability Over Grounding as Wreck Removal Continues".

75 Inquiries to Vick Tahalooa of 18 October 2021 and 9 November 2021, and to the parent company in Japan of 3 November 2021.

76 The Japan Times, 27 December 2021: "Ship captain sentenced to 20 months over MV Wakashio oil spill off Mauritius"; AllAfrica, 21 December 2021: "Mauritius: MV Wakashio Insurer Grants Compensation of Rs 112,000 to Affected Fishers, Applicant Fishers and Fishmongers".

Salvage operation on the MV Wakashio wreck, October 2021

the Mauritian Ministry of Environment apparently wanted to measure the damage to the marine ecosystem and claim it from the insurer.[77] However, in March 2022, Ameenah Gurib-Fakim, a biodiversity expert and former president of Mauritius, said that the impact of the *Wakashio* disaster on Mauritius' marine flora and fauna was still unknown, because there had never been a proper scientific survey.[78]

WHAT LESSONS CAN WE LEARN?

The IMO defines shipping lanes for commercial vessels. The lanes around Mauritius and Réunion run rather close to the islands. Over 2,000 vessels per month sail little over 10 nautical miles past these islands. Considering that the ecosystem of the islands belongs to the world heritage, this seems foolhardy. What happened to MV *Wakashio* was unclear, but the likelihood of the accident happening would have been far smaller if the shipping lanes for large ships in transit had evaded the islands altogether by at least 50 miles. Here IMO has serious questions to answer. What is more, IMO in its press statement on "Responding to MV *Wakashio* oil spill" tries to evade the question of why the area was not recognised as a "Particularly Sensitive Sea Area" (PSSA).

77 GCaptain, 12 January 2022: "Wakashio's Stern Dismantled in Mauritius".

78 Financial Times, 1 April 2022: "Wakashio oil spill highlights fragile Mauritian ecology".

Linked to the proximity of the shipping lanes is a further problem: the obvious lack of preventive measures, even though Mauritius does have a Coast Guard with rapid boats and helicopters.[79] Every state, in particular if it lives from fishery and tourism, has – one would assume – a duty to effectively protect its assets.[80]

There are rules about safety management on board ships. Large shipping companies boast they have highly developed operations control centres and companywide safety management systems. Unluckily, daily practice does not seem to live up to the standards on paper.

And if things should go wrong, rapid response is imperative: why wait four to six days before even bothering to officially visit the accident site, why not call in oil prevention booms by plane immediately? Could it be that the rules of engagement with salvage companies are still too old fashioned and time consuming? What is more, how is it possible to take the decision to scuttle a toxic ship close to shore in the breeding areas of endangered species? Have the IMO, the shipping companies, the insurers and the salvage companies teamed up with a weak government to find the cheapest possible solution?

Is the insurance system outdated? Should there not be mandatory and unlimited insurance[81] for damage to the environment through genuine insurance companies, separate from the shipping companies through their P&I Clubs?

These may all sound like technical questions. But they are fundamental to an industry that is itself at the heart of our globalised world. Don't be put off by the jargon, acronyms, conventions and complexity. How the shipping industry is regulated and how it deals with environmental and social issues matters to us all.

79 Forbes, 19 October 2020: "Latest satellite analysis reveals new theory for deadly Wakashio oil spill in Mauritius".

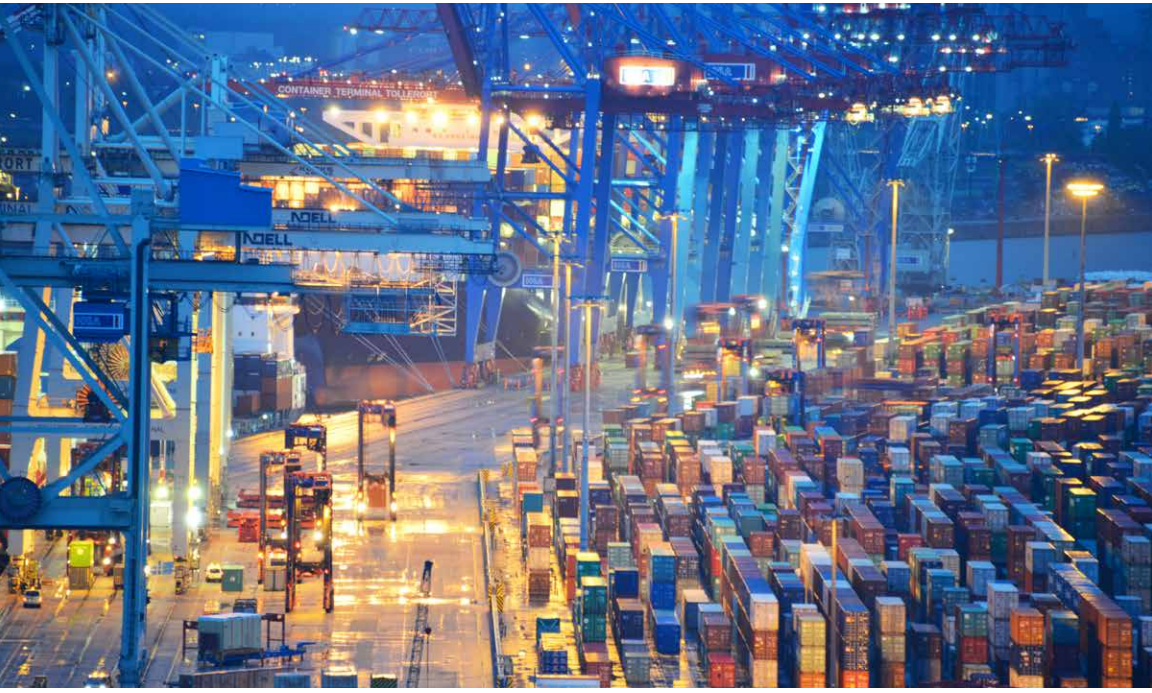
80 Splash247, 5 November 2020: "Wakashio stern to be removed from reef in complex process taking months" (comments Spark and Smith).

81 Goebel 2017, 403 (for classification societies).

02

THE ECONOMY OF SHIPPING

Merchant shipping is of enormous significance to the world economy. Many authors claim that up to 90% of all goods are transported by sea.[82] Yet most of us largely ignore the world of shipping and its environmental and social impacts. We seem to be struck by a kind of "sea blindness".[83]



82 George 2013 passim; Giannakoulis 2016, 71; Kraska/Pedrozo 2013, 355; lower, however: Alizadeh/Nomikos 2009, 24.

83 Metaphorically, "sea blindness" is used to describe a lack of attention to problems linked to the maritime industry, such as safety, environmental concerns, climate change and human rights; George 2013, 4.

The demand for shipping is understandably strongly dependent upon the current economic situation. It follows growth and crises of the world economy in general. Even if there has been a steady growth of the industry over the last centuries, shipping is dependent on cycles. Freight rates and ship prices went through the ceiling between 2003 and 2007,[84] then crashed shortly afterwards from 2008 to 2010. Another such cycle was caused by Covid. A particularity in the Covid crisis was that Eastern Asia recovered earlier from the first waves of Covid than the West. As a consequence, empty containers got stuck in the ports of the West.[85] After Covid, shipping experienced a boom: freight prices and with them the cost of second-hand and new ships went up again.

However, shipping is also strongly affected by political developments, trade wars[86] and regional destabilisation.[87] Shipping in the Black Sea was affected by Russia's aggression in Ukraine, hindering grain exports. In parallel, sanctions against Russia have led to the use of a large phantom fleet of tankers breaking the sanctions regime. Since these tankers are to a large extent no longer insured, the world is running high risks. This fact has led to serious consequences, for example when the *Pablo* exploded in early May 2023 close to Malaysia.[88]

One of the difficulties with these cycles is that demand ("seaborne commodity trade") and supply (availability of shipping space) rarely match. With a rise in demand, the order books of shipyards typically fill up. However, due to long planning and construction times, delivery of the ships may miss the peak and may hit the owner in an economic trough period.[89]

Shipping is also influenced by long-term developments, like the advent of containers. Freight prices dipped sharply when these

84 Stopford 2009, 71.

85 International Transport Journal, 16 April 2021: "The flood of the rare" (Hapag-Lloyd buying 150,000 new TEUs); International Transport Journal, 26 June 2020: "World container flows on hold".

86 Cf. the US vs. China: UNCTAD 2019, X, 3.

87 E.g. the closure of the Suez Canal after the Six-Day War.

88 Splash247, 8 May 2023: "Pablo explosion a warning sign of worse to come"; below Chapter 8.

89 Stopford 2009, 98, 130.

became widespread. Shipping companies have since been forced to acquire ever larger ships and to either merge or form alliances[90] to prevent bankruptcy.

THE HISTORY OF SHIPPING

The economy of shipping can be better understood with the help of a brief historical overview.

Prehistoric times

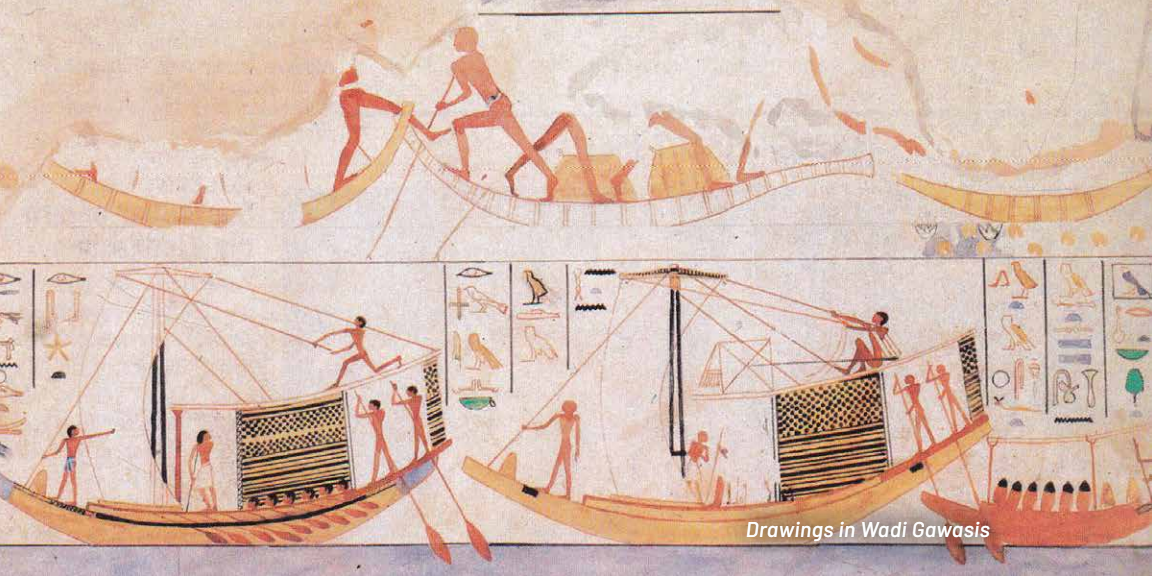
The use of floating devices goes back to the earliest times. Originally, rafts made of wood or reed, animal skins sown onto bones or branches, papyrus boats or dugouts made from hollowed-out trees were used to cross rivers or to navigate along shores. Early craft were also used to cross considerable stretches of water, like the Bering Strait[91] or across parts of the Pacific Ocean to other islands.[92]

Antiquity

As in many other areas, the Egyptians were forerunners. They are said to have used river navigation on the Nile as early as 11,000 years ago.[93] From 3000 BC, early ships left the Nile to cross the sea to what is now Lebanon.[94] The papyrus boats had been replaced by wooden ships, held together by ropes.[95] These boats were used for trade[96] and occasionally for warfare.

Rapidly, though, the Minoan culture from Crete and the surrounding islands built more sophisticated craft.[97] The Minoan culture was, however, overtaken by the Phoenicians.[98] They produced the first warships with a keel, rowing benches and a sail (the "Hippo").[99]

90 UNCTAD 2019, XI.
91 Woodman 2002, 185.
92 Ibid., 160.
93 Ibid., 197.
94 Stopford 2009, 8; Woodman 2002, 197, 232.
95 Woodman 2002, 232.
96 Bohn 2011, 12; Woodman 2002, 209.
97 Woodman 2002, 220.
98 Ibid., 243.
99 Bohn 2011, 9; Woodman 2002, 255.



Drawings in Wadi Gawasis

Their merchant ships were high, heavy vessels with rounded hulls and sterns. The Phoenicians founded a net of colonies serviced by their merchant ships (Cadiz, Carthage, Malaga, Palermo).[100]

Both the Minoan and the Phoenician expansion ended when Greece came to power.[101] The Greeks learned a lot in shipping especially from the Phoenicians. They developed the oared galley into the "Trireme",[102] with variations like the "Pentecantor" with 50 oarsmen[103]. In their struggles against the Persian Empire, they used their agile galleys, which had been fitted with bronze-tipped rams at the water level.

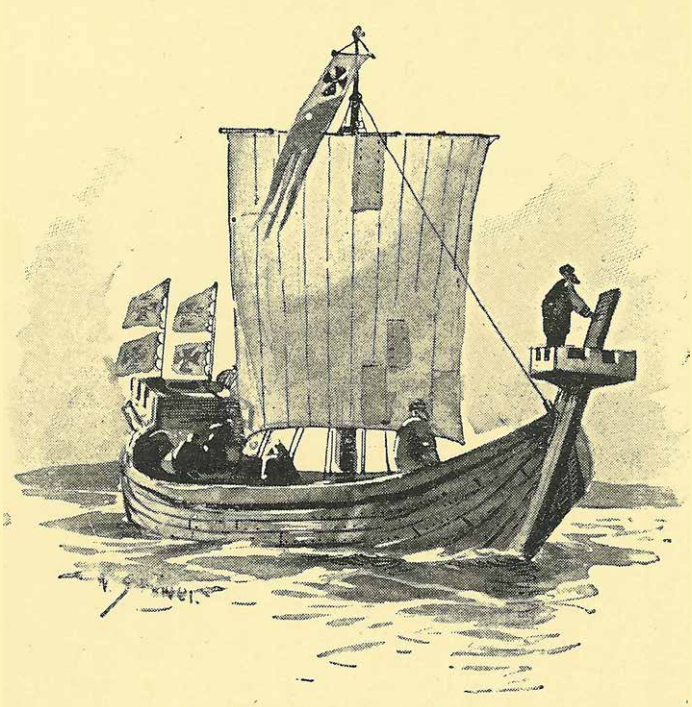
When the Romans took power from the Greeks[104] they used their techniques and perfected them. Again, warships and merchant ships were built according to separate concepts. The combination of oars and sails was kept for the warships. The Romans added catapults with which they would hurl rocks or "Greek fire", an inextinguishable mix of naphtha, sulphur and pitch.[105] The Romans also constructed heavy, rounded merchant ships similar to the Phoenicians.[106] This type of merchant ship already anticipated much of what would later be seen in medieval times.

100 Bohn 2011, 10.
101 Stopford 2009, 9; Woodman 2002, 267.
102 Woodman 2009, 302; Zeilbeck 2020, 53.
103 Woodman 2002, 291.
104 Stopford 2009, 10.
105 Woodman 2002, 361.
106 Ibid., 361, 373.

While there have been remarkable developments in shipbuilding also in China,[107] in the Arabic world[108] and in Northern Europe,[109] for our purposes the development in medieval Northwestern Europe is particularly significant.

The Middle Ages

The Vikings with their mix of piracy, trade and colonisation are relevant, as they contribute yet a further notable ship type, the "Long Ship" from about 1000 AD. The ship with 36 oars on each side was only gradually supplied with a sail. Sails were, however, necessary for those long journeys to Iceland, Greenland or down the European Coast as far as Britain or France.[110]



Cog

107 Bohn 2011, 11; Woodman 2002, 709.

108 Bohn 2011, 18.

109 Bohn 2011, 32 et seq.; Woodman 2002, 438 et seq.

110 Ibid.

The northern German trading houses of the Hansa,[111] in particular with cities like Hamburg, Bremen and Lübeck, learnt shipbuilding from the Vikings and the Mediterranean,[112] when they developed the "Kogge" (the Cog).[113] The Cog, built from roughly 1200, is the archetype of the ship used in the Middle Ages. It had a single mast and a single square sail. What was new was its stern-hung rudder.[114] It was a very simple ship, offering little shelter for the crew and even for cargo.[115] The Cog carried up to 250 tons of cargo. It was gradually replaced by a more refined and larger version, called the "Hulk", in around 1400 AD.[116] The further development led to the so-called "Carrack" (Karak), a two- to three-masted ship of 600 to 1,400 tons.[117]

Whereas the Hansa was particularly active in the Baltic region,[118] Mediterranean shipping had by now been taken over by Venice and Genova.[119]

The Age of Discovery

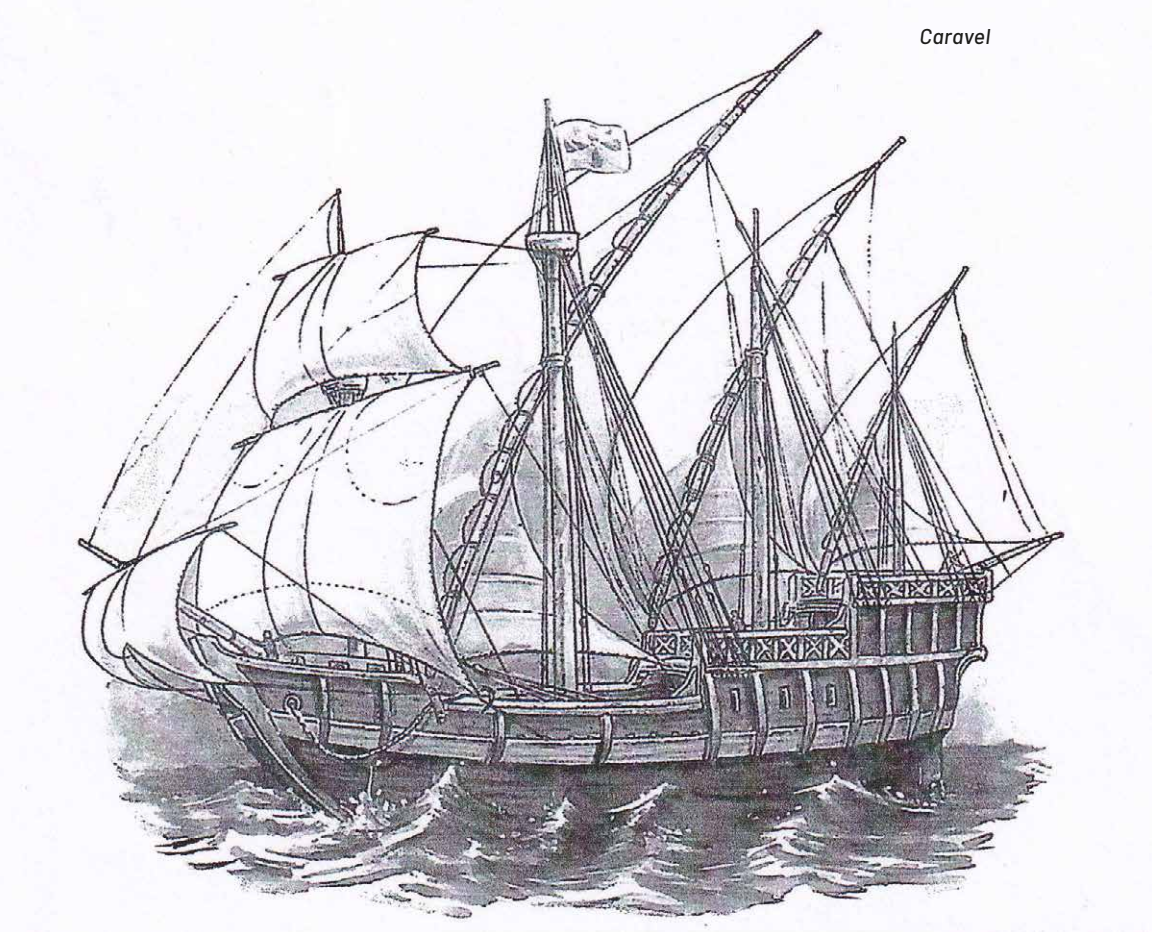
The land route to India and China as well as to Southern Africa had been blocked by new political powers. This was one of the motivations for European states to look for a seaway east.[120]

PORTUGAL

Whereas Spain was still very much occupied with conquering its South back from the Arabs,[121] Portugal took the lead in developing trade routes. Prince Henry of Portugal ("the Navigator")[122] was obsessed with finding the east route to India. The Portuguese struggled down the coast

111 Stopford 2009, 11.
112 Woodman 2002, 697.
113 Bohn 2011, 38 et seq.; Woodman 2002, 781.
114 Bohn 2011, 39; Woodman 2002, 697.
115 Woodman 2002, 793.
116 Ibid., 781.
117 Ibid., 1086, 1099.
118 Stopford 2009, 12.
119 Ibid., 11.
120 Bohn 2011, 42 et seq.; Stopford 2009, 13 et seq.
121 Bohn 2011, 47 et seq.
122 Woodman 2002, 1147.

of Africa, especially around Cape Bojador,[123] using small, but elegant "Caravels"[124] with two or three masts. Gil Eanes, Bartolomeo Dias, Vasco da Gama, Pedro Álvares Cabral and Fernando de Magelhâes were some of the famous discoverers of the time.[125] They opened routes, established trading relations and founded trading posts, but they did not create actual colonies. For Portugal it was crucial, though, to have hubs in Goa, Calicut and Malacca.



Caravel

123 Ibid., 1159.

124 Ibid., 1171 et seq.

125 Ibid., 1195 et sq.

SPAIN

When Spain came into the race, the route east was pretty much established. Christopher Columbus managed to convince the King and Queen, known as the "Reyes Católicos", that an alternative west route to the Spice Islands could be found. His expeditions also used the small but easier manageable Caravels[126] instead of the heavier merchant vessels of the time (the Carrack[127] or the Galleon[128]). Once South America had been discovered, as is well known, the Spaniards systematically exploited the gold and silver mines.[129] They then used Galleons to take the bounty back to Europe.

England, France and the Netherlands were the latecomers. They did not have a navy to speak of at the time. England used pirates as "privateers" for a kind of guerrilla warfare against Spain, especially in the Caribbean.[130] Philip II of Spain intended to put an end to this hassle by invading protestant England with his fleet, the Armada, in 1588.[131] It is well known that the attempt went seriously wrong, maybe more due to bad weather than to superior English tactics. The consequence of this defeat was that the way for new naval powers was open, in particular for England, the Netherlands and France.

THE NETHERLANDS

The Netherlands, between 1600 and 1800, managed to replace the Portuguese in East Asia. This was also the time when the Hansa lost most of its influence. Rich business men in protestant Netherlands – recently freed from Spain – founded the Dutch East India Company (Vereenigde Oostindische Compagnie).[132] At the same time the Netherlands grew to become the number one shipyard of Europe. A hundred shipyards built thousands of ships for Europe. It is said that the Netherlands alone had around 6,000 ships available in 1669.[133]

126 Ibid., 1171, 1207, 1232.
127 Ibid., 1171.
128 Ibid., 1243, 1266, 1279.
129 Pieth 2019, 42 et seq.
130 Bohn 2011, 54 et seq.
131 Woodman 2002, 1268.
132 Bohn 2011, 75; Woodman 2002, 2117 et seq.
133 Bohn 2011, 77; Stopford 2009, 19.

The reconstructed Batavia

In the first phase, the so-called "Flyte" or "Fleute"[134] was the preferred ship. It was a very long and thin ship with a large storage area, a small crew and little draught, i.e. distance below the waterline. The ships had to be tugged through the shallow waters of the Zuider Zee, a bay in the Northwest of the country that has since been reclaimed. Shipbuilding was revolutionised by standardisation and highly organised work.[135] Particularly for the East India service, a larger variation was developed. The "Pinassship", a less narrow ship, served as a cargo ship as well as a model for naval ships.[136]

ENGLAND

Roughly at the same time, merchants in England founded their own "East India Company".[137] Whereas the Dutch East India Company was oriented primarily towards Indonesia (the Spice Islands) and further east, as far as Japan, the English (later British) company was mostly involved in trade with India. It helped transform India into a colony.

Starting with Portugal, on to the Netherlands and then to England, ships used seasonal winds and currents. They would cross from Madeira or the Canaries towards the coast of Brazil in order to turn back east, round the Cape of Good Hope and across the Indian Ocean to India.[138] This is one of the reasons why Portugal – on its way to India – discovered and occupied Brazil. Gradually, on the Atlantic a triangular rhythm evolved. European goods were transported to Africa, slaves from Africa to the Caribbean, rum and sugar etc. from the Caribbean region back to Europe.[139]

Colonialism

From 1700 onwards the European colonial powers emerged and found themselves in a near permanent state of war. England, France and the

134 Bohn 2011, 76; Stopford 2009, 19; Woodman 2002, 1435, 2271.
135 Bohn 2011, 77.
136 Ibid.
137 Bohn 2011, 81 et seq.
138 Stopford 2009, 14.
139 Bohn 2011, 86 et seq.; Stopford 2009, 17.

Netherlands were involved in a never-ending sequence of sea battles. With Napoleon, the Dutch role at sea diminished. Shortly afterwards Britain beat France and its allies at Trafalgar. During the 19th century "Britannia" ruled the seas of the world. This omnipresence came at a price, though: at the time of Trafalgar the Royal Navy had 709 ships in commission, of which 113 were "of the line", meaning they had between 60 and 120 guns each. Another 111 vessels were under construction. The Royal Navy needed 100,000 seamen and 32,000 marines to operate theses ships.[140] Many of these men were forced labour.

Towards the end of the 19th century, with Germany and Italy, new players entered the political stage. They became essential participants in the emerging imperialism. Slightly earlier, the US had emancipated itself from Britain and, after the Civil War, started its journey to becoming a world power. Britain and France lost much of their power from the First World War on.

Sail versus steam

With industrialisation, steam engines conquered much of commercial life. It was to be expected that they would also be used to drive ships as an alternative to wind.[141] Although wind is cheap, there is no guarantee that there is wind. Even so, it took almost 50 years for steam to finally win the race in large commercial shipping. Early steamboats were extremely insecure: boilers were inefficient, coal used much of the cargo space, boilers could explode. Paddle wheelers may have been useful on lakes, but in heavy sea they were exposed.[142]

Matters changed when the screw propeller was invented.[143] For some time, large metal-hulled sailing boats kept up the competition,[144] but eventually steam-driven cargo and passenger ships won the race. Large passenger steamers were used by impoverished emigrants and rich tourists alike.[145]

140 Woodman 2002, 2904.
141 Ibid., 3026 et seq.
142 Bohn 2011, 109; Stopford 2009, 25; Woodman 2002, 3204.
143 Woodman 2002, 3180.
144 Stopford 2009, 26.
145 Woodman 2002, 3971.

Windjammer

A transatlantic passenger steamer

20th century

Like life in general, merchant shipping suffered dramatically in the first half of the 20th century. Cargo transport was on the rise, but in both world wars large numbers of ships were lost, in particular to submarine warfare.

After 1945 a fresh start was needed. Some private operators were able to acquire surplus "Liberty Ships" from the US Government, a type of ship that was mass produced during World War II at great speed to replace lost supply ships. They typically served as "tramp ships" in post-war times, cargo ships without a set schedule that would pick up work wherever it was to be found.[146]

In the early years after World War II, coal was exchanged for oil in commercial shipping, typically low-grade heavy crude oil. Gradually, diesel turbines connected to electric propulsion systems replaced the boilers.[147]

Tramp ship on the river Thames

146 Bohn 2011, 95; Stopford 2009, 22; Woodman 2002, 4057 et seq.

147 Bohn 2011, 111.

With the increasing globalisation of trade, merchant shipping volumes grew dramatically.[148] In parallel, specialisation[149] took place: general cargo was now a matter for container ships. The invention of containers and containerships contributed to a large extent to accelerating globalisation. Freight transportation became cheap and rapid, making it possible to move manufacturing locations to low-wage countries.[150] Large quantities of commodities, like iron ore, coal or grain, could be transported in so-called bulkers. The use of tankers also grew dramatically, especially when political crises in the Middle East led to the blockage of the Suez Canal. Ultra Large Crude Carriers would again go around the Cape.[151]

THE MODERN MARITIME INDUSTRY

The maritime industry is a huge sector. It excludes the navy and leisure boats, but includes merchant shipping, fisheries, the cruise industry and so-called marine resources (especially offshore installations[152] and ships servicing them). It also includes services like ports and terminals, shipbuilding and engineering, as well as insurance, brokerage, banking, legal business and the activities of classification societies.[153]

Ship types

Specialised demand has led the industry to distinguish different types of ships. Bulkers have emerged in five sizes. They are typically divided into "wet" or "dry" bulkers. Amongst the dry bulkers, there are "major" (for coal, iron ore and grain) and "minor" bulkers (for rice, sugar, wood, fertilisers, cement and the like).[154]

148 Woodman 2002, 4057 et seq.
149 Stopford 2009, 35 et seq.
150 Zeilbeck 2020, 426 et seq.
151 Stopford 2009, 40.
152 Hübner 2016, 32 et seq.
153 Stopford 2009, 48 et seq.
154 Hübner 2016, 15 et seq.

A bulker

Loading of a coal bulker

Wet bulkers or tankers[155] are divided into "clean" (e.g. for orange juice) and "dirty" tankers (for crude).[156] Again six size classes exist.[157] The tendency is, like with bulkers and container ships, to build ever-bigger ships for relatively cheaper transportation.

The trend has been followed by container ships since they revolutionised the general cargo market. Whereas up to the 1960s dockers (also known as stevedores – those who load and unload ships at ports) used to load and unload cargo ships in a longish process, sometimes taking weeks, containers are now unloaded and onloaded in a matter of a few hours[158] at the harbour-stop of the container ship.[159] From early experiments in the 1960s, container ships have grown to carry more than 24,000 TEU – that is 24,000 standard shipping containers.[160]

A tanker

155 Ibid., 20.
156 Alizadeh/Nomikos 2009, 35.
157 UNCTAD 2019, IX.
158 Ibid., VIII, 14 et seq.
159 Levinson 2006, 16 et seq.
160 UNCTAD 2019, IX:

MSC Michel Cappellini with a capacity of up to 24,346 TEU

Further shipping types have been developed for special purposes, to transport cars, forestry products, refrigerated goods, chemical products or liquid gas[161] or to service offshore installations,[162] to lay cables or pipelines,[163] etc. The emphasis in this book is on the merchant marine industry, so other types of ship including cruise ships, ferries and fishing vessels will only be mentioned on the margins.

Economic players

Looking at the players[164] involved in the life cycle of a cargo ship, one would need to start with the investors or financiers, the prospective owners, ordering the ship at the yard or acquiring it second hand.[165] The owner is rarely the operator. They will need a technical and a commercial manager, maybe a charterer and an actual operator. Manning agencies and other specialised service providers play a key role. Certain steps in the process of marketing shipping space are undertaken by brokers. At the end of a ship's life, intermediaries, cash buyers and scrapyards become relevant.

161 Stopford 2009, 53 et seq.

162 Hübner 2016, 32 et seq.

163 Ibid.

164 Hübner 2016, 1 et seq.

165 Giannakoulis 2016, 71; Goldrein et al. 2012, 1 et seq.

The value chain

Looking at the value chain in shipping, goods are produced, possibly sold through traders or other intermediaries, then moved to port by logistics companies. Freight forwarders, warehouses and terminal operators play a vital role. The goods are then handed over to ship operators, typically loaded automatically and unloaded at the destination. From there, they are again moved by freight forwarders to the buyer. Trade finance (involving banks and pre-shipment inspection companies) as well as insurance companies play an essential role.

FOUR MARKETS

Authors on the economy of shipping typically distinguish four shipping markets:[166]

- freight market,
- sale & purchase market,
- newbuilding market, and
- demolition market.

The freight market and the risk of illegal trusts

As mentioned, freight prices are highly volatile. One of the major challenges is to obtain the necessary information.[167] Freight prices are typically set by so-called alliances, which resemble cartels.[168] There are currently two such alliances: THEA – THE Alliance (Hapag-Lloyd, ONE, Yang Ming) and Ocean Alliance (COSCO, OOCL, CMA CGM, Evergreen). 2M (Maersk and MSC) separated in 2023.[169] However, it seems that Maersk and Hapag-Lloyd are about to form a new alliance. The alliances cover 80% of the container market and are

166 Alizadeh/Nomikos 2009, 35 et seq., 55 et seq.; Duru 2019, 9 et seq.

167 Duru 2019, 29 et seq.

168 Hübner 2016, 31.

169 Metro Shipping, 16 February 2023: "M split by MSC and Maersk to transform shipping from Asia"; The Loadstar, 25 October 2023: "MSC and Maersk 'decouple' their fleets, ready to go their separate ways".

amongst the last surviving cartels; they face heavy criticism as they do not meet the requirements of a so-called "block exemption" from EU antitrust rules.[170] What is considered clearly illegal is direct price fixing and market sharing. The industry, however, continues to use alliances to share information and to pool freight room.

The US Federal Maritime Commission (FMC) became active in the face of the extremely high freight prices in the aftermath of the Covid-crisis.[171] In the case of MSC the FMC ruled, however, that a congestion fee of USD 1,000 per container was not unreasonable.[172]

A key question in shipping is who carries which part of the cost. This depends very much on the arrangement:

VOYAGE CHARTER

Under the arrangement of a voyage charter, transport for a specific cargo is provided from one part of the world to another for a fixed price per ton. Under these circumstances the shipowner pays for their capital costs, operating costs and voyage costs, including port costs and the cost of bunkers (fuel) and cargo handling.[173]

TIME CHARTER

Under the regime of time charter, ownership and management of the ship stays with the shipowner. The charterer, however, for a certain time directs the commercial operation of the ship. According to this arrangement, the owner pays for their capital and for the operating cost, while the voyage costs are picked up by the charterer.[174]

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170 EU BER March 2020-April 2024; Ortiz Blanco 2007.

171 Splash247, 9 July 2021: "Biden vows to tackle competition issues in liner shipping"; Splash247, 13 July 2021: "US FMC and DoJ sign MOU to collaborate on antitrust issues"; Splash247, 11 August 2021: "Wash debates taking action against global carriers"; Splash247, 2 August 2021: "American manufacturer files landmark suit with the FMC over soaring liner charges"; Container news, 16 September 2021: "MCS resolves FMC dispute with COSCO, complaint against MSC pending"; The Loadstar, 28 September 2021: "US shipper MCS Industries settles court action against COSCO, but remains in legal action with MSC".

172 Splash247, 3 October 2023: "MSC wins landmark FMC case".

173 Alizadeh/Nomikos 2009, 44; Stopford 2009, 182.

174 Alizadeh/Nomikos 2009, 44; Stopford 2009, 184.

BAREBOAT CHARTER

According to the bareboat arrangement the owner maintains ownership but the charterer obtains full operational control over the ship for a period of time, usually up to 10 or 20 years. Here merely the capital costs are born by the shipowner. The operating and voyage costs are paid by the charterer.[175]

The newbuilding market

The main challenge in newbuilding is that construction may take months to years. In a highly volatile demand situation it is rather risky to order new ships. They may be delivered when freight prices are down. However, it may also turn out to be the contrary, as between 2003 and 2008.[176] Nevertheless, recently large series of very big ships (container ships or cruise ships) have been ordered to conquer new markets. This is also a reaction to an ageing containership fleet.[177] The major challenge is, however, that the fleet is renewed before new alternative climate-friendly propulsion systems are really available.

The sale & purchase market

The second-hand or sale & purchase (S&P) market reflects in many ways more directly the changes in freight rates.[178] Worldwide about 1,000 ships are sold per year on the second-hand market.[179] As a direct consequence of the Covid crisis, second-hand markets boomed.[180] A major problem is that the valuation of these ships is very insecure.[181]

The demolition market

The demolition market depends on the one hand on the demand for shipping space. In times of overcapacity more ships will be demolished.

175 Alizadeh/Nomikos 2009, 44; Stopford 2009, 185.

176 Alizadeh/Nomikos 2009, 56 et seq.

177 International Transport Journal, 27 October 2023: "Ageing containership fleet poses challenges".

178 Hübner 2016, 19: the second-hand prices for dry bulkers dropped 60 to 70% after 2008.

179 Alizadeh/Nomikos 2009, 58.

180 Clarksons, 23 April 2021: "Ships' values soar".

181 Duru 2019, 62; Stopford 2009, 202 et seq.

On the other hand, it depends on the price of steel on the local markets. The prices differ over time[182] and according to location. Prices are markedly higher at shipbreaking yards with minimal security arrangements and particular low salaries, as in Bangladesh, India or Pakistan. Overall they range from USD 100 to USD 400 per lightweight ton or lwt – in boom times up to USD 700 per lwt.[183]

SHIPPING MARKET CYCLES

The economist Martin Stopford says: "Just as the weather dominates the lives of seafarers, so the waves of shipping cycles ripple through the financial lives of shipowners".[184] Depending on the investment, huge sums of money are at stake, and the prices of ships follow the general economy and freight prices. Typically, there is a time lag for a crisis to hit: the subprime crisis of 2008 fully hit the shipping industry in the following year.[185] Whereas at the begin of the Covid crisis everybody expected a further crash of the shipping industry, freight prices have dramatically risen in the course of 2021. As a consequence second-hand ships have gained value.[186] Correspondingly, shipbreaking was down. Recently a new downturn has set in.[187]

For investors, as in other markets, the challenge is to foresee such market movements. Once in crisis, they would need to anticipate the upturn and buy when shipping space is still cheap. But if – thanks to easily available capital – many investors buy in a time of crisis, they may kill off the recovery.

Overall, one of the major economic strategies against financial risk is to prepare for crisis with a broad enough portfolio of ships.

182 Stopford 2009, 213.

183 London High Court, Particulars of Claim re *Hamida Begum* vs. *Maran* (UK) Ltd, 17 February 2020, para. 41; our on-site visit to Alang.

184 Stopford 2009, 93; cf. also Duru 2019, 44 et seq.

185 Duru 2019, 60 et seq.

186 NZZ, 26 April 2021: "Konsumlust und Containermangel: Für die Reedereien zahlt sich die Pandemie aus".

187 Splash247, 3 November 2023: "'Challenging times ahead': Maersk lets go of thousands of staff".

CONTAINER SHIPPING AS A MAJOR CONTRIBUTOR TO ECONOMIC GLOBALISATION

It has been mentioned that container shipping was one of the major innovations in transportation over the last 50 to 60 years. Up to the 1960s cargo had to be loaded by hand in a drawn-out process, piling boxes, barrels, baskets, cases, cartons, packages and drums of mixed items according to their destination into the hold of a ship. The goods needed to be hauled aboard on pallets or in nets attached to winches and hooks. The loading took days and weeks and was dangerous. The culture at the docks was rough, theft normal and industrial action frequent.[188]

It was actually not a maritime specialist but a truck entrepreneur, Malcolm McLean, who had the idea of standardised "boxes" on ships, trains and trucks. He entered the shipping business with the help of the engineer Keith Tantlinger, who invented the seamlessly stacked boxes and the twistlock for connecting them.[189] The next essential step for McLean was to convince the US Army, at the time engaged in the war in Vietnam, to use his ships for logistics.[190]

Containers are now the backbone of general cargo shipping (apart from bulkers and tankers). Roughly 15 million containers make up to 230 million journeys a year.[191]

Container shipping is generally cheap. With steadily growing ships and thinned out crews, freight prices are additionally reduced. Container shipping is one of the key factors in shifting manufacturing to low-wage countries and importing products from Southeast Asia. The invention was one of the key boosters of economic globalisation. It will be noted, though, that many unnecessary goods – goods also available at the places of destination – are being shipped across the world, at the price of pollution of the marine environment and labour abuses on board and at the production place.

188 Levinson 2006, 16 et seq., 33 et seq.

189 Ibid., 39; Wikipedia, "Twistlock".

190 BBC, 9 January 2017: "The simple steel box that transformed global trade".

191 Kraska/Pedrozo 2013, 355.

THE VULNERABILITY OF THE MODERN SUPPLY CHAIN

Several recent examples show how much modern logistics rely on open waterways:

Blockage of the Suez Canal in 2021

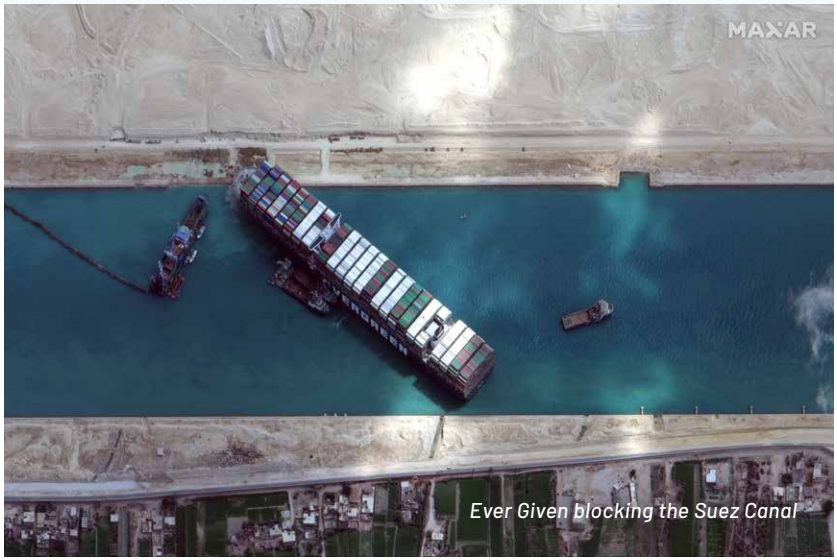
In a drastic way our dependency on the merchant marine industry was demonstrated when a mega-container ship, operated by Evergreen (*Ever Given*), blocked the Suez Canal. The owner claims that a sandstorm pushed the 400-metre-long ship with 20,000 TEU aside. Experts claim that the ship had, as a consequence of its size and the narrow margin of water left by its draught of 16 metres, been pulled to the canal wall by the so-called "bank effect" (or "Bernoulli principle").[192] It jammed diagonally in the 200-metre-wide canal, thereby blocking the route from Europe to Asia for everybody else. Luckily, it only took a week to free the ship. Nevertheless 370 ships had been blocked at both entries of the canal. Once traffic picked up again, it took weeks to deal with the backlog in ports. Egyptian authorities estimated the cost of the incident for Egypt alone at close to USD 1 billion.[193] However, they obtained far less in the final settlement, as a large part of the responsibility for the accident was attributed to incoherent pilot behaviour.[194]

192 NDTV, 25 June 2021: "S***!": Moment when ship got stuck in Suez and more details revealed"; NZZ, 11 May 2021, 16: "Hat der 'Ever Given'-Kapitän den Sogeffekt des Kanalrandes unterschätzt?".

193 Abc.net.au, 31 March 2021: "Losses from Ever Given blockage of Suez Canal estimated to reach more than $1 billion".

194 NDTV, 25 June 2021: "S***!": Moment when ship got stuck in Suez and more details revealed"; Splash247, 31 May 2021: "Ever Given compensation battle stretches into June".

The incident teaches us just how fragile international supply chains are and how vital shipping is to globalisation:[195] one ship is able to block world trade.[196] Much has to do with the ever growing size of the merchant ships.[197]



Ever Given blocking the Suez Canal

Panama canal drought

A further drastic example of how dependent the "just-on-time" supply chain has become on shipping routes is the drought crisis that hit the Panama Canal in 2023.

The Panama Canal is one of the key waterways preventing long detours. When originally built it was relatively narrow. It has recently been enlarged as a reaction to continuously larger ships and growing demand.[198] However, in 2023 a dramatic draught hit

195 WOZ, 1 April 2021: "Stau im Suezkanal, Buchstäblich quer gestellt".
196 NZZ, 25 March 2021: "Blockierter Suezkanal bringt Welthandel in Atemnot".
197 NZZ am Sonntag, 28 March 2021: "Suezkanal: Der teuerste Stau der Welt".
198 US Embassy in Panama, 31 March 2019: "The Expanded Panama Canal".

the canal. Even though Panama is one of the wettest areas in Latin America, the rains necessary to fill the lake system feeding the canal system failed. The canal authority had to reduce the daily transits of ships and the amount of cargo they carried. Supply chains and "just-in-time" delivery are inevitably hampered by such events.[199] Neighbouring countries are exploring building rail tracks from the Atlantic to the Pacific Ocean as alternatives.[200]

Attacks by Houthis on merchant ships

Iranian-backed Houthi rebels in Yemen started attacks on merchant ships passing through the Red Sea in connection with the war between Israel and Hamas in 2023. Several container ships managed by worldwide shipping companies like MSC and Maersk were hit by drone attacks or boarded by militia men. The major shipping companies reacted by re-routing around the Cape of Good Hope, obviously pushing up delivery time and cost.[201] The US created a naval defence coalition.[202]

Once more these incidents demonstrate the vulnerability of supply chains and their reliance on the shipping industry.

199 Splash247, 15 November 2023: "Shipping locks in Panama Canal diversion plans"; NZZ, 9 November 2023: "Dem Panamakanal geht das Wasser aus"; Splash247, 1 November 2023: "Record dry weather forces further dramatic cuts at the Panama Canal"; Reuters, 12 September 2023: "Panama Canal to further reduce daily transits if drought continues"; Wall Street Journal, 12 September 2023: "Panama Canal drought conditions seen extending into 2023"; The Guardian, 14 August 2023: "Long delays at Panama Canal after drought hits global shipping route".

200 NZZ, 2 November 2023: "Konkurrenz für den Panamakanal".

201 MSC Press Release, 16 December 2023: " MSC PALATIUM III Incident in Red Sea – Rerouting Suez Traffic to Cape"; NZZ, 18 December 2023: "Das Huthi-Regime bedroht den Welthandel".

