



Sjøfartsdirektoratet
Norwegian Maritime Authority



FOCUS ON **ENVIRONMENT** 2019

Photo: Steinar Haugberg/
Sjøfartsdirektoratet.

Publisher:

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Circulation: 500
Print: Merkur Grafisk AS
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Focus on environment

Since 2014, the Norwegian Maritime Authority (NMA) has had an annual focus area for our risk-based supervision. The focus areas have been chosen based on our annual risk analyses, which in turn have been based on accident statistics, reports from the Accident Investigation Board Norway, findings from surveys and inspections and other available information. The focus areas have resulted in more targeted supervision and strengthened legislation.

In the same period, we can conclude that it has become safer to work on board Norwegian ships. The number of accidents involving commercial vessels has decreased, and it is particularly encouraging that the number of persons who have lost their lives in accidents on board or involving ships has gone down. The number of fatalities in the period from 2013 to 2017 is almost halved compared to the preceding five-year period.

Even though we should be careful to claim that this positive trend is solely a result of the NMA's more focused efforts, we hope and believe that the measures we have implemented have had a positive effect. The work of developing our risk-based approach will therefore continue.

In addition to working for safety on board, the NMA is also working to