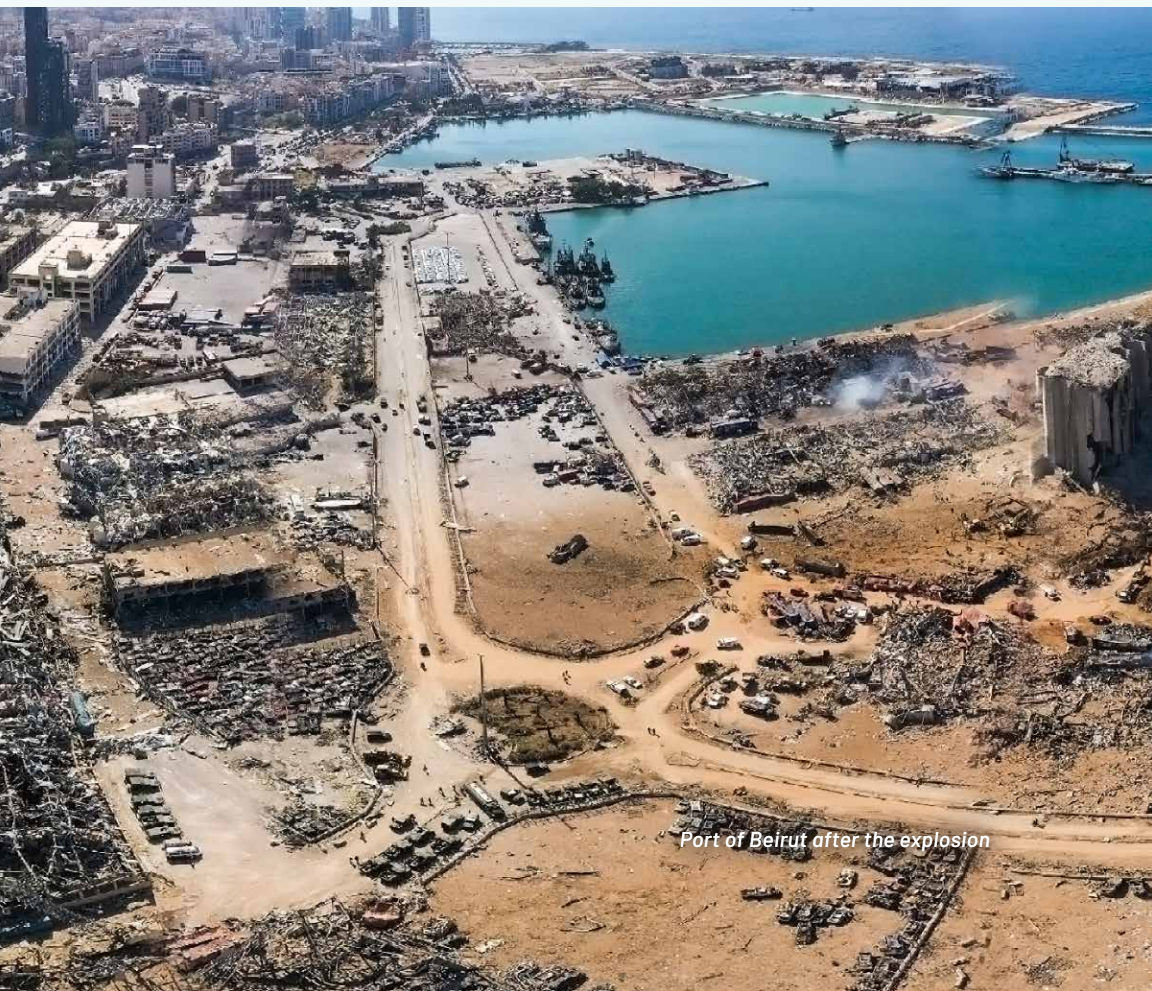
202 The Guardian, 19 December 2023: "US announces navel coalition to defend Red Sea shipping from Houthi attacks".

03

SHIP OWNERSHIP, OPERATION AND FINANCE

MV *RHOSUS*: THE FLOATING BOMB

When one of the biggest civilian explosions ever shook Beirut on Tuesday, 4 August 2020, killing more than 200 people, wounding over 7,000, leaving 300,000 homeless, and causing billions of dollars in



Port of Beirut after the explosion

damage,[203] few realised that the catastrophe had to do with shipping and a detainment process that went dramatically wrong.[204]

Seven years before the explosion, an old, rusty ship, the MV *Rhosus*, in service since 1986,[205] chartered by the Russian businessman Igor Grechushkin of Khabarovsk,[206] was under way from Georgia transporting 2,750 tons of highly explosive ammonium nitrate to Mozambique.[207] Ammonium nitrate is at the same time a base substance for fertilisers and for explosives. The ship had to make an unforeseen stop at Beirut to pick up additional cargo and earn cash to pay for the Suez Canal passage:[208] apparently, a UK-based seismic study firm sub-chartered the ship to transport 160 tons of survey equipment on deck from Beirut to Jordan.[209] Things went wrong, though: the heavy machinery caused the old ship's hatches to buckle.[210] Additionally, the charterer could not pay the harbour fees.[211] The harbour authorities subjected the ship to Port State Control and considered it not seaworthy. The ship was impounded in 2013.[212]

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203 Human Rights Watch, "They Killed Us from the Inside", An Investigation into the August 4 Beirut Blast, August 2021, 1; New York Times, 10 August 2020: "Lebanon's Government resigns amid widespread anger over blast"; New York Times, 4 August 2020: "Deadly explosion shatters Beirut, Lebanon"; NZZ, 6 August 2020: "Viele tickende Zeitbomben"; WoZ, 1 October 2020, 15: "Nach dem grossen Knall".

204 Pieth/Betz in NZZ, 19 August 2020: "Wie die MV 'Rhosus' zur schwimmenden Bombe für Beirut wurde".

205 Equasis.org, MV Rhosus, IMO 8630344.

206 New York Times, 5 August 2020: "Blame for Beirut explosion begins with a leaky, troubled ship"; Globe and Mail, 5 August 2020: "How neglected cargo became a 'ticking time bomb' in Beirut".

207 BBC, 6 August 2020: "Beirut explosion: How ship's deadly cargo ended up at port".

208 New York Times, 5 August 2020: "Blame for Beirut explosion begins with a leaky, troubled ship".

209 According to a lawsuit filed in 2022 in the US by victims of the Beirut explosion: Organized Crime and Corruption Reporting Project (OCCRP), 15 July 2022: "Beirut Blast Victims File Lawsuit in U.S."; Reuters, 14 July 2022: "Victims of Beirut port blast file complaint in U.S. court".

210 OCCRP, 15 July 2022: "Beirut Blast Victims File Lawsuit in U.S."; Human Rights Watch, "They Killed Us from the Inside", An Investigation into the August 4 Beirut Blast, August 2021, 21.

211 New York Times, 5 August 2020: "Blame for Beirut explosion begins with a leaky, troubled ship".

212 Human Rights Watch, "They Killed Us from the Inside", An Investigation into the August 4 Beirut Blast, August 2021, 21-22; Globe and Mail, 5 August 2020: "How neglected cargo became a 'ticking time bomb' in Beirut"; New York Times, 5 August 2020: "Blame for Beirut explosion begins with a leaky, troubled ship".

The shipowner, charterer, cargo owner[213] and banks abandoned ship, cargo and crew.[214] A longish legal battle ensued during which captain Boris Prokoshev and parts of his crew were held hostage by authorities.[215] Upon appeal to a judge, the crew was finally freed and the cargo was displaced to warehouse No. 12 in the harbour zone of Beirut. However, the dangerous cargo was not adequately secured.[216] Harbour, customs and security authorities apparently appealed repeatedly to the Justice Ministry to auction off or otherwise dispose of the dangerous substance.[217]

However, nothing happened. In the meantime, the leaky ship sank in the harbour zone.[218]

The inability of the Lebanese authorities to secure the dangerous goods, until a fire set off the huge explosion, cannot be excused. However, the catastrophe is linked to two much bigger stories: that of the failing Lebanese state and the issue of opacity in the global shipping industry.

The story that cannot be explained in detail here is the state of affairs in Lebanon. Feuding factions are keeping a delicate balance of power. Widespread corruption is one of the key mechanisms of power, and occasionally the factions resort to violence, by setting off bombs (like the one killing the Prime Minister Hariri in 2005) or by triggering civil war.[219]

The other story is explored below.

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213 According to a judgment of the London High Court of 31 January 2023, the owner of the cargo was the UK-based company Savaro Ltd that was held liable for death, personal injury and property damage; the identity of the ultimate beneficial owner behind Savaro was not disclosed, though. In June 2023, Savaro was ordered to pay more than GBP 800,000 to victims of the Beirut explosion. However, it remains unclear who will eventually pay: Essex Court Chambers, 28 February 2023: "Beirut port explosion: UK defendant held liable"; Reuters, 13 June 2023: "London court orders UK-registered firm to pay nearly $1 million to Beirut blast victims".

214 New York Times, 5 August 2020: "Blame for Beirut explosion begins with a leaky, troubled ship"; Reuters, 6 August 2020: "Beirut's accidental cargo: how an unscheduled port visit led to disaster"; stableseas.org, 5 August 2020: "Seafarer rights, ship abandonment, and the explosion in Beirut".

215 BBC, 6 August 2020: "Beirut explosion: How ship's deadly cargo ended up at port"; fleetmon.com, 23 July 2014: "Crew kept hostages on a floating bomb – m/v Rhosus, Beirut".

216 Globe and Mail, 5 August 2020: "How neglected cargo became a 'ticking time bomb' in Beirut"; New York Times, 5 August 2020: "Blame for Beirut explosion begins with a leaky, troubled ship".

217 New York Times, 5 August 2020: "Blame for Beirut explosion begins with a leaky, troubled ship"; NZZ, 6 August 2020, 1: "Viele tickende Zeitbomben"; Wikipedia, "Explosionskatastrophe in Beirut 2020".

218 New York Times, 7 August 2020: "Ship cited in Beirut blast hasn't sailed in 7 years. We found it".

219 Cf. the assassination of Prime Minister Rafik Hariri on 14 February 2005: Reuters, 3 August 2020: "The assassination of Lebanon's Hariri and its aftermath".

SHIPPING AS THE WORLD'S MOST OPAQUE BUSINESS

The example of the MV *Rhosus* shows that it is not always easy to find out who really owns a ship and who controls its operations. It can be difficult to hold anyone responsible if things go wrong with a ship or its cargo. This is because the global shipping industry today is characterised by three particular features: open registers, offshoreism and outsourcing.

Open ship registers and substandard ships

In the 1920s, during the US Prohibition and in order to evade strict labour regulations, ships were increasingly "flagged out" to countries with "open ship registers", applying next to no supervision and charging minimal taxes.[220] In the meantime nearly 75% of the world's fleet is now flagged by such "flags of convenience", typically in Panama, Liberia or the Marshall Islands.[221]

In our case, MV *Rhosus* was registered in Moldova.[222] From 2005 to 2012, the ship changed its flag four times, from Belize to Panama, Georgia and finally Moldova.[223] In order to safeguard against abuses and lack of supervision on board ships flying flags of convenience, maritime administrations have drafted various regional memoranda, in particular the "Paris MoU". Port states agree to inspect suspicious ships docking with them. They are permitted to detain unseaworthy ships and order the defects to be mended.[224]

If ships of a specific flag state are repeatedly detained, the flag can be placed on a grey or even a black list, subjecting their ships to intensified controls.[225] Under certain circumstances, a ship whose flag is

220 König/Salomon 2022, para. 5; NGO Shipbreaking Platform, "Flags of Convenience".

221 Benson, E./Puga, C., "Flagging the Issues: Maritime Governance, Forced Labor, and Illegal Fishing", Center for Strategic and International Studies, 9 August 2021; Wikipedia, "Flags of Convenience".

222 IMO GISIS, Ship Particulars, MV Rhosus, IMO 8630344.

223 Ibid.

224 parismou.org / Memorandum.

225 International Chamber of Shipping: Shipping Industry Flag State Performance Table 2023/2024; parismou.org: White, Grey and Black List.

on the Paris MoU grey or black list can even be refused access to ports in the Paris MoU region.[226]

Moldova has an open register.[227] Based on inspections carried out and detentions ordered from 2011 to 2013, the flag of Moldova was on the 2013 black list of the Paris MoU.[228] MV *Rhosus* was inspected several times during the last two years of its active life (18 May 2012 in Cyprus (Larnaca); 21 August 2012 in Bulgaria (Varna); 12 May 2013 in Algeria (Tenes); 8 June 2013 in Lebanon (Saida); 28 July 2013 in Spain (Seville)). Following the inspection in Seville, the ship was detained for 13 days based on 14 serious defects, including deficient auxiliary engines. Regarding the structural condition of the ship, the inspection found that the decks were corroded.[229]

Not surprisingly, after the Beirut explosion, media reports called the MV *Rhosus* a "garbage ship", meaning "a ship which, like 10 to 15% of the world fleet, does not comply with international safety regulations and most of the time carries low value-added cargoes."[230]

MV Rhosus

226 https://parismou.org/PMoU-Procedures/Library/banning.

227 Ziarul de Gardă, 23 August 2020: "The Secretes Behind Moldova Naval Power".

228 Paris MoU, Port State Control, Annual Report 2013, 35.

229 Equasis.org, MV Rhosus, IMO 8630344, ship inspection, list of port state controls; medmouic.org, Rhosus, IMO 8630344, list of inspections.

230 Le Commerce du Levant, 15 September 2020: "From the Rhosus' Departure to the Port Explosion, Chronicle of a Disaster Foretold".

Offshoreism

News reports and even official registries are astonishingly vague as to the ownership of the MV *Rhosus*. It may be understandable that right after the Beirut explosion, news reports considered the Russian Igor Grechushkin as the "owner" of the ship.[231] He seemed to make the perfect villain in the scenario. However, he was technically speaking the manager of the company that chartered the ship.[232] The registered owner of MV *Rhosus* was a Panamanian company called Briarwood Corp.[233] The charterer was a Marshall Islands company called Teto Shipping Limited.[234] The ship manager (including the roles of the commercial and safety manager[235]) appeared to be Interfleet Shipmanagement EOOD, Bulgaria.[236] It is typical for the world of flags of convenience that the actual beneficial owner of the ship is unknown. The beneficial owner should be registered in the IMO GISIS (Global Integrated Shipping Information System)[237] database. Interestingly, though, according to a reliable source, in the case of MV *Rhosus* the database says "unknown" where the ultimate owner should show up.[238]

231 RadioFreeEurope/RadioLiberty, 5 August 2020: "Death toll rises in Beirut blast linked to seized Russian-owned ship"; Siberian Times, 5 August 2020: "First pictures emerge of a Russian man whose ammonium nitrate cargo detonated in the port of Beirut".

232 New York Times, 5 August 2020: "Blame for Beirut explosion begins with a leaky, troubled ship".

233 IMO GISIS, Ship Particulars, MV Rhosus, IMO 8630344; IMO GISIS, Company Particulars, Briarwood Corp, IMO 5403395.

234 Reuters, 11 August 2020: "Who owned the chemicals that blew up Beirut? No one will say".

235 The ISM Manager is the company "responsible for the effective implementation of the 'International Safety Management' Code aboard the ship" and "referenced in the 'Safety Management Certificate' of the ship" (www.equasis.org; below Chapter 9).

236 Equasis.org, MV Rhosus, IMO 8630344.

237 The IMO GISIS was launched in 2005 and allows access for different user groups to data supplied to the IMO by maritime administrations, member states and port authorities. Its modules cover a range of topics such as marine casualties, pollution prevention, crew change and repatriation and maritime security (marineinsight.com, 16.04.2021: "What is IMO's Global Integrated Shipping Information System (GISIS)?").

238 According to an investigation by the Organized Crime and Corruption Reporting Project (OCCRP), Briarwood belonged to the Cypriot shipping magnate Charalambos Manoli; Mr. Manoli denies this: OCCRP, 21 August 2020: "A Hidden Tycoon, African Explosives, and a Loan from a Notorious Bank: Questionable Connections Surround Beirut Explosion Shipment".

In legal terms, the owner of a ship is "the person, either a physical presence or a legal entity, which holds the ownership of the vessel."[239] This description fits the registered owner of a vessel (an individual or a company) who appears in the IMO GISIS and other publicly available databases. Frequently, the registered owner is a one-ship owning shell company (cf. above Briarwood Corp.) domiciled in offshore centres such as Panama or Hong Kong. While being the registered shipowner, such a shell company is not involved in the operation and management of a ship.

Next to the registered owners, ships have beneficial owners. The beneficial owner is the "natural person(s) who ultimately owns or controls a corporation (or in our particular area of interest a vessel) and/or the person on whose behalf a transaction is being conducted."[240] The beneficial owners of a ship profit from the vessel's operations, although they may not be directly involved in the ship's day-to-day operations and management.[241]

But why is a ship's ultimate beneficial owner not known, as in the case of the MV *Rhosus*?

Opacity surrounding ship ownership is not illegal *per se*, however, it does raise the question why there is such a desire for secrecy. Different situations must be distinguished.

First, shipping companies may register shell companies as shipowners because in liability cases, they may want to attempt to limit the access of creditors to just one ship (instead of the entire fleet).[242] Or, shell companies as registered owners may serve to avoid taxes.[243]

239 Plomaritou and Papadopoulos 2018, 109.

240 OECD 2004, 9.

241 Lloyd's List Intelligence, "Below the Surface: Ownership and Risk"; Panayides describes ship owning as follows: "Ship ownership entails the investment by a company or individual in the purchase (or building) of the asset (ship), which will then be operated for a financial benefit (profit). This may also be referred to as 'beneficial' ownership. In contrast, a company may own a ship by virtue of 'nominal' ownership whereby the company is simply a 'brass plate' entity that has the legal ownership of the vessel for tax purposes; that company usually is residing in a flag of convenience country. In some cases, the ship-owning company may wish to confine its engagement to the financial benefit derived from ownership by way of bareboat chartering the ship to a charterer wishing to operate the vessel. This arrangement involves transfer of the operating risk to the charterer." (Panayides 2017, 2).

242 Carballo Piñeiro 2015, 32; Panayides 2017, 4; Stopford 2009, 273; Zeit Online, 13 November 2022: "Gulf Livestock 1 – Dem Sturm ausgeliefert".

243 Plomaritou and Papadopoulos 2018, 110; The Independent, 26 March 2021: "Global shipping: The world's most opaque industry".

Second, in other situations, opacity may be a method to hinder the access of authorities to an unscrupulous beneficial owner of a ship that is involved in unethical, harmful or illegal activities. There are many examples:

- A shipowner may go bankrupt and abandon ship and crew.[244]
- A ship may cause an environmental disaster, e.g. an oil spill, or crew members may be injured or killed on board.[245]
- Ships may be used to conceal the transfer of goods of problematic origin, e.g. from countries to which trade sanctions apply, to other parts of the world,[246] and to smuggle illegal goods (drugs etc.).
- Investments in ships may be a method to launder money.[247]
- Ships may be involved in activities such as illegal, unreported and unregulated (IUU) fishing.[248]
- Finally, a ship may be scrapped at the end of its working life in breach of international or regional legislation.[249]

In such situations, the current global system of open ship registration that allows the ultimate beneficial owner to remain secret enables unscrupulous shipowners to escape responsibility, including criminal sanctions. Depending on the circumstances, shipowners may profit from illegal activity without having to fear confiscation of the proceeds of crime.

All of this is well known to industry insiders. The question is whether there is a push at the political level to develop international rules to solve these problems.

Back in 2004, in a detailed report on options for how to improve transparency in the ownership and control of ships, the Maritime Transport Committee (MTC) of the Organisation for Economic Co-operation and Development (OECD) said that "shipowners who wish to hide their

244 Above the MV *Rhosus* case and below Chapter 4.

245 Cf. the cases discussed below in Chapter 8.

246 Lloyd's List Intelligence, "Below the Surface: Ownership and Risk"; Splash247, 21 June 2023: "Exclusive satellite images of wrecked Pablo tanker cast dark light over shadow fleet"; below Chapter 8 on the risks emanating from "shadow" tankers.

247 Urbina 2019, 172 et seq.

248 Below Chapter 5.

249 Below Chapter 10.

identities … have access to many jurisdictions, and especially established offshore centres, that openly offer corporate services that enable beneficial owners (whether involving ships or other commercial enterprises) to effectively hide their identities within those corporate structures."[250]

As a pragmatic way forward, the MTC suggested that confidentiality (as opposed to anonymity) of ownership could be maintained, allowing authorities to identify beneficial owners of ships if necessary. Referring to the efforts of the UN, the Financial Action Task Force (FATF) and other OECD subgroups in this field, the MTC suggested that it should "not undertake any independent action to address issues at this level."[251]

However, the 1986 UN Convention on Conditions for Registration of Ships has not entered into force as it has not received sufficient ratifications.[252] Apparently, current IMO regulations do not require flag states to determine the beneficial ownership of vessels registered under their flag.[253]

The work of the FATF has a strong impact on the shipping industry when it comes to the financing of ships through bank loans, because knowing your customer (KYC) is fundamental under the international standards set by the FATF Recommendations.[254] It is reported that a Norwegian shipping bank rejected up to 15% of loan applications due to its anti-money laundering/KYC rules.[255] However, as explained further below, bank loans are only one way to finance ships.

FATF publications do not seem to specifically focus on shipping. In its 2019 evaluation of Greece, the FATF said that "information on Greek registered shipping companies is maintained in a separate, paper-based registry. This impedes swift access to accurate and up-to-date information for this higher risk sector, which has frequent issuance of bearer shares

250 OECD 2004, 7.

251 OECD 2004, 4.

252 Cf. https://www.imo.org/en/OurWork/Legal/Pages/Registration-of-ships-and-fraudulent-registration-matters.aspx.

253 King's College London, 5 June 2019: "Stepping up on sanctions – evaluation of the meeting of the International Maritime Organisation in March 2019".

254 FATF 2012, Recommendation 10.

255 Lloyd's List, Daily Briefing, 13 April 2018, p. 3: "Anti-money laundering rules killing one in eight shipping deals, says M&M".

and complex structures established in offshore locations."[256] It is unclear whether the FATF followed up on its findings by taking a closer look at the shipping industry.

The MTC may have become a victim of its outspokenness. It was abolished by the OECD Council in 2005, after 57 years of existence.[257]

Outsourcing

Sometimes, neither the registered nor the beneficial owner of a vessel are directly involved in its day-to-day-operation. This depends on the contractual arrangements that define the roles of the owner, charterer, manager and operator of a ship. In global shipping, it may well be that operational control, cost and risk are fully transferred to a charterer who in turn outsources tasks to a number of management companies.

THE ROLE OF THE CHARTERER

Chartering can be defined as follows:

> "A '*charter*' is the agreement for commercial employment of a ship. It is contracted between two involved parties, the '*shipowner*' and the '*charterer*', the former representing the ship's interests and the latter using the ship's services either for a specific cargo voyage or for a period of time. In exchange for that, the charterer undertakes to pay a financial compensation called '*freight*' or '*hire*' in accordance with the selected type of charter …".[258]

The different types of charter – voyage, time and bareboat – are explained above. The charterer can be, but is not necessarily, the manager or operator of the ship.

THE ROLE OF THE SHIP MANAGER

Although the term "ship manager" is widely used in maritime law, literature and practice, it is not defined in legal texts. The ship manager (be it an individual or a company) provides services against

256 FATF, Anti-money laundering and counter-terrorist financing measures, Greece, Mutual Evaluation Report, September 2019, p. 4.

257 S&P Journal of Commerce, 12 June 2005: "OECD disbands maritime group".

258 Plomaritou and Papadopoulos 2018, 1.

a management fee to the shipowner (or charterer) under a contractual arrangement. Services provided by ship managers are typically broken down into the following groups:

- technical management (e.g. maintenance/repair, inspections);
- crew management (e.g. selection/engagement, certification control);
- commercial management (e.g. chartering, operations/bunkering); and
- ancillary services (e.g. insurance of vessels).

A managing company within the larger shipping group of the shipowner may perform these services, but often they are outsourced in part or in whole to so-called "third party ship management companies".[259]

The level of management and control of an involved ship manager becomes relevant in the context of limitation of liability actions. In the *Stema Barge II* case for example, the UK Admiralty Court said that the ship manager in the sense of the 1976 Limitation Convention is:

> "…the person entrusted by the owner with sufficient of the tasks involved in ensuring that a vessel is safely operated, properly manned, properly maintained and profitably employed to justify describing that person as the manager of the ship. I put it that way because if a person is entrusted with just one limited task it may be inappropriate to describe that person as the manager of the ship. A person who is entrusted with one limited task of management may be described as assisting in the management of the ship, rather than as being the manager of the ship."[260]

THE ROLE OF THE SHIP OPERATOR

In everyday usage, the terms "ship operator" and "ship manager" are used interchangeably.[261] Courts have tried to distinguish the two functions over many pages.[262] The Federal Court of Australia, referring

259 Ibid., 113 et seq.; Panayides 2017, 3.

260 [2020] EWHC 1294, para. 64; Wikborg Rein, 23 June 2020: "Limitation of liability – the English courts consider the meaning of the terms 'operator' and 'manager'".

261 [2020] EWHC 1294, para. 70.

262 See e.g. [2020] EWHC 1294, paras. 54 et seq.; *ASP Ship Management PTY Limited v The Administrative Appeals Tribunal* [2006] FCAFC 23, paras. 89 et seq.

to the Australian Navigation Act 1912, said that: "The phrase '*operated by*' in s 10 encompasses the notions of a real, substantial and direct role in the management and control of the commercial, technical and crewing operations of the ship."[263] There can be more than one operator of a ship.[264]

Shipping and the price cap on Russian oil

When the US Treasury Department enforced the price cap on Russian oil in October 2023, the entities that were put on the Office of Foreign Assets Control (OFAC)'s List of Specially Designated Nationals were the one-ship owning shell companies registered as owners of the two vessels that carried the Russian oil, as well as the ships themselves.[265] The companies were registered with addresses in the UAE and in Turkey, but the vessels used US-based service providers: their flags (Liberia and Marshall Islands) are both run by companies incorporated in the US.[266] One ship, the *SCF Primorye*, was apparently one of the tankers of the Russian state-owned Sovcomflot. It appears unclear who ultimately owned the second ship, the *Yasa Golden Bosphorus*, although its commercial manager was known.[267]

The US Treasury explained the implications of the sanctioning of the ships and shell companies as follows:

> "all property and interests in property of the [sanctioned] persons … that are in the United States or in the possession or control of U.S. persons are blocked and must be reported to OFAC. In addition, any entities that are owned, directly or indirectly, 50 percent or more by one or more blocked persons are also blocked. All transactions by U.S.

263 *ASP Ship Management PTY Limited v The Administrative Appeals Tribunal* [2006] FCAFC 23, para. 106.

264 [2020] EWHC 1294, para. 101.

265 See https://ofac.treasury.gov/recent-actions/20231012; Lloyd's List, 12 October 2023: "G7 crackdown on Russian oil shipping breaches begins".

266 Lloyd's List, 12 October 2023: "G7 crackdown on Russian oil shipping breaches begins".

267 Lloyd's List, 12 October 2023: "US to sanction Türkiye- and Russia-owned tankers for oil price cap breaches"; S&P Global, 17 October 2023: "Russia price cap enforcement action by US eases some concern over policy's waning impact"; The Maritime Executive, 13 October 2023: "Global Oil Markets Respond as US Sanctions Tankers for Price Cap Violations"; Reuters, 12 October 2023: "US imposes first sanctions under Russian price cap on tanker owners".

> persons or within (or transiting) the United States that involve any property or interests in property of designated or blocked persons are prohibited unless authorized by a general or specific license issued by OFAC, or exempt. These prohibitions include the making of any contribution or provision of funds, goods, or services by, to, or for the benefit of any blocked person and the receipt of any contribution or provision of funds, goods, or services from any such person."[268]

Does this mean that the Liberia and Marshall Islands ship registries, that are run from offices in the US, can no longer offer their services to the two ships? And does it mean that the ships may be arrested if they travel in US waters?[269] Enforcement has stepped up in the past months,[270] but the practical consequences of listing vessels are not entirely clear yet.

The problem with the three o's

Open registers, offshoreism and outsourcing can make it very difficult to identify who is responsible for a ship if anything goes wrong, and to enforce legal claims. It is highly problematic that national and international regulators sometimes do not know who the ultimate beneficial owner of a ship is. At the extreme end, this enables unscrupulous shipowners to abuse the current system of how global shipping is regulated for illegal activities.

FINANCING SHIPS

The shipbuilding market

Shipping and shipbuilding markets are closely linked. The largest merchant ships are primarily built in Chinese, South Korean and Japanese shipyards today. Special ships such as ferries, cruise ships or luxury yachts are also built in Europe, for example in Germany, Italy, the Netherlands, France and Finland.

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268 See https://home.treasury.gov/news/press-releases/jy1795.

269 Cf. Bloomberg, 13 October 2023: "Exxon Saddled With Oil Tanker That US Sanctioned on Thursday".

270 Cf. Splash247, 9 February 2024: "Washington unveils further sanctions against Russian-linked tanker operators"; Splash247, 8 April 2024: "Sanctions and drones take their toll on Russian oil exporting machine".

Shipyards require capital to pay for material and labour when building new ships, as those expenses may not be covered by down payments and interim payments before ships are delivered.[271] Some shipyards are state owned; in others, governments acquire shareholding interests to contribute to their finance. Private investors also play an important role: the Swiss Julius Bär Gruppe AG for example holds a 21.46% stake in the Chinese Yangzijiang Shipbuilding (Holdings) Ltd. that *inter alia* runs several shipyards and a scrapping facility.[272]

In addition to the newbuilding market, there exists a sprawling second-hand market for ships that offers the advantage of readily available additional tonnage. Interest in newbuildings may also be limited because of uncertainty over future environmental regulations.[273]

How much does it cost to buy a ship?

Financing ships is expensive. Newbuildings of huge tankers, bulkers, container and cruise ships cost millions of dollars. The *MSC Irina*, currently one of the largest container ships in the world with a capacity of 24,346 TEU, was ordered by a Chinese leasing company (Bank of Communications (Bocomm) Financial Leasing) for MSC in a four-ship deal with an estimated value of USD 600 million in total.[274] The *Icon*

271 OECD 2019, 7, 22.

272 As of 30 August 2023; ch.marketscreener.com; OECD 2019, 23; www.yzjship.com.

273 Lloyd's List, 16 March 2021: "Hot dry bulk market spurs interest in secondhand ships".

274 Offshore Energy, 13 March 2023: "MSC shatters records with delivery of 24,346 TEU MSC Irina".

of the Seas, the largest cruise ship in service that carries up to 7,600 passengers and 2,300 crew, cost USD 2 billion.[275]

Mechanisms to finance ships

Shipowners thus need to raise significant capital to finance ships. Especially cruise ship companies are unable to purchase new ships with their own resources. Financing methods include:

- private funds (own funds, private investment);
- debt finance (loans, bonds, leasing schemes);
- equity finance (the sale of shares); and
- special purpose acquisition companies.

Many large cruise ship companies are listed on the stock exchanges. To spread the financial risk of the investment, a variety of sources are regularly used.[276]

Who finances newbuildings?

Commonly, in merchant shipping, the financing of newbuildings involves the borrowing of money from a bank. However, as the market value of ships and charter rates may deteriorate, after the 2008 financial crisis, especially Western banks have become reluctant to lend money, or may even withdraw completely from this market.[277] Chinese banks, as well as Chinese leasing companies[278] that are less strictly regulated than commercial banks regarding capital adequacy requirements, are filling the gap.[279] The cruise ship industry is similarly treated as a high-risk market. Frequently, bank loans will be secured with a mortgage on

275 Tagesanzeiger, 28 January 2024: "Weltweit grösstes Kreuzfahrtschiff 'Icon of the Seas' startet Jungfernfahrt"; Der Spiegel, 28 January 2024: "Premiere für das grösste Kreuzfahrtschiff der Welt".

276 OECD 2019, 13 et seq.; Kizielewicz 2017, 71 et seq.; Otto and Scholl 2015, 56 et seq.

277 Otto and Scholl 2015, 57; Reed Smith LLP, 23 October 2019: "Ship Sale and Leaseback Transactions".

278 E.g. the financial leasing unit of China State Shipbuilding Corporation (CSSC) or Bank of Communications (Bocomm) Leasing (Reed Smith LLP 16 October 2020: "A new world of ship leasing and sale and leaseback transactions").

279 OECD 2019, 26 et seq.; Reed Smith LLP, 23 October 2019: "Ship Sale and Leaseback Transactions".

the ship.[280] Syndicated loans, where a group of lenders (banks) work together to split the risk, are frequent.[281] Financing may be offered by commercial banks as well as export credit banks.[282]

Leasing in particular

Leasing[283] is a widely used mechanism in ship finance. Operating lease and finance lease are the two most commonly used leasing structures in shipping:

- Operating lease is "used for hiring ships in the form of a short or mid-term bareboat or time charter."[284] Advantages of an operating lease for the ship operator include cash management and the limited impact on its balance sheet.[285]
- Finance lease is used for long-term ship finance for most of the ship's economic life, where the lessor is mainly the financier who owns the asset but is otherwise little involved in it. The lessee carries all operating responsibilities.[286]

Sale-and-leaseback are getting ever more important. These are transactions by which the owner sells their ship (that might still need to be built) to the lessor and then charters it back under a time or bareboat charter. Usually, the lessee will indemnify the lessor regarding liabilities arising from the vessel's operation, especially from pollution. For the lessor, sale-and-leaseback is attractive because in case of default (the lessee stops charter payments), they can easily repossess the ship (as the owner) whereas enforcing a mortgage is time consuming and expensive.[287]

280 Kizielewicz 2017, 72.

281 Ibid., 73; Otto and Scholl 2015, 57.

282 OECD Council Working Party on Shipbuilding (WP6), Report on ship financing, June 2007, 7.

283 Defined as "a process by which one party [the lessee] obtains the use of a fixed asset for which it must pay a series of contractual periodic rentals to the owner of the fixed asset [the lessor]." (Clausius 2015, 246).

284 OECD 2019, 16.

285 Clausius 2015, 248 et seq.

286 OECD 2019, 16; Clausius 2015, 249 et seq.

287 Reed Smith LLP, 23 October 2019: "Ship Sale and Leaseback Transactions".

For the lessee, sale-and-leaseback is an alternative way to finance a ship when traditional bank financing may not be readily available due to stricter risk management by (especially Western) banks. Sale-and-leaseback also frees up cash for the lessee and improves its liquidity. Finally, depending on the contractual terms, the lease may be an "off balance sheet" transaction for the lessee and thus attractive from an accounting perspective.[288]

The role of export credit agencies

Export credit agencies[289] play an important role especially in cruise ship finance. Their services include the backing of loans by financial institutions to overseas buyers. In export credits, the OECD Arrangement on Officially Supported Export Credits and its Sector Understanding on Export Credits for Ships (SSU) create a legal framework for participants to operate. Export credit agency support that complies with these agreements is not considered a prohibited subsidy by the World Trade Organization.[290]

In sum

Ship financing, especially with regard to newbuildings, involves significant capital and risk. The mechanisms for financing a newbuilding are diverse. After the 2008 financial crisis, Western banks have started to pull out from the market, or at least have reduced their exposure. Chinese banks and leasing companies are filling the gap.

288 Ibid.; Clausius 2015, 255.

289 Private or quasi-governmental institutions acting as intermediaries between national governments and exporters to issue export insurance solutions and guarantees for financing (Wikipedia, "Export credit agency").

290 OECD 2019, 18 et seq.

04

LABOUR AT SEA

The romantic idea of life at sea of past centuries often seen in literature and music has long gone. The seafarer's profession has always been difficult and dangerous. Next to the risks inherent in the normal operation of a ship, seafarers are exposed to natural hazards such as heavy storms, to maritime piracy, and even to armed conflicts. The job today is characterised by huge time pressure in ports and a massive workload due to ever smaller crews. Manning levels are pushed down to the absolute minimum necessary to safely handle the ship, and sometimes below that minimum.[291]

Officers in the engine room

291 ITF 2020.

Seafarers spend many months in a year isolated from friends and families. While they travel the entire globe, the time they get to spend ashore is short. It takes less than 24 hours to unload and reload a large container ship or car carrier, and not much longer for a tanker. Only bulkers may spend a few days in port as they are more difficult to load and unload.

Seafarers live in the confined space of a ship, and although that ship may be a giant, 400 metres long and more than 60 metres wide, their freedom of movement is very limited. Officers and crew (and passengers) of container ships, bulk carriers and cruise ships originate from countries all over the world. The ship they work or travel on might be built in South Korea, financed by a consortium of German, Singaporean and Norwegian banks, owned by a Hong Kong company, chartered and operated by a Swiss company, run under a Panamanian flag, insured in London, and certified by an Italian classification organisation. Manning agencies that sometimes hire officers and crew might be based in Cyprus or the Philippines.

Such working environments pose many challenges for seafarers. Obviously, work on a container ship or tanker is very different from work on a ferry or cruise ship, but may be just as challenging in different ways.

AN ITF INSPECTOR AT WORK

We wanted to know more about seafarers' labour conditions and asked the International Transport Workers' Federation (ITF) whether we could join them during ship inspections in port.

The Covid-19 pandemic upset our plans several times, but in June 2022, we were able to join ITF Inspector Christian Roos at work for two days in the ports of Ghent and Zeebrugge in Belgium.[292]

On the road to the first ship of the day, Christian explained to us that the ITF onboard inspections are based on collective bargaining agreements (CBA) and apply to ships that fly flags of convenience. The CBA is signed by an ITF maritime affiliate union and a shipping company (the beneficial owner, operator, manning agency or manager of the ship). Usually, the maritime union that signs the CBA is from the country where the beneficial owner of the ship is based.

The CBA contains all the details regarding the crew's employment on the ship, including wage scale, working hours, etc. Each seafarer then has an individual employment contract based on the CBA.

The first ship we approached was a small bulker transporting food pellets, sailing under a Liberian flag. We climbed the shaky gangway to board the ship and received a friendly welcome from a Cape Verdian seaman. "It's good you are here," he said.

The first mate was a Ukrainian from Odessa. His family had managed to flee the country on the day after the Russian invasion. His contract had expired at the end of May, and he was going to leave the ship in the next port of call.

The Russian captain took us to his office. When Christian asked for the documents he wanted to see – especially the crew list, CBA, employment contracts, individual wages accounts, overtime and rest hour records – he caught the captain on the wrong foot: he had boarded the ship only a month ago and was not familiar yet with the former captain's filing. After pulling out several seventies-style Leitz binders, not finding one of the requested documents, the captain clearly started to feel uneasy.

292 The following section is based on the visits and interviews with Christian Roos, 13-14 June 2022.

Christian reassured him: "Captain, don't worry. Just send me the document tomorrow by e-mail, once you have found it." The ITF Inspector was adamant, though, with regard to the contract extension of the first mate. He called the Cypriot manning agency, where no one was available due to a public holiday. Christian insisted that the captain took care of the extension as soon as possible; otherwise, there was no insurance for the first mate. Asked what his means of enforcement were, Christian hinted at calling Port State Control at the harbour of destination.

The second ship we visited was a 200-metre-long bulker, transporting coal from the North American Great Lakes region to Europe. The Marshall Islands-flagged ship was manned by an all-Indian crew of about 20 people. The captain readily provided all requested documents. Then Christian wanted to see the cadet and his training handbook. The cadet had been on board for a few months already, but his handbook was still empty. Christian urged him to start filling in the book to document his training progress, and the first mate to oversee the cadet in doing so. Christian also checked the crew cabins, kitchen, provisions storage and gym.

On the following day, we visited a car carrier with a crew of 22 from India, Malaysia, the Philippines and Thailand. Again, Christian asked to see the cadet, noting that overtime was registered for him, which is not allowed because cadets are there for training, not as cheap labour. Regarding provisions, the ship had refilled supplies about three weeks previously. Some salads and vegetables were past their time, but there were no major deficiencies.

An issue that Christian addressed on every ship was access to internet. For seafarers, this is vital because it allows them to connect with the outside world, especially with friends and family. However, seafarers often do not have internet access on ships. In May 2022, seafarers' groups achieved an amendment to the Maritime Labour Convention (MLC) 2006 for mandatory internet access for crews. Even so, seafarers may need to pay for it.

The quality of drinking water on board was another crucial question. One of the captains kindly offered us coffee and tea, but looking at the

crew's cabins, we wondered whether they always had access to clean drinking water, for example in the form of refillable five-gallon bottles and dispensers. In fact, in its May 2022 meeting, the Special Tripartite Committee (see below) agreed on a change to the MLC 2006 to improve seafarers' access to free drinking water and quality provisions.

The insights we gained over the two days with the ITF Inspector led us to ask whether and how seafarers are protected by the law and how well the system works.

Wall painting on a ship we visited

THE INTERNATIONAL LEGAL FRAMEWORK

If one looks at the existing regulation, it seems that the international community has recognised that seafarers live and work under difficult conditions and need special protection. A number of international treaties are applicable to maritime labour relations. They set the global minimum standard of protection of seafarers and are the result of much work done by the International Labour Organization (ILO) and IMO. The most important treaty is the Maritime Labour Convention (MLC) that was adopted by the International Labour Conference[293] in 2006 and consolidates the earlier patchwork of treaties dealing with individual aspects of maritime labour.[294] The working of the Convention is kept under continuous review by the Special Tripartite Committee, a body composed of representatives of governments, shipowners and seafarers.[295]

The Maritime Labour Convention

The MLC came into force on 20 August 2013 and regulates important issues such as wages, working hours, repatriation, accommodation, social protection, occupational safety and health. As of December 2023, the Convention has been ratified by 104 states. However, it applies to non-ratifying states as well through the mechanism of Port State Control.[296]

The MLC contains three different but related parts: the Articles, the Regulations and the Code.[297] While the Articles and Regulations establish core rights and principles, the Code sets out the details for implementing the Regulations. Part A of the Code contains mandatory Standards, Part B non-mandatory Guidelines.[298]

The Convention defines seafarers as: "any person who is employed or engaged or works in any capacity on board of a ship to which this

293 The International Labour Conference meets once a year in Geneva. ILO member states are represented by a delegation consisting of two government delegates, an employer delegate and a worker delegate.

294 Carballo Piñeiro 2015, 46.

295 Art. XIII MLC 2006.

296 Carballo Piñeiro 2015, 43.

297 MLC 2006, Explanatory Note, para. 2, p. 12.

298 Explanatory note to the Regulations and Code of the Maritime Labour Convention, Nr. 2–4.

Convention applies".[299] Therefore, the Convention covers not only nautical staff. On cruise ships, the MLC also applies to bartenders, hotel staff, casino workers, and so on.[300] However, according to Christian Roos, this rule if often neglected in practice.[301] The Convention applies to any ships that do not exclusively navigate in inland waters, sheltered waters or areas where port regulations apply.[302]

Title 1 of the MLC Regulations contains the minimum requirements for seafarers to work on a ship in terms of age (16 years in principle), medical fitness, training and qualification, recruitment and placement. Private agencies may not charge seafarers fees or other charges for recruitment or placement, or for providing employment.[303]

In Title 2, the Regulations require from states parties that seafarers have a fair employment agreement that is clear, written and legally enforceable, and consistent with the MLC standards. The employment agreement should be signed by both the seafarer and the shipowner, or a representative of the shipowner. Regulation 2.2 deals with wages, but the Convention sets no minimum wage and does not contain the principle of "equal pay for equal work".[304] Maximum hours of work and minimum hours of rest, and entitlement to paid annual leave, are set out in Regulations 2.3–2.4. Regulation 2.7 is concerned with manning levels.

Regulation 2.5 deals with repatriation of seafarers. Under the circumstances set out in the MLC, seafarers have the right to be repatriated at no cost to themselves. Member states shall require ships under their flag to provide financial security to ensure that seafarers are duly repatriated. Regulation 2.5 was amended in 2014 to include the requirement that shipowners must provide financial security, e.g. in the form of an insurance policy, covering not only repatriation but also unpaid wages.[305]

299 Art. II(1)(f) MLC 2006.
300 Stevenson 2016, 214.
301 Interview with Christian Roos, 14 June 2022.
302 Art. II(1)(i) MLC 2006.
303 Regulation 1.4, Standard A1.4(5)(b) MLC 2006.
304 Carballo Piñeiro 2015, 51.
305 Ibid., 52.

If shipowners do not fulfil their obligation to repatriate seafarers, the flag state should take responsibility. If it does not, "the obligation shifts either to the state from whose territory the seafarers need repatriating or the state of which the seafarers are nationals".[306] The respective state may recover the costs from the flag state, and the flag state may recover the costs from the shipowner.[307] The state that has paid the repatriation costs may detain the ship until it gets reimbursed.[308]

In addition, the MLC regulates other important topics such as compensation in the event of loss or foundering (sinking) of a ship, accommodation and recreation facilities on board, food and drinking water, access to medical care, liability of the shipowner for the financial consequences of sickness, injury or death of a seafarer, safety and health at work, accident prevention, and social security.

Title 5 of the Regulations deals with compliance and enforcement of the MLC's standards. Regulation 5.1.1 states the general principle that: "Each Member is responsible for ensuring implementation of its obligations under this Convention on ships that fly its flag." To this end, states parties are required to establish effective inspection and certification systems for maritime labour conditions.[309] When a foreign-flagged ship enters a port of an MLC state party, the port state may carry out an inspection of the working conditions on board the ship. If there is a clear risk to the safety or health of the crew, the port state can detain the ship. This means that the MLC also applies to non-ratifying states via the Port State Control mechanism.[310]

The MLC contains numerous references to collective agreements. Other ILO Conventions are also relevant in this regard.[311]

306 Ibid.

307 Regulation 2.5, Standard A2.5.1(5) MLC 2006.

308 Regulation 2.5, Standard A2.5.1(6) MLC 2006.

309 Regulation 5.1.1(2) MLC 2006.

310 Art. V(4), Regulation 5.2 MLC 2006; Carballo Piñeiro 2015, 43.

311 Including the ILO-Convention No. 87 of 1948 (Freedom of Association and Protection of the Right to Organise Convention); ILO-Convention No. 98 of 1949 (Right to Organise and Collective Bargaining Convention); Carballo Piñeiro 2015, 47.

Seafarers' training and certification

Another relevant treaty in the context of maritime labour is the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW Convention) that was adopted in 1978 and entered into force in 1984. The STCW Convention establishes uniform international standards for training and certification of seafarers. It consists of three parts: the Articles with the legal responsibilities of states parties, the Annex with technical details on how the legal responsibilities should be met, and the STCW Code that specifies the technical details in more depth. Part A of the Code establishes mandatory standards of training, certification and watchkeeping. Part B contains non-mandatory guidelines.[312] The STCW Convention applies not only to seafarers, but also to shipowners, training establishments and national maritime administrations.[313]

Seafarers will usually get trained in their home country – as far as the opportunity exists – before they go to sea. Well-trained crews are important for the safety of shipping and for the environment. The STCW Convention establishes the requirements for masters, nautical and engineering officers, radio operators and ratings (a general term of a variety of skilled seafarers) to obtain certificates of competence in general. It also covers requirements for obtaining certificates of proficiency for specific activities, e.g. for service on certain types of ships (tankers, passenger ships), or for seafarers who perform specific tasks (safety, security, pollution prevention).[314]

So-called endorsements are issued to masters and officers to certify that a national certificate has been issued in accordance with the requirements of the STCW Convention. Fraudulently issued certificates have repeatedly been a problem in the past, which is why the Convention was amended in 2010 to tighten up the endorsement process.[315]

312 ITF 2017, 10.
313 Ibid., 10.
314 Ibid., 14 et seq.
315 Ibid., 14.

View from the bridge with electronic sea chart

Proper training of seafarers can become a political issue. A European Maritime Safety Agency (EMSA) audit found in 2022 that the Philippines did not comply with the STCW Convention, after EMSA had been warning the country about noncompliance since 2006.[316] The Philippines Government relies on private institutions to train seafarers without, according to critics, sufficiently subsidising them. The EU Commission subsequently considered a ban on Filipino seafarers on EU-flagged ships.[317] This would have put tens of thousands of seafarers out of work. However, in early 2023, the EU Commission agreed to continue recognising seafarers' certificates issued by the Philippines, after the country's Government addressed the EMSA's concerns.[318]

Human rights of seafarers

From a legal perspective, seafarers on merchant ships as well as on cruise ships and fishing vessels are protected by human rights treaties, including the UN Human Rights Conventions and regional treaties such as the European Convention on Human Rights (ECHR), insofar as they are applicable.[319] The UN Migrant Workers Convention[320] does not apply to seafarers, including fishers, unless they are admitted to take up residence and engage in paid work in the state of employment.[321] The ECHR covers seafarers who work on a ship flying the flag of a state party to the ECHR, regardless of where in the world that ship is located.[322]

In many cases, though, effective remedies for human rights abuses at sea are difficult to obtain.[323]

316 SWZ Maritime, 3 January 2023: "Filipino seafarers could be banned from EU-flagged ships"; Ships & Ports, 30 December 2022: "EMSA audit: Over 400,000 Filipino seafarers face sailing ban".

317 The Maritime Executive, 29 December 2022: "Report: EU Considers Filipino Seafarer Ban Over Training Deficiencies".

318 The Maritime Executive, 31 March 2023: "EU Drops Proposed Ban of Filipino Seafarers Over Training Deficiencies".

319 Papanicolopulu 2018, 118 et seq., 152-153.

320 International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families, adopted on 18 December 1990.

321 Art. 2(2)(c), 3(f) of the Migrant Workers Convention; Carballo Piñeiro 2015, 45 et seq.

322 Carballo Piñeiro 2015, 45.

323 Cf. https://www.humanrightsatsea.org/.

WHO IS THE EMPLOYER?

Seafarers are sometimes directly employed by the shipowner, ship charterer or operator. In other cases they conclude an agreement with a manning agency. It is important for seafarers to know exactly who their employer is in the case of a problem, e.g. if wages are not paid.

The MLC takes a functional approach to defining the employer.[324] It treats shipowners as employers, but defines shipowners in a way that includes ship charterers, operators, agents etc.:

> "shipowner means the owner of the ship or another organization or person, such as the manager, agent or bareboat charterer, who has assumed the responsibility for the operation of the ship from the owner and who, on assuming such responsibility, has agreed to take over the duties and responsibilities imposed on shipowners in accordance with this Convention, regardless of whether any other organization or persons fulfil certain of the duties or responsibilities on behalf of the shipowner."[325]

Involvement of manning agencies

Manning agencies sometimes hire seafarers on their own behalf.[326] If not, three different contracts can be distinguished if a manning agency is involved in the employment of a seafarer:

- the contract between the manning agency and the shipowner (that deals with placing the order to hire seafarers);
- the contract between the seafarer and the manning agency (the placement agreement); and
- the contract between the seafarer and the shipowner (the employment agreement).[327]

324 Carballo Piñeiro 2015, 27.
325 Art. II(1)(j) MLC 2006.
326 Carballo Piñeiro 2015, 30.
327 Ibid., 29.

Confusion can arise if the employer is not clearly specified in the employment agreement. The MLC therefore requires from member states that:

> "seafarers working on ships that fly its flag shall have a seafarers' employment agreement signed by both the seafarer and the shipowner or a representative of the shipowner (or, where they are not employees, evidence of contractual or similar arrangements) providing them with decent working and living conditions on board the ship as required by this Convention…"[328].

Ship operators or owners are ultimately responsible for the employment relationship.[329]

REALITY OF A SEAFARER'S LIFE

According to estimates, at the time of writing there are close to 1.9 million seafarers working in global merchant shipping, including roughly 857,500 officers and 1,035,100 ratings (skilled seafarers). The Philippines, the Russian Federation, Indonesia, China and India send the most seafarers.[330] In Western countries, the profession is often considered unattractive due to the labour conditions and low wages. Reports of crews being stuck on board during the Covid-19 pandemic have further reduced the attractiveness of the profession. In addition, the Russia–Ukraine war has caused experienced seafarers to return home to join the army. In sum, these factors have led to a current shortage of ship officers.[331]

328 Regulation 2.1, Standard A2.1(1)(a) MLC 2006.

329 Carballo Piñeiro 2015, 29.

330 https://www.ics-shipping.org/shipping-fact/shipping-and-world-trade-global-supply-and-demand-for-seafarers/.

331 GCaptain, 7 June 2023: "Ship Officer Shortage Worsening, Drewry Says".

Working at sea is no walk in the park, especially for seafarers from emerging economies. We interviewed Matthias Ristau, Seafarers' Pastor of the "Nordkirche" in Hamburg, who explained to us the situation of Filipino seafarers as an example.

Due to a lack of prospects at home, many Filipinos go abroad to work. The Philippine Information Agency[332] reported that in 2023, over 489,000 Filipino seafarers worked on ships somewhere in the world.[333]

Their employment contracts are always limited to one year. This is stipulated by Philippine law, which does not permit permanent contracts. They spend 9–10 months on board and have 2–3 months leave. Under Philippine law, seafarers are not allowed to enter into contracts with shipping companies directly but must conclude a contract with a so-called manning agency. All contracts are then approved by the Philippine Overseas Employment Administration, a government agency.

To finance their education, many young Filipinos get into debt with their families. To repay this debt, they have to work at sea for at least 10 years. However, every year, they need to reapply for a contract, pass the medical tests and undergo further training. Although there is no official blacklist, this means that Filipino seafarers will not complain about too long working hours, stress, fatigue or false working hour records. If they do, they will no longer find work. At home, they will not talk about problems either: Seafarers in the Philippines are considered rich – and privileged.[334]

332 The Philippine Information Agency is the government's official publication arm: https://pia.gov.ph/.

333 Philippine Information Agency, 26 June 2023: "The Future of the Filipino Seafarer".

334 Interview with Matthias Ristau, Seafarers' Pastor of the "Nordkirche", 1 December 2021.

SEAFARERS EXPOSED TO SERIOUS HUMAN RIGHTS VIOLATIONS

The Covid-19 pandemic as well as the Ukraine and Israel–Hamas wars with the subsequent attacks by Houthi rebels on merchant ships show how seafarers are threatened by global crises. Whether through armed rebel attacks, hijackings, missile strikes or sea mines, armed conflicts can directly endanger the health and lives of seafarers.[335]

During the pandemic, due to travel restrictions, crews were forced to work aboard ships for many months beyond the duration of their original contracts; some seafarers stayed on board for more than 18 months.[336] At the same time, approximately 400,000 seafarers were waiting at home, unable to travel and start working according to their contracts.[337]

This led to increasingly fatigued crews. There are clear indicators of higher suicide rates amongst seafarers forced to stay aboard, on merchant as well as on cruise ships.[338] Under international law, seafarers may not spend more than 11 months in a row at sea, for their own protection.[339] It is understandable that governments took emergency measures in an attempt to avoid the spread of Covid-19. What is needed, though, is a coordinated approach by governments, ports and shipowners to ensure that global trade continues in a pandemic without violating the basic rights of seafarers and subjecting them to working conditions that deprive them of their liberty and come close to forced labour.

Not only in situations of crisis, but also in the course of their normal work, seafarers are sometimes exposed to serious human rights violations.

335 See e.g. Reuters, 28 December 2023: "Bulk carrier hits mine in Black Sea, two people injured, Ukraine says"; AP News, 4 December 2023: "3 commercial ships hit by missiles in Houthi attack in Red Sea, US warship downs 3 drones"; Spiegel, 20 November 2023: "Autofrachtschiff im Roten Meer laut Eigentümer per Helikopter geentert"; BBC News, 8 November 2023: "Russia strikes civilian ship in Black Sea port of Odesa – Ukraine".

336 GCaptain, 13 May 2022: "COVID-19's Impact on Seafarer Populations Will be Felt for Years to Come".

337 ITF, 24 September 2020: "Crew change crisis risks becoming forced labour epidemic as tragedy hits six-month mark on World Maritime Day".

338 Bloomberg, 30 December 2020: "The Cruise Ship Suicides"; NZZ, 31 July 2020: "Gefangen auf offener See".

339 Regulation 2.4, Standard A2.4 MLC 2006; Splash247, 1 July 2021: "Crew change crisis goes from bad to worse".

Piracy is a risk that will be discussed further below. Other critical issues include abandonment of seafarers and crimes against seafarers.

Abandonment of seafarers

Joining ITF Inspector Christian Roos at work, we had the chance to visit an abandoned ship and its crew.[340] The ship had landed in the port of Ghent in early September 2021 and was detained by Port State Control for multiple deficiencies. When we visited the ship in June 2022, the crew had been stuck on board for more than nine months already.

According to the ILO/IMO database,[341] the ITF reported the abandonment of the seafarers on 25 October 2021. They were still provided with supplies (fuel, food and drink) and visited by the ITF Inspector, and the salaries were paid. However, simply leaving the ship was no option for the crew; they were responsible for the ship and its value. They would never find a job at sea again if they did. The shipowner, a state-owned company, did not take steps to fix the deficiencies identified by Port State Control. When we were on board, the crew was glad that they were about to be repatriated and exchanged by another crew. However, Christian stressed that no more crew should be sent to that ship at all.

Every year, dozens of ships are abandoned by their owners, leaving entire crews to their fate without pay, food and medical supplies, and without money to return home. According to the IMO, between 2004 and December 2022, 713 incidents of abandonment were recorded, involving 9,971 seafarers.[342] From 2011 to 2016, there were between 12 and 19 abandonment cases reported per year. The numbers started to

340 Visit to the port of Ghent, 13 June 2022.

341 Together with the IMO, the ILO keeps a list of abandoned ships and their status ("disputed" or "resolved"). The database contains all reported incidents of seafarers' abandonment since 1 January 2004 and is available at: https://www.ilo.org/dyn/seafarers/seafarersbrowse.home.

342 https://www.imo.org/en/OurWork/Legal/Pages/Seafarer-abandonment.aspx.

rise in the years 2017–2019 (between 40 and 55 cases per year). Although it is unclear whether there is a direct linkage, according to the IMO, "since the outbreak of the COVID-19 pandemic there has been another, alarming spike in cases."[343] In 2020 (the first year of the pandemic), 85 cases were reported, in 2021, 95 cases and in 2022, 109 new cases.[344]

Owners abandon ships because they are in financial difficulties, or because they calculate that it is cheaper to abandon a ship than to continue paying for its operation, including the crew, as the ship is in bad shape and at the end of its sea life.[345] Frequently, abandonment occurs after a ship has been detained in port as it was deemed unseaworthy by inspectors.[346]

An abandoned crew

343 Ibid.

344 Ibid.

345 ITF Seafarers, Factsheet "Abandoned Seafarers", available at: https://www.itfseafarers.org/en/issues/abandoned-seafarers.

346 https://seafarersrights.org/seafarers-subjects/abandonment-of-seafarers.

Under international law, a seafarer is deemed to have been abandoned where a shipowner, in violation of their legal or contractual duties:

a. fails to cover the cost of the seafarer's repatriation; or

b. has left the seafarer without the necessary maintenance and support; or

c. has otherwise unilaterally severed their ties with the seafarer including failure to pay contractual wages for a period of at least two months.[347]

The process leading up to the abandonment of a ship and crew can involve several stages: salaries are not paid any more, supplies stop and fuel for generators runs out. Seafarers lose connection to the outside world as phone cards run out of credit, and the spirit amongst the crew suffers. Medical care is usually out of the question. The lack of pay also affects the family at home, either because debts are piling up due to outstanding wage payments, or because a seafarer is unable to repay an education loan. Also, there is no money for a flight home. Eventually, families of seafarers are left begging for help.[348]

Seafarers on an abandoned ship may be unable to go ashore because the nearest port refuses to grant them permission to do so. If they stay in a country illegally, they face arrest and deportation and may not be able to return to the country for a certain or indefinite period of time.[349] Furthermore, if they simply take off and leave the ship, they risk not receiving their wages from the proceeds if the abandoned ship is auctioned off.[350]

The shipowner, who often cannot be traced, may threaten the crew or make false promises. In the case of the Belize-flagged tanker MT *Arabian Victory*, the shipowner even filed a criminal complaint against the captain and crew, claiming that they had hijacked the ship. In May

347 Standard A2.5.2(2) MLC 2006.

348 BBC, 21 February 2020: "Abandoned seafarers: Hungry, penniless and far from home"; https://seafarersrights.org/seafarers-rights-fact-files/abandonment/; https://seafarersrights.org/abondonment-insight-1.

349 https://seafarersrights.org/seafarers-rights-fact-files/abandonment.

350 The Guardian, 12 April 2019: "Abandoned at sea: the crews cast adrift without food, fuel or pay".

2002, after the ship was stuck in the heat off Dubai for 45 days without food, water or fuel, some of the crew developed serious health problems. The captain did not get help from the shipowner, Dubai authorities or Indian Consulate in Dubai. Fearing fatalities amongst the crew, the captain sent a distress notice to the owner, informing him of his plan to seek refuge in an Indian port, and subsequently sailed to India to try to land in another port.[351]

If a ship is abandoned by its owner, the seafarers are effectively trapped on board. For the crew, abandonment is a humanitarian disaster and can have life-threatening consequences. In extreme cases, crews were left to their fate for months to years – some abandonment cases have lasted up to 32 months.[352]

In January 2017, an amendment to the MLC 2006 entered into force according to which member states must ensure that financial security (e.g. insurance) is in place for ships flying their flag to cover, in cases of abandonment, four months' wages for seafarers, the cost of adequate food, clothing, accommodation, drinking water and medical care until seafarers arrive at home, as well as their repatriation costs.[353] The insurance certificate must be posted on board, in English, in a place visible to the seafarers and should include the name and contact details of the insurer or financial security provider.[354] However, examples (*Miss Gaunt*, *Northwind*, *AHT Carrier*) show that insurers are sometimes reluctant to fulfil their obligations. Only through interventions of the IMO and the ILO has progress been made in these cases, even if they appear to be only partly resolved.[355]

The amended MLC 2006 surely marked a milestone. Nevertheless, seafarers' abandonment in 2022 reached a record high.[356] Although not only major seafaring nations, but also popular flag states such as Panama

351 ITF 2006, 13-14.

352 https://www.imo.org/en/OurWork/Legal/Pages/Seafarer-abandonment.aspx.

353 Regulation 2.5 MLC 2006.

354 Regulation 2.5, Standard A2.5.2 MLC 2006; https://www.itfseafarers.org/en/issues/abandoned-seafarers.

355 https://www.imo.org/en/OurWork/Legal/Pages/Seafarer-abandonment.aspx.

356 The Maritime Executive, 8 February 2023: "Alarm as Cases of Seafarers Abandonment Hit New Highs in 2022".

or Liberia have ratified the MLC 2006, there exist loopholes in ratification. Unscrupulous shipowners might even flag out their ships to a non-ratifying state to try to circumvent the MLC 2006. The bigger problem is, though, that enforcement of the MLC provisions is often weak.

We interviewed Mohamed Arrachedi, ITF Arab World and Iran Network Coordinator, about the current situation regarding seafarer abandonment. Did the 2017 MLC amendments improve matters? The record high numbers of reported abandonment cases tell a different story.

Mr. Arrachedi explained to us that the numbers are not accurate – in fact, there are more cases, and even if the MLC definition of seafarer abandonment is strictly applied, the numbers are increasing. It is only clear in theory what constitutes a case of "abandonment". In every individual case, a diagnosis must be made. Seafarers are afraid to complain, and without internet access they might not have the possibility to do so. The situation is particularly risky for seafarers in regions where the MLC has not been ratified.

The ITF representative also explained to us that currently, all the burden is on the trade unions. Seafarer abandonment is only discussed in specialised media. There is no broad political or academic discussion, although there is a growing interest now. Confiscating and auctioning ships – as a way to cover salaries and repatriation – is difficult and risky. Success depends on where the ship is and where the auction is, and on the competent court.

If the shipowner fails to pay salaries for many months and to repatriate the crew, this can amount to a modern form of slavery. Seafarers are also at risk of becoming victims of human trafficking: for example, they may get a visa to fly to the UAE to board a ship, but get deviated to Oman to join a ship in Iran. The responsibility in all these cases is with the shipowner, i.e. the beneficial owner.[357]

357 Interview with Mohamed Arrachedi, 6 July 2022.

The abandonment of seafarers is one of the worst human rights violations in the maritime industry. If neither the shipowner nor the flag state, port authorities or seafarer's home state take responsibility, trade unions or humanitarian organisations such as the ITF or the Mission to Seafarers step in and offer emergency assistance, or even pay for the repatriation of abandoned seafarers. It is clear, though, that shipowners must be held responsible for the safety and wellbeing of their crews.

Seafarers as victims of crime

What happens if e.g. a crew member (or passenger) is raped or killed by another crew member or passenger aboard a cruise ship on the high seas? Crime aboard cruise ships apparently is not uncommon. In theory, the captain has the authority to arrest someone aboard the ship. However, there are no police or forensic experts available until the ship reaches the next port, and in the meantime, evidence may get destroyed. The criminal law of the flag state is applicable to crimes committed on board, and the flag state's law enforcement authorities would need to investigate, no matter where in the world the ship enters port. This does not really happen. Cruise ship companies prefer to keep quiet about the problem, as it is bad for business.[358]

In 2010, the United States introduced the Cruise Vessel Security and Safety Act that requires cruise companies to report crimes committed on board against US citizens to the US authorities.[359] However, if other nationals or seafarers on other types of vessels become a victim of crime on a ship on the high seas, it is very likely that no investigation or conviction will ever occur.

358 SRF, 4 May 2017: "'Mord an Bord ist schlecht fürs Geschäft'"; Clarembaux, P., "Crimes on board: Investigations that sink", available at: http://huelladigital.univisionnoticias.com/cruceros-vacaciones-en-aguas-de-nadie/crimen/index-lang=en.html.

359 Clarembaux, P., "Crimes on board: Investigations that sink", available at: http://huelladigital.univisionnoticias.com/cruceros-vacaciones-en-aguas-de-nadie/crimen/index-lang=en.html.

RESPECT FOR SEAFARERS' RIGHTS

Global trade depends heavily on the shipping industry to transport goods. To Western consumers, the people who make such trade possible – the seafarers – are invisible on the giant ships that they move around the world and that are their workplace. From the shore, it is impossible to see what life is like on a merchant ship.

It is primarily the responsibility of shipowners, charterers and operators to ensure that their crews work and live under fair employment agreements and decent conditions. Flag states are supposed to ensure that the minimum labour standards foreseen in the MLC are upheld. However, reports from trade unions, seafarer missions and the media show that this is often not the case even during the ordinary course of a seafarer's engagement, and especially not in unusual situations such as a global pandemic.

The extremely globalised nature of the shipping industry makes it difficult for seafarers to protect themselves and secure their rights. Stricter enforcement and honest employers would help, though they will not change the fundamental issues of open registers, offshoreism and outsourcing that enable shipowners to escape responsibility for the seafarers that earn them their wealth.

On a broader level, what is needed is respect for seafarers' human rights and an awareness that these individuals are key to keeping the global economy running and that their work is vital for job and food security worldwide.

05

FISHERIES

Global marine fisheries raise different problems from merchant shipping. Important topics beyond the scope of this book are fishing quotas and zones. Two issues discussed in the previous chapters, though, also occur and are taken to the extreme in fisheries: labour conditions on board and the question of ownership of vessels. What needs to be done to overcome human rights abuses and to ensure that unscrupulous shipowners do not profit from illegal activity?

IMPORTANT FOR GLOBAL NUTRITION, BUT OFTEN NOT SUSTAINABLE

From an economic perspective, marine fisheries are a relevant and growing sector. According to the UN Food and Agriculture Organization (FAO), global annual consumption of aquatic foods (excluding algae) per capita has grown from an average of 9.9 kilograms in the 1960s to 20.2 kilograms in 2020 and will continue to rise.[360] Global capture fisheries production (marine and inland waters) reached 90.3 million tons in 2020, with an estimated value of USD 141 billion.[361]

Aquatic foods provide an important source of animal protein for 3.3 billion people. In a number of South Asian and African states, and in particular in small island developing states, such foods contribute to half or more of the population's total animal protein intake.[362]

At the same time, according to the FAO, marine fisheries are a great burden for the environment. In 2019, 35.4% of global stocks were fished at biologically unsustainable levels; in the Southeast Pacific Area, as much as 66.7% of stocks were overfished.[363] Many marine species are threatened with extinction. This development is also driven by the production of fish meal (for animal feed) and, depending on the fishing method, bycatch (the incidental capture of non-target species) and shark finning (sharks have their fins cut off and are thrown back into the sea alive, where they die).[364]

Fishing by use of explosives, poisons, stupefying substances, electric currents and the like is prohibited in many parts of the world.[365] Common fishing methods include bottom trawling (towing a cone-like net close to the seabed), gillnets (a curtain of netting that hangs in the water), longlines (the boat trails a long line with baited hooks behind it), purse seines (a vertical net surrounds a school of fish before the net

360 FAO 2022, p. xvi.

361 Ibid., p. xviii.

362 Ibid., p. xx.

363 Ibid., 47.

364 Interview with Ian Urbina in FranceTV: https://www.theoutlawocean.com/appearances/urbina-on-francetv/.

365 Cf. e.g. for the European Union: Art. 7 of the EU Regulation 2019/1241.

is drawn together), pole and line (where one fish at a time is targeted), dredges (rigid frames with a net that are towed along the seabed) and pelagic trawling (cone-shaped nets towed in mid- and surface water).

Especially bottom trawling and dredging can involve high amounts of bycatch and cause damage to seabed habitats. Bycatch is a problem with all fishing methods, though.[366] Marine fisheries also negatively affect the environment because an estimated 640,000 tons of fishing gear (ropes, nets, lines, etc.) made of plastic are lost or abandoned at sea every year, endangering marine life as well as safety at sea.[367]

THE PROBLEM OF ILLEGAL, UNREPORTED AND UNREGULATED (IUU) FISHING

A major contributor to the declining fish stocks is illegal, unreported and unregulated (IUU) fishing. IUU fishing is a broad term that encompasses a number of activities, including where:

- fishing areas and quotas are disregarded;
- fishing is carried out without a licence;
- catches are undeclared or falsely declared;
- fishing vessels without nationality are used; or
- fishing takes place in unregulated areas.[368]

It is estimated that IUU fishing generates illicit profits of between USD 15.5 billion and USD 36.4 billion per year.[369] Traditionally, international regulators were concerned with the impact IUU fishing has on the conservation and management of global fish stocks, and on fishers who act responsibly and honestly and therefore suffer a disadvantage.[370]

366 https://www.msc.org/what-we-are-doing/our-approach/fishing-methods-and-gear-types.

367 Greenpeace, "Ghost Gear: The Abandoned Fishing Nets Haunting our Oceans", November 2019, 5.

368 https://www.fao.org/iuu-fishing/background/what-is-iuu-fishing/en/.

369 Channing May, "Transnational Crime and the Developing World", Global Financial Integrity, March 2017, 62.

370 See e.g. the websites of the FAO (https://www.fao.org/iuu-fishing/en/) or of the IMO (https://www.imo.org/en/OurWork/IIIS/Pages/IUU-FISHING.aspx).

More recently, though, regulators, civil society organisations and academics have started to address the link between IUU fishing and violations of workers' and human rights in marine fisheries.[371] Working conditions are often particularly problematic on IUU vessels. Frequently, fishers working on IUU vessels are victims of unscrupulous shipowners who make profits from illegal activity. The ILO and the International Organization for Migration (IOM), as well as the International Transport Workers' Federation, are therefore rightly concerned about forced labour, human trafficking and the exploitation of migrant workers in marine fisheries.[372]

LABOUR IN FISHERIES: THE LEGAL FRAMEWORK

The above-mentioned MLC and STCW Convention are not applicable to fisheries,[373] where there are two special conventions:

- The 2007 Work in Fishing Convention (WFC)[374] (complemented by the Work in Fishing Recommendation 2007)[375] that entered into force in 2017.
- The 1995 STCW-F Convention (International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel) of the IMO that entered into force in 2012.

The WFC is strongly influenced by the MLC. It covers all types of commercial fishing except subsistence and recreational fishing.[376] Its requirements are more stringent for vessels of 24 metres in length and over, or that remain at sea for more than three days or navigate further out at sea.[377] At least in principle, the WFC aims to establish in marine fisheries the same minimum international labour standards

371 See e.g. Mackay/Hardesty/Wilcox 2020; IOM 2016, p. xi-xii; ITF 2006, 19 et seq.

372 See https://www.ilo.org/global/topics/forced-labour/policy-areas/fisheries/lang--en/index.htm; IOM 2016; ITF 2006.

373 Art. II(4) MLC 2006; ITF 2017, 10.

374 ILO Convention No. 188.

375 ILO Recommendation No. 199.

376 ILO 2007, 3.

377 Art. 4, 10, 12, 14, 30, 32, 41 WFC 2007.

as in merchant shipping[378] including a written work agreement, decent accommodation and food, medical care, regulated working hours and repatriation.[379] Under the WFC, it is possible to inspect foreign flagged vessels under Port State Control.[380] In serious cases, port authorities can detain the ship until the deficiencies are corrected.[381]

The STCW-F Convention contains minimum standards for training and certification of fishing vessel crews, including basic safety training. It generally applies to crews of seagoing fishing vessels and "in particular, to skippers and officers in the deck department of fishing vessels of 24 metres in length and over, and officers in the engine department of fishing vessels … powered by main propulsion machinery of 750 kW propulsion power or more."[382]

Ratification of the two treaties progresses slowly: as of April 2024, the WFC has been ratified by 21 states and the STCW-F Convention by 35 states. It appears that political will to improve the situation of fishers is weak. Enforcement of minimum labour standards in marine fisheries is even more difficult than in merchant shipping. As discussed right below, rough labour conditions are only one side of the coin. On the other side, grave human rights violations occur.

LABOUR CONDITIONS

In general

The ILO estimates that over 58 million people worldwide are engaged in capture fisheries and aquaculture, and that over 15 million people work full time on fishing vessels.[383] Some of them work on large commercial vessels; the majority, however, work on small or very small boats, with or without engines. In 2007, 90% of fishers worked on vessels under 24 metres in length.[384]

378 Carballo Piñeiro 2015, 57 et seq.

379 https://www.gov.uk/government/collections/ilo-work-in-fishing-convention.

380 Art. 43 WFC 2007.

381 Safety4Sea, 25 July 2018: "First fishing vessel detained under ILO Fishing Convention".

382 https://www.imo.org/en/ourwork/humanelement/pages/stcw-f-convention.aspx.

383 https://www.ilo.org/global/standards/subjects-covered-by-international-labour-standards/fishers/lang--en/index.htm.

384 ILO 2007, 3.

A fisher's job is dangerous: risks include "the possibility of the fishing vessels being wrecked or capsized; fires and explosions on board; being washed overboard, or tripping and falling due to the motion of the vessel or slippery surfaces, or both; injury from working with heavy, dangerous or unguarded equipment (e.g., unguarded winches); asphyxiation from working in confined spaces; and many other hazards."[385] Professional medical care may be far away. According to the NGO Human Rights at Sea, more than 32,000 fishers lose their life at work every year.[386]

Next to dangers to life and health, fishers face bureaucratic obstacles. According to the ILO, shore leave in foreign ports and obtaining visas for joining or leaving vessels in foreign countries is often difficult for fishers.

Regarding salaries, fishers are mainly paid by flat wage, that is a fixed salary per pay period, or under share system contracts, which means that fishers earn a percentage of the profits or revenue of a fishing trip. Fishers may also be paid a low minimum wage plus a share of the catch, or bonuses e.g. for finding fish.[387]

385 ILO 2007, 15.

386 https://www.humanrightsatsea.org/.

387 https://www.ilo.org/global/standards/subjects-covered-by-international-labour-standards/fishers/lang--en/index.htm.

Violence, bonded labour, human trafficking and modern slavery

Ian Urbina, an American investigative journalist, spent five years researching working conditions aboard fishing vessels, particularly in East and Southeast Asia. In his book published in 2019, he describes unimaginable situations. Some of the ships are barely seaworthy and overcrowded, there are rats and cockroaches everywhere, and sanitary conditions are atrocious.[388]

Young men, sometimes children, with no prospects in life are hired by labour agents and manning agencies and exploited in a system of debt bondage. They sign English-language contracts, a language they do not speak. They do not receive a copy of the signed documents. They work for very low wages, from which the agents deduct up to 30% for vague expenses. To ensure fulfilment of the contract, the men are forced to leave their most valuable possessions as collateral. Breach of contract means economic ruin.[389]

Crew members are traded on the high seas between fishing boats against their will, sometimes after they were sold illegally across borders by smugglers to a captain. They are therefore in the captain's debt. For years they do not come ashore. In extreme cases, they are chained to prevent them from escaping.[390] Sometimes they are recruited by force, or by the use of drugs in brothels.[391] Physical violence against crew members including beatings with wooden or metal rods is common,[392] as is sexual violence by officers.[393] Crew members are also murdered.[394]

Urbina's detailed report sheds light on an industry that is usually working in the dark, or rather far out at sea. Increasingly, the question

388 Interview with Ian Urbina in FranceTV.
389 Urbina 2019, 100 et seq., 186 et seq.
390 Ibid., 227 et seq.
391 Ibid., 252.
392 Ibid., 100, 232.
393 Ibid., 99 et seq.
394 Interview with Ian Urbina in FranceTV.

is asked how human rights violations in the global food chain can be traced and avoided, focusing on marine fisheries.[395]

CATCH CERTIFICATION

Labels

Traditionally, certification of seafood for global consumers focuses on ecological sustainability. Labels such as the one of the Marine Stewardship Council (MSC) seek to guarantee sustainability, in particular with regard to wild-caught fish, through certification.[396] Certification by the MSC and similar organisations has recently been criticised for not adequately considering human rights.[397]

Actions by states

Importing states have taken measures to ensure that no illegally caught fish enters the market. The European Union, for example, introduced a Regulation in 2010 to prevent, deter and eliminate IUU fishing.[398] The Regulation foresees a catch certificate scheme that should prevent products originating from IUU fishing from entering the EU market.[399] The scheme foresees that:

> "all fisheries imports entering the EU must be accompanied by import documents known as catch certificates. These import documents must be validated by the flag State (i.e. the country which authorises the vessel that caught the fish) to certify that the products were caught in compliance with national and international fishing laws, as well as conservation and management measures."[400]

395 See e.g. Human Rights At Sea 2023; Greenpeace, Fake my Catch, The Unreliable Traceability in our Tuna Cans, 2022; Urbina 2019, 192; cf. also Human Rights Watch, Hidden Chains, Rights Abuses and Forced Labor in Thailand's Fishing Industry, 2018; https://www.rmg.co.uk/stories/topics/protecting-human-rights-fishing-industry; https://www.humanrights.dk/promoting-human-rights-fisheries-aquaculture.

396 https://www.msc.org/about-the-msc.

397 Human Rights At Sea 2023.

398 EC Regulation 1005/2008.

399 Art. 12 of the Regulation.

400 https://www.iuuwatch.eu/the-iuu-regulation/catch-certification/.

The EU regulation is concerned with the ecologically sustainable management of marine resources. It does not address human rights considerations. A further weakness is the fact that catch certification relies on validation by the fishing vessel's flag state. As in merchant shipping, it is easy to flag out a fishing vessel to a flag of convenience. The choice of flag has far-reaching consequences: for example, without permission of the flag state, regional fisheries inspectors cannot board a vessel, and flags of convenience often withhold such permissions.[401]

The EU Corporate Sustainability Due Diligence Directive (CSDDD) will address environmental as well as human rights issues in fisheries supply chains, as far as it is applicable.[402] Furthermore, the EU is developing legislation to ban products made with forced labour from its market.[403]

MARINE FISHERIES SUPPLY CHAINS: THE TRANSSHIPMENT ISSUE

In marine fisheries, the regulatory difficulties do not end with changing flags. Looking at the supply chains of seafood consumed worldwide, a major problem is traceability of the products that is hampered by so-called transshipment.

Transshipment means the (direct or indirect) transfer of catch between vessels at sea.[404] It is common practice for fishing vessels to offload their catch onto large, refrigerated cargo vessels because it allows them to remain at sea – especially if they also refuel there – instead of travelling back to shore which costs time and money. It increases the freshness and value of the catch.[405] Transshipment is not necessarily illegal. Indonesia for example banned the practice by Indonesian

401 https://stopillegalfishing.com/.

402 https://commission.europa.eu/business-economy-euro/doing-business-eu/corporate-sustainability-due-diligence_en#which-companies-will-the-new-eu-rules-apply-to.

403 European Parliament, Press Release, 5 March 2024: "Deal on EU ban on products made with forced labour"; Environmental Justice Foundation, 13 March 2024: "Press Comment: EU Ambassadors say yes to the EU forced labour law".

404 FAO 2020, 109.

405 https://globalfishingwatch.org/transshipment/.

companies in 2014, but re-allowed legal transshipment, an approach recommended by the FAO, in 2020 under strict controls.[406]

Regarding IUU fishing, transshipment can make it very difficult for authorities to monitor and control fishing practices because it is easy to omit and manipulate data regarding the catch. Especially if illegal is mixed with legal catch, it becomes difficult to trace the origin.[407]

Transshipment involving illegal catch can happen far out at sea and is hard to track. Satellite data and digitalisation can help, though. Focusing on tuna fishing, Global Fishing Watch[408] analysed vessel tracking data over eight years to better understand how fishing fleets travelling in distant waters are supported.[409] The analysis concludes that vessel identification, authorisation and tracking data of carrier and bunker vessels needs to be published to "encourage all stakeholders to use transparency to better implement policies to address IUU fishing and forced labor in fisheries."[410]

In 2020, the FAO published an in-depth global study that evaluates the risk that IUU-caught fish enters the seafood supply chain because of transshipment. The study shows that the risk is significant "that transshipment practices may contribute to laundering IUU-caught fish into the market."[411] In July 2022, Voluntary Guidelines for Transshipment, developed by the FAO members, were adopted.[412] However, it appears that these Guidelines "build on the primary responsibility of the flag States of donors and receiving vessels to implement transshipment regulations and prevent the use of transshipment that support IUU fishing and IUU fishing products from entering the seafood supply chain."[413]

406 https://www.oceansinc.earth/transshipment.

407 Ibid.

408 Global Fishing Watch was founded in 2015 and is a collaboration between Oceana (an international ocean conservation organisation), SkyTruth (a technology firm that uses satellite imagery and data to protect the environment), and Google (that helps process big data), see https://globalfishingwatch.org/about-us/.

409 Global Fishing Watch 2021, 2.

410 Ibid., 38.

411 FAO 2020, p. xiv.

412 https://www.fao.org/iuu-fishing/news-events/detail/en/c/1598976/.

413 FAO, Voluntary Guidelines for Transshipment (PSMA_StrategyWG1/2023/Inf.3), March 2023, p. 2.

Not only is the standard voluntary, it is also very easy to circumvent by flagging out vessels to states that do not apply it.

WHO PROFITS FROM IUU FISHING?

Global marine fisheries are a huge, profitable market. The start-up costs to enter into IUU fishing activities are low. For example, in 2014, a 157-foot tuna long liner built in 1972 was available for USD 200,000. An academic study calculates that within one year, such a ship could earn over USD 1.2 million if it was continually deployed, and after paying crew and fuel, the owner would still make an attractive profit.[414]

However, IUU fishing is illegal, and some states do take action to combat the practice. It is therefore not surprising that complex offshore legal structures are used to hide the true beneficial owners of vessels, i.e. those who most profit from this activity.[415] Ever-changing vessel names and flags help efforts to conceal illicit money flows.[416] It has been argued that illegal activities in the fisheries sector can amount to transnational and organised crime.[417] The victims – next to directly affected crew members – are often the people of coastal developing states. For those states, it is already difficult to control IUU fishing in their waters, and law enforcement is even more difficult when the beneficial owners of vessels are unknown.[418]

What is ultimately at stake in IUU fishing is the laundering of profits from illegal activity. This fact opens another door for combatting such activities: money laundering investigations related to IUU fishing and the identification, freezing, seizure and confiscation of the assets linked to IUU fishing.[419] There are some examples where

414 Telesetsky 2014, 952.

415 For a case study, see Dutot 2021.

416 Trygg Mat Tracking/C4ADS 2023; mongabay.com, 17 September 2021: "For sustainable global fisheries, watchdogs focus on onshore beneficial owners".

417 Telesetsky 2014, 939 et seq.; UN Office on Drugs and Crime (UNODC) (2011), Transnational Organized Crime in the Fishing Industry.

418 Trygg Mat Tracking/C4ADS 2023, 2.

419 For a report focusing not on IUU fishing, but on the illegal wildlife trade: Financial Action Task Force (FATF) (2020), Following the money of the illegal wildlife trade to stop the trade in endangered species and the laundering of profits.

states sought to recover the illicit proceeds from IUU fishing, although this can be challenging.[420]

WHAT NEEDS TO BE DONE?

Marine fisheries are a huge topic, and this book can only focus on a few aspects: labour conditions, beneficial ownership of fishing vessels and illicit money flows. Three conclusions can be drawn:

- First, regarding imports of marine fisheries products, state regulators should not only consider ecological sustainability, but also the working conditions and human rights of fishers.
- Second, regulators should not rely on flag states to take on responsibility for ensuring that supply chains of fisheries products do not originate in IUU fishing and are free from human rights abuses.
- Third, the huge profitability of IUU fishing means that money laundering investigations to confiscate profits and assets related to IUU fishing may be an effective tool to deter such activity.

Illegal fishing falls under the FATF category of environmental crime and is a designated predicate offence[421] to money laundering.[422] The question is whether – especially landlocked – countries have implemented the FATF Recommendations in this regard, and whether IUU fishing should be explicitly mentioned as a predicate offence to money laundering in the FATF Recommendations.

The lack of transparency of beneficial ownership of vessels that engage in IUU fishing and the ability to hide illegal profits in complex offshore structures make IUU fishing a tempting business opportunity for unscrupulous shipowners. The lack of enforcement of laws around IUU fishing, especially by flags of convenience, means that fishing vessels crews are unlikely to see an improvement in their working conditions or a reduction in the risk of falling into modern slavery any time soon.

420 Dutot 2021.

421 In criminal law, a predicate offence is the criminal activity that generates assets that are subsequently laundered.

422 See FATF 2012, 126 ("Designated categories of offences"); Asia/Pacific Group on Money Laundering, APG Issues Paper: Illicit financial flows generated from illegal fishing, November 2023, 2.

06

SHIPPING AT ODDS WITH THE ENVIRONMENT

THE ESSENTIAL ROLE OF THE OCEAN FOR LIFE ON EARTH

Few people are aware just how fundamental the role of the ocean is for life on Earth: it covers roughly two thirds to three quarters of the surface of the Earth and supplies 95% of its habitats. Seas and oceans play a considerable role in the Earth's biodiversity and store 97% of the world's water.[423]

423 Word Ocean Review, "Die Weltmeere – Motor des globalen Klimas"; imo.org: "IMO and its role in protecting the world's oceans".

The ocean regulates climate and weather, stores solar radiation and moderates temperature and moisture. The ocean with its phytoplankton produces roughly 50% of the world's oxygen and helps to absorb and store carbon.[424]

A key role in climate regulation is played by the large-scale systems of ocean currents. Currents are driven by Earth's rotation, by tides and the wind, but especially by temperature and salinity. In the northern hemisphere currents typically flow clockwise; in the southern hemisphere typically counter-clockwise. Warm water flows from the equator zones to the poles where the heavier, colder and saltier water sinks to deeper layers and is transported back to the equatorial zones.[425] The main role of the ocean currents is to distribute heat and moisture across the Earth.[426]

Obviously, seas and oceans are large-scale suppliers of food. Billions of people live off fish and the fishing industry.[427]

THE OCEAN IS UNDER STRESS

Largely through human intervention since industrialisation, the ocean has been ill-treated. The ability of the ocean to protect life is at serious risk.

Probably the most dramatic risk for marine life is the considerable reduction of phytoplankton due to the rise of the temperature on Earth. Considering that the role of plankton is the production of oxygen and its role in the food chain, this evolution is highly problematic.[428]

Other consequences of industrialisation are equally damaging to sea life. The acidification of the ocean is a direct consequence of the burning of fossil fuels and intensified agriculture on land. With the increase of the ocean's acidity, a set of harmful effects for sea life has

424 oceanservice.noaa.gov: "How much oxygen comes from the ocean?"; Tech Explorist, 2 June 2023: "A new study reveals how phytoplankton produce oxygen"; oceanservice.noaa.gov: "What are phytoplankton?"; geo.de: "Plankton".

425 oceanexplorer.noaa.gov: "How does the ocean affect climate and weather on land?"; planet-schule.de: "Meeresströmungen"; planet-wissen.de: "Golfstrom".

426 oceanexplorer.noaa.gov: "How does the ocean affect climate and weather on land?".

427 Armstrong 2022, 12 et seq.

428 Stern, 29 July 2010: "Nahrungskette in Gefahr, grosses Plankton-Sterben in den Weltmeeren".

set in: calcifying organisms (molluscs, corals, relying on their ability to build shells and skeletons) are at risk.[429]

Warming of sea water leads to coral bleach and to the dying off of fish around coral reefs.[430] It also leads to rising sea levels and the displacement of populations living close to the shore.[431] The warming of sea waters further leads to the melting of polar icecaps, including the Greenland ice. Specifically the melting of the Greenland ice sets free large quantities of sweet water with lower density than salt water, responsible for the slowing of the Gulf Stream. The effect could be to disturb the climate in the North Atlantic region.[432]

A further dramatic consequence of industrialisation is our production of waste. A large part of this waste ends up in the seas, since people believe that the sea can take no end of it. Particularly problematic is non- or slowly degradable waste. A large part of plastic waste ends up in the seas and is extremely harmful to marine life. Again, microplastic moves up the food chain and ultimately endangers mankind.[433]

Overfishing is another dramatic example of wilful deterioration of our marine environment. Organised crime syndicates systematically breach the rules, depleting the seas. Frequently, this goes hand in hand with exploitation of the workforce with modern forms of slavery, as discussed earlier in this book.

Another key aspect of preserving coastal regions is mangrove conservation. Mangrove forests, especially in areas like Indonesia (where 23% of the world's total of 92 mangrove species grow) have been lost to aquaculture ponds for shrimp and the like. What is rarely realised is that millions of people depend on the protection of mangroves.

429 World Ocean Review: "Die Folgen der Ozeanversauerung"; Wikipedia, "Ocean acidification"; Armstrong 2022, 22 et seq.

430 Armstrong 2022, 22 et seq.

431 National Geographic, Christina Nunez, 10 April 2023: "Sea levels are rising at an extraordinary pace. Here's what to know"; World Ocean Review: "Die Küsten – ein wertvoller Lebensraum unter Druck".

432 umweltbundesamt.de, 3 August 2013: "Kippt der Golfstrom und kommt es daher in Europa zu einer Abkühlung?"; quarks.de, 6 April 2021: "Was passiert, wenn der Golfstrom noch langsamer wird?".

433 Allianz, Günther Thallinger/Barbara Karuth-Zelle, 7 April 2022: "Fighting for a future free from plastic pollution".

Mangrove forest

Mangrove forests prevent coastal lands from flooding, secure habitats, provide food and above all store carbon. The World Bank claims that Indonesia's mangroves alone can store 3.1 billion tons of carbon, equating to greenhouse gas emissions from approximately 2.5 billion vehicles per year.[434]

Small islands are fighting pollution in court

The Commission of Small Island States on Climate Change (COSIS) has requested the International Tribunal for the Law of the Sea (ITLOS, the UN sea tribunal) to give an advisory opinion on whether the emission of greenhouse gases is "marine pollution".[435] The context is that these states are acutely threatened by rising sea levels as a consequence of global warming.[436] Art. 194(1) of UNCLOS contains an obligation for

434 The World Bank, 16 July 2021: "Mangrove Conservation and Restoration: Protecting Indonesia's 'climate guardians'"; WWF: "The Mangrove Alliance: Uniting to conserve and restore valuable coastal forests".

435 ITLOS Press Release, ITLOS/Press 343/rev, 8 September 2023; VOA News, 11 September 2023: "Small Islands take Ocean Protection Case to UN court".

436 The Guardian, 11 September 2023: "Small island nations take high-emitting countries to court to protect the ocean"; commondreams.org, 11 September 2023: "'We come here seeing urgent help': Vulnerable islands want climate pollution covered by Ocean Treaty".

member states "to prevent, reduce and control pollution of the marine environment from any source".

Whereas Art. 194 UNCLOS is binding law, the Paris Climate Agreement is far softer. While it does demand respect of the goal to reduce global warming to 1.5°C, it leaves it to states to seek the way to do so. Countries like Australia argue that ITLOS cannot go beyond the Paris Climate Agreement. What is more, some of the biggest polluters like Australia claimed that member states of UNCLOS could not prevent emissions entirely. ITLOS found in its legal opinion that "anthropogenic" greenhouse gas emissions could be considered a marine pollutant. Countries had a legal obligation to mitigate their effect on oceans.[437]

HOW SHIPPING HARMS MARINE ECOLOGY

In this book, we have to distinguish harm that shipping is causing to the seas in everyday activities and through accidents. This chapter will largely deal with pollution through shipping in everyday operations.

Pollution through waste dumping

There are several ways in which shipping is harmful to the environment – be it marine biodiversity or the coastal regions – even in day-to-day operations. Probably the crudest example is the crew of a cruise ship simply disposing of garbage over board. This practice is far more frequent than one might think. It was thanks to an observant passenger who filmed the crew when releasing garbage into the sea from *MSC Magnifica* that MSC Cruises was fined BRL 2,505,000 (USD 635,545) in Brazil.[438] Princess Cruise Lines, it was reported, was fined repeatedly for dumping oily waste off southern England or for depositing fecal coliform in Alaskan waters.[439]

437 Cf. ITLOS Press Release of 21 May 2024.

438 Cruise Law News, 20 September 2015: "Brazil fines MSC Cruises R$ 2,505,000 for dumping bags of garbage".

439 The Guardian, 19 April 2020: "Is the cruise industry finally out of its depth?" (a fine of USD 40 million in 2017; USD 20 million in 2019).

Such practices are clearly prohibited by the IMO's Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matters (the 1972 London Convention[440]). Recently the EU has decided to step up its prohibition of harmful discharges.[441] The New York Times journalist Ian Urbina details how cruise ships are using a bypass (the "magic pipe") to dispose of sewage and oil directly into the ocean instead of holding it in tanks until the ship reaches port.[442]

Anti-fouling systems

Another environmental issue is so-called anti-fouling systems. Ships need protection against algae and molluscs under the waterline, which slow down ships and increase fuel consumption.[443] Whereas historic sailing ships used arsenic, currently paints on the basis of heavy metals are used. They are, however, potentially as poisonous as their historical forerunners.

The International Convention on the Control of Harmful Anti-fouling Systems on Ships therefore prohibits the use of harmful "organotins" in anti-fouling systems.[444] Biofouling Guidelines were first adopted in 2011. A revised Guideline was adopted by the MEPC in July 2023.

440 In force since 1975, cf. also the 1996 "London Protocol", in force since 2006.

441 Splash247, 17 November 2023: "Europe to clamp down on ship discharges".

442 Urbina 2019, 270 et seq.

443 Cf. imo.org: "Anti-fouling systems".

444 2001, in force 2008.

Ballast water management

Modern ships are stabilised by pumping ballast water into tanks. Depending on the loading conditions the water is pumped back into the sea. It is relatively recent that researchers have realised that this practice may bring microorganisms from other world regions into a new environment: "bacteria, microbes, small invertebrates, eggs, cysts and larvae" could become invasive in their new environment, competing with native species and threaten biodiversity (the talk is of "aquatic bio-invasions"[445]).

After several voluntary regulations in Guidelines the IMO finally adopted a Convention on the problem: the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention[446]). An additional set of Guidelines has been adopted, in force since 2019. The regulation is based on two different standards, one for new ships (D-2) and one for existing ships (D-1). The rather weak D-1 standard merely asks ships to exchange their ballast water in open seas in order to allow the microorganisms to mix with existing species. A BWM Convention Review Plan has been adopted by MEPC 2023 with a view to finalising the review by 2026.

Noise pollution

Many shipping companies ignore that there is life in the sea. Their main interest is driven by economics. And yet, scientists and regulators are recognising to what extent underwater noise can affect marine life. In particular marine mammals are exposed to the noise of engines and so-called propeller cavitation (simply put, the bubbles produced by propellers). They are at risk of losing their sense of direction, and in extreme cases noise has proven deadly for mammals.

The IMO has acknowledged the problem. So far, however, it has merely been addressed by voluntary Guidelines of 2014.[447] They contain

445 imo.org: "Ballast Water Management".

446 Of 2004, in force since 2017, cf. imo.org, Media Centre, 8 September 2017: "Global treaty to halt invasive aquatic species enters into force".

447 Cf. IMO, Media Centre on "ship noise"; IMO MEPC "Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life", 2014; revised 2023 by the MEPC.

suggestions on the design of propellers, hull and machinery and on the reduction of vibration. The Guidelines recognise that noise of course also affects human beings, be it on board or ashore.

Another – voluntary – Guidance (of 31 July 2009) deals with the risk of ship strikes, especially of whales. Again, monitoring of implementation is not foreseen.

Other regulations on preventing pollution from ships

Beyond the regulations mentioned above, a series of more general conventions are applicable.

In particular, MARPOL and its Annexes covers the risk of pollution by oil (Annex I), chemicals (Annex II), harmful substances carried in packaged form (Annex III), sewage discharges (Annex IV), garbage (Annex V) and atmosphere pollution (Annex VI). The more recent HNS Convention[448] on hazardous and noxious substances has not yet entered into force. The Marine Environment Protection Committee (MEPC) of the IMO is developing recommendations on lost containers and plastic pellets.[449]

Another approach protects particularly sensitive areas: there is a procedure to declare areas "Particularly Sensitive Sea Areas" (PSSAs) or at least "Special Areas".[450] Special protective measures apply, according to the Polar Code,[451] to the Antarctic and the Arctic waters.[452]

On 19 June 2023, the UN adopted its treaty to protect the high seas: the Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction. Its goal is the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction.[453] This is a decisive step forward.

448 International Convention on liability and compensation for damage in connection with the carriage of hazardous and noxious substances by sea 1996 (HNS Convention) and Protocol 2010; Jacobsson 2012, 23 et seq.

449 See below the accident of *MSC Zoe*.

450 In 2023 the MEPC agreed to designate a PSSA in the North-Western Mediterranean Sea.

451 In force since 1 January 2017.

452 Marine Traffic, 15 July 2021: "Trebing thaw".

453 Cf. Intergovernmental Conference on an international legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (UN General Assembly resolution 72/249, https://www.un.org/bbnj/).

According to the treaty, 30% of seas should be transformed into protected areas, fishing is limited and shipping lanes regulated. However, 60 ratifications are necessary for entry into force; at the time of writing, Chile and Palau are the only two of 87 signatories to have ratified it.

Interestingly, the IMO only participated in drawing up the treaty and did not take a leading role in its development. Maybe this is due to the lingering conflict between protection of the environment and the interest of the shipping industry. IMO has frequently been perceived as partisan for shipping interests.

Harmful emissions

The shipping industry is amongst the biggest polluters in the world. Ships burn the dirtiest fuel.[454] Amongst the most prominent pollutants emitted are sulphur oxides (SOx), nitrogen oxides (NOx), carbon dioxide ($CO_{2)}$, nitrous oxides (N_2O), black carbon (soot), methane (CH_4) and fine particles (PM 2.5).

Many of these pollutants are immediately harmful to human health. For example, sulphur leads to lung diseases, cardiovascular diseases and premature deaths. Rightly, the populations of attractive cruise destinations, like Marseille, Venice and Barcelona, are in fear for their health.[455] Emissions also lead to further acidification of the sea and to acid rain.[456]

Some of these pollutants also have long-term consequences; in particular as greenhouse gases they contribute considerably to global warming.

SULPHUR OXIDES (SOX)

Shipping is supposedly responsible for 13% of human sulphur emissions worldwide. Their harmful effects on human health are recognised.[457]

454 Oceana, July 2008: "Shipping impacts on climate", 2; Pieth/Betz in St. Galler Tagblatt, 9 February 2021: "Das Meer als Sondermülldeponie – die Seeschifffahrt schert sich wenig um die Klimaziele".

455 NZZ, 6 September 2019, 7: "Im Qualm der Kreuzfahrtschiffe"; Transport & Environment, 4 June 2019: "One corporation to pollute them all"; Zeit Online, 10 June 2019: "Klimaaktivisten blockieren Kreuzfahrtschiff".

456 Transport & Environment, 4 June 2019: "One corporation to pollute them all", 4.

457 imo.org: "IMO 2020 – cutting sulphur oxide emissions".

Therefore, IMO already started to regulate sulphur reductions in 2005. A decisive step was the adoption of the IMO 2020 sulphur cap (MARPOL Annex VI concurrently with the EU Sulphur Directive[458]). Whereas until 2019 it was accepted to use heavy fuel oil containing up to 3.5% sulphur, the new rule demands a reduction to 0.5% in general and to a maximum of 0.1% in particularly protected areas, so-called "sulphur emission control areas". This is a big step, but it will be noted that motor vehicles in Europe are not allowed to emit more than 0.001% sulphur, that is 100 times less than ships.[459] This is one of the reasons why critics observe that, for example, the 47 ships of one cruise ship company alone, Carnival Corporation & Plc, emitted about 10 times more SOx in European exclusive economic zones than 260 million passenger vehicles in Europe.[460]

Basically, shipping companies have two alternatives to reach the IMO 2020 sulphur cap targets:

1. Ideally they would change to lighter forms of fuel. Instead of using heavy fuel oil, they would use marine diesel oil for the 0.5% maximum and marine gas oil for the 0.1% target. However, these new forms of fuel will add to costs and they may not be immediately available worldwide. It may be necessary to adapt older engines.
2. Until new viable alternative means of propulsion have been developed, many companies resort to "scrubbers". If the flag state approves the use of scrubbers they are permitted according to IMO 2020.[461]

So-called "open-loop scrubbers" are, however, highly problematic. Put simply, ocean water with sufficient alkalinity is used to neutralise the acid contained in the exhaust gas.[462] The real problem is that the "wash water", containing acids, heavy metals and potentially carcinogenic polycyclic aromatic hydrocarbons or PAHs, is poured back into the sea.

458 Cf. Transport & Environment, 4 June 2019: "One corporation to pollute them all", 5.

459 Ibid., 4.

460 Ibid., 6.

461 imo.org: "IMO 2020 – cutting sulphur oxide emissions".

462 For details: Shipinsight, 22 October 2018: "How do scrubbers on ships really work".

Cruise ship in Singapore

According to reports, for every ton of fuel, 45 tons of wash water are needed. Since this is still the cheapest way of adapting to IMO 2020, one is expecting many thousands of ships to install such scrubbers,[463] including most cruise ships.

It may not astonish the reader that the majority of ships registered under flags of convenience would use this relatively easy way to continue to burn the cheapest, dirtiest 3.5% heavy fuel oil and tip the filth into the water rather than let it dissipate in the air. Understandably, several ports and coastal states are banning the discharge of wash water in their coastal areas alltogether.[464] Critics call the open-loop scrubbers "cheat devices".[465]

To some extent, IMO is recognising the problem. After a multitude of ships began installing scrubbers, the rather soft Guidelines of 2015 were revised by the MEPC in 2021.[466] The new Guidelines do not, however, solve the fundamental problem that scrubbers contribute to the already highly problematic acidification of the seas.

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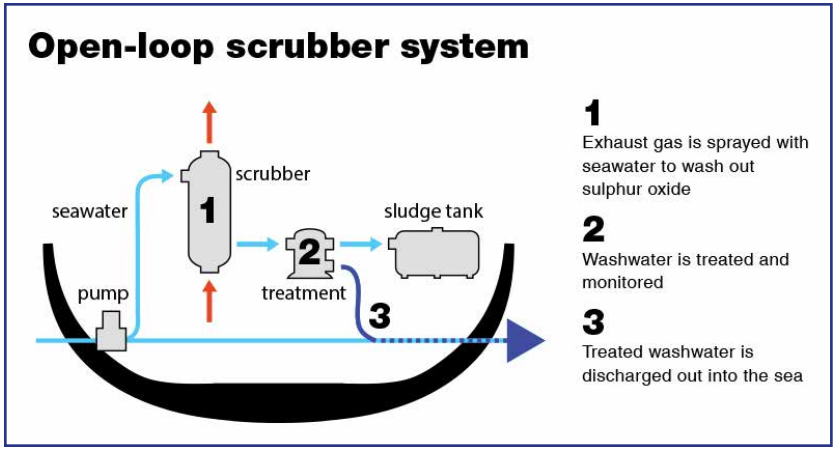
463 According to SWI, 9 September 2018: "Swiss-based traders scramble to adapt to sulphur shipping cap", MSC has spent nearly USD 2 billion to install scrubbers on its fleet.

464 Splash247, 29 April 2021: "Politicians urged to act as interactive map shows scale of global scrubber washwater discharges".

465 The Independent, 25 October 2019: "Thousands of ships fitted with 'cheat devices' to direct poisonous pollution into the sea".

466 MEPC 77/16, Add. 1, Annex 1.



GREENHOUSE GASES

According to the Fourth IMO GHG Study 2020[467] greenhouse gas emissions by ships have increased from 977 million tons in 2012 to almost 1.1 billion tons in 2018, or by 9.6%. The report goes on to state that the proportion of shipping emissions in global anthropogenic (manmade) emissions has increased to 2.89%. Greenhouse gases, in particular CO_2, black carbon, nitrous oxides (N_2O), methane and indirectly nitrogen oxides (NOx), creating ozone, are potent drivers of global warming.

The shipping community does not in principle dispute that it is a major contributor to global warming. However, in the Paris Climate Agreement of 2015 it was left to the IMO to regulate the reduction of greenhouse gases in shipping.[468] In 2018, the IMO agreed on a strategy which should at least reduce the emissions of greenhouse gases by 50% by 2050 (instead of going neutral).[469]

In 2020 however, during the 75th session of the MEPC, the IMO backtracked dramatically under pressure from the industry, shipbuilding countries and flags of convenience. It initially followed a proposal by

467 imo.org: "Fourth Greenhouse Gas Study 2020".

468 Transport & Environment, 4 June 2019: "One corporation to pollute them all", 2; SWI, 9 September 2018: "Swiss-based traders scramble to adapt to sulphur shipping cap".

469 WEF, 23 October 2020: "Here's how we can reduce emissions from the shipping industry".

Japan, Panama, Norway and others to merely reduce the expected rise of 15% to 14% by 2030 and to delay mandatory enforcement until 2030.[470] Under counter-pressure from NGOs, the MEPC decided in July 2023 that greenhouse gas emissions should be lowered to net zero by "about 2050".

A LACK OF LEADERSHIP

The MEPC negotiations in 2020 demonstrated the lack of political will of states that really should be playing a leading role in combating climate change. Critics talk of shipping as an "industry that has gone rogue",[471] and it is obvious that the international regulator (IMO) is weak. In the organisation, which works on the basis of unanimity, ecological interests typically lose out against shortsighted economic interest. Where is the leadership? Once again shipping is treated as a world apart: whereas everyone else is struggling to achieve the Paris goals, IMO still uses soft language and leaves the question how it will enforce its targets open.

The new MEPC 80 (2023) Strategy on the Reduction of GHG Emissions from Ships includes an enhanced common ambition to reach net zero greenhouse gas emissions from international shipping close to 2050. The MEPC text aiming at reaching net zero greenhouse gas emissions "by or around, i.e. close to 2050", takes into account national circumstances. For 2030 the strategy sets a target of 20% reduction, "striving for 30%",[472] and 70% (ideally 80%) by 2040. It is understandable that zero emissions will come at a price.[473] Achieving these new goals will be a lengthy process.[474]

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470 Climate Change News, 15 October 2020: "Ships to get free pass on their missions until 2030, under compromise proposal"; Financial Times, 10 November 2019: "Shipping industry seeks response to calls for cuts in emissions"; Forbes, 24 October 2020: "Global shipping's UN climate talks fail amid threats of a walkout"; The Independent, 18 November 2020: "Could the shipping industry derail plans to address the global climate emergency?".

471 Forbes, 24 October 2020: "Global shipping's UN climate talks fail amid threats of a walkout".

472 IMO Press Release, 7 July 2023: "Revised GHG reduction strategy for global shipping adopted".

473 Splash247, 7 December 2023: "$200 per container cost gap for zero emissions shipping".

474 IMO Press Release, 7 July 2023: "Revised GHG reduction strategy for global shipping adopted".

DEEP-SEA MINING

Shipping is not the only industry that is acutely endangering the marine ecosystem; the industries that shipping supports and relies upon also do so. The accident of *Deepwater Horizon* has dramatically demonstrated what damage oil rigs and in particular deep-water drills can cause.[475] Another looming danger is deep-sea mining. The drive to reduce greenhouse gases is leading to increased demand for cobalt for car and marine batteries, among other technologies.

Large deposits of cobalt are expected to be found on the seabed, captured in manganese nodules. Plans already exist to industrially source these nodules with the help of large robots. It is obvious that such deep-sea mining would destroy natural habitats.[476]

Nevertheless, there are initial moves to allow deep-sea mining. One would not believe that Norway, a country otherwise careful to preserve the environment, is amongst the first movers to allow deep-sea mining in the area of Greenland.[477] It is time for NGOs and activists to step up pressure. If Norway sees no reason to hold back, who would then?

CONCLUSION

Few realise the extent to which we are reliant upon the health of the ocean, not only as a source of food but also for the role it plays in our climate, biodiversity and water. Shipping is not the only threat to the health of our seas, oceans and coastal areas. Over-fishing and extinction of rare species[478] as well as deep-sea mining are serious problems. But shipping plays a major role.

There are a multitude of existing and new regulations on issues such as waste dumping, toxic materials in anti-fouling paints, "aquatic bio-invasions" caused by transferring ballast water from one part of

475 Soyer 2012, 59 et seq.

476 Deep-Sea Conservation Coalition, "Impacts of deep-sea mining"; Financial Times, 1 May 2023: "Governance of deep-sea mining must avoid conflicts of interest."

477 SRF4 News, 21 December 2023: "Mineralien vom Meeresboden – Norwegen erlaubt Tiefseegrabungen – das steckt dahinter"; Guardian, 9 January 2024: "Norway votes for deep-sea mining despite environmental concerns".

478 Urbina 2019, 3 et seq., 47 et seq., 91 et seq. (illegal fishing), 380 et seq. (illegal whaling).

the world to another, noise pollution and more. Furthermore, efforts are being made to reduce problematic SOx, NOx and greenhouse gas emissions. But though targets have been defined on paper, there is a long road ahead before they are achieved. Several of the chosen paths may well prove to be impasses or to have unacceptable side effects, like the use of scrubbers that result in toxic water polluting the ocean or LNG that is meant to reduce greenhouse gases but lets slip large quantities of methane.

The question is whether these regulations and conventions have teeth and whether shipping companies are implementing them in practice. Many are simply voluntary guidelines, or not yet in force due to a lack of ratifications. For others, there appears to be no practical way to ensure enforcement in an opaque industry where flags of convenience are charged with enforcement and where shipowners can evade ultimate responsibility through offshore structures and outsourcing.

07

ALTERNATIVE MARINE PROPULSION SYSTEMS

If greenhouse gas and sulphur emissions are to be drastically reduced, ambitious alternatives to the currently used heavy diesel engines will be necessary. The following chapter looks at what alternatives are available.

BACK TO WIND?

The one commodity on high seas that is available for free is wind.

The freight sail movement

Several professional seafarers are using traditional sailing boats to transport goods. These classic sailing boats are obviously no comparison

The Tres Hombres

to today's cargo ships. Their payload – what they can carry – is restricted to a few TEU, i.e. what would fit in a handful of shipping containers. They resemble medieval cargo ships and they service orphan routes, especially between the Caribbean and Europe. They send the message that wind is still an option, and that one would in world transport have to focus on reducing unnecessary cargo[479] and cutting unnecessarily long supply chains.[480] These ships tend to transport rum, chocolate, coffee, etc., like the *Avontuur*[481] or *Tres Hombres.*[482] They are, however, not a real alternative to large-scale merchant shipping.

Modest experiments

Ship operators, owners, classification societies and ship builders are joining forces to develop new ways of harnessing wind for propulsion.[483] Many of them have joined the International Windship Association. The concepts, however, still diverge substantially.

479 Haller 2021, 66 et seq.

480 Ibid., 71.

481 International Transport Journal, 12 September 2023: "Atlantic eco voyage".

482 Haller 2021.

483 International Transport Journal, 1 November 2022: "RINA now at IWSA"; International Transport Journal, 24 June 2021: "Analysing wind propulsion for commercial ships"; Splash247, 30 November 2020: "Rotor sail partnership launches to take technology mainstream".

Ships with a Flettner rotor in 1924 (top right) and today

Some marine architects have gone back to an old design of the 1920s, the so-called "Flettner rotor", making use of the "Magnus effect". An up to 30-metre-high cylinder turns in the wind, whereby the wind passes more rapidly on one side than the other, causing suction that propels the ship forward.[484] The technology is in use, but its reduction in terms of greenhouse gases is rather limited at around 10%.

Some classic tankers or bulkers are experimenting with kites raised into the wind on the high seas.[485] However, the reduction in greenhouse gas emissions is again rather limited (5–8%).[486] Similarly insufficient is the

484 International Transport Journal, 22 August 2023: "Anemoi rotor sails cut fuel and emissions"; International Transport Journal, 10 May 2023: "Rotor sails for MOL and Vale's bulk"; NZZ, 14 August 2021, 51: "Emissionsfrei unterwegs auf hoher See"; Splash247, 30 November 2020: "Rotor sail partnership launches to take technology mainstream".

485 1E9, 18 November 2020: "Dieses futuristische Schiff ist ein Segelfrachter, der 2024 vom Stapel laufen soll"; Forbes, 24 October 2020: "Global shipping's UN climate talks fail amid threats of a walkout".

486 Splash247, 10 December 2020: "MOL presses ahead with wind powered coal carrier project".

Shofu Maru with Wind Challenger hard sail

reduction of greenhouse gas emissions achieved by a joint venture between MOL and Tohuku Electric Power (5–8%). What is more, MOL uses the first one of its partially sail-equipped cargo ships as a coal carrier![487]

Wind-assisted propulsion

Currently an entire school of more ambitious ships is being developed and launched. Their commonality is that they do not aim for zero emissions. Rather, their propulsion systems are hybrid. They aim for 30 to 45% reduction in greenhouse gas emissions through wind. Typically, these are large-scale merchant ships equipped with futuristic-looking vertical aircraft wings made of modern materials, including metals and composite materials.[488] Some of these ships are newbuilds, while others are retrofitted.[489] Next to the BARTech WindWings,[490] other technologies have been developed.

487 Ibid.

488 International Transport Journal, 24 November 2023: "ONE's wind power trial" (Ventofoils); International Transport Journal, 16 September 2021: "Ayro raises funds for 'Oceanwings'"; International Transport Journal, 12 September 2023: "A tailwind for Ventofoils"; International Transport Journal, 24 August 2023: "New wind technology sets sail" (Pyxis Ocean); International Transport Journal, 16 August 2023: "NYK: more wind energy to reduce emissions"; International Transport Journal, 9 June 2023: "Navigating with "'Windwings'"; Ocean Learning Platform, 14 December 2022: "Conoship 'future-proof' vessel design pushes ahead".

489 Splash247, 17 October 2023: "Berge Bulk unveils the world's most powerful sailing cargo ship".

490 The Marine Executive, 19 June 2023: "BARTech's WindWings Receive Full DNV Approval as Installation Proceeds".

The major challenge with these futuristic sails is how to manoeuver them. They have to be taken down when entering port and in a storm. The difficulty is that the attachment withstands the powers it is exposed to. The Liebherr components product segment specialises in industrial components for mechanical, hydraulic and electrical drive techology,

Berge Olympus equipped with BARTech WindWings

Tanker with OceanWings® from AYRO

Sail attachment components from Liebherr

as well as control technology and offers components for wind-assisted propulsion. They are pre-mounted and apparently easy to install. They consist of slewing bearings, slewing drives, swiveling drives, electric motors and a lubrication system. These devices make it possible to turn the sails into and out of the wind. Crucially, two sets of seals prevent salt water from penetrating the bearings and prevent the grease from leaking out.[491]

So far, wind-assisted propulsion has been tested predominantly for bulk carriers, due to the open deck space. Only recently have studies of modern wind propulsion been initiated for container ships.[492]

Zero emissions?

There is debate about returning fully to wind even with large-scale commercial ships.[493] Obviously, if we do not want to return to the 19th-century "windjammer", some additional technology will be needed. The *Oceanbird,* known for its huge telescope-type sails, is aiming to

491 Liebherr, 9 March 2022: "Wind-assisted propulsion: Harness the wind with Liebherr".

492 Splash247, 11 December 2023: "Hapag-Lloyd studies wind propulsion for boxships".

493 Splash247, 27 April 2023: "Why I am backing a return to sailing ships".

reduce greenhouse gas emissions by 90%. It will not be an ultra-fast ship; it would take 12 days to cross the Atlantic. The remaining 10% of emissions are needed for the ancillary motor, in the case of slack periods and for berthing in harbour. The naval architects are confident that the ship would need a smaller crew than an ordinary merchant ship, since the main motor would not need constant servicing. The ship is planned for launch in early 2025.[494]

An even more ambitious project seems to be in the making: Windship has presented a project of a triple-wing rig (the "Tesla of the seas"). They are claiming that the combination of wind, solar energy, carbon capture, optimised hull shape, etc. should eliminate CO_2, NOx and SOx entirely. The authors fail though to explain how the "diesel electric ship drive" (an ancillary motor?) would become "zero-carbon".[495]

Windship's triple wing concept

494 1E9, 18 November 2020: "Dieses futuristische Schiff ist ein Segelfrachter, der 2024 vom Stapel laufen soll".

495 Riviera, 15 February 2021: "Windship Technology unveils zero-emissions ship design".

UNAMBITIOUS COMBUSTION ENGINE ALTERNATIVES

The most unambitious alternative used by the shipping industry – especially in times of bad business – is "slow steaming", thereby using less fuel.[496]

LNG (liquefied natural gas) has been hailed as a viable alternative.[497] While the reduction may be a promising alternative with regard to SOx and NOx, it is not necessarily a solution for greenhouse gases: as long as engines do not use high-pressure injection technology,[498] there is a considerable risk of methane leakage (the so-called "methane slip").[499] And methane is a 25–30 times more powerful greenhouse gas than CO_2! What is more, refueling stations are still rare.[500]

Especially large cruise ship companies have come under heavy criticism since they have been emitting huge amounts of toxic substances, including in ports and near coasts. The market leader Carnival Cruises[501] (with the brands Costa and Aida) as well as MSC[502] have come under particular pressure. Cruise ship companies are trying to change their tarnished image by ordering new LNG-powered cruise ships. NGOs and the World Bank and even competitors are, however, criticising e.g. MSC Cruises for their decision to resort to LNG: greenhouse gas emissions are likely to be even higher than with traditional heavy fuel oil.[503]

Modern engine builders such as Wärtsilä[504] are looking for ways to refit traditional engines rapidly (within two years) with hybrid LNG components. Their main challenge is to reduce methane slip.

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496 Financial Times, 10 November 2019: "Shipping industry seeks response to calls for cuts in emissions".

497 Marine Traffic, 11 June 2021: "Full steam ahead for the LNG-propelled 'Mardi Gras'".

498 Fathom World, 6 August 2019: "LNG study dispute puts methane slip in the spotlight".

499 Baughen 2021, 194; Transport & Environment, 4 June 2019: "One corporation to pollute them all", 9 et seq.

500 NZZ, 2 April 2019, 23: "Stürmische See für eine saubere Schifffahrt".

501 Transport & Environment, 4 June 2019: "One corporation to pollute them all".

502 ShippingWatch, 6 July 2021: "Shipping lines responsible for massive CO2 emissions in 2020 according to EU"; MSC Press Release, 7 July 2020: "MSC responds to recent EU shipping carbon emissions data analysis".

503 Tagesanzeiger, 31 July 2021: "Luxusliner mit Nebenwirkungen – Neue Kreuzfahrtschiffe sind schädlich fürs Klima".

504 Pieth/Betz 2022, 141 et seq.

Some shipping companies[505] and logistics providers[506] are leaning more towards biofuels. This is, however, a very heterogenous category of fuels. If they rely on palm oil or soya, these are frequently linked to deforestation. They would simply be replacing one evil with another.[507]

ELECTRICITY, GREEN HYDROGEN, METHANOL, AMMONIA?

Electricity

Coastal ferries and service boats for oil platforms are increasingly equipped with hybrid engines, including an electric component. However, the reach of batteries is limited. Especially Nordic companies are experimenting with electric technologies. The Norwegian fertiliser trader Yara has put into operation a new cargo ship *Yara Birkelund*. Maersk is cooperating with Wärtsilä to develop hybrid electro-oil engines.[508]

Green hydrogen

Hydrogen is considered probably the most promising greenhouse gas-neutral energy source. It is already used for cars and trucks. However, there are several challenges, including that producing hydrogen consumes large quantities of electric energy. If it is produced with oil or coal, it is far from being climate neutral. "Green hydrogen" has to be produced with the help of greenhouse gas-neutral energy.[509] Critics fear that hydrogen plants will compete with other recipients of solar or wind energy.[510]

There are further challenges. Hydrogen needs to be cooled down to -253°C. It uses up considerable space if carried on board. If used in combustion engines it is greenhouse gas neutral; however, the flashpoint is low and hydrogen is a risk for fire and explosions.[511]

505 E.g. MSC.

506 International Transport Journal, 4 December 2023: "Cut carbon emissions with 'Sea Alternative'" (Bolloré Logistics).

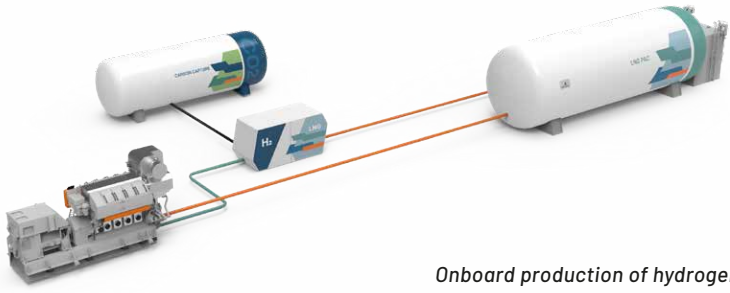
507 The EU has therefore banned palm oil as basis for biofuels.

508 Wärtsilä Press Release, 28 May 2021: "Maersk selects Wärtsilä hybrid solution to support decarbonisation effort".

509 BBC Future, 30 November 2020: "The fuel that could transform shipping".

510 NZZ, 2 July 2022: "Ohne Wasserstoff keine Energiewende, aber noch ist er zu wenig grün".

511 Pieth/Betz in St. Galler Tagblatt, 9 February 2021: "Das Meer als Sondermülldeponie – die Seeschifffahrt schert sich wenig um die Klimaziele".



Onboard production of hydrogen

There are several ways of circumventing these risks and challenges. Instead of transporting hydrogen in tanks, the engine company Wärtsilä, together with the classification society RINA and the technology corporation ABB, in 2021 worked on a solution to produce hydrogen on board with the help of LNG.[512] Wärtsilä also partnered with Hycamite to develop such technology.[513] LNG is converted into hydrogen and CO_2 in a steam converter. The converter would feed 25% hydrogen into the LNG used to drive the engine. The hydrogen would thus be immediately consumed upon production. The CO_2 let off in the process would be captured, liquefied and offloaded in harbour. The amibition is to reach 100% hydrogen fuel.[514]

In shipping there is currently more interest in the use of hydrogen power cells, transforming hydrogen into electricity through an electro-chemical reaction. The concept is technically developed. Several ships are due to be delivered by 2025. The 3.2 megawatt fuel cells are supposed to last for a voyage of 700 nautical miles. The aim is net zero by 2040, even if the ships are going to be equipped with diesel generators as a backup.[515]

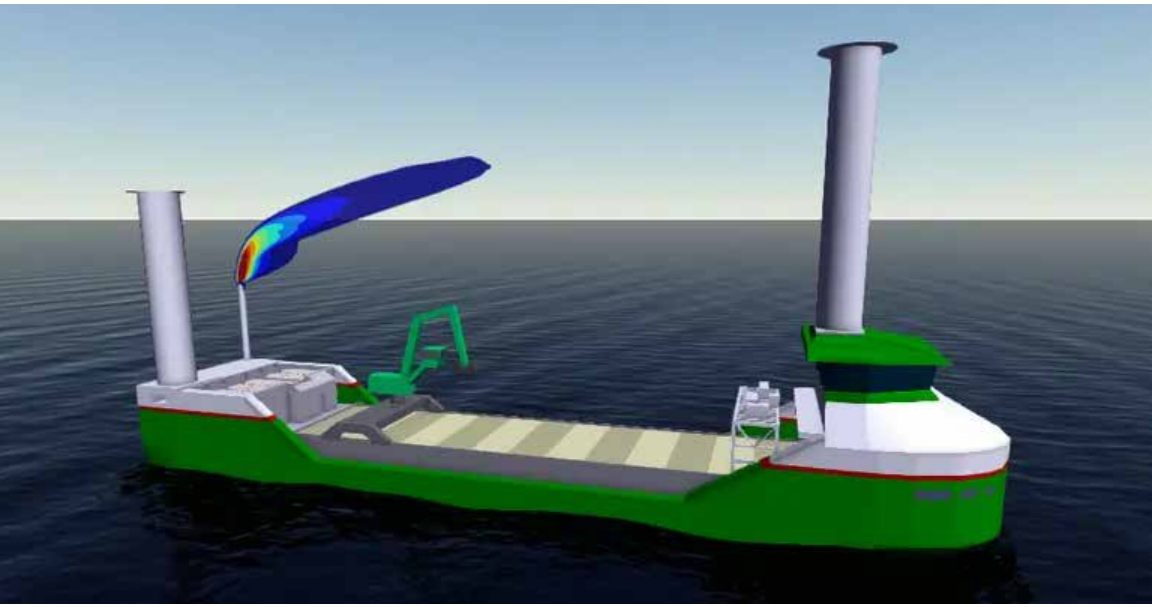
512 Wärtsilä Corporation, Press Release, 25 November 2021: "Wärtsilä and RINA partner with other stakeholders to deliver a viable hydrogen fuel solution to meet IMO 2050 target".

513 Wärtsilä Corporation, Press Release, 28 November 2022: "Wärtsilä partners with cleantech start-up Hycamite to jointly develop technology for onboard production of hydrogen from LNG".

514 Ship & Bunker, 25 November 2021: "Onboard Production Of Hydrogen Bunkers Explored in New Wärtsilä Partnership"; Pieth/Betz 2022, 144 et seq.

515 International Transport Journal, 28 September 2023: "ABB to propel Samskip's hydrogen ships".

Dispersion studies and explosion assessments are required for approval of hydrogen vessels. The below illustration by HYEX Safety shows a CFD-simulation predicting the flammable hydrogen plume during tank emergency venting for "With Orca", a vessel concept developed by the Norwegian Ship Design Company AS.



Methanol

Again, Nordic ship operators have gone ahead with ordering methanol-driven ships in Southeast Asia, especially from South Korea. The IMO Interim Guidelines have paved the way and the industry considers propulsion systems using methanol to be feasible.[516]

However, methanol is, like hydrogen, a low-flashpoint fuel. Its toxicity requires specific safety precautions while bunkering (refuelling). Fuel tanks take roughly 2.5 times more space than oil tanks. It is supposed to become harmless, though, in contact with water and is rapidly biodegradable.

516 IMO Interim Guidelines for the Safety of Ships Using Methyl/Ethyl Alcohol as Fuel, MSC.1/Circ. 1621, 7 December 2020.

The main challenge is that the methanol cycle is not greenhouse gas neutral. This would require the use of "green methanol", not yet readily available on the market. Availability of green methanol and sufficient bunkering infrastructure across the world are the main challenges.[517] Nevertheless first ships have already been put into service and many others ordered.[518] Other companies are working on methanol dual-fuel retrofits.[519]

Ammonia

Ammonia, another synthetic fuel, is a derivate of hydrogen. It needs far less storage space and less extreme temperatures. It does have a downside, though: it is toxic.[520]

Again experiments are underway. At a visit to the ship engine laboratory of Winterthur Gas & Diesel (WinGD) we were able to witness experiments with engines burning ammonia at zero greenhouse gas emissions. Both WinGD[521] and Yara[522] are working on ships to be delivered by 2026.

Overall innovation in engine construction is moving fast[523] – faster than politicians, who should be indicating the direction. CO_2-neutral propulsion is in theory possible. It does require, however, moving from experiments to testing in practice. Furthermore, once political decisions have been taken, the market would need to provide adequate bunkering networks, other infrastructure and supply chains.

517 DNV Maritime Impact, 20 April 2023: "Methanol as fuel heads for the mainstream in shipping".

518 GCaptain, 28 September 2023: "CMA CGM Orders Eight Additional Methanol-Fueled Containerships"; GCaptain, 14 September 2023: "Maersk Names World's First Methanol-Powered Containership".

519 Splash247, 8 December 2023: "COSCO signs for methanol engine retrofits at Marintec China"; International Transport Journal, 8 December 2023: "Alfa Laval to power Maersk's eco-fuel transition".

520 International Transport Journal, 15 June 2021: "K Line joins ammonia research".

521 International Transport Journal, 21 November 2023: "WinGD's methanol move"; International Transport Journal, 18 October 2023: "Ammonia-fuelled engines by WinGD"; GCaptain, 5 September 2023: "WinGD and Samsung Heavy Industries to Collaborate on Ammonia-Fuelled Ship Engines".

522 Splash247, 2 November 2023: "World's first ammonia-powered boxship set to deliver in 2026".

523 Allianz 2023, 35.

CORPORATE CARBON FOOTPRINTS

What about those political decisions? How will they be taken and who will be able to influence them? As noted above, the IMO has decided to change its approach and to align with the Paris goals of decarbonisation.[524] The shipping industry is increasingly involved in global decarbonisation efforts. At the COP28 climate summit in Dubai in 2023, the International Chamber of Shipping met with other maritime organisations and governments to plan implementation.[525]

It is time to look at how the leading shipping companies are faring. CDP's sector research into shipping companies for investors[526] gives a good overview of the status of low-carbon transitions. Three criteria serve to draw up a "League Table Summary":

- Transition risk (assessing operational and technical efficiency and relating them to market risk);
- Transition opportunities (innovation activities); and
- Climate governance and strategy (targets, quality of disclosure).

Three large liner companies come out at the top of the list: NYK Line, Maersk and MOL.[527] There are significant absentees from the list of 18, including MSC. The explanation could be that the report focuses on 18 of the largest publicly listed shipping companies,[528] while MSC is a private company.

It must be assumed, though, that MSC would not be amongst the high scorers. Largely due to incomplete reporting by MSC, Transport & Environment (T&E) considered MSC's Energy Efficiency Operational Indicator among the lowest in the industry and greenhouse gas emissions amongst the highest in the EU.[529] MSC obviously defended its carbon footprint in the aftermath.[530]

524 Zeit Online, 7 July 2023: "Weltschifffahrtsorganisation einigt sich auf Klimaziele".

525 Splash247, 11 December 2023: "Shipping leaders set out plans to deliver on IMO emission targets."

526 CDP, June 2019: "A Sea Change", Executive Summary.

527 Ibid., 4.

528 Ibid., 3.

529 Splash247, 13 December 2019: "MSC defends its carbon footprint".

530 Ibid.

The summary League Table below presents headline company performance and ranking. It is based on detailed analysis across a range of climate related indicators which could have a material impact on company performance. The League Table is designed to serve as a proxy for business readiness in an industry which will have significant opportunities as governments increase efforts to implement the Paris Agreement. Companies placed towards the bottom are deemed less prepared for a low-carbon transition.

Figure 1: League Table summary [i]

League Table rank	Company	Ticker	Stock exchange	Market Cap Average FY 2018 Q4 (US$bn)	Weighted rank	Transition risks rank	Transition opportunities rank	Climate governance & strategy rank	Fleet breakdown (%)
1	NYK Line [iv]	9101 JP	TSE	3.4	4.89	3	1	2	
2	A.P. Moller-Maersk	MAERSKA DC/ MAERSKB DC	CSE	25.3	5.03	6	2	1	
3	Mitsui O.S.K[ii]	9104 JP	TSE	3.5	6.53	1	3	6	
4	K Line [iv]	9107 JP	TSE	2.2	7.43	5	4	3	
5	HMM	011200 KS	KRX	1.0	8.87	7	8	4	
6	Norden	DNORD DC	CSE	0.6	9.34	9	9	5	
7	OOIL[iii]	316 HK	HKEX	6.0	10.15	11	5	9	
8	U-Ming	2606 TT	TWSE	0.9	10.24	2	10	11	
9	Hapag-Lloyd	HLAG GR	FWB	4.5	10.32	4	6	14	
10	Wan Hai	2615 TT	TWSE	1.2	11.26	12	12	8	
11	Evergreen Marine	2603 TT	TWSE	1.8	11.55	17	7	12	
12	COSCO S.H [iii]	601919 CH/1919 HK	SSE/HKEX	5.4	11.91	8	11	16	
13	Yang Ming	2609 TT	TWSE	0.7	12.40	10	13	15	
14	Pacific Basin	2343 HK	HKEX	0.9	12.46	16	14	10	
15	Teekay	TK US	NYSE	0.3	12.58	18	16	7	
16	Euronav	EURN BB	BXS	1.6	12.72	15	17	13	
17	NS United KK	9110 JP	TSE	0.5	13.86	14	18	17	
18	COSCO S.ET	600026 CH/1138 HK	SSE/HKEX	2.4	13.94	13	15	18	
Weighting						**35%**	**30%**	**35%**	

(i) Weighted ranks are calculated for each area. We display non-weighted ranks in this summary for simplicity only.
(ii) K Line, NYK Line and Mitsui O.S.K formed a joint venture to form the Ocean Network Expree (ONE) in April 2018.
(iii) COSCO S.H acquired a majoriy equity stake in OOIL in July 2018.
(iv) Only K Line, Maersk, MOL, Norden and NYK Line responded to CDP's 2018 Climate Change questionnaire. We encourage investors to raise the lack of transparency by other companies in discussions with company management.
Source: CDP

However, other NGOs came out with similarly low results for MSC for 2023. The "Ship it Zero" Report Card 2023 gives MSC 57/100 and an overall grade of D. It demands that a company with a 19% container market share should be far more ambitious. Its targets align with the second IMO figures applicable to the entire industry (2030: 30% reduction, 2040: 80% reduction, 2050: net zero). MSC focuses on CO_2 instead of greenhouse gases in general. The company is ready to work with interim solutions like biofuel and LNG. The company widely uses the problematic scrubbers. The assessors were unhappy with the lack of a clear strategy to replace "dirty ships".[531]

In comparison, the Ship it Zero Report Card 2023 for Maersk is far more optimistic at 76/100, giving the company an overall grade of B. The company gets top marks for its commitment and the first steps towards implementation: Maersk is committed to a 70% reduction by 2030 and net zero by 2040. The first of several "green methanol enabled" newbuilds will be delivered in 2024.[532] Maersk is a founding member

531 Ship it Zero, MSC Zero-Emission Shipping Report Card 2023.

532 GCaptain, 9 October 2023, "First Look: Maersk's First Large Green Methanol-Powered Containership".

of the First Movers Coalition. Terminals and inland transportation are rapidly being electrified. Maersk is far more transparent than MSC.[533]

Shipping companies have another, commercial incentive to take greenhouse gas emissions more seriously. Increasingly, large producing corporations are concerned about their carbon footprint. For example, Nestlé has decided to reduce its greenhouse gas emissions by using Maersk's Eco Delivery solution.[534]

ALL HANDS ON DECK

In the last two chapters we have seen that shipping is in many ways extremely harmful to the environment – not only to ocean life but to life on earth in general due to its major contribution to air pollution and climate change.

Naval architects and technicians are fast at work on alternative propulsion systems. Politicians and shipping industry leaders should encourage these in every way they can, while recognising that there is not one single solution to the multiple issues described above.

The urgency of climate change demands serious attention and all hands on deck. Decisions should not be influenced by companies that profit from keeping the status quo. NGOs have a valuable role to play in raising awareness of the issues and holding companies and politicians to account. And that will require more transparency in what we have seen is a traditionally closed and opaque industry.

533 Ship it Zero, Maersk Zero-Emission Shipping Report Card 2023.

534 International Transport Journal, 7 December 2023: "Nestlé significantly cuts sea freight emissions".

08

RISKS AND ACCIDENTS

MSC ZOE LOSES HUNDREDS OF CONTAINERS CLOSE TO THE FRISIAN ISLANDS

Another blatant example of how many goods are unnecessarily transported across the world and how risky it is that shipping lanes pass close to shorelines, just to save cost, was the accident of *MSC Zoe*. We spent a week in the Netherlands to speak to people affected by the incident and we studied the accident reports closely.

Fire on the X-Press Pearl

The accident

On the night of 1 January 2019, the North Sea was hit by heavy weather. The effects of the storm termed Alfrida[535] that cut down entire woods in Northern Europe were felt also in the area of the Dutch and German Frisian Islands. Waves towered five metres high and occasionally beyond, hitting every 12 to 13 seconds. Winds reached force 8 to 10 on the Beaufort scale, indicating a heavy storm.[536] One might wonder, nevertheless, why one of the world's biggest container ships (roughly 400 metres long and close to 60 metres wide[537]) would get into serious trouble, since such gales are not at all unusual for the time of the year.[538] *MSC Zoe*, capable of carrying close to 200,000 tons of goods in over 19,000 containers,[539] started rolling heavily.[540] Crew members reported when they arrived at Bremerhaven that they had feared for their lives.[541]

The passage of the ship was only 20–30 kilometres off the Dutch and German coasts in the Waddenzee.[542] The southern route is, at its shallowest, a mere 17 to 26 metres deep.[543] Several experts immediately assumed that the ship – when rolling particularly strongly – must have hit the ground,[544] leading to the collapse of several container towers. A further indicator for this theory seemed, at the time, that Port State Control in Bremerhaven identified "hull damage

535 VRT NWS, 2 January 2019: "Bijna 300 containers na zware storm in zee bij Waddeneilanden, sommige bevatten giftige stoffen".

536 DSB/BSU Joint Interim Report MSC Zoe 2019, 6; Captain Schütze, The Maritime Executive, 16 March 2019: "An analysis of MSC Zoe's container loss".

537 DSB/BSU Joint Interim Report MSC Zoe 2019, 3; PMA/DSB/BSU, Schlussbericht MSC Zoe 2020, 32.

538 Captain Schütze, The Maritime Executive, 16 March 2019: "An analysis of MSC Zoe's container loss".

539 PMA/DSB/BSU, Schlussbericht MSC Zoe 2020, 32.

540 DSB/BSU Joint Interim Report MSC Zoe 2019, 6; PMA/DSB/BSU, Schlussbericht MSC Zoe 2020, 74 et seq.; DSB Final Report MSC Zoe 2020, 60 et seq.

541 Report by Pastor Andreas Latz, Zembla, 21 October 2019: "De ramp op het wad" (2/2).

542 DSB Final Report MSC Zoe 2020, 40.

543 Captain Schütze, The Maritime Executive, 16 March 2019: "An analysis of MSC Zoe's container loss".

544 Schuttevaer, 24 October 2019: "MSC Zoe raakte zeebodem boven Wadden voor container ramp"; Stern, 9 March 2019: "Millionen Plastikteilchen der 'MSC Zoe' angespült – wie konnte das nur passieren?"; Zembla, 21 October 2019: "De ramp op hed wad" (2/2).

Containers of MSC Zoe

impairing seaworthiness" after the accident.[545] Overall, *MSC Zoe* lost 342 containers, 297 in Dutch, 45 in German territorial waters.[546] Most of the containers disintegrated when hitting the water, spilling their contents into the North Sea.[547] Additional debris fell over board when close to 1,000 containers were damaged on board.[548]

What really happened may ultimately be difficult to reconstruct since there are doubts that the Voyage Data Recorder was properly working.[549] At least the inspection report of Port State Control, conducted on 3 January 2019 upon arrival at Bremerhaven, stated that the Voyage Data Recorder was "not as required".[550] Whereas NGOs and the media got rather excited by the news and salvage experts and former captains stated that such malfunctioning hardly ever happens,[551] the ship manager MSC claimed that everything was in order.[552]

545 Port State Control Bremerhaven, 3 January 2019, deficiencies.

546 DSB/BSU Joint Interim Report MSC Zoe 2019, 6.

547 Ibid.

548 cedre.fr: "MSC Zoe".

549 Port Technology International, 14 October 2019: "Reports: 'Black box defect' hinders MSC Zoe investigation".

550 Port State Control Bremerhaven, 3 January 2019, deficiencies.

551 Cf. Ellen Kuipers of Waddenvereniging, RTV Noord, 10 October 2019: "Waddenvereniging over kapotte zwarte doos MSC Zoe: 'Wij zijn flabbergasted'"; Zembla, 21 October 2019: "De ramp op hed wad" (2/2).

552 World Cargo News, 14 October 2019: "MSC Zoe incident investigation causes stir in the Netherlands".

This recorder – similar to the black boxes that aeroplanes carry – is essential to the investigation of accidents at sea, since it registers information on the course, speed, draught (depth) of the ship as well as communications with land and amongst the crew. Could it have been manipulated? This is difficult to tell; however, investigation reports published in 2020 by the Panamanian, Dutch and German authorities did rely on data from the Voyage Data Recorder.[553]

In the aftermath of the accident, several possible reasons were discussed. At first, there was doubt whether the crew (in cooperation with the so-called lashing crews, the former "stevedores") had during its 24-hour stop at Sines, Portugal, adequately secured the container towers with twistlocks, lashings and the like. Had the towers in rows seven, eight and nine been secured or had the crew simply cut corners due to time pressure?[554]

One indicator that the crew of a mere 22 people, in charge of supervising loading as well as manoeuvring the giant boat, had been overworked surfaces in the inspection report of Port State Control at Bremerhaven of 3 January. It says under "labour conditions" and "fitness for duty": "rest hours insufficient".[555] Inadequate lashing obviously would have made the container towers vulnerable to strong winds. However, German authorities publicly exonerated the crew of any responsibility a few months later.[556] Another theory suggested that logistics companies misrepresented the weight of containers.[557]

Overall, experts and laymen asked themselves how one of the biggest ships could lose so many containers. Obviously, such weather conditions are no rarity in the North Atlantic and they are generally manageable.[558] Gunter Schütze, an experienced captain and expert, developed his theory in The Maritime Executive: he explained how,

553 Cf. PMA/DSB/BSU, Schlussbericht MSC Zoe 2020 and DSB Final Report MSC Zoe 2020.

554 RTV Noord, 18 October 2019: "Bemanning MSC Zoe kreeg te weinig rust volgens Duitse haven autoriteiten".

555 Port State Control Bremerhaven, 3 January 2019, deficiencies.

556 Buten un binnen, 16 May 2019: "Ermittler entlasten nach Havarie Besatzung der 'MSC Zoe'".

557 Tagesanzeiger, 7 January 2019: "MSC Zoe galt als sicherster Frachter".

558 The investigation considered the weather conditions "severe, but neither extreme nor exceptional" (DSB Final Report MSC Zoe 2020, 54).

through a "2:1 resonance",[559] under certain circumstances even such big ships can critically lose stability due to "parametric rolling".[560] His explanations of how such a heavy ship can develop extreme roll angles in a short time goes back to the design of modern container ships. The underwater ship design is "geared primarily for speed". Under the water, the ship is very slim in order to expand like a "bulb" above water, where the storage rooms are.[561] His concerns should be heard, especially since ever-bigger container ships are being ordered.

What did the investigation find out?

Since the incident was rated a "very serious marine casualty" according to the IMO terminology,[562] the flag state (Panama Maritime Authority, PMA) together with the affected shore states (Dutch Safety Board, DSB and Bundesstelle für Seeunfalluntersuchung, BSU) conducted an in-depth analysis. In addition, the DSB investigated route-specific risks on shipping routes north of the Wadden Islands. The reports, however, are more focused on prevention than on determining liability.[563]

The reports describe the events of the night in detail. They basically see four weather-related reasons for the container losses:

- the extreme rolling movements of the ship;
- possible contact with the seabed in the event of large heave and roll motions;
- so-called "greenwater loads" hitting the containers (water piling up sideways from heavy waves, unable to pass under or over the ship); and
- steep waves due to shallow water slamming against the ship.[564]

559 Captain Schütze, The Maritime Executive, 16 March 2019: "An analysis of MSC Zoe's container loss".

560 Cf. also the January 2020 report into a similar accident by the UK Marine Accident Investigation Branch: "Report on the investigation into the loss of 137 containers from the container ship CMA CGM G. Washington in the North Pacific Ocean on 20 January 2018".

561 Captain Schütze, The Maritime Executive, 16 March 2019: "An analysis of MSC Zoe's container loss".

562 Casualty Investigation Code (CI-Code) of the IMO.

563 PMA/DSB/BSU, Schlussbericht MSC Zoe 2020, 6; DSB Final Report MSC Zoe 2020, 24.

564 PMA/DSB/BSU, Final Report MSC Zoe 2020, 73 et seq.; DSB Final Report MSC Zoe 2020, 60 et seq.; The Maritime Executive, 26 June 2020: "Dutch Safety Board: ULCVs Risk Bottom Contact in Specific Conditions".

All those reasons most probably exerted pressure on the fixing (twistlocks) and the lashing systems of the containers that exceeded their design limits.[565]

The investigation is based on detailed research on the development of waves and its effects on ships of the kind of *MSC Zoe*, which was an Ultra Large Container Vessel. Astonishingly, a stable ship with a deep centre of gravity is particularly sensitive to the kind of "beam" (sideways) waves encountered.[566] The investigation denies the phenomenon of "parametric rolling" mentioned above.[567] It also considers the mechanical inclinometer of *MSC Zoe*, that indicated an extreme rolling motion (30°) – that was interpreted by crew members as the actual rolling angle of the ship – as insufficient.[568] *MSC Zoe*'s Voyage Data Recorder did not register data on actual roll motions and accelerations as this was not mandatory.[569] The report assumes an inclination of up to 16.9°.[570] Independently from the exact degree of inclination in rolling, it is obvious that such large container ships are at risk of losing cargo in bad weather.[571]

The reports are unclear about whether margins of tolerance in loading and lashing had been respected.[572] A later report by the Dutch prosecution service absolves the captain of any guilt. It considers that the lashing had been state of the art, and goes on to claim that he was allowed to take the route close to land.[573]

The passage on the navigation lane is the weakest part of the reports. The lane allows even very large container ships to pass through a protected

565 PMA/DSB/BSU, Schlussbericht MSC Zoe 2020, 50, 78 et seq.; DSB Final Report MSC Zoe 2020, 57 et seq., 62.

566 PMA/DSB/BSU, Schlussbericht MSC Zoe 2020, 61 et seq.

567 Ibid., 72.

568 Ibid., 76 et seq.

569 Ibid., 72.

570 Ibid., 74-75.

571 NDR, 3 August 2020: "'MSC Zoe': vom Containerweltriesen zum Havariefall".

572 PMA/DSB/BSU, Schlussbericht MSC Zoe 2020, 91 et seq.; DSB Final Report MSC Zoe 2020, 93 et seq.

573 Leeuwarder Courant, 15 January 2021: "Kapitein MSC Zoe niet strafrechtelijk vervolgd voor containerverlies Waddengebied"; PMA/DSB/BSU, Schlussbericht MSC Zoe 2020, 88 et seq., 94.

sea area. Apparently, Germany, Denmark and the Netherlands allow this for economic reasons.[574] Another close miss occurred in 2023 with a fire on the car carrier *Fremantle Highway*.

What fell over board?

What was in the containers that fell over board? At first, MSC did not want to share detailed information with authorities and the wider public and merely talked about a "broad spectrum of goods, including consumer goods".[575] Later on, when pushed to share the detailed cargo lists,[576] it became obvious that the logistics industry knows very little about the contents of the containers it moves: the list is full of generic terms like "garments", "electronics", "car parts", or simply "plastic".[577]

What does not emerge clearly from this packing list, later obtained by the media, is where there are dangerous goods. A container containing "lithium ion cells" may serve as an example: the shipping company does not know automatically that we are talking about 1.4 tons of highly poisonous batteries.[578] Another such example is the container carrying 280 boxes with bags of dibenzoyl peroxide powder, a substance that can be poisonous to animals and human beings.[579] Several bags with white powder were picked up on the Dutch island Schiermonnikoog and empty bags on the German island Borkum.[580] It is unclear under what title these substances show up on the packing list ("chemicals"?).

574 NDR, 7 January 2022: "'MSC ZOE' – Havarie in Nordsee: Warnung vor nächstem Unglück".

575 Stern, 9 March 2019: "Millionen Plastikteilchen der 'MSC Zoe' angespült – wie konnte das nur passieren?".

576 RTV Noord, 13 November 2019: "Details over lading MSC Zoe bekend, al zijn er nog steeds vraagtekens".

577 Crit. Ellen Kuipers of Waddenvereniging; cf. also Omrop Fryslân, 20 February 2020: "Informatie over inhoud containers MSC Zoe blijft beperkt".

578 PMA/DSB/BSU, Schlussbericht MSC Zoe 2020, 19.

579 Ibid.; The Maritime Executive, 4 January 2019: "Netherlands seeks damages for MSC Zoe cargo cleanup"; Spiegel Online, 7 January 2019: "Mehr als 200 verlorene Container in der Nordsee geortet"; Stern, 9 March 2019: "Millionen Plastikteilchen der 'MSC Zoe' angespült – wie konnte das nur passieren?".

580 Stern, 9 March 2019: "Millionen Plastikteilchen der 'MSC Zoe' angespült – wie konnte das nur passieren?".

The islanders in the Netherlands and Germany were soon to find out what was in the containers when their beaches were cluttered with rubbish in the following days: shoes, bags, toys, cushions, blankets, chairs, TV sets, plastic cups, soap dispensers, car parts, plastic arms, little toy ponies… .[581]

One might say this was a mess, but once it is dealt with, the beaches seem clean again. One tends to forget that years after the accident still one quarter of the respective goods are on the ocean floor.[582] Worse, maybe, is that 22.5 tons of industrial plastic pellets dropped into the sea.[583] These millions of micro pellets (up to 4 millimetres in diameter) are floating in the ocean and being eaten by birds and fish.[584] According to research by the University of Groningen and the nature management organisation Natuurmonumenten, alone for Schiermonnikoog it was estimated that 5.5 million pellets washed ashore for more than a year after the *MSC Zoe* incident.[585] The ranger Jan Willem Zwart of Natuurmonumenten is ready to show where they lie.[586] This problem is recognised in the investigation reports, but the reports are themselves not ready to follow up on the challenge[587] – rather they leave it to universities[588] and to NGOs.

581 Bluewin, 31 March 2019: "Baggern bei Borkum – Spezialschiff hebt den Müll der 'MSC Zoe'" and our interview with Mayor Ineke van Gent of Schiermonnikoog of 15 November 2019; Pieth/Betz in NZZ am Sonntag, 19 December 2020: "Riesenschiffe riskieren bewusst den Unfall".

582 PMA/DSB/BSU, Schlussbericht MSC Zoe 2020, 19; Dutch News, 27 November 2019: "Wadden container disaster – a quarter of the cargo is still at sea"; Dagblad van het Noorden, 28 November 2019: "Restanten veertig containers MSC Zoe noordzee moeilijk te vinden"; nrc.nl., 21 November 2019: "Plastic korrels van 'rampschip' nog steeds niet opgeruimd".

583 PMA/DSB/BSU, Schlussbericht MSC Zoe 2020, 19; DSB Final Report MSC Zoe 2020, 74.

584 Blog Jan Andries van Franeker, Wagenigen University, 4 February 2019: "Wadden Sea island Schiermonnikoog two weeks after the container incident with MSC Zoe"; NDR, 21 May 2019: "'MSC Zoe': Behörden überprüfen Containerbergung"; nrc.nl, 21 November 2019: "Plastic korrels van 'rampschip' nog steeds niet opgeruimd"; Stern, 9 March 2019: "Millionen Plastikteilchen der 'MSC Zoe' angespült – wie konnte das nur passieren?".

585 Nordic Council of Ministers, Acute plastic pollution: causes, problems and solutions, 2023, 27-28.

586 Visit to Schiermonnikoog of 16 November 2019.

587 DSB Final Report MSC Zoe 2020, 20, 22.

588 DSB Final Report MSC Zoe 2020, Appendix E.


Plastic pellets...


...and the consequences

Manfred Santen of Greenpeace[589] and the Dutch NGOs Stichting de Noordzee[590] and Waddenvereniging[591] are very explicit: these pellets pose a real danger to the food chain of the animals of the Wadden Islands.[592]

Immediately after the accident, a huge clean-up operation was launched on the islands, which were declared a UNESCO World Heritage Site in 2009. Thousands of volunteers went to the islands in the still cold and stormy weather. The Mayor of Schiermonnikoog, the island hit most by the rubbish, Ineke van Gent, rapidly realised that she needed professional help.[593] The former deputy of the Green Party turned to the military. Rapidly she found the help she needed in Major Sebastiaan Postema and the more than hundred soldiers arriving on the island.[594]

Representatives of insurers and shipping company

Already on the day after, a representative of the insurance pool turned up. He could not do much more than personally help clean

589 Our interview of 1 November 2019.

590 Our interview with Ewout van Galen of 13 November 2019.

591 Our interview with Ellen Kuipers of 13 November 2019.

592 Cf. also NDR, 21 May 2019: "'MSC Zoe': Behörden überprüfen Containerbergung"; Stern, 9 March 2019: "Millionen Plastikteilchen der 'MSC Zoe' angespült – wie konnte das nur passieren?".

593 Our interview with Ineke van Gent of 15 November 2019.

594 Our interview with Sebastiaan Postema of 14 November 2019.

Military cleaning up

up. As explored later in Chapter 9, ships are insured in three ways.[595] One insurance company takes care of the ship itself. This type of insurance is called "hull and engine".[596] Another insurer pays for loss and damage of goods transported.[597] Finally, a third insurance category called "P&I Club" (for "Protection and Indemnity Insurance Club"[598]) picks up the bill for damage to third parties. These are typically the really large sums. In order to promote merchant shipping, international treaties have defined liability limits, especially in view of oil spills. Even apart from such general limits, the concrete incident handling is usually cumbersome.

In the case of *MSC Zoe*, the islanders have filed claims for volunteer work, for the machines they had to hire and other costs linked to the salvage. The state billed its own costs. Whereas the P&I Club, in the case of *MSC Zoe* the West of England Ship Owners Club,[599] picked up the cost of salvage ships clearing the ocean floor, they at first repeatedly refused to honour the requests of the islanders and the fishermen.[600]

595 Business Law Briefings, 4 February 2019: "The containers of MSC ZOE".

596 Pavliha/Padovan 2016, 583 et seq.

597 Ibid.

598 Our interview with Harald von Seydlitz of 5 March 2020; Pavliha/Padovan 2016, 588 et seq.

599 Insurance Marine News, 3 June 2019: "Salvage of MSC Zoe comes to an end".

600 BMT Global and P&I Club West of England: The Northern Times, 4 March 2019: "Insurance companies deny first MSC Zoe damage claims"; RTV Noord, 17 October 2019: "Verzekeraar MSC Zoe weigert vervolgschade te betalen"; RTV Noord, 12 August 2019: "Van Gent wacht noog op tonnen van rederij MSC Zoe".

In January 2019, as an immediate reaction to the accident, MSC promised to find every one of the lost containers in the North Sea.[601] However, by the end of 2019, the salvage operations, both in Germany[602] and in the Netherlands[603] seem to have stopped, even though one quarter of the lost cargo was still missing. A letter to Diego Aponte, CEO of MSC, by a group of Dutch NGOs[604] was ignored.

The insurers in turn started to use the usual legalistic delaying tactics: "prove that the plastic pellets have dropped off *MSC Zoe*".[605] Obviously, with useless packing lists this would be a bit of a challenge. What the population must see as pure mockery is simply an example of delaying tactics traditionally practised by lawyers in liability cases, for example when facing asbestos claims or liability for pharmaceutical malpractice.

A further problem the officials of Rijkswaterstaat (the Dutch Ministry of Infrastructure and Water Management) saw themselves confronted with is the question of ownership and liability.[606] MSC is the ship manager of *MSC Zoe*,[607] but the company is not registered as the owner of the vessel. In the case of *MSC Zoe*, the technical "owner" is an obscure Hong Kong shell corporation incorporated shortly before the ship was launched: Xiangxing International Ship Lease Co., Limited.[608] It is unclear who is the beneficial owner of the company.

To complement the veil of obscurity, *MSC Zoe*, like many of her sister ships, is flagged in Panama. This has led to the involvement of

601 FAZ, 5 January 2019: "Schiffseigner will Container suchen und Reinigung zahlen"; Leeuwarder Courant, 10 January 2019: "Onderzoeksraad voor Veiligheid doet onderzoek naar containerramp"; MSC Press Statement of 2 January 2019: "MSC hires Clean-up Company, Sonar-Equipped Vessels for North Sea Search"; Splash247, 7 January 2019: "MSC promises to find every spilled box in the North Sea".

602 RTL DE, 11 November 2019: "Bergungsarbeiten nach Havarie der 'MSC Zoe' abgeschlossen"; NDR 1 Niedersachsen, 17 September 2019: "Havarie 'MSC Zoe': Container-Suche eingestellt".

603 Insurance Maritime News, 3 June 2019: "Salvage of MSC Zoe comes to an end".

604 Stichting De Noordzee, Waddenvereniging et al., Letter to Mr. Aponte of 6 September 2019.

605 RTV Noord, 17 October 2019: "Verzekeraar MSC Zoe weigert vervolgschade te betalen".

606 Interview of 14 November 2019 with Rex Toornvliet (claims management manager) and Robin Meijerink (senior legal advisor international affairs).

607 Equasis, MSC Zoe (IMO No. 9703318).

608 IMO No. 5869621; icris.cr.gov.hk, Company Particulars Search, CR No. 2154824, Xiangxing International Ship Lease Co., Limited: Date of Incorporation: 13 October 2014.

the Dirección General de Marina Mercante, Panama, formally leading the investigation into the accident.[609] It remains open if the opacity of ownership and control affected the final settling of claims in the case of *MSC Zoe*, when in January 2021 MSC and the Dutch authorities struck a deal. MSC paid the Netherlands EUR 3.4 million in damages.[610] This figure obviously does not cover the cleanup of microplastic. It was left to the Dutch Lottery – the Postcode Loterij – to step in and give various NGOs like De Waddenvereniging and the Stichting De Noordzee funds to conduct a plastic cleanup.[611]

Lessons learned and recommendations

The investigation reports contain several suggestions for the future. The Netherlands are most concerned about the shipping routes. They have asked experts to test the influence of the depth of the seabed on the risk of serious rolling.[612] In an "interim warning" of 31 October 2019, the DSB reminded operators of large ships that the shallow passage on the southern route posed the risk of bottom contact in heavy weather.[613] German authorities (the "Havariekommando") have in the meantime added their voice to demand that giant ships use the outer sea lane through the North Sea.[614] The main difficulty of routing is that the IMO, a UN organisation, and not the shore states define international shipping routes and decision making is considered "a lengthy process".[615] What is more, the governments of the relevant states have not made decisive steps to change navigation lanes.

609 DSB/BSU Joint Interim Report MSC Zoe 2019, 7.

610 BNNVARA, 28 January 2021: "Rederij MSC Zoe betaalt 3,4 miljoen euro schadevergoeding"; NL Times, 29 January 2021: "Shipping company pays €3.4 million compensation for overboard containers".

611 Nationale Postcode Loterij, 29 January 2021: "Schenking van 1.9 miljoen euro an Waddenvereniging voor opruimactie containerramp".

612 DSB Final Report MSC Zoe 2020, 49 et seq.

613 Ibid., Appendix A.6, Appendix C.

614 NDR, 11 November 2020: "Havariekommando: Riesenschiffe auf küstenferne Routen lenken".

615 DSB Final Report MSC Zoe 2020, 94.

Other suggestions relate to the construction of ships to prevent excessive rolling (bilge keels, anti-roll tanks, stabilisers etc.).[616] The German Government has initiated work on criteria for improved stability of large containerships and bulkers.[617]

A third set of recommendations relates to the design of containers and of strengthened lashing systems,[618] adapted to the needs of Ultra Large Container Vessels.[619] In the immediate aftermath of the accident, especially German officials and politicians demanded that containers carrying dangerous goods should be fitted with tracking equipment.[620] Shipping companies immediately objected to the suggestion,[621] partly because of the risk of overheating of batteries of such devices, but mostly because of cost. The German Government, asked by Members of Parliament of the FDP party, merely indicated that it will observe the technical developments.[622] Other experts have demanded that the entire procedures around the handling of containers be reviewed and rules upgraded as a consequence of this and similar accidents.[623]

Furthermore, additional training of captains and officers should alert them to the specific risks of the hydrodynamic phenomena of the Wadden Sea.[624]

The major issue, however, remains that such huge container ships carry an unnecessary amount of goods across the world, risking the destruction of pristine shores and serious harm to the people and species that inhabit the area.

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616 PMA/DSB/BSU, Schlussbericht MSC Zoe 2020, 101.

617 Deutscher Bundestag Drucksache 19/21523, 3.

618 PMA/DSB/BSU, Schlussbericht MSC Zoe 2020, 93 et seq.

619 Ibid., 45, 50.

620 Blick, 4 January 2019: "'MSC Zoe'-Havarie: Strand wird mit Containerladung zugemüllt"; NDR, 21 May 2019: "'MSC Zoe': Behörden überprüfen Containerbergung"; Stern, 9 March 2019: "Millionen Plastikteilchen der 'MSC Zoe' angespült – wie konnte das nur passieren?".

621 Buten un binnen, 4 January 2019: "Havarie in Nordsee: Reeder lehnen Peilsender für Container ab".

622 Deutscher Bundestag Drucksache 19/21523, 5.

623 Handelsblatt, 15 February 2019: "Norddeutsche Länder wollen schärfere Gefahrgut-Regeln für Containerschiffe"; cf. Captain Schütze, The Maritime Executive, 16 March 2019: "An analysis of MSC Zoe's container loss".

624 PMA/DSB/BSU, Schlussbericht MSC Zoe 2020, 101; DSB Final Report MSC Zoe 2020, 25 et seq.

DANGERS AT SEA

Seafarers have always lived dangerous lives. It is said that between 1830 and 1900 up to 20% of mariners lost their lives at sea.[625] Samuel Plimsoll, the British MP who lobbied his colleagues to enact legislation in protection of seafarers, claimed in 1873 that a great number of ships were sent to sea in such rotten and otherwise inadequate states that they could only reach their destination if they had fine weather. On top of that, frequently shipowners overloaded their ships in order to maximise profit.[626] Their main interest was clearly money and not the safety of

625 Parsons/Allen 2018, 18

626 Plimsoll 1873, cf. Parsons/Allen 2018, 16.

the ship and its crew. As we will see, much of this has not changed to the present day.

This chapter will discuss major risks to seafarers, ships and shipping today, namely accidents, political risks, piracy and smuggling. We will look first at general risks and then focus on particular risks related to container ships and tankers, including shadow tankers. In the following chapter, we will look at how the industry addresses these problems through risk management, regulation, monitoring and insurance.

Accidents

The industry has learnt a lot from past experience, but accidents remain a real risk. One reason is simply the modern dimension of the industry, with its close to 90,000 vessels, 1.5 million seafarers and the ambition to transport 90% of the world's goods.[627] Insurance companies like Allianz routinely publish statistics. In their last six reports they identified a marked reduction of so-called "total losses".[628] However, the insurers at the same time talk of a trend towards ever larger vessels, bringing bigger losses when something does go wrong.[629] In its 2019 report, Allianz talked of USD 1.5 billion in claims for total losses (due to sinking or collision) and USD 1 billion in claims for machinery damage and related incidents in 2018.[630] The 2023 report sees a continuation of this trend with a jump in fires and additional safety risks through the growth of the shadow tanker fleet.[631]

The overall risk spectrum is very broad. Shipping literature in general echoes Plimsoll when it holds market forces responsible for a multitude of accidents. Overcapacity of shipping space as a consequence of economic downturns leads shipowners and managers to attempt to make savings wherever possible. Frequently maritime safety is one of the first victims of an economic crisis.[632]

627 Oltedal/Lützhöft 2018, 71.

628 Allianz 2023, 4.

629 Ibid., 19, 21; Loadstar, 10 June 2019: "Bigger ships mean 'bigger risks for everyone'".

630 Allianz 2019, 5.

631 Allianz 2023, 23, 31.

632 Mandaraka-Sheppard 2013, Vol. 2, 15 et seq.; Allianz 2023, 19 et seq.

General causes of accidents

WEATHER CONDITIONS

The most traditional of risks at sea still stems from severe weather. Some authors claim that the likelihood of heavy storms is growing though with climate change.[633] Some areas like the South China Sea are particularly vulnerable to typhoons:

> A small Panamanian livestock freighter (*Gulf Livestock 1*) en route from New Zealand to China with several thousand live cows on board was caught in a typhoon when a serious wave hit the ship sideways so that it capsized. Only two crew members out of 40 were rescued alive by the Japanese Coast Guard (the accident had taken place in Japanese waters).[634] The shipping company will have to answer the question, why did the ship not evade the typhoon? Was their motive to take such risks economic? Obviously, this accident raises another serious issue: should live animal transports continue to be permitted? Several European countries are considering a ban on live animal transports by sea altogether in order to protect the animals from the ordeal, even if the ship finally reaches its destination.[635]

As we have seen in the case of *MSC Zoe*, even very large ships are not immune to bad weather. We will revisit the problem of serious rolling of even very stable ships shortly.

Frequently severe weather conditions lead to secondary causes for loss. One not infrequent reason for engine failure in heavy storms is that the lubrication of engines becomes irregular. That means the engine might stop just when it is most needed, due to heavy rolling.

633 Allianz 2020, 40 et seq.

634 NZZ, 4 September 2020: "Tragödie im Taifun: Nach dem Untergang eines Viehfrachters vor Japan haben Retter erst drei Crewmitglieder gefunden – zwei von ihnen lebend".

635 NZZ, 29 June 2021: "Qualvolle Tiertransporte sollen abgeschafft werden".

When the cruise ship *Viking Sky* was hit by a heavy storm and high waves near the coast of Norway in March 2019 the engine broke down or worked irregularly and the ship drifted dangerously towards the coast. 479 passengers had to be airlifted by helicopters off the ship. The remaining passengers could leave the ship in port after the engines were restored.[636]

STRUCTURAL FAILURE

In several incidents, heavy weather has led to structural failure.

The loss of the MV *Derbyshire* belongs here. Heavy waves cut off the covers of small ventilation pipes near the bow of this very large bulker. The continuing storm allowed saltwater to enter the front of the ship, pushing the bow steadily deeper into the spray. When the front hatch gave in to the massive waves, the ship rapidly filled with water, causing it to sink with all 44 people on board.[637]

Structural stress and the resulting failure in storms is by no means rare:

On 18 January 2007 *MSC Napoli* was hit by the storm Kyrill while on its way into the English Channel. Huge waves inflicted serious damage to the hull, which cracked under the stress. The ship had to be abandoned by the crew. The ship was then taken under tow and beached artificially near Branscombe, England. It was later broken up into two pieces and tugged to Belfast to be dismantled.

636 TravelPulse, 23 March 2019: "Viking Sky evacuated 1'300 people via helicopter after engine problems".

637 Wikipedia, "MV Derbyshire"; Telegraph, 9 November 2000: "Crew cleared over sinking of Derbyshire".

According to the accident report, many containers were heavier than their declared weight. This may have contributed to the structural failure.[638]

On 29 May 2013 the *MOL Comfort*, a large containership, had just passed the five-year "special survey" by its classification society when it ran into bad weather. It buckled and burst into two parts on 17 June 2013. Both parts sank before they could be salvaged. The crew could be rescued, but the ship lost massive amounts of heavy crude oil and all 4,382 containers on board. Astonishingly the classification society that had certified the ship as safe, NK, was allowed to write the accident report. It suggested that Mitsubishi Heavy Industries was responsible for construction errors.[639]

MOL Comfort

638 UK MAIB 2008.

639 Wikipedia, "MOL Comfort".

Finally, another very serious accident goes back to a mix of bad weather and "catastrophic structural failure":

> *Stellar Daisy*, a Very Large Ore Carrier, had run into a storm in the South Atlantic between 29 and 31 March 2017. On 31 March Stellar Daisy rapidly started to list (lean) to one side as a consequence of serious structural failure and uncontrolled flooding set in. Of the 24 crew members, only two were rescued. Again, earlier inspections in dry dock (in 2011, 2012 and 2015) had failed to detect potential defects in the structure.[640]

Many of the worst oil spills were triggered by bad weather, with ships hitting rocks and ultimately breaking apart. In Europe the *Amoco Cadiz*, the *Erika* and the *Prestige* disasters were amongst the worst experienced, triggering stricter regulations as a knee-jerk reaction. The patterns of the accidents are in many ways similar:

> On 16 March 1978 the *Amoco Cadiz*, a Very Large Crude Carrier transporting 220,000 tons of light crude oil for Shell Oil, suffered a rudder failure near the coast of the Bretagne. Tugboats unsuccessfully sought to prevent it from further drifting towards shore. It hit a rock five kilometres off the coast and broke into parts before the oil could be pumped out. The consequence was a dramatic oil spill.[641]
>
> MV *Erika*, another single-hulled ship built in 1975, overloaded by 10%, broke into two and sank close to the Breton town of Lorient in a storm on 12 December 1999. Apart from the overload, it was later determined that the ship had been in a bad state. The owner and classification society were aware of

640 GCaptain, 23 April 2019: "Marshall Islands Releases long-awaited Stellar Daisy casualty report".

641 Wikipedia, "Amoco Cadiz".

the lack of seaworthiness. This catastrophe was one of the key motivations for ramping up regulation in the EU.[642]

In a similar way, bad weather and structural deficiencies of a 26-year-old single-hulled tanker led to one of the worst oil spills in Europe: MV *Prestige* burst a tank and sank in November 2002 off the coast of Galicia, Spain, spilling 60,000 tons of heavy crude oil. One of the problems was that after the initial incident, the costal authorities of several countries refused the ship in distress a safe haven, so that it was left to split in half in the heavy seas.[643]

Readers will not be surprised to learn that in the cases of *Erika* and *Prestige*, it proved to be enormously difficult to determine the real owners of the ships.[644]

HUMAN ERROR

According to specialised literature, probably the most significant risk factor is human error, frequently combined with bad weather or other stresses. Error has led ships to founder (sink), to ground or to collide. Navigational skills are key in seafaring. In the case of the *Torrey Canyon,* which hit a rock near Cornwall, UK, the tanker did not have adequate charts on board and the navigational system was inaccurate. A combination of bad weather and navigation error led to the grounding of MV *Rena* off New Zealand. The collision of *MSC Chitra* in the port of Mumbai, India, is probably primarily the responsibility of another ship. However the consequences were severe: up to 1,000 tons of oil were spilled into the harbour waters[645] and 300 containers fell over board when the ship listed.

An aspect that is frequently underrated is the behaviour of the crew, the company and the authorities in the aftermath of such an accident.

642 GCaptain, 25 September 2012: "More than a decade later, Total loses battle over MV Erika oil spill"; Der Spiegel, 14 December 1999: "Kapitän der 'Erika' festgenommen".

643 Wikipedia, "Prestige oil spill".

644 NZZ, 20 November 2002: "Wie bei 'Erika' führt die Ölspur auch nach Zug".

645 Cedre, 8 October 2013: "MSC Chitra".

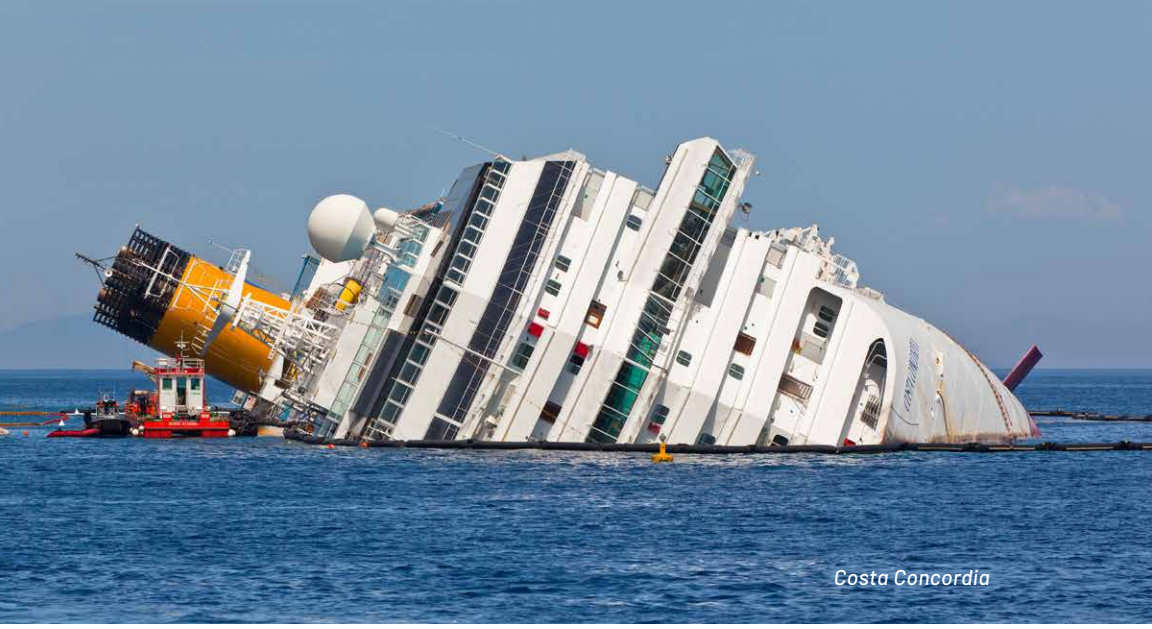

MSC Chitra

Especially in the case of fire or, in particular in an emergency involving a passenger carrier, much depends on the training and the coordination of the crew.

In the first stage after the ship hit a rock, almost everything went wrong on *Costa Concordia*. The passengers were not informed of the emergency and staff found it difficult to communicate, since Italian was the official language on board. Lifeboats and rafts were not deployed by the personnel with the safety training. The rescue operation made the impression of a great confusion and it was merely thanks to the closeness of the wreck to the island of Giglio that most passengers could save themselves or be rescued. That the captain left the ship as one of the first instead of coordinating the rescue operation fits his overall behaviour leading to the disaster.[646] Experts point out that the disorganisation to a large extent has to be accounted for by the company.[647]

646 Parsons/Allen 2018, 27; Wikipedia, "Costa Concordia".

647 Oltedal/Lützhöft 2018, 76 et seq.



Costa Concordia

In a second stage after an accident, essential decisions have to be taken about salvage. In some cases shipping companies were unable to salvage a wreck and prevent its sinking, like in the case of *MOL Comfort*. In other cases the salvage efforts were successful, like in the refloating of the *MSC Carole*[648] near Jakarta or the successful dismantling of the two pieces of *MSC Napoli*.[649]

In yet other cases it remains doubtful that best efforts were made to protect the environment or if simply the cheapest solution was chosen:

> After the collision involving *MSC Chitra* in the harbour of Mumbai, the shipping company – against original plans to break the ship at Alang, Gujarat – decided to simply tow the wreck into international waters and to deliberately scuttle it with all cargo (including some dangerous pesticides) and the remaining oil on board. Against UN law, the IMO had not been informed of these plans.[650]

648 APL, 29 February 2012: "M.V. MSC Carole"; Sea News, 5 March 2012: "MSC Carole refloated on Friday March 02".

649 UK MAIB 2008; Wikipedia, "Mediterranean Shipping Company".

650 SRF ECO, 16 January 2012: "Sinkende Rena: Die Rolle der Schweizer Firma MSC"; SRF ECO, 23 January 2012: "MSC: Fragwürdige Schiffsentsorgung"; Infosperber, 25 January 2012: "Die lange Ölspur der Genfer Reederei"; Wikipedia, "Mediterranean Shipping Company".

In a similar way MOL will have to answer the question whether it had no alternatives than to sink the wreck after MV *Wakashio* hit a coral reef off Mauritius on 25 July 2020.[651]

Overall, human error is a key factor in shipping accidents.[652] Typically, one would talk about negligence. Occasionally, however, there have been cases of recklessness. This was the finding of Italy's highest court in the case of *Costa Concordia*.[653]

POLITICAL RISK, PIRACY, RESCUE

A very different type of risk needs to be taken equally seriously: political risk. These include:

- warfare, e.g. the closure of the Suez Canal following the Six Day War in the Middle East;[654]
- other regional tensions, like attacks on tankers in the Strait of Hormuz[655] or in 2024 by Houthis in the Red Sea;
- embargoes like the embargo against Iran[656] or Venezuela[657];
- situations like Russia's aggression against Ukraine and its impact on shipping in general.[658]

Piracy is an old "trade", often thought to have been overcome. However, experiences in the Red Sea, in the Strait of Malacca and in the Gulf of Guinea[659] have demonstrated that this threat is still very real. Even large merchant vessels and their crew have been hijacked and held

651 UNCTAD/CNUCED, 19 August 2020: "CNUCED – Marée noire à l'île Maurice: la pollution par la faute des navires à la une".

652 Allianz 2019, 30 et seq.; Oltedal/Lützhöft 2018, 78.

653 Wikipedia, "Costa Concordia".

654 History, 11 May 2018: "Six-Day War".

655 Allianz 2019, 43.

656 Marine Traffic, 31 October 2019: "Tracking Iran's tankers"; NZZ, 20 May 2019: "Der Öltanker, der der aus dem Dunkeln kommt".

657 KYC 360, 30 December 2020: "UAE emerges as hub for companies helping Venezuela avoid U.S. oil sanctions".

658 Allianz 2023, 29.

659 International Transport Journal, 23 October 2023: "Pirates are picking up speed"; International Transport Journal, 26 October 2020: "IMB sees pirates growing stronger"; EDA, Fokus Maritime Piraterie; Zeilbeck 2020, 458 et seq.

Military operation against pirates

for ransom, enabling pirates to extort millions from shipowners and insurance companies. Only with the decision of major trading nations to send warships to the crisis zones have piracy attacks been reduced.[660]

The Law of the Sea[661] contains an obligation on ships to help others in distress, no matter how urgently the ship wants to reach its destination. Rescue operations are time consuming, but there are insurance policies covering the financial loss.[662] This includes assistance given to migrants in distress.[663] In this light, Italy's use of anti-migrant laws to target rescue ships in 2023 is highly problematic.[664]

RISKS RELATED TO CONTAINER SHIPS

Container shipping is the backbone of general cargo shipping. Yet container shipping is far from safe. One major challenge is the ageing fleet. On average container ships are over 14 years old. 20% are over 20 years old.[665]

660 Allianz 2019, 46 et seq.; Allianz 2023, 33; Mandaraka-Shephard 2013, Vol. 2, 20 et seq.

661 Art. 98 UNCLOS; Allianz 2019, 45.

662 Allianz 2019, 44 et seq.

663 Ibid.

664 Reuters, 23 September 2023: "Pope says impeding migrant rescues at sea is 'gesture of hate'"; Reuters, 26 March 2023: "Banksy's migrant rescue ship seized by Italy's coast guard in Lampedusa"; GCaptain, 17 January 2023: "Catholic Church Asks Italy To Scrap New Migrant Law"; WOZ, 11 March 2021: "Seenotrettung, Solidarität auf der Anklagebank".

665 International Transport Journal, 27 October 2023: "Ageing containership fleet poses challenges".

Loss of containers

As the accident of *MSC Zoe* has taught us, the industry does not really consider the risks of the contents of containers that fall into the water. One highly problematic issue is the sea transport of plastic pellets, i.e. raw material for future plastic. As in *MSC Zoe*, a recent container loss off the coast of Galicia, Spain, led to tons of pellets dropping into the sea and endangering sea life in Northern Spain.[666]

Another key problem is secure loading. Port stops are short, frequently less than 24 hours.[667] Loading has to happen according to a rigorous plan, aided by computer technology. With growing ships (the largest of which now carry more than 24,000 TEU) the piles on deck get higher and higher. Attachment remains precarious. The containers are stacked between eight and eleven tiers high[668] on deck and sometimes over six tiers deep under deck. The major challenge is not only to position containers correctly according to their destination, but to consider weight. Finally containers containing dangerous or inflammable goods need to be given special attention.[669] Refrigerated goods also have their special place.

So-called lashing bridges make it possible to secure containers up to tier 4 or 5; above this they have to be lashed together.[670] Once loaded, the containers need to be locked onto each other with twistlocks and then lashed with lashing rods. The attachment is strengthened with the help of so-called turnbuckles.

Normally, lashing crews from the harbour attach the lashings. However, the ship crew remains responsible for ensuring that the job is done well. They also have to check that the lashings remain secure once at sea.[671] This is one of the reasons why the ever smaller crews (around 20 for a large container ship) on ever larger ships are chronically

666 FAZ, 14 January 2024: "Nordspanien wird von Kunststoff aus dem Atlantik überflutet".

667 UNCTAD 2019, XIII.

668 Maritime Insight, 7 October 2019: "Important points for safe container lashing".

669 Shipping and Freight Resource, 3 August 2020: "How Containers Stowage Planning Works".

670 PMA/DSB/BSU, Schlussbericht MSC Zoe 2020, 38 et seq.

671 Maritime Insight, 7 October 2019: "Important points for safe container lashing".

Lashing

overworked.[672] Unions of seafarers like the International Transport Workers' Federation claim that companies tend to cut corners and force crews to undertake dangerous lashing work while the ship is already under way.[673]

The international investigation team analysing the reasons for the loss of containers by *MSC Zoe* have expressed doubts as to whether the lashing methods and rule books developed for container ships were adequate for such oversized ships.[674] Certainly the abnormal roll resonance observed created forces well beyond the safety limits of the containers and lashing equipment, which led to the loss of containers and to the collapse of container towers.

The risk of "parametric rolling" and of resonance[675] has also been described in analytic writing[676] and observed by similar accident reports, e.g. the Marine Accident Report of September 2014 of the Danish Maritime Accident Investigation Board (on the loss of 517 containers off *Svendborg Maersk* on 14 February 2014) and the MAIB Accident Report of January 2020 into the loss of 137 containers

672 Cf. the experience of *MSC Zoe* above.

673 Container News, 2 April 2020: "ITF claims shipping lines are ignoring lashing rules".

674 PMA/DSB/BSU, Schlussbericht MSC Zoe 2020, 45, 78, 93 et seq.; cf. also NDR, 3 August 2020: "'MSC Zoe': Vom Containerweltriesen zum Havariefall".

675 PMA/DSB/BSU, Schlussbericht MSC Zoe 2020, 54 et seq.

676 Krüger (Technische Universität Hamburg), Zur Frage des Erkennens von gefährlich grossen Rollwinkeln im praktischen Bordbetrieb, Hamburg 2007.

from *CMA-CGM G. Washington* on 20 January 2018. In October 2020, Australian maritime investigators concluded that another large, modern containership, the *APL England*, had lost 50 containers in a storm, due to rolling of up to 25° on each side. Another 63 containers were damaged on deck.[677] Likewise, the Danish Accident Investigation Board held that parametric rolling was responsible for the loss of 732 containers off *Maersk Essen* in 2021.[678]

As if the exposure of mega ships to extreme rolling and the loss of containers needed further illustration, the Japanese containership *ONE Apus* lost close to 1,900 containers in a storm in the Pacific in December 2020.[679] Sixty-four of the containers apparently contained dangerous goods.[680] Overall, container losses peaked at roughly 3,000 annually in 2020 and 2021.

Within the industry, voices are getting louder demanding an upgrade of lashing rules as ships get larger. A 2015 voluntary guide by the IMO is considered clearly insufficient. No one checks the steel thickness of container frames nor the strength of containers at the bottom of the tower.[681]

Retired Captain Colin Smith claims that shipowners jeopardise the environment and the lives of crews by dangerously stacking containers too high up and too far forward on ships. He suggests that IMO limit the number of containers stacked above deck, their positioning and protective structures. He considers action all the more urgent with the

677 GCaptain, 28 October 2020: "Preliminary Report Sheds Light on Container Loss from APL England".

678 DMAIB, Maersk Essen, Marine accident report on loss of cargo, 16 January 2021, 61 et seq., 65.

679 GCaptain, 2 December 2020: "Massive cargo loss: estimated 1'900 containers lost or damaged on ONE Apus"; The Maritime Executive, 1 December 2020: "ONE Boxship Suffers Container Stack Collapse in Mid-Pacific"; Reuters, 4 December 2020: "Container ship loses nearly 2'000 cargo carriers in Pacific storm". Container News, 8 December 2020: "Updated: One Apus arrives in Kobe for box discharge".

680 Container News, 8 December 2020: "Updated: ONE Apus arrives in Kobe for box discharge".

681 Shipping watch, 21 February 2022: "Maersk lost 962 containers at sea in 2021: 'Far above the norm'"; Container News, 1 April 2020: "Lashing rules upgrade imperative for container industry".

ONE Apus after the storm

increase of wave heights as a result of climate change.[682] Reports of freak waves of up to 30 metres in height abound.[683]

Overall, rougher weather combined with ever bigger ships and outdated lashing procedures seem to be responsible for a growing number of container losses. Shipping companies do not appear to take the risks to the environment and seafarers seriously enough. There is a serious need to rethink lashing procedures urgently[684] – but will companies voluntarily do this if it is likely to eat into their profits?

Fire

According to insurance companies[685] and media reports[686] explosions and fires are amongst the main risks for container ships.[687] The risks posed by cargo are frequently unknown to crews and companies. Insurers fear that a containership that catches fire may be lost.[688]

682 Splash247, 7 December 2020: "Why this box spill ought to spur change".

683 ESA, 21 July 2004: "Seeungeheuer gibt es doch: ESA-Radarsatelliten entdecken 'Monsterwellen'".

684 Allianz 2023, 27.

685 Allianz 2019, 22 et seq.

686 Wall Street Journal, 24 November 2019: "Spate of fires has shipping industry looking at how dangerous goods are handled".

687 GCaptain, 17 May 2019: "Grimaldi Group calls for tighter cargo controls after fires"; Süddeutsche Zeitung, 15 March 2019: "Schiffsunglück vor Frankreichs Atlantikküste, schwimmende Müllhalde"; Luxemburger Wort, 14 March 2019: "Ölpest bedroht Frankreichs Atlantikküste"; NZZ, 15 March 2019: "Ölteppich vor Frankreich: ein Wettlauf gegen Wind und Wellen";

688 GDV.de, 10 September 2015: "Riskante Fracht auf Containerschiffen".

Examples demonstrate how right they are:

In May 2021 the leakage of nitric acid set off a chemical reaction on the feeder *X-Press Pearl*, after the ship had in vain tried to offload the container in various harbours. Shortly afterwards the ship exploded near the coast of Sri Lanka, spilling toxic substances onto some of the most pristine beaches in the country. After burning for over a week, the ship sank.[689]

Reports say that the container ship *Maersk Honam* caught fire on 6 March 2018 in the Arabian Sea, killing five crewmembers. The crew was unable to extinguish the major fire. Salvage equipment and navy boats had to come to the rescue. The fire was controlled, but continued into April, when the ship was finally towed into the port of Jebel Ali weeks later.[690]

Maersk Honam

689 GCaptain, 24 May 2021: "Chemical Fire on 'X-Press Pearl' under control off Colombo, Sri Lanka-Operator"; 25 May 2021: "'X-Press Pearl' fire explodes in intensity, ship evacuated"; 26 May 2021: "X-Press Pearl looking worse for wear as raging fire continues to burn"; The Load Star, 27 May 2021: "Burning X-Press Pearl in danger of sinking, as boxes start to wash up"; The Maritime Executive, 13 June 2021: "Sri Lanka files initial $40M claim over X-Press Pearl fire".

690 Allianz 2019, 23; GCaptain, 10 June 2019: "Bigger ships mean bigger risks for everyone"; Wikipedia, "Maersk Honam".

On 14 July 2012 *MSC Flaminia* caught fire after an explosion of containers containing overheated chemicals. Three seamen died. MSC was cleared of responsibility.[691] The reason for the explosion was basically seen in the preparation in port, where the sensitive boxes had been left standing in the heat of the sun for various days prior to being loaded.[692]

Overall, insurance literature claims that inspections frequently demonstrate misdeclared cargo[693] and poor stowage.[694] The not-for-profit surveying organisation NCB reported deficiencies with 55% of 500 inspected containers. 49% of the containers imported into the US containing dangerous goods apparently failed the test. 44% had problems with the way cargo was secured. 39% of the import containers had improper signage. 8% contained misdeclared goods. Similar figures were found for containers being exported from the US.[695]

The weight of containers was frequently misrepresented in the past (cf. *MSC Napoli*). In general, cranes now measure the weight while lifting the containers on board. The industry organisation World Shipping Council is making efforts with its Cargo Safety Program to improve the screening of containers.[696]

691 US District Court, Southern District of New York, In re M/V MSC Flaminia, 10 September 2018; World Maritime News, 14 September 2018: "Court: MSC Not Liable for Losses from MSC Flaminia Fatal Fire".

692 Bundesstelle für Seeunfalluntersuchung, Investigation Report 255/12, Fire and explosion on board the MSC Flaminia on 14 July 2012 in the Atlantic and the ensuing events, 28 February 2014; Gefahrgut.de, 28 September 2018: "'MSC Flaminia': US-amerikanisches Gericht stellt Schuld fest".

693 GDV.de, 10 September 2015: "Riskante Fracht auf Containerschiffen"; Allianz 2023, 24.

694 Allianz 2019, 24 et seq; Wall Street Journal, 24 November 2019: "Spate of fires has shipping industry looking at how dangerous goods are handled".

695 Insurance Marine News, 11 September 2019: "Container inspections reveal misdeclared cargo, poor stowage".

696 GCaptain, 28 September 2023: "Liner Industry Seeks Help Finding Mis-Declared Dangerous Goods in Container Shipping".

As mentioned, the risks grow with the size of the container ships.[697] In the meantime, even insiders like the CEO of Hapag-Lloyd criticise the trend towards ever bigger ships.[698]

Beyond containerships, car carriers increasingly catch fire, like the *Fremantle Highway* in 2023[699] and Grimaldi's *Grande America* and *Grande Europa* in 2019[700]. A major fear relating to the increase in electric cars is that their batteries could lead to unextinguishable fires.[701]

Concealment of illegal goods

Another risk container shipping faces is that, due to the short turnaround periods, it is easy to conceal illegal goods in containers.[702] Customs and law enforcement are typically unable to detect them unless they are tipped off or they are running a covert operation. In the past, illegal arms have been transported. If not actually illegal but at least highly embarrassing for the Swiss flag state was that a state-subsidised vessel, the *Thorco Basilisk*, was caught carrying Serbian arms from the Bulgarian port of Burgas to Saudi Arabia to be used in the war in Yemen. Apparently, there was CIA involvement.[703]

In a covert operation, US FBI agents detained *MSC Gayane* and its crew in Philadelphia, having detected nearly 20 tons of cocaine

697 Allianz 2019, 6, 20 et seq.; Loadstar, 10 June 2019: "Bigger ships mean bigger risks for everyone"; Wall Street Journal, 24 November 2019: "Spate of fires has shipping industry looking at how dangerous goods are handled".

698 International Transport Journal, 29 March 2016: "More criticism – For and against mega-ships".

699 Splash247, 9 August 2023: "Hundreds of cars still intact on board fire-damaged Fremantle Highway".

700 GCaptain, 17 May 2019: "Grimaldi Group calls for tighter cargo controls after fires"; Süddeutsche Zeitung, 15 March 2019: "Schiffsunglück vor Frankreichs Atlantikküste, schwimmende Müllhalde"; Luxemburger Wort, 14 March 2019: "Ölpest bedroht Frankreichs Atlantikküste"; NZZ, 15 March 2019: "Ölteppich vor Frankreich: ein Wettlauf gegen Wind und Wellen";

701 Allianz 2023, 25.

702 Zhang/Roe 2019, 1 et seq.

703 Thorco Basilisk, IMO 9539377; SWI, 8 December 2019: "Swiss-flagged ship said to have carried arms to Saudi Arabia"; Watson, 24 December 2019: "Die CIA-Connection: nutzten die USA einen Schweizer Frachter für Waffenlieferungen?".

on board.[704] It turned out that the so-called Balkan cartel, based in Montenegro, had organised the racket.[705] Eight crew members were involved in the plot. They eventually all pled guilty.[706] The US authorities detained not only the crew but the ship including its cargo. It was only freed one month later when MSC paid a heavy bail.

The story is highly relevant because it illustrates one of the major challenges container companies face. MSC claimed ignorance and is apparently still fighting civil penalties in the US. Bloomberg Businessweek conducted a one-year investigation and interviewed close to a hundred people. According to its report,[707] MSC was particularly vulnerable to abuse by organised crime. Bloomberg claims that law enforcement in Europe and the US thought MSC was systematically used by manning agencies based in the Balkans. The organised criminals would hire and at the same time blackmail seafarers in Montenegro. MSC was particularly vulnerable as it was growing exponentially at the time and as its trade routes from Latin America through the Panama Canal to Europe coincided with cocaine-trafficking routes.

It seems open to what extent MSC was aware of its risks, but the company must have realised that in a short timespan four of its ships were searched and stopped for drug trafficking *(MSC Carlotta, MSC Desiree, MSC Avni* and *MSC Gayane)*. MSC objects to Bloomberg's headline and says that the *Gayane* incident "was certainly a wake-up call for the entire container shipping and logistics industry, given the elaborate nature of the underlying criminal activity."[708]

704 Business Insider, 11 July 2019: "4 surprising facts about the $1 billion of cocaine found on a ship owned by JPMorgan"; Forbes, 15 July 2019: "Ship Seized With 20 Tons Of Cocaine Has Italian Billionaire Ties"; NZZ, 27 June 2019: "Drogenfund auf Schiff von Schweizer Reederei grösser als angenommen"; Port Technology International, 17 July 2019: "Drug-Bust MSC Vessel Freed"; Wall Street Journal, 24 July 2019: "Inside Shipping's Record Cocaine Bust"; Tagesanzeiger, 8 November 2019: "Wie Banden Kokain in Schweizer Schiffen nach Europa schmuggeln"; Tagesanzeiger, 18 June 2019: "Historischer Kokain-Fund: Polizei stösst auf Milliarden-Ladung".

705 Splash247, 11 September 2020: "MSC Gayane crewmember provides details about the largest cocaine bust in US history".

706 SWI, 28 June 2021: "'Movie-plot' cocaine case highlights shipping industry drug problem".

707 Bloomberg Businessweek, 19 December 2022: "Cocaine Boats. How Balkan gangs infiltrated the world's biggest shipping company and created a global trafficking network".

708 MSC Press Statement of 17 December 2022: "MSC Statement on Bloomberg Article About MSC Gayane Incident".

Finally, ONE's vessel *Laura* and the *MSC Natasha* were both involved in the transport of shark fins to Hong Kong without a permit as required by the UN Convention on International Trade in Endangered Species (CITES). Representatives of both shipping companies said that the cargo had not been declared as shark fins and that the shipment broke the companies' own policies.[709]

THE RISK OF OIL SPILLS

The history of tankers is not that old. It really picked up with the invention of diesel engines. Crude oil needed to be transported from the well to refineries or refined light oil to the users. World War II, with all the mechanised troops, as well as the shift in shipping from steam to diesel engines, meant a huge expansion of tanker fleets. The expansion continued after the war, with ever bigger ships. It reached a peak with Ultra Large Crude Carriers, capable of loading between 300,000 and 500,000 tons of crude oil.[710]

Apart from the roughly 10,000 oil tankers there are specialised tankers for chemicals, but also for liquid nutrition, like orange juice. More recently, specialised liquid gas tankers (for LNG or LPG – liquid petroleum gas) are a growth industry.[711] Since the IMO and the EU banned single-hulled tankers, the scrapping of older vessels has intensified.[712]

We have already seen that tankers are a high-risk segment. Apart from the risk of explosion and fire,[713] oil spills are the main risk.[714] We have talked about the *Torrey Canyon*, *Amoco Cadiz*, *Erika* and *Prestige* disasters. In all these cases, old single-hulled ships in a bad state broke to pieces, foundered in bad weather and spilled their oil onto nearby coasts, causing dramatic environmental damage. Many similar disasters have happened in other parts of the world.[715]

709 Reuters, 10 July 2019: "Massive shark fin haul into Hong Kong dodges global shipping bans".

710 Hübner 2016, 20 et seq.; UNCTAD 2019, IX.

711 Hübner 2016, 38; UNCTAD 2019, XI.

712 UNCTAD 2019, XI.

713 Allianz 2019, 14 et seq.; in September 2020 cf. the fire on the *MT New Diamond* near Sri Lanka.

714 ITOPF Oil Tanker Spill Statistics 2018.

715 Cf. the major oil spills in history: ITOPF Oil Tanker Spill Statistics 2018, 3.

One of the worst catastrophes outside Europe was the grounding of the *Exxon Valdez* off Alaska on 24 March 1989. A mix of company and human failure was said to have caused the accident. The collision avoidance system was not functional. The third mate on watch at the time failed to properly identify the risk of the reef. That the captain had been drinking heavily that night was (unsuccessfully) used by Exxon to find a "scapegoat" for one of the worst environmental catastrophes in shipping. Approximately 38,000 tonnes of crude spilled into the sea, contaminating 2,000 kilometres of shore line and causing the death of hundreds of thousands of birds and mammals.[716]

Repeatedly, oil spills cannot be traced back to their origin despite sophisticated oil forensics. One such case is discussed below. Another unknown or phantom tanker lost oil near the Israeli coast line and killed large amounts of birds, fish and sea turtles.[717]

From statistics it appears that the number of incidents has been steadily diminishing since the 1970s and also that the amount of spilled oil is going down.[718] This may be the insurance perspective. It does not, however, adequately depict the risk of oil spills for the environment. First, there continues to be a serious risk of accidents especially close to particularly vulnerable environments:

The grounding of MOL's *Wakashio* in the tropical paradise Mauritius obviously was not the classic tanker accident, since the ship was an Ultra Large Bulk Carrier. However, it spilled hundreds

716 Wikipedia, "Exxon Valdez oil spill"; Der Spiegel, 21 March 2014: "Das dunkle Erbe der 'Exxon Valdez'"; Der Spiegel, 18 January 2010: "Das gefährliche Erbe der 'Exxon Valdez'"; NZZ, 24 March 2019: "Vor 30 Jahren verursachte die 'Exxon Valdez' eine der grössten Umweltkatastrophen der Seefahrt".

717 NZZ, 22 February 2021: "Schlimmste Umweltkatastrophe seit Jahren: Israel schliesst nach Ölpest seine Mittelmeerstrände".

718 ITOPF Oil Tanker Spill Statistics 2023.

of tons of bunker oil onto the pristine coastline, a breeding place for endangered species. The accident raises serious questions, explored in depth in Chapter 1.

Whereas the *Wakashio* disaster involved an Ultra Large Bulk Carrier rather than a tanker, several other recent accidents do involve tankers.

When a boiler exploded on board the ageing oil tanker MT *New Diamond* near Sri Lanka, it was to a large extent due to luck and intense fire fighting by international helpers that a larger oil spill was prevented.[719]

The list of near misses or dormant risks is long, however. The international community paid little attention in general to tankers that could easily spill their oil:

The FSO *Safer*, between 1976 and 1987 an active tanker and since then an oil storage facility off the coast of Yemen, has been left without maintenance since the beginning of the civil war in 2015. There was a serious risk that the hull could start to leak due to corrosion in the aggressively salty water of the Red Sea. Alternatively the one million barrels of oil could have gone up in a huge explosion, a possibility not at all remote since the gases have no longer been vacuumed off since 2015. Only in 2023 did the warring parties agree for the UN to organise the draining of the oil from the ship.[720]

719 Al Arabiya, 5 September 2020: "New Diamond oil tanker fire under control near Sri Lanka, ship towed away"; Forbes, 17 September 2020: "Sri Lanka misses our on $25 million insurance payout for oil tanker fire ship"; Marine Insight, 11 September 2020: "Watch: Salvage operation of fire stricken oil tanker MT New Diamond begins".

720 UN News, 11 August 2023: "UN concludes removal of one million barrels of oil from decaying tanker"; NZZ, 8 October 2020: "Ökologische Zeitbombe vor Jemens Küste"; Open Democracy, 18 February 2020: "Yemen's deadly ghost ship".

Under similar circumstances, an abandoned tanker serving as a storage facility lies moored between Venezuela and Trinidad and Tobago. The *Nabarima*, owned by Venezuela and partly operated by Eni, is a victim of the sanctions against Venezuela. In July 2020 it was realised that the tanker with its cargo of 1.3 million barrels of crude oil was starting to list or lean to one side. Water leaking on board increased the risk of the ship sinking. If the oil was to be set free it would have endangered the natural habitats and coral reefs of large parts of the Caribbean.[721] In October 2020, Eni announced that the US authorities had approved the offloading of the cargo.[722] The list was corrected.[723] In April 2021, the offloading was completed.[724] The current state of *Nabarima* is unclear: it is still anchored off the Venezuelan coast.[725]

A different kind of dormant risk of oil spills is posed by over 6,000 wrecks from World War II awaiting salvage. Experts claim that up to 15 million tons of heavy oil could be hidden in the slowly rusting bunkers.[726] Apparently there is little interest by states to engage in costly salvage or pumping activities, maybe with the exception of Norway.

Extreme risks from "shadow tankers"

Over the last decade, several oil-producing (Iran, Venezuela) or importing (North Korea) countries have been subjected to sanctions.[727] They have attempted to circumvent sanctions with the help of a "dark fleet". Around 600 to 1,000 ageing tankers, that oil majors would no longer use, were

721 Forbes, 21 October 2020: "Caribbean threatened by 1.3 million barrels of oil from sinking oil tanker".

722 Energy Chamber of Trinidad and Tobago, 30 October 2020: "US gives ENI green light to offload crude oil from Nabarima".

723 Offshore Engineer, 26 October 2020: "FSO Nabarima Is 'Upright' but Crude Transfer Could Be Risky".

724 Reuters, 9 April 2021: "Sanctions-hit Venezuelan facility completes offloading of stored crude".

725 Marinetraffic: Nabarima (IMO No. 9316567).

726 ARD, 14 March 2019: "Vergessene Wracks".

727 Lloyd's List Intelligence: "Below the surface: Ownership and Risk".

used for further voyages[728] instead of going to the scrapyards. Tankers older than 20 years are typically in a bad state. Such "dark" ships apply all possible technologies to remain clandestine. For example, they often travel with their Automatic Identification System (AIS) turned off.[729] Furthermore, sanctions busting relies on transhipment of oil in open waters (ship-to-ship transfers), again raising the risk of spills.[730]

With the Russian aggression against Ukraine, Russia was subjected to strict sanctions by G7 and EU countries. Russia became increasingly dependent on oil exports to finance the war. Sources claim that the shadow fleet grew by another 1,000 ships,[731] frequently called "grey vessels" because they would not necessarily sail entirely illegally. If they respected the USD 60-per-barrel price cap on crude and if they connected Russian harbours directly with countries not part of the sanctions regime (like China or India), they would be considered quasi-legal. The major problems are, however, the same as with Iran and Venezuela: the ships are of extremely bad quality[732] and transhipment is particularly risky. It is frequently done some 800 nautical miles west of Portugal.

What is more, the G7 and the EU have cut insurance and re-insurance for sanctioned goods and ships.[733] Whether this is a good idea can be disputed. Obviously, it is meant to raise the cost for Russia and its business partners. However, accidents with ships not protected by P&I coverage are a lapse back into the 1970s. Additionally, insurance companies frequently do not know whether the ships they insure are part of the "dark fleet": they have no way of telling at what price the oil is traded and whether the cap is respected.[734]

728 Windward Report, "Illuminating Russia's Shadow Fleet"; CNN, 1 March 2023: "Mysterious fleet is helping Russia ship oil around the world and it's growing".

729 Ibid.

730 Le Monde, 6 August 2023: "Russia's ghost fleet: Moscow's new routes".

731 Windward Report, "Illuminating Russia's Shadow Fleet"; Reuters, 5 December 2022: "Russian oil sanctions fuel boom for old tankers"; Splash247, 28 January 2023: "Splash investigation pinpoints the true scale of the shadow tanker fleet".

732 CNN, 1 March 2023: "Mysterious fleet is helping Russia ship oil around the world and it's growing".

733 The Maritime Executive, 8 October 2023: "Op-Ed: Western Price Cap on Russian oil may have been too clever".

734 Energy Intelligence, 4 August 2023: "Russia's 'Shadow' Fleet Retains Access to G7 Insurance".

The accident of a 26-year-old tanker used to circumvent Russian sanctions demonstrates the risk. The tanker *Pablo* that had offloaded in China exploded close to the coast of Malaysia. The ship had shortly before been reflagged to Gabon, widely considered one of the worst flags of convenience. Only 25 of the 28 crew could be rescued. The ship was left to itself.[735] A ship abandoned beyond repair falls into the ownership of the insurer, who becomes responsible for its scrapping.[736] *Pablo*, however, does not have an insurer.

Pablo

According to news reports it is not uncommon for such old and badly maintained tankers to encounter difficulties. Apparently the 26-year-old, Cameroon-flagged tanker *Turba* experienced engine failure on the way to Singapore. The Very Large Crude Carrier Yong Yang was grounded in Southeast Asia.[737]

735 Offshore Energy, 8 May 2023: "Devastating Pablo tanker explosion exposes dangers of growing shadow fleet".

736 The Guardian, 18 September 2023: "How a bust out, abandoned ship reveals the secrets of a shadow tanker network".

737 Splash247, 12 October 2023: "Struggling dark tanker limps towards Singapore".

THE PHANTOM TANKER

A different story raises serious questions not only about the shipping industry, but about oil exploration in a wider sense. In 2019–2020, a total of 2,900 kilometres of Brazil's most attractive and wild beaches were soiled by tons of crude oil. Pristine beaches, mangrove forests and wildlife resorts in Brazil were polluted by the massive oil spill, which affected 1,009 localities in 130 municipalities in 11 states.[738] Between August 2019 and January 2020, over 6,000 tons of heavy crude oil had to be removed from the shores,[739] a thick and highly poisonous sludge. And no one has an idea where it came from!

Intertidal rocky shores, rhodolith beds, mangrove forests, seagrass beds and entire estuary systems were polluted.[740] Birds, sea turtles, crabs

Oil sludge on the beach

738 www.ibama.gov.br, 19 March 2020: "Localidades Atinguidas"; Escobar 2019, 672; Soares et al. 2020, 155.

739 Mongabay, 22 November 2019: "Tanker identified as possible Brazil oil spill perpetrator"; Soares et al. 2020, 155; Soares et al. 2022.

740 The Maritime Executive, 20 December 2019: "Spill and run: Brazil struggles to ID tanker behind oil pollution"; Mongabay, 18 November 2019: "Nearly three months after Brazil oil spill, origins remain uncertain"; Reuters, 20 December 2019: "Black tide"; The Guardian, 7 November 2019: "Oil spill threatens vast areas of mangroves and coral reefs in Brazil".

Sea turtle covered in oil

and fish died.[741] And no one has an idea what more might come. Heavy crude does not float on the water surface, but sinks to the seabed or moves a metre or so under the waterline.[742] The damage done to ocean life on the high seas is not yet accounted for at all.[743]

The traditional fishing communities in Northeast Brazil were in panic. Close to 150,000 fishermen were without work.[744] Who would buy contaminated fish? The communities, left largely to fend for themselves against the "black tide", were running out of food.[745] Luckily, some

741 BirdLife International, 20 February 2020: "Full impact of mysterious Brazil oil spill remains unknown"; time.com, 11 October 2019: "Oil Is Killing Brazil's Turtles. No One Knows Where It's From".

742 Eos.org, 24 October 2019: "Brazil's oil spill is a mystery, so scientists try oil forensics"; MarineLink, 31 December 2019: "Brazilian beaches hit by second oil spill"; NZZ, 6 November 2019: "Nach den Bränden jetzt eine Ölpest"; Reuters, 20 December 2019: "Black tide".

743 The Maritime Executive, 20 December 2019: "Spill and run: Brazil struggles to ID tanker behind oil pollution".

744 BirdLife International, 20 February 2020: "Full impact of mysterious Brazil oil spill remains unknown".

745 Global Landscapes Forum, 14 November 2019: "Footprints in the sand: a mysterious oil spill in Brazil threatens livelihoods".

NGOs came to help with crowd financing.[746] Tourism, the other main source of income for the area, was however at an all-time low.

Probing the origin of the oil spill

For at least a year, next to every report on the mystery spill started by giving some hypotheses on its source. In the end, all had to acknowledge that one simply does not know.[747]

Originally, the idea was that some tanker had cleaned out its polluted bilge by dumping the oily slick on the high seas. However, rapidly experts observed that the amount was simply too big for this hypothesis.[748]

Of course, it cannot be ruled out that an old wreck suddenly started leaking or that a ship was lost. But would one not miss a ship?

Deliberate dumping in large quantities is unlikely, especially if it was – as Brazilian authorities claim – Venezuelan oil. Busting an embargo means you would want to sell, not waste the oil.[749]

Of course, it is possible that a ship-to-ship transfer of oil on the high seas went seriously wrong.[750] A hose could have broken. But again, would one let thousands of tons of oil flow into the sea, if one could prevent it?

Obviously, a further alternative cannot be ruled out: that a platform started leaking. Former staff of Petrobas offshore rigs that we interviewed would not at all rule out this option, claiming that Petrobas was not exactly a starring example of competence. But Brazilian sources rapidly claimed that the type of oil (Merey 16?) was more likely to originate from Venezuela.[751] Immediately PDVSA, the state-owned oil company of Venezuela, denied that there had been an accident.

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746 Ibid.

747 BBC, 1 November 2019: "Brazil oil spill: where has it come from?"; The Maritime Executive, 20 December 2019: "Spill and run: Brazil struggles to ID tanker behind oil pollution".

748 Mongabay, 18 November 2019: "Nearly three months after Brazil oil spill, origins remain uncertain".

749 Ibid.

750 Reuters, 20 December 2019: "Black tide"; Ship Technology, 24 March 2020: "Tracking and tracing polluting ships".

751 Riviera, 4 November 2019: "Oil pollution on Brazilian beaches traced to Venezuela crude oil".

Another riddle in this mystery story is why "oil forensics"[752] have not come up with an explanation. Agencies under MARPOL[753] have methods to detect polluters. Satellite observation, the most obvious source of information, gives the bigger picture, but does not make it possible to distinguish crude from other carpets (like algae). Aircraft surveillance, allowing for a close-up view, may not be at hand in many parts of the world.[754] Expert analysis in the aftermath explains why the existing means, including satellite images and ocean modelling, proved insufficient.[755]

Reconstruction, by going back four to eight weeks using drift models, information on currents, winds, dispersion of oil and other data, like potential speed of ships, is very unreliable.[756]

Brazilian authorities rushed to name those who might be responsible. The first guess was rather absurd. According to the Chinese news outlet Xinhuanet,[757] the Brazilian Environment Minister, Ricardo Salles, had suggested that the NGO Greenpeace had caused the oil spill with its ship sailing near the Brazilian coast. In a later news story, the Brazilian authorities claimed as a possible culprit the Greek-flagged tanker *Bouboulina*. Its operator, Delta Tankers, acknowledged that the tanker had picked up Venezuelan oil, but claimed that the voyage to Malaysia was "uneventful" and that the full load was delivered.[758]

752 Eos.org, 24 October 2019: "Brazil's oil spill is a mystery, so scientists try oil forensics"; The Maritime Executive, 20 December 2019: "Spill and run: Brazil struggles to ID tanker behind oil pollution"; Ship Technology, 24 March 2020: "Tracking and tracing polluting ships".

753 International Convention for the Prevention of Pollution from Ships (MARPOL) 1973; Mandaraka-Sheppard 2013, Vol. 2, 824.

754 Eos.org, 24 October 2019: "Brazil's oil spill is a mystery, so scientists try oil forensics".

755 P. Nobre, SciELO.br 2022: "The 2019 northeast Brazil oil spill: scenarios".

756 Reuters, 20 December 2019: "Black tide".

757 Xinhuanet, 25 October 2019: "Greenpeace to blame for oil spill implies Brazilian minister".

758 BBC, 1 November 2019: "Brazil oil spill: where has it come from?"; BBC, 2 November 2019: "Brazil oil spill: Greek-flagged tanker believed to be source"; hellenicshippingnews.com, 2 December 2019: "'No proof' Greek vessel activity led to oil leak off Brazil coast – ship manager"; Mongabay, 18 November 2019: "Nearly three months after Brazil oil spill, origins remain uncertain"; NZZ, 6 November 2019: "Nach den Bränden jetzt eine Ölpest"; Reuters, 20 December 2019: "Black tide".

A second hypothesis, that it was the tanker *Voyager 1*, was equally rapidly discounted when it turned out that the tanker had been close to India at the presumed time of the spill.[759]

The Brazilian Government named four other suspicious ships.[760] Experts, however, claimed that – since the time of the accident was unknown – hundreds of ships could have been in the region at the relevant time.[761]

One major difficulty in detecting possible polluters is that in areas under embargo, like Venezuela, ships tend to turn off their AIS to avoid detection.[762] Only recently and up to now only on an experimental basis, has it been possible to detect "dark ships" with a new satellite-based technology.[763]

Oil sludge

Slow Government response

One will remember that Brazil was governed by President Jair Bolsonaro, the right-wing populist who systematically dismantled environmental agencies and cut budgets for science.[764] At the time the oil first arrived on the beaches, Brazil was just surviving another major environmental catastrophe: uncontrolled fires in the virgin forests of the Amazon region.

759 Mongabay, 22 November 2019: "Tanker identified as possible Brazil oil spill perpetrator".
760 Reuters, 7 November 2019: "Brazil adds four other tankers as suspects for oil spill".
761 Mongabay, 22 November 2019: "Tanker identified as possible Brazil oil spill perpetrator".
762 Reuters, 20 December 2019: "Black tide".
763 Lloyd's list, 18 June 2019: "'Dark ship' detection exposes sanction-busting ships".
764 Brum/Campos-Silva/Oliveira 2020, 155 et seq.

It took Bolsonaro over 40 days to call an investigation into the oil spill.[765] What was probably worse was that there was no coordinated effort to combat the "black tide". Bolsonaro's administration had disbanded the Executive Support Committee responsible for dealing with oil spills in 2019.[766] The communities were virtually left alone, until after some weeks, finally the navy and the military offered help.[767]

The spill turned out to be a major embarrassment for an administration that was set on aggressively expanding the offshore extraction of oil.[768]

Brazil and environmental crises

Brazil is dogged by a long history of environmental crises. Oil spills are only one aspect and yet they come nearly every few years. The state has been incapable of dealing with the challenges. It is well possible that authorities are more interested in earning from unsafe oil rigs off the coast than in protecting the environment and the livelihoods of local fishing communities.

The oil industry, including its shipping arm, has a very serious responsibility in the face of these environmental disasters. Yet oil, gas and shipping companies that profit from poor environmental risk management are unlikely to change their ways without activism and boycotting on the part of consumers and investors.

GOVERNANCE AND OIL SPILLS

There is a long list of dramatic oil spills in history.[769] In many cases they are the consequence of human error.[770] In some they arise from

765 The Maritime Executive, 20 December 2019: "Spill and run: Brazil struggles to ID tanker behind oil pollution"; NZZ, 6 November 2019: "Nach den Bränden jetzt eine Ölpest".

766 Mongabay, 18 November 2019: "Nearly three months after Brazil oil spill, origins remain uncertain".

767 Global Landscapes Forum, 14 November 2019: "Footprints in the sand: a mysterious oil spill in Brazil threatens livelihoods".

768 The Guardian, 7 November 2019: "Oil spill threatens vast areas of mangroves and coral reefs in Brazil".

769 Cf. ITOPF Oil Tanker Spill Statistics 2018, 3.

770 Cf. *Torrey Canyon* (1967): Wikipedia, "Torrey Canyon oil spill"; Wikipedia, "Amoco Cadiz" (1978); Wikipedia, "Exxon Valdez" (1989).

a combination of the poor state of the ship, overloading and bad weather.[771] In the case of phantom tankers, often nobody knows. The number of incidents and the quantity of oil spilled may be declining overall,[772] making the insurance companies happy. But while companies argue about finances and attempt to untangle who is responsible, communities are left to fend for themselves against black tides of oil, dead birds and sea life and the destruction of their livelihoods.

Detailed risk management provisions were enacted as a direct consequence of major environmental disasters, in particular following the loss of the *Erika*. Furthermore, a complex web of international instruments deals with legal issues around oil spills, in particular responsibilities of member states, liability and the limitation of liability of shipowners, managers etc. Regarding compensation for damage, a set of international instruments has created compensation funds.[773] The public conventions are paralleled by voluntary funds (STOPIA, TOPIA[774]).

Experts claim that while the rules may look satisfactory on paper, enforcement is "highly fragmented" and "compliance insufficient". This could be because sometimes up to three countries are responsible for dealing with ship disasters: the flag state, possible port states and the state in whose (or close to whose) territorial waters the catastrophe takes place.[775] This arrangement is typically inadequate when we are dealing with unseaworthy ships, flags of convenience and unclear ownership.

Whereas the international rules would typically hold the owner responsible for a spill, there exist legal means to obtain compensation where the owner remains unknown[776] – as long as the state is party to

771 E.g. *MV Erika* (1999): Wikipedia, "Erika (Schiff)"; Prestige (2002): NZZ, 20 November 2002: "Wie bei 'Erika' führt die Ölspur auch nach Zug"; Wikipedia, "Prestige oil spill".

772 ITOPF Oil Tanker Spill Statistics 2023.

773 Mandaraka-Sheppard 2013, Vol. 2, 829 et seq.

774 Ibid., 860 et seq.

775 Diálogo Chino, 23 December 2019: "Spill and run: Brazil struggles to identify tanker behind major oil leak"; The Maritime Executive, 20 December 2019: "Spill and run: Brazil struggles to ID tanker behind oil pollution".

776 Mandaraka-Sheppard 2013, Vol. 2, 821 et seq.

the relevant treaty, that is.[777] And whether those legal means translate into practice is questionable. In the case of Brazil above, it is unclear whether the fishers and the communities dependent on tourism have been compensated at all for their losses.

All this demands a closer look at risk management in the shipping industry, which is the topic of the next chapter.

777 The Maritime Executive, 20 December 2019: "Spill and run: Brazil struggles to ID tanker behind oil pollution" (Brazil has not ratified the Convention on the International Oil Pollution Compensation [IOPC] Funds).

09

RISK MANAGEMENT

The last chapter has demonstrated that the risks of accidents, spills and even piracy are still very real. In fact, with growing volumes and ever larger ships they are rather on the rise. Safety and security efforts have been intensified. Whereas security regulations are primarily concerned with criminals and terrorists as well as warfare,[778] safety regulations target the more traditional threats discussed above. This type of regulation will be at the centre of this chapter.

778 Kraska/Pedrozo 2013, 96 et seq., 519 et seq., 691 et seq., 739 et seq.

The approach to safety in shipping has changed over the last decades from a person-focused to a process-oriented approach.[779] In addition, historically safety provisions were regarded as a technical issue. In more recent years there has been a move towards a "cultural" approach.[780] One example of the need for such a cultural approach relates to the explosion on the chemical tanker *Bow Mariner:*

> Greek officers and Philippine crew members not only found it difficult to communicate linguistically, they followed conflicting value sets. It did not help that the shipping company insisted on the absolute authority of the master, creating an atmosphere of intimidation and fear. When the captain ordered – against all rules – that empty tanks be opened instead of filled with nitrogen (to create a non-explosive atmosphere) nobody opposed the order. Neither the shipping company nor officers on its ships insisted on a culture of accident prevention.[781]

Regulators primarily adopted a reactive approach to accidents. Typically in the aftermath of major maritime disasters, conventions and other regulations were adopted to raise safety levels. A first step was made with the original draft of SOLAS in 1914 after the sinking of the *Titanic*. The *Torrey Canyon* accident in 1967 provoked MARPOL 1973. The tanker accident *Amoco Cadiz* in 1978 brought about STCW 1978 and Port State Control (especially the Paris Memorandum). The capsizing of the *Herald of Free Enterprise* in 1987 led to the upgrading of safety management systems (the ISM 1989).[782] The oil spills of *Erika* and *Prestige* led to more stringent EU rules on shipping.[783]

779 Oltedal 2018, 5.

780 Håvold /Oltedal 2018, 53 et seq.; Mandaraka-Sheppard 2013, Vol. 2, 10 et seq., 24; Oltedal 2018, 10 et seq.

781 Håvold/Oltedal 2018, 56 et seq.

782 Parsons/Allen 2018, 22 et seq.

783 Mandaraka-Sheppard 2013, Vol. 2, 28 et seq.

With the help of the IMO, close to 50 conventions and 800 codes have been enacted.[784] Yet the steady stream of major shipping accidents continues. This does beg questions. Maritime authors point out that implementation of standards is often weak.[785] Whereas some of the standards focus on structural and technical issues – and we have seen that structural failure remains a key challenge – most recent codes focus on the "human factor" and many of the recent accidents have been attributed to human error.[786]

Maritime safety regulations address various players. Flag states, port states, possibly coastal states (as victims of accidents), shipping companies, classification societies, insurers, salvors and others are all relevant.

REGULATION

International Maritime Organization

The IMO was founded shortly after World War II in 1948. It has now got 175 member states. It is the main worldwide regulator in shipping. As mentioned, IMO has helped negotiate hundreds of conventions, codes, guidelines, best practice standards, etc. As we have also seen in the above discussions of environmental and climate issues, IMO operates based on the unanimity principle and is under tremendous pressure by interest groups, in particular shipping companies. What is more, flags of convenience play a disproportionate role in this UN suborganisation.

As we have seen in the story of the *MSC Zoe* accident, the IMO is also responsible for designating sea lanes, especially routes in heavily used areas (traffic separation schemes). Theoretically, it would be responsible for protecting environmentally sensitive sea areas. It is not good, then, that observers generally consider the IMO to be a weak regulator.

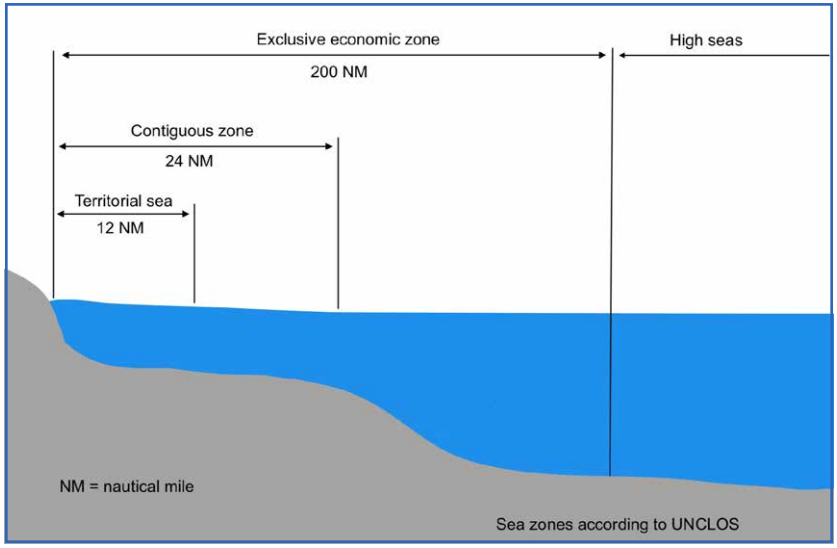
784 Kraska/Pedrozo 2013, 363 et seq.; Mandaraka-Sheppard 2013, Vol. 2, 46 et seq.

785 Zwinge 2011, 309 et seq.

786 Parsons/Allen 2018, 28.

UNCLOS

UNCLOS[787] is the overall umbrella convention codifying the Law of the Sea. UNCLOS is the result of a century-old debate between the "freedom of the seas" and sovereign ownership at least of the shores.[788] As a consequence of UNCLOS, two fifths of the world's seas fall under some form of national control.[789] UNCLOS distinguishes between the "territorial sea", the "exclusive economic zone", the "continental shelf" and the "high seas". It defines the legal status of member states in each of these areas. On the other hand, UNCLOS establishes the "freedom to sail"[790] and the so-called "innocent passage",[791] two fundamental concepts. It also defines the responsibilities and the jurisdiction of flag states.[792]



787 United Nations Convention on The Law of the Sea, 1982, in force 1994.

788 Armstrong 2022, 31 et seq., 35 et seq.

789 Ibid., 51 et seq.

790 Art. 87 et seq. UNCLOS.

791 Art. 17 et seq., 45 UNCLOS.

792 Kraska/Pedrozo 2013, 362 et seq., Mandaraka-Sheppard 2013, Vol. 2, 362 et seq.

UN High Seas Treaty

On 19 June 2023, the UN adopted a treaty to protect the high seas. It is no coincidence that the UN did not leave this major task to IMO or its environment protection committee MEPC. The task to protect the "Marine Biodiversity of Areas Beyond National Jurisdiction" (BBNJ) goes far beyond shipping. The UN sees its role in protecting the environment as such and that the seas are fundamental to survival. The treaty:

- should ensure that large-scale protected areas are established;
- should mean that the benefit of marine genetic resources are shared;
- contains clear rules to conduct environmental impact assessments.

The treaty will enter into force once 60 states ratify it.[793]

SOLAS

In its current form (after precursors in 1914, 1929, 1948 and 1960) SOLAS 1974[794] with its Protocol of 1978 is the key convention defining

793 European Commission, 19 June 2023: "An historic achievement: Treaty on the High Seas is adopted".

794 International Convention for the Safety of Life at Sea, 1974, in force 1980.

safety rules for merchant shipping.[795] It deals with construction issues, fire prevention and extinction, life boat equipment, radio communication and the safety of navigation, including the mandatory installment of Voyage Data Recorders and AIS. It also contains special rules addressing risks of cargo shipping, including of dangerous goods.

A crucial rule is the obligation of ships to come to the rescue of persons in distress (chapter V). The text has been amended repeatedly. In a recent edition, the so-called Polar Code, the Code for ships operating in polar waters, has been made mandatory.[796] SOLAS is therefore the overall text defining the safe management of a vessel.

MARPOL

When the Liberian tanker *Torrey Canyon* ran aground near Cornwall, UK in 1967, causing a dramatic oil spill, the IMO was forced to react with rules to protect the marine environment.[797] MARPOL 1973,[798] its Annexes and a Protocol of 1978 entered into force only in 1983. MARPOL has upgraded Port State Control measures in its Annexes. If the port state has "clear grounds" to believe that the vessel is not in "substantial compliance" with the Convention the ship may be detained. This rule extends to ships flagged by non-member states.[799]

As a consequence of the sinking of *Erika*, the IMO and the European Union enacted rules to phase out single-hull tankers. The IMO introduced an amendment to MARPOL.[800] When the single-hull tanker *Prestige* broke up shortly afterwards, the EU decided to speed up the phasing-out agenda for member states. The Regulation[801] also prohibits any single-hulled tanker, irrespective of its flag, from entering or leaving an EU port.[802]

795 Kraska/Pedrozo 2013, 368; Mandaraka-Sheppard 2013, Vol. 2, 3 et seq., 70 et seq., 368 et seq.; Parsons/Allen 2018, 21 et seq.

796 Chapter XIV.

797 Parsons/Allen 2018, 23.

798 International Convention for the Prevention of Pollution from Ships 1973, in force 1983.

799 Kraska/Pedrozo 2013, 373.

800 Mandaraka-Sheppard 2013, Vol. 2, 31.

801 Regulation (EC) 457/2007; repealed by EU Regulation 530/2012.

802 Mandaraka-Sheppard 2013, Vol. 2, 32.

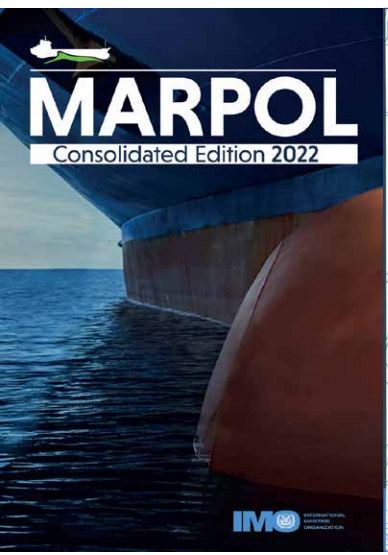
Load Lines and Tonnage Conventions

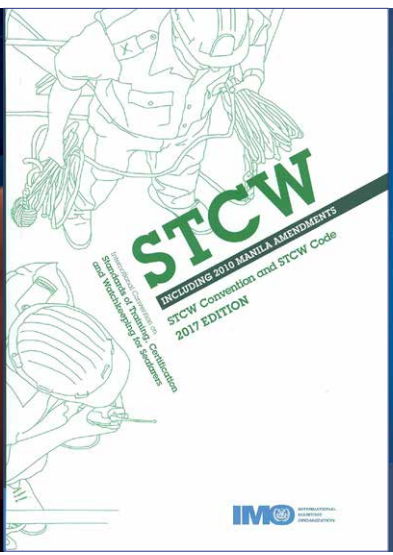
Ancillary Conventions on Load Lines[803] and Tonnage[804] helped to make the supervisory regime more effective, by marking ships to prevent overloading and to allow the inspection of tonnage.

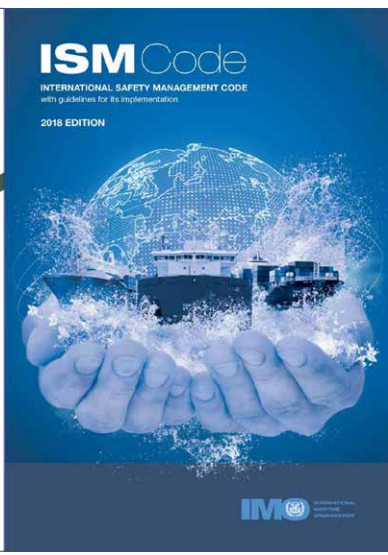
STCW Convention and ISM Code

The STCW Convention[805] defines standards on training, certification and watchkeeping of seafarers, including the ability to read electronic charts. An essential component is record keeping (so-called logs). Like the International Safety Management Code (ISM Code), developed by the IMO in 1989 and made mandatory in 1994,[806] the STCW Convention represents a change of approach in safety management towards the "human element".[807]

The ISM Code is a direct consequence of the sinking of the *Herald of Free Enterprise* at Zeebrugge, Belgium. Authors recount the







803 International Convention on Load Lines, 1966, in force 1968.

804 International Convention on Tonnage Measurement of Ships, 1969.

805 International Convention on Standards of Training, Certification and Watchkeeping, 1978, 1995, 2010.

806 Kraska/Pedrozo 2013, 371.

807 Parsons/Allen 2018, 28.

damning verdict of the judge in the official enquiry that "the company was infected with the disease of sloppiness at all levels".[808] The ISM Code demands that owners, managers or charterers introduce a "safety management system". This development fits into an overall trend in many industries to introduce safety management systems following ISO 9000. The standards are typically a mix between regulation and self-regulation (or "enforced self-regulation").[809] Responsibilities are placed on authorities, companies and the master. Companies need to clearly define respective responsibilities and procedures (Part A).[810] Part B deals with certification and verification. As mentioned, the ISM Code has been integrated into SOLAS and declared mandatory.[811] The ISM Code is further discussed below under industry responsibility.

The ISPS Code

The International Ship and Port Facility Security Code (ISPS Code) also covers some aspects of safe work on ships and in ports. Its main thrust, though, is to provide security standards, in particular against terrorism. The ISPS Code has also been integrated as a mandatory part of SOLAS.

DUTIES OF FLAG STATES

As mentioned, the Law of the Sea (UNCLOS) is the fundamental source of rules on how seafaring nations should deal with each other. UNCLOS is the place where the balance between national sovereignty and "innocent passage" is struck.[812] It contains the old concept of sovereign jurisdiction of the flag state.[813] The flag state has the primary responsibility for the implementation of international standards (e.g. UNCLOS, SOLAS, MARPOL, STCW and many other conventions

808 Batalden/Oltedal 2018, 35; Mandaraka-Sheppard 2013, Vol. 2, 77.

809 Batalden/Oltedal 2018, 38, 40.

810 Details: Mandaraka-Sheppard 2013, Vol. 2, 80 et seq.

811 Chapter IX; Mandaraka-Sheppard 2013, Vol. 2, 77 et seq.

812 Art. 17 et seq. UNCLOS.

813 Kraska/Pedrozo 2013, 365 et seq.

and codes).[814] Even when it comes to shipbreaking, the flag state is still a key factor.

Only recently have exceptions from the exclusive jurisdiction of flag states started to be accepted. The port state and, under certain circumstances, the coastal state are assuming increased responsibility.[815] It was to be expected that frictions between the right to passage and port and coastal state restrictions would arise. One example is the tough EU law as a consequence of the *Erika* and *Prestige* disasters.[816]

Flags of convenience

It is an old concept to choose a neutral flag to circumvent trade restrictions. The technique goes back to British merchants and privateers avoiding a Spanish trade monopoly in the Caribbean. In more modern times, so-called flagging out was developed from the 1920s when shipping companies wanted to evade US prohibition rules and registered their ships in Panama.[817]

814 Art. 94 UNCLOS.

815 Kraska/Pedrozo 2013, 414; Mandaraka-Sheppard 2013, Vol. 2, 68.

816 Mandaraka-Sheppard 2013, Vol. 2, 59 et seq., 69.

817 König/Salomon 2022, para. 5; above Chapter 3.

After World War II, the attraction of "flags of convenience" increased. Beyond Panama, which went through a time of instability, especially Liberia and the Marshall Islands became popular. In the meantime over 30 countries now offer these "open registries", open to non-resident shipping companies and beneficial owners of vessels.[818]

WHAT MAKES SUCH AN OPEN REGISTRY SO ATTRACTIVE?

Registration is simple and cheap. Taxes are low, as they are not based on revenue but on tonnage. Flags of convenience allow for the "freedom of manning", e.g. they allow shipping companies to hire labour where it is cheapest. Typically, they do not enforce international labour law, salaries are low for regular crew members and working conditions are precarious. This is one of the reasons why trade unions are amongst the toughest critics of flags of convenience.[819]

Environmental and safety standards are often not that rigorously enforced by flags of convenience. Many of the accidents discussed in this book involve vessels registered in an open registry, including *Amoco Cadiz*, *Deepwater Horizon*, *Erika*, *New Diamond*, *Prestige*, *Rhosus*, *Sea Empress*, *Torrey Canyon*, *Wakashio*, *Pablo* and others.

What is more, flags of convenience are used to conceal the ultimate beneficial ownership of vessels.[820] They allow shell corporations and nominee directors to be listed in the registers as "owners". Frequently, as in the case of Panama, flags of convenience are at the same time offshore financial centres. This means they combine obscure corporate structures and intransparent shipping registries. One will remember how difficult it was, in the aftermath of accidents like *Erika* and *Prestige*, to find the actual owner of the vessel.[821]

IDENTIFYING THE SHIPOWNER

Since 1996, SOLAS has demanded that every ship carry an identification number,[822] the so-called "IMO number". This is a seven-digit number

818 Mandaraka-Sheppard 2013, Vol. 2, 69.

819 Cf. International Transport Workers' Federation (ITF): König/Salomon 2022, para. 8.

820 Cf. above Chapter 3.

821 NZZ, 20 November 2002: "Wie bei 'Erika' führt die Ölspur auch nach Zug".

822 For passenger ships since 2004.

that stays with the ship even if it is sold, reflagged or has its name changed. In 2005, the IMO adopted a SOLAS regulation[823] giving every shipowner and operator an identification number as well. This concept should in principle allow the IMO and its member states to determine the beneficial owners of ships even if they do not show up in national registries. That the system is by no means foolproof was demonstrated by the *Rhosus* case.

Flags of convenience were considered a cheap way to undercut in particular safety regulations and labour laws.[824] In the 1950s, the International Law Commission adopted a so-called "genuine link" doctrine based on the International Court of Justice decision in the case *Nottebohm, Fürstentum Liechtenstein v. Guatemala*. The idea was to refuse recognition of the flagging of ships by a state not requiring a genuine link to the ship.[825] With a genuine link between the state and the ship, the Commission required in particular that the ownership of the ship had to be essentially in the hands of nationals of the registry country. This doctrine aimed at marginalising flags of convenience.

UNCLOS did in its Article 91(1) pick up the concept. However, it was interpreted in a different way in practice. The understanding was now that other states could *not* deny recognition of the nationality for failure to meet the genuine link requirement. According to ITLOS practice, compliance with international standards was not a precondition to flagging, but a subsequent duty of the flag state.[826]

Instead of marginalising flags of convenience, the industrialised world developed an interest in these offshore hubs as they allowed the shipping industry to cut costs.[827] The challenge that so many substandard ships

823 SOLAS regulation XI-1/3-1.

824 Ford/Wilcox 2019; IMI, Flags of Convenience; Naylorlaw, 21 February 2019: "What is a Flag of Convenience?" (https://naylorlaw.com/blog/flag-of-convenience/); Dmitry Shafran, What Are Ship Registries And Flag Of Convenience?, Maritime Page (https://maritimepage.com/ship-registries-and-flag-of-convenience/); Windward, Flag of convenience.

825 König/Salomon 2022, para. 9.

826 Gauci/Aquilina 2017, 176 et seq.; König/Salomon 2022, paras. 10 et seq.

827 The German shipping association (*Reederverband*) is highly critical of the doubts about FOCs. It holds the concept of FOC altogether for wrong, accepts though that their advantage is to cut cost: VDR, World of Shipping: "Why the term 'flags of convenience' is wrong" (https://www.reederverband.de/en/world-shipping/why-term-flags-convenience-wrong).

were registered with flags of convenience was approached differently. The exclusive jurisdiction of flag states was modified. Port State Control allowed ports to step in where flags of convenience failed to enforce seaworthiness.

FLAGS OF CONVENIENCE TAKE OVER

At the same time, industrialised states followed the route of flags of convenience by creating their own secondary registers. Countries like Norway opened an offshore register at a lower cost. The tradeoff was that this secondary register would insist – as the primary register of Norway – on safety requirements, yet offer a tax break.[828] European countries followed the approach of flags of convenience and introduced the tonnage tax, breaking the link between taxes and revenue.

In the meantime, flags of convenience have taken over. Close to 75% of the world's fleet is registered in these open registers. Nationality has become a commodity for sale.[829] It must be added that in most cases an open register is not run by a state alone. Typically, they are run by private companies (based for example in the US or in Luxemburg) and the income is shared with the state (e.g. Liberia).[830]

Since the states are not able to control ships flying their flags, supervision and certification is left to classification societies. As discussed in the next section, this "public service" function frequently leads to conflicts with the commercial goals of classification societies.

CLASSIFICATION SOCIETIES

As mentioned, flag states have the responsibility to exert effective control over ships flying their flag. In many cases when – especially talking of flags of convenience – they are not themselves able to assume this supervisory role, they would typically encharge so-called classification societies to conduct formal audits on their behalf.[831]

828 Gauci/Aquilina 2017, 175.

829 Ibid., 174.

830 SWI, 21 December 2023: "Liberias Billigflagge aus Zürich-Altstetten".

831 Goebel 2017 (passim); Kraska/Pedrozo 2013, 275; Mandaraka-Sheppard 2013, Vol. 2, 72 et seq.

The challenge with classificiation societies is that they are private companies fulfilling multiple tasks. Not dissimilar from auditors in general, there is a risk of conflict of interest. Classification societies not only act on behalf of sovereign entities, but are also information intermediaries between the owner and anyone who, for commercial reasons, needs to know from an independent source in what state the ship is (like leasing partners, insurers, buyers).

On top of these two roles, classification societies are also standard setters. Here the industry organisation, the International Organization of Classification Societies (IACS), is of key importance.[832] This is the forum where the private companies practise self-regulation. Occasionally classification societies are also involved in an advisory role for shipping companies.[833] Overall, the entire industry follows market principles. The societies are in intense competition[834] and there is, as mentioned, a real risk of conflict of interest.[835]

This may be one of the reasons why classification societies have in the past failed to spot some manifest deficiencies.

The Italian class society RINA has been accused of malpractice by France for certifying the tanker *Erika,* which broke up on the coast of Brittany.[836] In a similar manner the victims of the accident of the ferry *Al-Salam Boccaccio* attempted (unsuccessfully) to hold RINA responsible before a Genovese Civil Court.[837] Finally, we have seen in the last chapter that *MOL Comfort* broke up due to serious structural failures only months after an intensive five-year inspection by the Japanese classification society NK.

832 Goebel 2017, 115 et seq.
833 Ibid., 43.
834 Ibid., IX, 425 et seq.
835 Ibid., 330 et seq.
836 Ibid., 319 et seq., 353.
837 Ibid., 326 et seq.

It is difficult to say if these incidents could have been prevented by stricter inspection procedures. It is equally unclear whether the fact that the classification societies are private entities on the payroll of the shipping companies could have influenced their judgement. This was at least the accusation in the *Erika* case.

A major question with classification societies, when something goes wrong, is whether they could be held liable for damages suffered by third parties, like the consequences of an oil spill on a coastal region. One of the main impediments in legal practice has been that classification societies, as far as they are fulfilling sovereign duties for a flag state, are considered immune from liability. This position was taken by a US judge of the Southern District of New York in the case *Spain vs American Bureau of Shipping* (ABS) after the sinking of the MT *Prestige* off the coast of Galicia.[838] Equally, a Genovese court held that RINA was immune against the claims of the victims of the capsizing of the *Al-Salam Boccaccio*.[839]

Based on legal and economic arguments, legal writing rightly holds that liability for erroneous certificates should not be limited for damages to third parties if the liability risks can at all be insured.[840]

PORT STATE CONTROL

Based on international maritime law, flag states carry the primary responsibility to enforce regulations for the vessels on their register.[841] The experience has been in the past, though, that flags of convenience were frequently unable or unwilling to assume these obligations.[842] Classification societies, asked to perform the task *in lieu*, have frequently been found to be ineffective.[843]

838 Reino de España v. ABS 528 F.Supp.2d., 459 (S.D.N.Y. 2008).

839 Judgement 2097, Trib. Genova, 8 March 2012.

840 Goebel 2017, 359 et seq., in particular 405.

841 Cf. also parismou.org.

842 Kraska/Pedrozo 2013, 414.

843 Cariou et al. 2008/2017, 28.

Port State Control[844] is, according to the IMO, "the inspection of foreign ships in national ports to verify that the condition of the ship and its equipment comply with the requirements of international regulations and that the ship is manned and operated in compliance with these rules".[845]

In 1978, a number of European states met in The Hague to draft the first Memorandum of Understanding (MoU). Its main focus was to audit labour conditions on ships flying a flag of convenience. Shortly afterwards, as a direct consequence of the *Amoco Cadiz* accident (1978), the current "Paris MoU" was drafted. It entered into force in 1982 with then 14 states, and it now has 27 members (26 European states and Canada). Its focus has been enlarged from labour matters to safety issues and pollution prevention.

The initiative was supported by the IMO.[846] It received further encouragement when the ISPS Code was adopted after the 9/11 terrorist attacks in the US.[847] This Code focused on security, but also allowed the inspection of ships in port, delay or detention, restrictions, expulsion or denial of port entry.[848] It was, however, restricted to ships flying flags of member states. The ISPS Code was later on integrated into SOLAS as chapter XI-2. The approach received further support by the UN General Assembly with a Resolution in 2004.[849]

This support was necessary, since the concept went against the principle of free passage. The reason given for the discretion of port states to refuse entry or exit and to allow for inspection was that the ship had entered port voluntarily and had subjected itself to the laws of the port state.[850]

This logic of Port State Control now also applies to ships of non-member states of the Codes. It is essentially the basis for unilateral action by port states.[851] The Paris MoU became the model for several further regional Memoranda, the Acuerdo de Viña del Mar, the Tokyo

844 Kraska/Pedrozo 2013, 416 et seq.; Mandaraka-Sheppard 2013, Vol. 2, 70 et seq.

845 imo.org: "Port State Control"; cf. also Lloyd's Register, "Port State Control".

846 Cf. Art. 219 UNCLOS.

847 Kraska/Pedrozo 2013, 370 et seq., 378 et seq.

848 Ibid., 371.

849 UN General Assembly Resolution A/RES/58/240 (2004).

850 Kraska/Pedrozo 2013, 414.

851 Ibid., 383.

MoU, the Caribbean MoU, the Mediterranean MoU, the Indian Ocean MoU, the Abuja MoU, the Black Sea MoU, the Riyadh MoU, PERSGA and the US Port State Control (Coast Guard).[852]

The arrangements clarify that port states have the authority to inspect ships, to document and publish deficiencies, to detain ships or restrict their travel to the next shipyard.[853]

In practice, criteria[854] have been developed to target potential bad performers and to focus inspections on suspicious vessels. However, the MoUs set high targets for inspection: the Paris MoU 25% of entries, the Abuja MoU 15%.[855] The thoroughness of the inspection varies, too. During an initial inspection (2–3 hours), documents and certificates in particular are checked, while during a more detailed inspection (5 hours), the crew is also questioned.[856]

The Paris MoU ports detain by far the most vessels in comparison to the Tokyo MoU and the US tool.[857]

It is common for Port State Control to publish reports. They can be rather scathing:

> On 14 January 2017, *MSC Maria Laura* was subjected to Port State Control under the Paris MoU. The Panama-flagged ship was detained for eight days due to its 40 deficiencies, of which 33 were so-called "grounds for detention", impairing seaworthiness.[858] Several deficiencies like the loss of life rafts or fire hoses could be explained by rough weather. Other matters like "navigational and signal lights inoperative" or "bridge windows not installed correctly" were more difficult to explain.

852 Ibid., 423 et seq.; Mandaraka-Sheppard 2013, Vol. 2, 70.

853 Kraska/Pedrozo 2013, 419; Mandaraka-Sheppard 2013, Vol. 2, 71.

854 Cf. Cariou et al. 2008/2017, 30.

855 Kraska/Pedrozo 2013, 424, 427.

856 Interview with Pieter-Chris Blom of 20 February 2020.

857 Li/Zheng 2008/2017, 125.

858 Paris MoU on Port State Control, 22 June 2017 (including the video "Caught in the net", available on: https://www.parismou.org/msc-maria-laura-caught-net).

Engine room full of garbage on MSC Maria Laura

The Swiss-flagged vessel *Aargau* proved to be in an extremely bad state when it was detained. Amongst other matters like non-payment of wages, the port authorities found that the machinery was not as required, that the deck was corroded and that the steering gear was not properly maintained.[859]

Port State Control evaluates whether vessels are following international standards.[860] The vessel itself, certification, equipment, manning, training, but also whether salaries have been paid, are inspected. The patterns of deficiencies diverge. Empirical studies have shown that when vessels have been repeatedly inspected, some are never deficient and some vessels prove "always deficient".[861] Accordingly authorities will adapt their approach and concentrate on bad performers.

The MoUs blacklist flag states for repeated detentions. The Paris MoU has even drawn up a "grey" and a "black" list of states. The different MoUs do not target the same bad performers.[862]

859 equasis.org, details Port State Control: Aargau, IMO No. 9583897.

860 Kraska/Pedrozo 2013, 421; Mandaraka-Sheppard 2013, Vol. 2, 70.

861 Cariou et al. 2008/2017, 36 et seq.

862 Cf. the comparative table in Kraska/Pedrozo 2013, 434.

ParisMoU Performance List: valid 01-07-2023 / 30-06-2024

Paris MoU on Port State Control

GREY LIST

RANK	FLAG	INSPECTIONS 2020-2022	DETENTIONS 2020-2022	BLACK TO GREY LIMIT	GREY TO WHITE LIMIT	EXCESS FACTOR
GREY LIST						
40	Croatia	64	1	8	1	0.05
41	Saudi Arabia	61	1	8	0	0.07
42	Korea, Republic of	89	3	11	2	0.14
43	Morocco	46	1	7	0	0.17
44	Saint Vincent and the Grenadines	266	14	26	11	0.19
45	India	41	1	6	0	0.21
46	Panama	5,472	366	415	351	0.23
47	Iran, Islamic Republic of	47	2	7	0	0.31
48	Lebanon	40	2	6	0	0.37
49	Switzerland	35	2	5	0	0.42
50	Philippines	126	9	14	4	0.52
51	Belize	195	16	20	7	0.68
52	Egypt	40	4	6	0	0.69
53	Cook Islands	122	11	14	3	0.74
54	Palau	216	19	22	8	0.79
55	Azerbaijan	41	5	6	0	0.83
56	Saint Kitts and Nevis	140	14	15	4	0.88
57	Ukraine	57	7	8	0	0.91

After several serious accidents, the EU[863] decided to take stricter measures than the IMO with so-called Erika I (2000), II (2002), III (2009), regulatory packages steadily adapting EU Directives. In the Erika III package, EU Directive 2009/16/EC[864] upgraded Port State Control beyond the Paris MoU, by blacklisting not only states but also companies operating substandard ships.[865]

Port State Control is generally considered effective;[866] there are, however, some remaining challenges. Consider the example of MV *Rhosus*, the ship that was given up by its owners and operators in the harbour of Beirut when it was impounded. The leaky ship with its highly dangerous cargo was left in the hands of an incompetent harbour authority. What is more, the Lebanese authorities took the crew as hostages to try to extort harbour fees and the like. But they did

863 In detail: Mandaraka-Sheppard 2013, Vol. 2, 28 et seq.

864 OJ L 131 of 28 May 2009, p. 57-100.

865 Mandaraka-Sheppard 2013, Vol. 2, 42.

866 Cariou et al. 2008/2017, 26 et seq.; Li/Zheng 2008/2017, 117 et seq.

not find an adequate solution to deal with the dangerous cargo and a sinking ship.[867]

THE RIGHTS OF THE COASTAL STATE

Where a ship is not heading for port, it can still affect the coast along its route. The *MSC Zoe* accident has illustrated what this could mean. The grounding of MOL's *Wakashio* on the coral reef of Mauritius demonstrates the risks in an even more dramatic way: coastal states have to have possibilities to protect themselves and to hold polluters accountable. Port State Control is one way of protecting the rest of the world against substandard ships, many of them registered at offshore open registers. However, the Law of the Sea insists on "innocent passage"[868] and ships lose their innocence according to Art. 19(1) UNCLOS primarily through aggression, smuggling and the like. Within the territorial sea (the 12 nautical miles from the baseline) coastal states can intervene in the interest of the safety of navigation, for the conservation of the "living resources of the sea" and the environment in general.

Whereas Port State Control allows authorities to assess certification, equipment, manning, etc. of a foreign ship,[869] the coastal state is more restricted. Art. 25 UNCLOS does allow the authorities to intervene inside territorial waters against unsafe, unseaworthy ships posing an environmental risk, though. As mentioned above, coastal states can also prevent ships from emitting wash water from scrubbers close to the coast.

Beyond territorial waters, in exclusive economic zones, the options for intervention are more restricted, even if Art. 56 et seq. UNCLOS do allow the coastal state to take measures for conserving and managing natural resources, namely fisheries.

867 Above Chapter 3.

868 Art. 17 et seq. UNCLOS.

869 Kraska/Pedrozo 2013, 417.

THE ROLE OF THE HOST STATE

A matter that is rarely discussed in shipping literature is the role of host states of shipping companies. Maritime law is focused on the flag state of the individual ship and possibly on port or coastal states.

Shipping companies could potentially, however, be held civilly liable for damages caused abroad. This principle may even apply to their responsibility for illegal acts by subsidiary companies. Difficult legal issues arise, though, out of the question whether the host state of the company offers a court ("a forum") to plead to and whose law is applicable.

Shipbreaking offers examples of the potential legal responsibility of entities hosted abroad:

> In a British case, the London High Court granted leave to a plaintiff (the widow of a Bangladeshi worker who fell to his death in an extremely dangerous shipyard) against a British shipping company who sold the ship, through a chain of cash buyers and intermediaries, in full knowledge of the horrid conditions at the shipyard where the ship was going to be dismantled.[870] The case was later settled by the parties.[871]

Alternatively, shipping companies risk criminal liability, for example for the illegal disposal of toxic substances, possibly leading to prison sentences against individuals or fines and forfeiture of profits against companies.[872] Another example is causing bodily harm or harm to property.[873]

The general attitude of host states is, however, insufficient. For example, at the time of writing it is yet to be seen what responsibility Japan is going to assume for MOL as the charterer and for Nagashiki Shipping Co. Ltd, as the owner of *Wakashio*.

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870 The Guardian, 11 February 2021: "Bangladesh shipbreakers win right to sue UK owners in landmark ruling".

871 See below Chapter 10.

872 A recent case in Norway: Splash247, 30 November 2020: "Norwegian ship owner handed jail sentence in landmark demolition ruling".

873 Pieth/Zerbes 2020, 556 et seq.

INDUSTRY RESPONSIBILITY: THE ISM CODE

We have described the maritime safety architecture, starting from international regulation to national implementation and enforcement. However, it is ultimately up to the shipping companies and individual crews and their masters to make a real difference.

As mentioned, safety concepts are very much a reaction to past accidents and typically technical standards and the so-called "human factor" are in the foreground of safety considerations.[874] Accident reports place a major emphasis on human error.

> It will be remembered that in 2012 the *Costa Concordia* passed too close to land, grounded and then capsized. Thirty-two people died. The captain was tried and sentenced to a 16-year prison sentence for homicide and other crimes. The official accident investigation focused next to exclusively on human error in navigation and the following chaotic evacuation.

Only in recent times has the focus moved from what happened immediately on the ship to the larger structural view. The safety culture of companies is moving to centre stage. Beyond possibly ill-guided decisions at the moment of the accident, modern reports analyse the corporate risk culture. For instance, lack of experience is attributed to the company rather than to the staff.[875] This is even the case where serious individual negligence (like in the case of the *Herald of Free Enterprise*) or recklessness (in the case of *Costa Concordia*) are established: if a company has experienced before that a ship has left port with open bow doors, a control procedure is seriously needed. Likewise, if a cruise company is aware that routine malpractice has established itself, like "sail-pasts close to the shore", it has to intervene.[876]

This is the moment where safety management becomes relevant. The industry organisations International Chamber of Shipping and

874 Oltedal/Lützhöft 2018, 75.

875 Grech 2018, 91.

876 Batalden/Oltedal 2018, 35; Oltedal/Lützhöft 2018, 77.

International Shipping Federation reacted to accidents in the 1980s with a voluntary code of good practice. Under pressure following several serious accidents due to management failure, the IMO stepped in and developed a concept that is now called "enforced self-regulation". A working group prepared guidelines adopted by the IMO in 1993,[877] later to be included as a binding standard into SOLAS.[878] Its mandatory character is reinforced through outside pressure, i.e. enforcement through flag states, classification societies and Port State Control.[879]

The ISM Code fits into a series of industry-specific safety codes. It is described by the IMO as a "structured and documented system enabling company personnel to implement effectively the company safety and environmental protection policy".[880] It is part of the corporate governance and compliance wave that sent ripples through all industry branches, i.e. going beyond safety issues to preventing corruption and the like.[881]

A safety management programme typically:

- relies on a risk analysis;
- clearly states the position of senior staff ("tone from the top") on values and norms;
- contains detailed norms and procedures;
- clarifies institutional decision levels and reporting lines;
- ensures education;
- ensures the documentation of procedures and incidents;
- anticipates supervision and sanctioning; and
- is set up to be improved based on experience and to adapt to changes in the regulatory framework.[882]

877 Batalden/Oltedal 2018, 35.

878 Chapter IX; Mandaraka-Sheppard 2013, Vol. 2, 77 et seq.

879 Batalden/Oltedal 2018, 38 et seq.

880 IMO, ISM Code, International Safety Management Code with Guidelines for its implementation, London 2010; Batalden/Oltedal 2018, 36.

881 Aiolfi 2020.

882 Pieth 2011.

These general concepts have been translated in the ISM Code into the world of shipping. A Safety Management System requires:

- a safety and environmental protection policy;
- instructions and procedures to ensure the safe operation of ships and protection of the environment in compliance with relevant international flag state regulations;
- defined levels of authority and lines of communication between and amongst shore and shipboard personnel;
- procedures for reporting accidents and non-conformities;
- procedures to prepare for and respond to emergency situations; and
- procedures for internal audits and management reviews.[883]

Whereas Part A of the ISM Code goes into detail on each of these items,[884] Part B focuses on certification and verification.[885] The significance of the ISM Code in accident investigation should not be underrated. Even if the Code is not directly sanctioned by criminal law provisions, it could easily be the basis for civil litigation and claims for damages.

In modern safety literature the step from the individual to the systemic perspective is welcomed. The ISM Code is not considered the end of the road on safety, though. Recent focus is placed on "design for safety". Naval architects are made aware of the need to develop "human-centred design" beyond simply technical accident prevention.[886]

Overall, a serious gap between risk management on paper and organisational effectiveness in real life is seen as one of the major challenges for shipping.[887]

883 Batalden/Oltedal 2018, 36; Mandaraka-Sheppard 2013, Vol. 2, 79 et seq.

884 Mandaraka-Sheppard 2013, Vol. 2, 80 et seq.

885 Ibid., 84 et seq.

886 Lützhöft/Vu 2018, 106 et seq.

887 Splash247, 23 June 2021: "Re-writing the rules on risk management".

INSURANCE AND SALVAGE: THE PROBLEM OF WRONG INCENTIVES

And if worst comes to worst, do we not have insurance? Marine insurance is a key element in dealing with maritime disasters. An interesting aspect here is the preventive power of the insurance industry when it comes to enforcing safety standards. However, critical authors, some of them high profile like Sir Richard Branson, consider maritime regulation and in particular insurance as antiquated. In times of tanker accidents with huge consequences it is hard to explain to victims why the liability of shipping companies and of their insurers can be limited. Equally, the rules for salvors are fit for the times of Robinson Crusoe, not for giant vessels carrying over 20,000 containers.

Marine insurance

Marine insurance is one of the oldest forms of insurance altogether, already known in ancient Greece and Rome and then in medieval Italy. For modern times, what started with Lloyd's Coffee House in 17th century London is key: this and similar coffee houses developed into meeting places for those looking for an insurer and for underwriters willing to run the risk.

The primary focus of marine insurance was on vessels with so-called "hull and machinery" insurance.[888] According to the wishes of the parties, this type of insurance could be restricted to total loss[889] or also include partial loss.[890] The other key aspect of marine insurance was the cargo. Again, different types of policies emerged over time. So-called "institute cargo clauses" decide over the insured risks, from clause C (basic insurance against explosion, fire, distress, sinking) and clause B (for additional risks like water affecting cargo) to clause A for full coverage of all risks.[891] There are several ancillary policies dealing with port incidents, wages etc. Cargo insurance typically also covers failing income (for freight).

888 Rose 2012, 41.

889 Ibid., 474 et seq.

890 Ibid., 461 et seq.

891 Lloyds Market Association, Joint Cargo Committee (JCC).

From the perspective of traditional shipping, indemnity for third-party damage was primarily liability for collision. Classic marine policy covered a mere three-quarters of this liability. The remainder was typically insured by shipowners themselves in mutual "protection and indemnity clubs" (P&I Clubs). Shipowners became members of P&I Clubs and contributed to a fund in order to help meet the cost if disaster hit.[892]

P&I Clubs have changed their role in times where third-party damage would include in particular environmental damage of oil spills and the like. The examples of the *MSC Zoe* accident or the *Wakashio* and the *X-Press Pearl* disasters have demonstrated that negotiations over compensation for damage can be extremely tedious and that such mutual funds are very reluctant to actually pay for the cost of the cleanup. In the Netherlands they refused to pay for the spill of microplastic from the containers washed ashore.[893] The *Wakashio* example has demonstrated another shortcoming of the insurance system. MOL, the charter company involved, is at the same time one of the key players in the responsible Japan P&I Club and, understandably, interested in keeping compensation low.

Limited liability for maritime claims

Readers may be astonished to learn that maritime regulation exempts shipowners and operators from facing full liability for damage they have caused. Already in 14th-century England, the liability of shipowners (in particular *vis à vis* the cargo owners) was limited to the value of the ship itself and limited to knowledge of the risk by the shipowner.[894] This was apparently necessary to make seafaring at all economically viable.[895] The former British limitation of liability for shipowners was extended by US Congress in 1851 to establish a level playing field for businesses.[896] The explanation given in modern textbooks is telling:

892 Readman 2012, 181.

893 Interviews with NGOs in the case of the *MSC Zoe*.

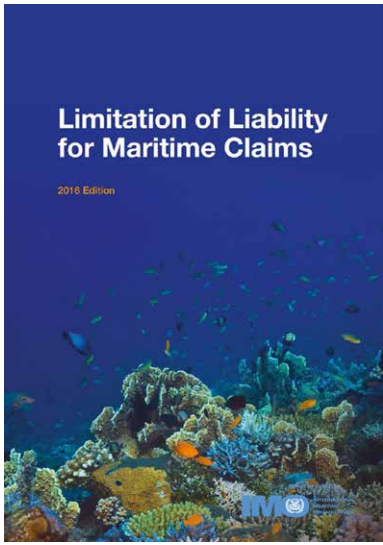
894 Mandaraka-Sheppard 2013, Vol. 2, 739.

895 Goebel 2017, 392.

896 Anderson 2012, 88 on the US "Limitation of Liability Act".

> "Why then does the law seem to be benevolent to ship-owners? The concept has developed more on the basis of public policy than on a critical legal analysis of concepts of fault and recompense. It is justified for practical reasons and convenience in order to permit recovery by many claimants in proportion to their loss. The system has also been designed to encourage and protect trade. Some have argued that limitation of liability is anachronistic and overprotective of ship-owners and their insurers. However, if there was unlimited liability, there would be no insurance capacity to insure risks for liability to third parties. Limitation ensures that insurance, which is now compulsorily imposed by almost all the International Conventions […], is obtained, and, thus, victims are protected, even if their claims are not fully met."[897]

Other authors rightly criticise the concept from a modern perspective, in particular from a law and economics approach, and hold that the limitation of liability encourages a lax attitude to risk.[898]



Nevertheless, seafaring nations concluded a Convention on Limitation of Liability for Maritime Claims (the LLMC).[899] The Convention confers a right to owners, charterers, operators, salvors and insurers to limit their liability.[900] However, in the case of actual fault, e.g. recklessness or intent by the perpetrator and knowledge by the liable company or individual manager, limitation of liability is not possible.[901]

897 Mandaraka-Sheppard 2013, Vol. 2, 739 et seq.

898 Goebel 2017, 391.

899 1976, Protocol of 1996, in force since 2004.

900 Griggs 2012, 8; Mandaraka-Sheppard 2013, Vol. 2, 744.

901 Mandaraka-Sheppard 2013, Vol. 2, 764 et seq., 776.

Regarding oil spills, liability is limited for bunker pollution according to Art. 2(1)(a) of the LLMC.[902] Oil pollution by tankers, however, according to the International Convention of Civil Liability for Oil Pollution Damage, does not fall under the limitation of liability rules of the LLMC.[903] Another Convention deals with further hazardous and noxious substances, in particular chemicals (the HNS Convention). It has, however, not yet entered into force.

As the accident in Mauritius demonstrates, this multitude of Conventions could lead to very unreasonable and problematic consequences. Is it correct when the IMO representative in Mauritius claimed that the islanders would be better off if they had been hit by a tanker than merely a bulker?[904]

Again, we are confronted with an antiquated set of rules that unilaterally serve the interests of shipping companies and insurers at the cost of the environment and the population of affected coastal states.

Salvage

The way salvage is organised and how salvors are remunerated by shipowners and insurance companies have a direct effect on the environment in the case of accidents.

Again, salvage is an old concept. Seafarers are obliged to assist mariners in distress. Traditionally the law of salvage was totally focused on saving the vessel and its cargo. The classic approach was to allow the salvor to claim a high compensation if the operation was successful. However, the principle "no cure, no pay" has survived till modern times.[905] From 1892 it was stipulated in a set form, the Lloyd's Open Form, allowing rapid response to accidents.

With the emergence of a professional salvage industry, new considerations become essential. A salvage company has to maintain tugs and other material all over the world, binding large amounts of

902 De la Rue 2012, 18 et seq.

903 Mandaraka-Sheppard 2013, Vol. 2, 761 et seq.

904 Forbes, 24 November 2020: "Legal loophole opens $10 billion compensation claim for Mauritius oil spill".

905 Bishop 2012, 175; Mandaraka-Sheppard 2013, Vol. 2, 511.

Salvage operation

cash. Traditional salvage remuneration proved dysfunctional where the compensation was not attractive because there was little value to save or where the vessel was not going to be saved at all. The classic approach to salvage focusing entirely on vessel and cargo[906] ignored the protection of the environment.

Finally, even though the standard contract encouraged a rapid response, frequently lengthy discussions over compensation wasted essential time.[907] This could have been one of the reasons for the fatal delay in the *Wakashio* case.

The IMO's Salvage Convention of 1989[908] introduced clauses that should take care of these shortcomings. "Enhanced award" was foreseen for salvors who, in addition to saving property, also prevented pollution damage from oil tankers. The so-called "safety net" or "special compensation" compensated the salvors for the expenses if they prevented pollution to the coastline even if they failed to rescue the property interests, i.e. ship and cargo.[909]

Nevertheless, the Convention had several shortcomings and loopholes. It was focused on pollution of coastal and inland waters, not on the

906 Mandaraka-Sheppard 2013, Vol. 2, 510.

907 Ibid., 485.

908 International Convention on Salvage: London, 1989, entry into force 1996.

909 Mandaraka-Sheppard 2013, Vol. 2, 552, 571.

high seas, and it accorded the salvor expenses rather than profit for its endeavours to save the environment. And, as in all previous arrangements, the salvor had no certainty around what a "fair rate" was going to be. This needed to be defined after the incident, if need be by arbitration.[910]

As a reaction to these insufficient rules, the salvage industry (the International Salvage Union), the underwriters and the International Chamber of Shipping got together to develop an alternative approach. Instead of relying on the Convention (Art. 14) they developed the SCOPIC clauses,[911] an addition to the Lloyd's Open Form establishing pre-arranged rates, immediate security by shipowners and the right of salvors to invoke SCOPIC at any moment during the salvage operation. The P&I Clubs agreed through a code of conduct to provide any security required for SCOPIC remuneration, which would go beyond cost and allow a profit for the professional salvor for preventing pollution damage even beyond the framework of the Convention.[912]

Professional salvors, through the International Salvage Union, have attempted to introduce this concept into the Salvage Convention. So far, this has not been successful.[913]

The slow pace of international regulation and the inability to find a convincing solution for the remuneration of salvors, above all in relation to the prevention of environmental damage, is once again due to the unanimity concept of IMO, an organisation in which the shipping industry and the flags of convenience exert veto powers. The regulation of marine insurance and the way salvors are remunerated remains archaic.[914] It is still focused on property (vessel and cargo) and the interests of the environment are neglected. The cost of tidying up after a disaster is to a large extent left to the taxpayer of the affected coastal states.[915]

910 Ibid., 553 et seq.

911 Ibid., 556 et seq.

912 Ibid., 571.

913 Ibid., 571 et seq., 580.

914 Forbes, 17 September 2020: "Sri Lanka misses out on $25 million insurance payout for oil tanker fire ship".

915 E.g. the Netherlands in the *MSC Zoe* case or Mauritius in the *Wakashio* disaster.

ENSURING ORGANISATIONAL EFFECTIVENESS

We have mentioned several times that regulation on paper does not automatically ensure labour standards and sound protection of the environment. There are major challenges on at least three levels.

First, while there is a dense web of regulations in shipping, the extent to which these are enforced is uncertain. There are various forms of control, ranging from flag states to class, from trade unions to Port State Control. However, much remains technical and rule based. The checks do not necessarily capture life on board, and the role of host states in enforcement and sanctioning seems to be missing.

On a second level, it is unclear whether rule books like the ISM Code really encourage the industry to ensure serious risk management. Again, much is formulaic.

On a third and deeper level, regulations around risk management and salvage are still archaic. They hark back to a time when concerns were focused on property and economic benefit rather than on environmental protection and the safeguarding of communities in coastal states. The piling up of ever more conventions and codes since those times has led to a confusing muddle of rules and illogical loopholes, for example regarding the limitation of liability in the case of accidents.

10

SHIPBREAKING

In this chapter, we will tell the story of some of the most gruesome working conditions in the world. But we will also ask what ways out there are. In the first part of this chapter, we will talk about the environmental and labour challenges ship recycling in South Asia poses. In the second part, we will discuss a series of international treaties and national laws to overcome the challenges.

Finally, since views diverge widely about the current situation, we decided to go to one of the largest shipbreaking areas of the world, to Alang in India, to see for ourselves how the shipbreaking industry is changing. A comparable visit to Aliağa in Turkey was called off at short notice by the relevant company board.

RECYCLING PRACTICES

The lifecycle of a ship presupposes disposal. Dereliction (abandonment) or scuttling (deliberately sinking) are not really viable options. The deliberate sinking of the aircraft carrier *São Paulo* with all its asbestos, toxic chemicals and heavy metals was not only a direct attack on the environment, it was a waste of millions of dollars worth of reclaimable substances.[916]

Modern commercial ships are far too valuable. They need to be recycled. Traditionally, commercial ships at the end of their operational life of 25 to 30 years[917] were dismantled in dry docks and the like in industrialised states where they had been built,[918] e.g. in the US or in Europe[919]. With the rise in average wages, and increased cost of environmental protection and health and safety requirements, the profit from recycling diminished.[920] Centres of recycling moved to east to places with cheaper labour, first Taiwan and Korea[921] and later to Turkey and China.[922] When industrialisation in these States pushed up the cost of scrapping, further players entered the field: India, Pakistan and Bangladesh.[923]

A story like a fairy tale recounts the beginning of shipbreaking on the beaches near Chattogram, formerly known as Chittagong, Bangladesh. A typhoon beached a large ship in the 1960s, the Greek ship MD *Alpine*.[924] This was gradually taken to pieces by the local population. Out of this early start, a huge industry in India (Alang), Pakistan (Gadani) and Bangladesh (Chattogram) developed.

All three emerging economies were in desperate need of steel for construction. Ships were a valuable source of raw material for the

916 NGO Shipbreaking Platform, Press Release 4 February 2023.
917 Puthucherril 2010, 10.
918 Karim 2018, 1; Puthucherril 2010, 1, 11, 101.
919 Puthucherril 2010, 43, 46.
920 Ibid., 11.
921 Ibid., 11.
922 Ibid., 38 et seq., 41 et seq.
923 Ibid., 39.
924 Karim 2018, 1.

steelworks nearby.[925] Today, 80–90%[926] of global end-of-life gross tonnage is dismantled on these three beaches. We are talking of – according to sources – 469[927] tankers, bulkers, floating platforms, cargo and passenger ships for 2019, before the Covid pandemic. For 2022, reports tell of 292 ships and offshore units that were sold for scrapping in South Asia.

The drop in numbers is partly due to high ocean freight rates that made it profitable for shipowners to continue operating older ships.[928] Reports talk of close to 170 yards in Alang and 145 in Chattogram.[929] It appears, however, that Bangladesh is currently overtaking India in the shipbreaking business, since it is able to offer markedly higher steel prices due to its lower working standards.[930]

Beaching

It is typical for these beaches that they are extremely flat and that the tide level is substantial (up to 10 metres).[931] Ships are driven at full speed onto the beach at high tide, where they are dismantled practically by hand. Thousands of migrant workers from the poorer areas of their countries flock to the shipbreaking yards, where they are employed as gas cutters or as all-purpose employees.[932] Traditionally, large chunks of

925 Ibid., 3; National Geographic, May 2014 (Issue 5).

926 NGO Shipbreaking Platform, Press Release, 1 February 2023: "Platform publishes list of ships dismantled worldwide in 2022"; NGO Shipbreaking Platform, Impact Report 2020-2021, p. 8; Hellenic Shipping News, 5 February 2020: "NGO Shipbreaking Platform: Most shipping companies continue to opt for the highest price at the worst scrapping yards"; Mikelis 2019, 3 et seq.

927 Hellenic Shipping News, 5 February 2020: "NGO Shipbreaking Platform: Most shipping companies continue to opt for the highest price at the worst scrapping yards".

928 NGO Shipbreaking Platform, Press Release, 1 February 2023: "Platform publishes list of ships dismantled worldwide in 2022".

929 NGO Shipbreaking Platform, "The Problem", India and Bangladesh.

930 ICIJ, 23 July 2019: "'A moral crime': Leaked contract reveals how ship owners wash their hands off toxic vessels via offshore world – finance uncovered"; Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 34; Recycling International, 9 October 2019: "Ship recycling market waking up after disappointing summer"; The Guardian, 31 January 2020: "'Mollah's life was typical': The deadly ship graveyard of Bangladesh".

931 Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 27; Rousmaniere/Raj 2007, 360.

932 Puthucherril 2010, 35; Rousmaniere/Raj 2007, 364.

A ship's hull has been cut, before...

...it drops on the beach, where workers gather next to it

the ship were cut off with oxygen-acetylene torches[933] and according to the "gravity method" dropped onto the mud flats. They were then cut up into smaller pieces and dragged up the beach with winches. Workers carried smaller pieces of iron in groups to the place where "secondary cutting" was done.

Cranes and trucks were only used closer to land, as the mud means it is not possible to use them closer to the ship. Workers generally did not wear protective clothes or masks.[934]

ENVIRONMENTAL ISSUES

Ships dismantled in this way were rarely pre-cleaned when they arrived on the beach.[935] Typically the hold would still contain hazardous substances. The machinery – operational up to the very last moment – still contained oil and bunkers were partly full. The bilge water was frequently emptied shortly before arriving at the beach, again containing oily substances.[936] Freezers contained toxic refrigerating fluids. Especially in older ships, the structure itself could be highly contaminated. Substances now banned for decades would be found on these ships, like asbestos,[937] toxic chemicals[938] and biocides (especially in anti-fouling paint).[939] Heavy metals like lead, copper, chromium and mercury would be very much present.[940]

Toxic substances stemming from cargo residues or built into the structure poured out into the sea as soon as the hull was cut open. The

933 National Geographic, May 2014 (Issue 5); PublicEye, January 2019: "Wo Schiffe sich zum Sterben verstecken", 10, 34; Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 25.

934 London High Court, Particulars of Claim re *Hamida Begum* vs. *Maran* (UK) Ltd, 17 February 2020, para. 9.

935 Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 3, 9 et seq.

936 Karim 2018, 4; Puthucherril 2010, 18.

937 Cf. details IG-Metall, Arbeitskreis andere nützliche Produkte, abwracken: die dreckigste Arbeit der Welt; Puthucherril 2010, 15 et seq.; Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 24 et seq.

938 Puthucherril 2010, 16 et seq.

939 Ibid., 17.

940 Karim 2018, 4; Puthucherril 2010, 17 et seq.

Workers resting on the roadside in Alang

high tide entered into the ships lying on the beach twice a day and carried the hazardous substances away.[941]

Frequently overlooked is that the downstream process of recycling affected the environment gravely. The coating of copper cables was typically burnt off in the fields nearby,[942] and the recycling of steel went along with further environmental degradation.

HUMAN COST

Thousands of migrant workers were and still are attracted to the yards. As farmers, they would have to make do with around two dollars a day; here they have a chance of earning at least three to five dollars a day.[943] Typically the workers would be illiterate, have no training and no equipment.[944] They live in a makeshift shanty town near the yards.[945] They work 10 to 12 hours a day, seven days a week, with no holidays.[946]

941 PublicEye, January 2019: "Wo Schiffe sich zum Sterben verstecken", 10; Rousmaniere/Raj 2007, 360; Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 26.

942 Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 28.

943 Human Rights Watch/NGO Shipbreaking Platform 2023, 28; Karim 2018, 8; Puthucherril 2010, 35 et seq.; Rousmaniere/Raj 2007, 362 et seq.

944 Karim 2018, 5; National Geographic, May 2014 (Issue 5).

945 Rousmaniere/Raj 2007, 363.

946 The Guardian, 31 January 2020: "'Mollah's life was typical': The deadly ship graveyard of Bangladesh".

They were not insured. They had no labour rights and typically the shipbreaking towns had no trade unions.[947] Especially for Chattogram (Bangladesh) child labour has been reported.[948]

Shipbreaking is considered one of the most dangerous occupations in the world, several times more lethal than the next dangerous occupation, mining.[949] Workers are exposed to explosion or fire as a consequence of lack of pre-cleaning of ships. They risk falling from great heights or being trapped when chunks of ships are dropped onto the beach. Occasionally workers are suffocated by toxic gases or for lack of oxygen.[950] NGOs, academics and the media have recorded numerous accidents.[951] The NGO Shipbreaking Platform has documented more than 400 fatalities for the three major shipbreaking locations between 2009 and 2021.[952] Major accidents have caused the death of dozens of workers.[953]

First aid facilities are considered inadequate at most shipbreaking locations and hospitals are typically far away, at least one hour's drive.[954]

Since the workers cannot afford insurance, accidents are a major tragedy for them and their family. In the case of death by accident on the yard, employers are obliged to compensate the victim family; however, compensation is low, ranging from a few hundred dollars to more than

947 Karim 2018, 3; Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 16 et seq.

948 Chowdhury, M. S., Study Report on Child Labour in the Shipbreaking Sector in Bangladesh, 19 June 2019; Karim 2018, 8.

949 PublicEye, January 2019: "Wo Schiffe sich zum Sterben verstecken", 9.

950 Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 19 et seq.; Guardian, 31 January 2020: "'Mollah's life was typical': The deadly ship graveyard of Bangladesh"; London High Court, Particulars of Claim re Hamida Begum vs. Maran (UK) Ltd, 17 February 2020, para. 34.

951 GCaptain, 9 January 2017: "Another deadly blast at Gadani shipbreaking yard"; Karim 2018, 4 et seq.; Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 19 et seq.; London High Court, Particulars of Claim re Hamida Begum vs. Maran (UK) Ltd, 17 February 2020, paras. 34, 35.

952 NGO Shipbreaking Platform, Impact Report 2020-2021, p. 4.

953 E.g. the explosion in Gadani on 1 November 2016 costing at least 26 lives and causing more than 60 severe injuries: Business & Human Rights Resource Centre, 7 November 2016: "Pakistan: Blast at ship breaking yard calls for safe working conditions".

954 Karim 2018, 5.

USD 2,000.[955] Yards occasionally do pay up to USD 5,000 to families.[956] As a consequence of toxic substances inhaled at work, death by illness is frequent. Here there is no mandatory compensation foreseen.

The economic logic of shipbreaking

Shipbreaking on the beaches of the Indian subcontinent is highly lucrative, both for the shipowner and for the scrapyard.[957] The price per ton of steel is far higher than in the yards of Turkey and China, where the health and safety as well as environmental protection is given more weight. In fact, the price paid for a ship at the end of its life is a direct indicator of the location of the scrapping and for the working conditions. Whereas the owner would obtain around USD 250 per ton in China, they would get over USD 400 per ton in Bangladesh.[958]

This high price may attract customers, but the price difference is paid for by the workers, the inhabitants of the area and the environment.[959] Ship recycling may be a boost for the local steel industry, but "at an enormous cost".[960] The local authorities may profit from the business, but the funds do not seem to benefit public institutions, like hospitals. And the administrations of the three countries in question have a legacy of widespread corruption.[961] Shipowners find it hard to resist the temptation. Maersk, which had decided to leave the beaches, has since returned to Alang for economic reasons.[962]

955 Ibid., 8; Puthucherril 2010, 36; Rousmaniere/Raj 2007, 365.

956 E.g. London High Court, Particulars of Claim re *Hamida Begum* vs. *Maran* (UK) Ltd, 17 February 2020, para. 78.

957 Puthucherril 2010, 19 et seq., 101 et seq.

958 Cf. ICIJ, 23 July 2019: "'A moral crime': Leaked contract reveals how ship owners wash their hands off toxic vessels via offshore world – finance uncovered"; Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 34; Recycling International, 9 October 2019: "Ship recycling market waking up after disappointing summer"; The Guardian, 31 January 2020: "'Mollah's life was typical': The deadly ship graveyard of Bangladesh".

959 PublicEye, January 2019: "Wo Schiffe sich zum Sterben verstecken", 10; Rousmaniere/Raj 2007, 359.

960 Puthucherril 2010, 2.

961 Karim 2018, 2.

962 Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 32.

Overall, instead of the concept of "the polluter pays", the contrary is happening: "the polluter profits".[963]

THE ROLE OF CASH BUYERS

Even the most reputed shipping companies continue to send their ships to the beaches in Asia to be dismantled.[964] Obviously, they want to protect their reputation, though. Therefore, they typically sell the ships to a shell corporation, incorporated in an offshore jurisdiction, hiding the beneficial owner. This company in turn sells the ship to a cash buyer, who also takes a cut. Cash buyers have special relationships with certain yards.[965] At the same time, the name of the ship is often changed and it is registered under an end-of-life flag: a flag of convenience whose authorities ask no questions.

If something goes wrong at the yard, the owner or operator who has made the profit during the operational life of the ship, and who is again profiting from the scrapping operation, will claim not to know where the ship has gone for scrapping, since it was sold to a scrap dealer or even better to someone claiming to continue to use it. The aim of the cash buyer system is to pass through an intermediary and thereby to obscure that the owner or operator was in fact aware that they were selling to a substandard scrap yard.[966]

INTERNATIONAL STANDARDS APPLICABLE TO SHIPBREAKING

Standard shipping conventions

Many traditional international instruments aiming to prevent pollution of the seas have a potential bearing on shipbreaking. Already UNCLOS of 1982 intended to prevent the pollution of the seas by vessels. It was

963 Puthucherril 2010, 174 (referring to a statement by Greenpeace International).

964 E.g. Maersk, MSC and Evergreen.

965 Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 36.

966 Ibid., 37; The Guardian, 31 January 2020: "'Mollah's life was typical': The deadly ship graveyard of Bangladesh".

a useful start, as it defined the roles of the flag, port and coastal states.[967] MARPOL 73/78,[968] which was drafted after the *Torrey Canyon* disaster,[969] prohibits the discharge of oil and other noxious fluids at least into areas of the sea near coasts. Other instruments deal with the discharge of bilge water,[970] restrict the use of dangerous anti-fouling paint[971] or the dumping of waste from a ship.[972] All this may in some way be useful, however, it presupposes that the pollution emanates from an active ship, rather than a piece of waste lying on the beach.[973] So far, these regulations lack the necessary coherence to tackle wild scrapping on beaches.[974]

Basel Convention

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal[975] does not primarily have shipbreaking in mind. Nevertheless, it is relevant to shipbreaking as its aims are to reduce the generation and movement of hazardous waste into non-OECD countries. The Convention was adopted in 1989 and entered into force in 1992. To date it has 191 member states.

The fundamental concept of the Convention is the "environmentally sound treatment of hazardous wastes and other wastes", according to Art. 2(8).[976] According to the Convention, member states will allow the export of such substances exclusively based on a permit obtained by the importing state, based on "prior informed consent".[977]

967 United Nations Convention on the Law of the Sea (UNCLOS) 1982; cf. Karim 2018, 49; Puthucherril 2010, 116 et seq.

968 International Convention for the Prevention of Marine Pollution from Ships 1973; Protocol of 1978 (MARPOL); cf. Karim 2018, 50 et seq.; Puthucherril 2010, 133 et seq.

969 Wikipedia, "Torrey Canyon".

970 International Convention for the Control and Management of Ships' Ballast Water and Sediments 2004 (BWM Convention); cf. Karim 2018, 52; Puthucherril 2010, 130 et seq.

971 International Convention on the Control of Harmful Anti-fouling Systems on Ships 2001; cf. Karim 2018, 52 et seq.; Puthucherril 2010, 128 et seq.

972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters 1972, Protocol 1996 (London Convention); cf. Puthucherril 2010, 122 et seq.

973 Puthucherril 2010, 113.

974 Karim 2018, 68; Puthucherril 2010, 144.

975 Basel Convention 1989.

976 Karim 2018, 54 et seq.; Puthucherril 2010, 106 et seq.

977 Karim 2018, 55.

The Convention applies to the generator, exporter, carrier, importer and disposer of such wastes. The definition of hazardous waste is based on lists in the Annex. The Convention does not apply to waste generated by the ordinary operation of a ship (Art. 1(4)); here other, more specialised treaties apply.[978]

BASEL GUIDELINES

When does a ship turn into hazardous waste? Because this remained a matter of hot debate,[979] the Basel Convention's Conference of Parties in 2002 adopted Technical Guidelines for the Environmentally Sound Management of the Full and Partial Dismantling of Ships, the so-called Basel Guidelines or the TGSD.[980] This soft-law instrument recognises that ships structurally contain hazardous waste independently from what they transport.[981]

BAN AMENDMENT

A second decisive step was made when the Conference of Parties adopted the so-called Ban Amendment in 1994: banning the export of hazardous waste from OECD to non-OECD countries altogether.[982] The Ban Amendment took until 5 December 2019 to enter into force.

REMAINING CHALLENGES

The Basel Convention is considered a major first step in regulating shipbreaking, even if its focus is on waste management in general. It does, however, contain some fundamental shortcomings. MARPOL deals with active ships, Basel with "waste". The truth is in between: a ship on its last voyage turns into waste. This raises delicate questions:

978 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters 1972, Protocol 1996.

979 Karim 2018, 56 et seq.; PublicEye, January 2019: "Wo Schiffe sich zum Sterben verstecken", 9; Puthucherril 2010, 83 et seq.

980 Basel Guidelines, adopted at the 6th CoP; cf. Karim 2018, 56; Puthucherril 2010, 112 et seq.

981 Cf. also 7th CoP to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Geneva 25 to 29 October 2004, UNEP/CHW.7/33, recognising that ships and other floating structures may become hazardous wastes.

982 3rd CoP of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Geneva 18 to 22 September 1995, UNEP/CHW.3/35.

who is the generator or the exporter of the waste? Which state is responsible for the export?

The shipping industry – shying away from the consequences of the Basel Convention – has repeatedly claimed that the Basel Convention is not suited to address the challenges of shipbreaking.[983]

The major challenge seems to be that the Law of the Sea places ships under the governance of the flag state.[984] This makes it easy to evade scrutiny, as many flags of convenience are not in a position to control shipowners or operators. As far as the Basel Convention is applicable, the exporting nation could, however, be determined differently. For example, the port of last voyage or even the host state of the operator organising the last journey could be considered responsible. After all, Art. 2(10) of the Convention defines the state of export as "a party from which a transboundary movement of hazardous wastes or other wastes is planned to be initiated or is initiated".

Imagine e-mails are found at the head office of a shipping company in Europe, say, that owns or simply operates a ship, making a decision to send a ship for scrapping. According to the text of the Basel Convention, this company would be considered the exporter and its host country the exporting state. This principle would even apply where the ship is sold to an intermediary (a cash buyer) to obscure the traces.

The Hong Kong Convention

The horrible, but spectacular world of shipbreaking makes eye-catching news stories. Shipping companies and the IMO have found themselves under pressure by media and NGOs to replace the makeshift system of international treaties marginally applicable to shipbreaking by a binding treaty addressing the environmental and labour issues at the yards head on. The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships (Hong Kong Convention) was adopted in 2009.[985] The Convention has high threshold requirements for

983 Puthucherril 2010, 113 et seq.

984 Art. 92(1) UNCLOS.

985 Hong Kong Convention 2009.

entry into force.[986] After Bangladesh and Liberia ratified the Convention in June 2023, it will enter into force on 26 June 2025.[987]

The declared aim of the Hong Kong Convention is to address environmental and labour hazards.[988] It assumes a "cradle to grave" approach[989] by attempting to reduce the use of hazardous materials already in the construction phase. However, it still places the main responsibilities on the flag state and the recycling state, as opposed to the owner or operator state as discussed above.

RESPONSIBILITIES

The flag state has to ensure that its ships prepare an Inventory of Hazardous Materials.[990] The list is made up of three parts: I. Materials built into the structure; II. Operationally generated wastes; and III. Stores. The original Inventory of Hazardous Materials is drawn up at the time of commissioning. It must be updated with every relevant change. Several surveys and certifications follow the life of the ship up to the final survey prior to scrapping.[991]

The recycling state has the responsibility for the ship recycling facility. It authorises the yard based on a Ship Recycling Facility Plan and relevant inspections.[992] They are supposed to ensure environmentally sound

986 Art. 17(1) lists the conditions for the entry into force of the Hong Kong Convention 2009: "1 This Convention shall enter into force 24 months after the date on which the following conditions are met:
.1 not less than 15 States have either signed it without reservation as to ratification, acceptance or approval, or have deposited the requisite instrument of ratification, acceptance, approval or accession in accordance with Article 16;
.2 the combined merchant fleets of the States mentioned in paragraph 1.1 constitute not less than 40 per cent of the gross tonnage of the world's merchant shipping; and
.3 the combined maximum annual ship recycling volume of the States mentioned in paragraph 1.1 during the preceding 10 years constitutes not less than 3 per cent of the gross tonnage of the combined merchant shipping of the same States."

987 International Maritime Organization, 26 June 2023: "Hong Kong ship recycling Convention set to enter into force".

988 Preamble, 9th indent.

989 Karim 2018, 78.

990 Annex: Regulation 5 Inventory of Hazardous Materials; cf. Karim 2018, 81; Puthucherril 2010, 152.

991 Annex: Regulation 10 et seq. Surveys and Certification; cf. Karim 2018, 81 et seq.; Puthucherril 2010, 153 et seq.

992 Annex: Regulation 15 et seq.; Regulation 18 (SRFP).

dismantling and the enforcement of health and safety provisions,[993] including training programmes.

For each individual ship, a Ship Recycling Plan is required.[994] It contains key information on the "safe-for-entry" and "safe-for-hot-work" – especially taken from the updated Inventory of Hazardous Materials. The Ship Recycling Plan goes to the authority of the recycling state, which can explicitly or implicitly approve or reject it.

DEFICITS

On a merely technical level, the Hong Kong Convention is definitely a step forward.[995] However, even on the technical level it suffers from serious deficits. Beaching, with its major risks to the environment, is still permitted. Even where concrete floors with cranes alongside the ship are installed, the tides may still wash through the open hulls and disperse toxic substances.[996]

There are further serious gaps, as downstream waste management is not addressed. What happens with the asbestos or the toxic chemicals?[997] Furthermore, labour rights are not an issue that concerned the authors.[998] Child labour, present at the yards in particular in Bangladesh, is not mentioned.[999] Pre-cleaning is not a requirement of the shipowner.[1000] The relevant text was cut due to opposition by the shipping industry.[1001] Ensuring safe-for-entry and safe-for-hot-work conditions is left to the recycling country.[1002]

The major object of debate, however, remains that the Hong Kong Convention allows beaching. This is a make it or break issue for the

993 Karim 2018, 80 et seq.; Puthucherril 2010, 152, 156 et seq.

994 Annex: Regulation 9.

995 Puthucherril 2010, 167 et seq., 173.

996 Ibid., 184 et seq.; Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 35, 43.

997 Karim 2018, 86 et seq.; Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 43.

998 Ibid.

999 Puthucherril 2010, 189.

1000 Karim 2018, 85 et seq.; Puthucherril 2010, 175 et seq.

1001 Karim 2018, 89 et seq.; Puthucherril 2010, 155, 167, 176.

1002 Annex: Regulation 8.3.

South Asian countries involved in this industry, since they cannot afford dry docks, or it may not be possible to build dry docks on the flat tidal beaches. Their position is that the EU applies double standards, since EU-accredited yards in Turkey also operate with beaching. This issue is discussed below on the basis of a field trip.

Critics like Baskut Tuncak, former UN Special Rapporteur on the Implications for Human Rights of the Environmentally Sound Management and Disposal of Hazardous Substances and Waste,[1003] as well as NGOs and academics consider the Hong Kong Convention a step back from the Basel Convention. They claim that it has been drafted under heavy influence of the shipping industry and the states representing it. The main responsibility is shifted to the recycling nation. The concept of "toxic colonialism"[1004] is upheld: the primary polluters, the shipowners and operators continue to profit. The recycling state carries the environmental and human rights cost, with the only economic profits gained by a small elite of yard owners and some officials.[1005]

EU ship recycling regulation

The EU has proactively implemented the Basel Convention, the Basel Ban Amendment and the Hong Kong Convention prior to its entry into force. The EU Regulation 1013[1006] of 2006, applicable to hazardous waste in general, has been replaced for shipbreaking by Regulation 1257[1007] (Ship Recycling Regulation) in 2013. It is now, as far as the EU is concerned, exclusively applicable to shipbreaking. The EU Ship Recycling Regulation entered into force on 31 December 2018.

On the one hand, the EU is picking up elements of the Hong Kong Convention, strengthening its Port State Control mechanisms for ships not carrying an adequate Inventory of Hazardous Materials. Whether

1003 In 2009: cf. PublicEye, January 2019: "Wo Schiffe sich zum Sterben verstecken", 9; Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 30 et seq.

1004 Cf. Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 3, 43; Hadjiyianni/Pouikli 2024, 271 et seq.; Puthucherril 2010, 5, 173 et seq.

1005 Cf. Puthucherril 2010, 174 (referring to a statement by Greenpeace International).

1006 EC Regulation 1013/2006.

1007 EU Regulation 1257/2013.

or not ships fly a flag of a EU member state, they can all be detained when calling at an EU port.[1008]

On the other hand, EU-flagged ships can be scrapped exclusively at an EU-accredited facility.[1009] The European Commission is of the opinion that beaching is not permitted and that the described facilities on the Indian subcontinent do not fulfil the requirements to be listed.[1010]

LEGAL ACTION AGAINST ILLICIT SCRAPPING

In shipbreaking countries

So far (as long as the Hong Kong Convention is not yet in force) the shipbreaking countries have largely been left to fend for themselves.[1011] Their major difficulty is that they are competing for business against each other by paying better prices to the cash buyers, at the cost of their workers and their environment. In all three countries discussed here, the judiciary has at one point stepped in and forced the administration to upgrade the laws on shipbreaking.

In Pakistan, action was taken after a particularly gruesome spell of accidents, in particular the 28 deaths and 58 serious injuries after an explosion in January 2017 at the Gadani yard.[1012] However, already in spring 2018 work was resumed again in Gadani.[1013]

In India, the Supreme Court stepped in when particularly toxic ships were going to be scrapped in Alang. The three cases of the French aircraft carrier *Clemenceau,* heavily polluted with asbestos,[1014] the ferry

1008 Art. 11, 12 EU Regulation 1257/2013.

1009 Art. 14-16 EU Regulation 1257/2013.

1010 Gorrissen Federspiel 4 September 2019: "Legal landscape after the entry of the EU ship recycling regulation"; PublicEye, January 2019: "Wo Schiffe sich zum Sterben verstecken", 9; Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 47 et seq.; crit.: Mikelis in The Maritime Executive, 21 January 2019: "Another Dutch ship owner fined for beaching a vessel" and ShippingWatch of 2 February 2018: "Cash buyer criticizes blacklisting: 'It's not realistic'".

1011 Karim 2018, 35.

1012 GCaptain, 9 January 2017: "Another deadly blast at Gadani shipbreaking yard".

1013 Splash247, 24 April 2018: "Pakistan to resume tanker scrapping".

1014 Puthucherril 2010, 81 et seq.; Rousmaniere/Raj 2007, 366.

ship *Riky*[1015] and the cruiser *Blue Lady*[1016] sparked off legal battles. The administration was forced to upgrade legislation. However, observers claim that enforcement stayed lax.[1017]

Similarly, in Bangladesh environmental activists and lawyers initiated legal action at the Supreme Court. In the case surrounding the MT *Enterprise*[1018] it defined standards and held inactive officials responsible for contempt of court.[1019]

Overall, the three main shipbreaking nations have been largely left alone to deal with the issue and they are exposed to regulatory arbitrage.[1020] Action in the more economically developed shipping nations is rare.

The Netherlands

An exception is the Netherlands. Based on EU legislation and national implementing laws, Dutch prosecutors have taken several shipping companies to court. In a prominent case, Seatrade has been convicted for allowing four ships to be beached in South Asian yards. The main argument was that they contained hazardous waste according to the Basel Convention and the EU regulation. The decision was later annulled and Seatrade reached a settlement with the prosecutors over a total sum of EUR 5.65 million.[1021]

In another case, Holland Maas Scheepvaart Beheer II BV had to agree in a settlement with prosecutors on a fine of EUR 780,000 and the confiscation of EUR 2.2 million – the illegal benefit from beaching.[1022]

Whereas in these two cases the offence of the companies was the illegal export of hazardous waste, in further cases Dutch courts decided

1015 Puthucherril 2010, 77 et seq.

1016 Ibid., 86 et seq., in particular 99 et seq. (discussing the issue of proportionality).

1017 Ibid., 54.

1018 Supreme Court of Bangladesh, High Court Division, writ petition No 7260 of 2008 re BELA vs Bangladesh.

1019 Karim 2018, 110 et seq., 114.

1020 Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 34.

1021 District Court of Rotterdam of 15 March 2018 *(Seatrade)* [ECLI: NL: RBROT: 2018: 2108]; NGO Shipbreaking Platform, Press Release, 30 April 2024: "Seatrade reaches settlement with Dutch Public Prosecution Service".

1022 The Maritime Executive, 21 January 2019: "Another Dutch Shipowner Fined for Beaching a Vessel".

on slightly different issues. In July 2023, the Rotterdam Court imposed fines on a Dutch shipping company (EUR 25,000) and two of its directors (EUR 2,500 each) for a breach of the notification procedures under the European Waste Shipment Regulation when exporting an end-of-life ship to Turkey.[1023] In the case of HMS *Laurence* a disciplinary court sanctioned the master to six months' conditional suspension of his licence for beaching.[1024] In another case Greenpeace forced the Secretary of State for Environment to withdraw the export licence of MV *Otopan,* since it contained more asbestos on board than specified in the notification.[1025]

Norway

In a landmark criminal investigation by Økokrim, Norway's national authority for investigating and prosecuting economic and environmental crimes, the former owner of a salvage ship was sanctioned to six months' imprisonment for attempting to export a ship full of hazardous substances to Pakistan for scrapping. He had sold the ship to a cash buyer. The first attempt of the final voyage failed. The ship was renamed various times and reflagged. The owners gave the wrong destination to authorities. Økokrim alleged that the original owner was aware that the ship was going to be scrapped in Asia. He was tried in Norway for violating Norway's Pollution Control Act.[1026] The Norwegian Supreme Court confirmed the sentence.[1027]

United Kingdom

Whereas the cases discussed so far are criminal or administrative proceedings for offences against the environment, a recent UK civil claim demands compensation for the death of a worker in Chattogram.

1023 NGO Shipbreaking Platform, Press Release, 13 July 2023: "Ship owner and two directors fined by Dutch Court for breaching EU waste law".

1024 Ibid.

1025 Administrative Jurisdiction Division, Greenpeace NL vs Secretary of State re MV Otopan, Judgement on 21 February 2007.

1026 The Maritime Executive, 29 November 2020: "Norwegian Shipowner sentenced to Prison for Demolition Sale".

1027 NGO Shipbreaking Platform, 10 October 2022: "Prison sentence for attempted illegal export of the Harrier reveals reckless actions by all parties involved".

Khalil Mollah, an unskilled worker from the poor north of Bangladesh had fallen to his death[1028] when dismantling a ship that had been operated by the UK company Maran (UK) Ltd during its commercial life. The claim alleges that the ship was beneficially owned, commercially operated and technically managed by Maran UK, a subsidiary of Maran Tankers Management Inc (Liberia) and part of the Angelicoussis Shipping Group.[1029]

The ship had, as the claim says, been sold for USD 16.25 million (i.e. USD 404 per lwt)[1030] to an unknown shell corporation, which had in turn sold it on to a cash buyer (Wirana).[1031] It ended up at one of the worst shipyards in Chattogram, Zuma Enterprise Shipyard.[1032] According to the claim, the deceased received no training, had no protective equipment and had to work shifts of 12 hours and more for minimal pay.[1033]

The claim argued that Maran had negotiated and agreed to the demolition in an unsafe yard in Bangladesh (or had recommended this form of demolition to the owners of the vessel) and that it had failed to take steps to avoid endangering human health at the yard.[1034] The Court of Appeal of England and Wales ruled that a shipping company selling a vessel to South Asia owed a duty of care to shipbreaking workers, even where there was a multitude of third parties involved in the transaction.[1035] Based on this verdict, the shipowners agreed to settle the case.

1028 The Guardian, 31 January 2020: "'Mollah's life was typical': The deadly ship graveyard of Bangladesh".

1029 London High Court, Particulars of Claim re *Hamida Begum* vs. *Maran* (UK) Ltd, 17 February 2020, paras. 13 et seq.

1030 Ibid., paras. 16, 41.

1031 Ibid., paras. 41, 43, 71 (at least Wirana guaranteed for the buyer).

1032 Ibid., para. 16; PublicEye, January 2019: "Wo Schiffe sich zum Sterben verstecken", 15; Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 12 et seq.

1033 The Guardian, 31 January 2020: "'Mollah's life was typical': The deadly ship graveyard of Bangladesh"; London High Court, Particulars of Claim re *Hamida Begum* vs. *Maran* (UK) Ltd, 17 February 2020, para. 7.

1034 London High Court, Particulars of Claim re *Hamida Begum* vs. *Maran* (UK) Ltd, 17 February 2020, para. 91.

1035 The Guardian, 11 March 2021: "Bangladesh shipbreakers win right to sue UK owner in landmark ruling".

WAYS OUT OF THE IMPASSE?

The challenges

The vast majority of end-of-life ships go to the beaches of South Asia. If the EU considers itself a part of the solution of environmental or labour issues, it could start with the large players in the shipping industry that are based in Europe.

What is currently happening is that the EU certifies "clean" yards and lists them on its own list.[1036] Yards based in South Asia may find it attractive to apply for a Hong Kong Convention certificate with a classification society, but the yards have so far not been accepted by official EU certifiers.

European shipping companies on the other hand typically flag their ships out and sell or end their charter arrangement prior to the last voyage. A no-name company would then sell a possibly renamed ship flagged at a low-grade location (Comoros, Palau, St Kitts and Nevis or Tuvalu).[1037] It would be uncertain if such a ship carried an adequate Inventory of Hazardous Materials on board and if any serious safe-for-work clearance was given prior to beaching. The EU may look like it is trying hard to monitor environmental and labour conditions of recycling of its ships. But how can it do this if they typically leave Europe prior to heading for the beach?

1036 Commission Implementing Decision (EU) 2023/2726 of 6 December 2023 amending Implementing Decision (EU) 2016/2323 establishing the European List of ship recycling facilities pursuant to Regulation (EU) No 1257/2013 of the European Parliament and of the Council on ship recycling.

1037 Shipbreaking Platform/PublicEye, 22 January 2019: "Behind the Hypocrisy of Better Beaches", 37.

"Green yards" in Alang?

Since Alang has acquired a bad reputation in the Western media, it has become quite difficult to go there and especially to visit the yards. However, yards in transition towards what they call "green recycling" are more open to guests. One reason may be that they are interested in positive reporting since upgrading yards is expensive and the shipowners still tend to prefer low-grade maximum return yards.

We managed to convince a cash buyer to take us to some of the advanced yards in Alang.

On the road to Alang

THE ROAD TO ALANG

It is just over an hour's drive from the bustling district capital Bhavnagar to Alang on roads crowded with cars, rickshaws, motorcycles, trucks, bikes and free-roaming cows. Already on the approach to Alang beach, the shipbreaking industry becomes visible. Not only is the ships' steel recycled and re-rolled. Everything else of value is also stripped from the ships and sold over kilometres along the road leading down to the shipbreaking yards. We learnt that people from all parts of India come here to buy washing machines, dishes and other kitchen supplies,

Ropes for sale

Lifeboats at the roadside

mattresses, ropes, furniture, tools and much more. Even the lifeboats are removed from ships and are lined up along the road.

The engine of a scrapped ship is not cut apart but taken to pieces, providing spare parts to ships still in operation. Since the war against Ukraine, Russian-owned ships are in dear need of such spares. Supply operations are openly visible close to Alang. In this part of the state of Gujarat, shipbreaking is an important economic factor. Next to the workforce employed in the yards, a sizeable business of selling second-hand goods has grown around Alang, which used to be a small fishing village until the early 1980s.

PROTECTION OF THE ENVIRONMENT

When we visited Alang in January 2023, we quickly understood that a modern yard there would still rely on beaching of the ship. We were told that the flat tidal sand beaches found here are not suited for the construction of dry docks. The method used by yard owners to avoid pollution, as they explained, is to keep the ship afloat with the tide while the superstructure is gradually dismantled. Instead of the "gravity method" (cutting entire chunks off the ship and letting them drop onto the mud flats) now increasingly large cranes hold a piece until it is cut and transfer it to a concrete platform for secondary cutting. To get such large cranes, yard owners sometimes take unconventional approaches:

they re-use huge cranes from offshore rigs, for example, that had been sent to Alang for scrapping.

Our interview partners told us that they do not own the land on which they run their yards. Rather, they lease their plots from the state. Apparently, even long-term lease agreements can be terminated at any time. Therefore, investments in upgrading the yards are risky and yard owners must have the possibility to pass on the investment costs to their customers – the shipowners – who will consequently get a lower price for their scrap steel.

Alang beach – concrete platform and cranes

The concrete platform is apparently fitted with special drainage for oil and there is a specified area for polluted pieces. Hazardous waste is brought to a special waste disposal station in Alang. To prevent oil spills onto the beach, the ship is cut down to a height that allows it to still float. According to the yard management, oil tanks are emptied, washed and cleaned before cutting. The superstructure is continuously cut back to the next bulkhead.

The challenge is obviously to maintain the ship stable up to the last moment. Therefore, the ballast tanks need to be maintained and used

Crane lifting a cut piece of steel to a concrete platform

to balance the ship. At high tide, the ship is pulled gradually further up the shore. This is the method applied at the yards we visited (Bharat, Kiran and Leela).

It is obvious that in Alang not all yards have adopted the "green recycling" philosophy. It was sufficient to look across the beach into neighbouring yards to see the traditional approach, with chunks of the ship being dropped onto the sand and pulled into the yard with winches for secondary cutting, and with workers wading through knee-deep mud. So far only advanced yards have made the investment to transform the work platform into a concrete area. Media and experts have recently again identified oil spills into the Gulf, though.[1038]

WORKING CONDITIONS

The Alang ship recycling yard, as it is called on a welcome sign above the access road, is in fact divided into dozens of individual yards (plots) stretching across several kilometres of beach. Work cycles are in constant flux. If there is no ship, there is no work. Most workers spend the harvest season at home, working in the fields. At the time we were there, only about 30–40 ships were being dismantled.

Advanced yards in Alang hand out overalls, protective boots, gloves and helmets to their staff. Work runs from 7am to 7pm; there are no night shifts. On pictures presented to us, gas cutters appear to wear masks. In such yards, new workers undergo 12 days of basic training and further training for specific tasks. Team leaders coordinate the work and hold daily morning briefings.

From what we were able to see on neighbouring, lower standard yards, this is obviously not yet the general standard. We were also not able to determine whether workers used the protective masks when certifiers were not on the premises. Despite the improvements, the work is still dangerous. We have been told that deaths and injuries of workers on modern yards have decreased, but still occur. Risks include explosions, electric shocks, breaking winch cables, falls from great height and being crushed by falling parts of the ship.

1038 SRF, 31 May 2023: "Abwrackungen in Indien, Die umstrittene Reise zum Schiffsfriedhof".

In an organised yard, the stages of the dismantling process are determined by the Ship Recycling Plan by trained staff. Hazardous substances and areas have to be cordoned off on board.

Living quarters of workers are very much in transition. Some yards have built dormitories in the fields behind the yards. Workers are transferred with buses to the yards. However, the dormitories seem empty – although for example the sanitary facilities appear in better shape than any that could be found in the streets of Alang. The explanation may be that workers prefer not to live in conditions resembling military barracks. Many of them continue to live in the shanty town immediately behind the yards, allowing them to return to their quarters over the lunch break.

Salaries seem to have risen in the better yards to approximately 500 rupees per day in total, which is around six dollars. We were told that widows and/or orphans of deceased workers may receive a pension or compensation.

Inside a workers' dormitory

Street life behind the yards

MEDICAL AID

As mentioned, shipbreaking is one of the most dangerous occupations. We were told that in all of Alang, about 15,000 workers are employed. Given the high risk of accidents and the substantial distance to the next town (Bhavnagar), one would expect a well-equipped emergency station. Representatives of yards that had unsuccessfully applied for EU certification claimed that rejections by the EU Commission were largely due to the insufficient health care, and especially the lack of a trauma centre. This is a responsibility of the state, they argue, which is dependent on the recycling industry and should be able to provide adequate health care for workers.

THE ISSUE WITH EU CERTIFICATION

For owners, scrapping a ship is often an economic decision. Is it still profitable to operate the vessel or not? Once the decision to scrap is taken, the owner must consider whether to send the ship to a yard that adheres to high environmental and labour standards – and can therefore pay less per ton of steel – or to a substandard yard that pays top dollar.

Cash buyers can help shipowners because they know the yards. Ideally, responsible shipowners would only agree to their ships being

scrapped in yards that are clean and safe, thereby putting pressure on others to raise their standards. This means, though, that shipowners must accept that they get less money for their vessel. As we were told, this is easier for large shipping companies that send many ships for scrapping than for small companies with only a few ships.

A number of yards in Alang have invested in upgrading their facilities and standards. The NGO Shipbreaking Platform states that since 2015, "more than 90 shipbreaking yards in Alang have received a so-called Statement of Compliance (SoC) with the Hong Kong Convention from private consultants, including ClassNK and RINA."[1039] As mentioned, some yards exceed the requirements of the Hong Kong Convention and have applied to be added to the EU list of ship recycling facilities.

1039 NGO Shipbreaking Platform, Impact Report 2020-2021, p. 11.

PUSHING FOR SUSTAINABLE SHIP RECYCLING

The starting point is clear to next to everyone. Ships need to be recycled responsibly and to the fullest extent possible to preserve valuable materials rather than simply dumped. It is equally obvious that the traditional shipbreaking methods on the beaches in South Asia expose workers, the local population and the environment to unbearable harms.[1040] Our on-site visit to Alang convinced us, though, that there is progress. The challenge is how to proceed from here.

Enforcing international regulations

International regulation is an option. It seems that with the Basel Ban Amendment now in force, shipowners from OECD countries that have ratified it[1041] cannot send ships that contain hazardous waste for scrapping in non-OECD countries without breaking the law. Furthermore, next to the Hong Kong Convention, the EU Ship Recycling Regulation is important, not so much because of the ships flagged in the EU (a mere 22% of the world's fleet[1042]), but because a significant number of shipping companies are based in Europe. The mechanism itself is applicable to EU-flagged ships. It insists that these ships are dismantled at the end of their life in an EU-approved facility. The EU Ship Recycling Regulation has a wider scope already prior to scrapping by insisting that all ships visiting European harbours carry an Inventory of Hazardous Materials.

The problem with approved facilities is that they are predominantly in Europe itself and that South Asian yards have so far been refused approval by European inspectors even where the yards had obtained a certificate of compliance with the Hong Kong Convention from a classification society. It remains unclear whether this reticence goes back to the dislike of beaching as such.[1043] However, having learned how beaching is practised by the most advanced yards in Alang, we ask

1040 Human Rights Watch/NGO Shipbreaking Platform 2023; Ingvild Jenssen in Safety4Sea, 11 November 2022: "Ship recycling at a turning point: Reasons for optimism".

1041 E.g. the US has not ratified the Basel Convention 1989 and Ban Amendment 1994.

1042 Mikelis 2019, 43.

1043 Ibid., 40.

ourselves whether it is fair to treat Indian shipbreaking yards differently to Turkish yards that apply the "landing" method. Arguably, the methods applied in Turkey do not fundamentally diverge from the refitted yards in Alang. There is therefore a debate about protectionism.[1044] The fact is that up to 90% of tonnage is still dismantled on the beaches of South Asia.

As mentioned above, European shipowners have been observed to flag out their ships destined for recycling to a flag of convenience to evade regulation.[1045] Under certain circumstances, European law enforcement agencies have nevertheless sanctioned such owners, in particular where the ship left a European harbour for the last voyage or where the sale was organised in a European country.

As a consequence, European authorities have been thinking about financial incentives to promote sound recycling. One such idea was to demand that ships of whatever flag visiting European harbours would have to buy a Ship Recycling Licence. Their contribution would be transferred to a fund. If a ship is recycled at a recycling facility on the official EU list, the owner would be repaid the tax. If on the other hand they go outside the European list, the money remains in the fund.[1046] Opposition of the shipping industry to this concept is intense.[1047] At the time of writing, the European Commission has yet to make up its mind about how to make beaching unattractive, not to mention the underlying problems with flagging out.

Self-regulation

Self-regulation has in general grown into an alternative or a supplement to state regulation, e.g. in areas like combating corruption or money laundering.

Many shipping companies have published recycling policies, declaring that they are "led by strong values" and assuring that they "visit selected recycling yards". But self-regulation has matured into something far

1044 Ibid., 47.
1045 Ibid., 49.
1046 Karim 2018, 97; Mikelis 2019, 50 et seq.
1047 Ibid.

more demanding over the last decades. Corporations are expected to report on how they implement their policies.[1048] Transparency about implementation allows the wider public to assess whether they are living up to their standards. This has become crucial in times where many corporations are accused of engaging in greenwashing.

The flip side of this evolution for shipbreaking yards was to seek certification against internationally recognised standards, like the Hong Kong Convention, even before its entry into force.

The essential question remains: How does civil society, both in the country of the shipowner and the recycling state, obtain assurances that shipping companies send their ships to responsible yards only? "Naming and shaming" by NGOs cannot be underrated in ship recycling, just as in other areas of corporate social responsibility. In search of more clout, the attitude of investors is key. It does help when banks adhere to Responsible Ship Recycling Standards.[1049] When the Norwegian Sovereign Wealth Fund placed several large shipping companies, known for their use of unsafe beaching, on a "black list", it did cause a stir. It sent a clear signal that declarations were not sufficient, and that actions were needed.[1050]

Overall, our experience in India, when visiting Alang, was that some yard owners do make real efforts towards environmentally and socially responsible ship recycling. However, pressure on sellers of ships needs to be far more rigorous to choose the responsible yards. Governments of recycling states profiting from the recycling industries need to contribute especially by providing adequate health care facilities and by enforcing environmental and safety at work provisions.

1048 Cf. the Ship Recycling Transparency Initiative (SRTI): https://www.shiprecyclingtransparency.org.

1049 Cf. e.g. https://www.nordea.com/en/doc/nordea-rsrs-1.pdf.

1050 NGO Shipbreaking Platform, Press Release, 16 January 2018: "Norwegian Central Bank excludes companies from government Pension Fund Global because of their beaching practices"; crit. Mikelis in ShippingWatch, 2 February 2018: "Cash buyer criticizes blacklisting: It's not realistic".

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HOW TO DEAL WITH THE CHALLENGES?

Looking back at the challenges discussed in this book, we have seen that merchant shipping is a cornerstone of globalisation. Up to 90% of goods are moved over the globe by ship. Sea transport continues to grow. Few realise the extent to which we are reliant upon shipping, including not only consumers and traders but the multitude of people employed in its companies, on board ships and in the yards where ships end up being dismantled.

But we are also utterly reliant upon the health of the ocean – as a source of food as well as for the role it plays in our climate, biodiversity and water. Shipping is currently at odds with our stated aims to protect the environment and climate for future generations and to provide safe, decent labour conditions for workers.

Economic pressure forces shipping companies to acquire ever larger ships. The risks linked to these ships, however, do not diminish. Rather, environmental hazards and labour issues seem to grow with the size of the ship already in everyday operations. If such a ship meets an accident, the hazards grow exponentially. The solution, however, cannot be to go back to the times of Columbus.

Regulations and institutions evolved with globalisation and were designed to serve the industry and economic priorities. Even where "patches" have been added to take into account externalities and risks relating to the environment, climate change and human rights, the big picture remains: the regulatory framework is a net that allows the big fish to swim free.

As a result, we believe the plethora of existing regulations needs to be simplified and strengthened in order to aid implementation and enforcement. Shipping nations have, especially under the guidance of the IMO, enacted Conventions, Guidelines etc. on all possible issues. Observers and seafarers agree, though, that the major challenge lies in insufficient implementation. Critics consider the shipping industry "too big to regulate", an industry too sure of itself and too slow to change. In next to every aspect from anti-trust to the Paris Climate Agreement, the shipping industry has managed to obtain a carve-out.

Existing rules need to be enforced by effective supervision and monitoring. But the institutions responsible for this are powerless to stop the bigger fish from swimming free. The IMO, far too influenced by industry lobbyists and hampered by its unanimity principle, has proven a weak player when it comes to both regulating global shipping and overseeing the implementation of regulations.

We have seen that some of the key issues are pollution prevention and drastic reduction of emissions, seafarer welfare and action against IUU fishing and modern slavery. For some problems, technical solutions like alternative propulsion systems, design and construction of ships, training, safer shipbreaking facilities, etc. will help a little. Governments and the industry, as well as investors, should encourage these.

But technical solutions and more stringent implementation of existing rules will never be enough if the fundamental governance

issues in the shipping industry are not addressed. Chief among these is that the Law of the Sea currently gives shipowners the freedom to choose which flag state should be responsible for safety, environmental and labour issues on board.

But many flag states offering open registers are not able to ensure that their ships meet decent environmental and labour standards. The system of classification societies – frequently caught up in conflicts of interest – and Port State Control has proven to be insufficient at implementing the regulations, as revealed by problems like accidents, abandonments and ongoing issues with labour standards and pollution. The system seems designed to allow unscrupulous shipowners and other profiteers to escape control and responsibility.

Nevertheless, the International Chamber of Shipping, claiming to represent over 80% of the world's merchant fleet, is particularly committed to justifying flags of convenience. Its Flag State Performance Table seems to be based on a pure paper exercise, not reflecting practical experience.[1051] Again, this seems to be an issue of pursuing economic gains at the expense of the environment, climate and human rights.

Adding to the issue of open registers are two more "O"s: outsourcing and offshoreism. A lack of transparency in ownership and finance, including complex chains of ownership and management and incomplete entries in ship registries, spread a cloak of opacity over the entire industry.

Many actions by individual shipping companies, such as the creation of single-ship shell companies in offshore financial centres, are not themselves illegal and may make commercial sense to them and their shareholders. But the system as a whole allows shipowners and charterers to escape responsibility – including when they send their vessels to scrapyards with dire working conditions and environmental protection. Insurance and salvage laws that grew around this opaque industry are outdated and insufficient to ensure a fast reaction and adequate compensation in the case of a disaster.

1051 International Chamber of Shipping, Shipping Industry Flag State Performance Table 2023/2024.

Beyond modernising rules, the main issue is – as mentioned – how to ensure enforcement. In many other regulatory areas, such as around anti-corruption and anti-money laundering or organised crime, international organisations in cooperation with NGOs have managed to improve enforcement on an international level. The method of choice is a mix of country evaluation and strong enforcement action by individual states. In a complex industry dominated by powerful commercial interests, there may be a place for the OECD and G20, in cooperation with NGOs, to do more.

What is ultimately needed, though, is a cultural change and commitment from all stakeholders – companies, governments, international regulators – to take the risks of the shipping industry seriously. They need to work together with organisations that advocate for better labour and environmental standards in practice and not only on paper. In the end, it serves us all to build a stronger and cleaner industry that looks beyond short-term profit and takes proper account of people and the planet.

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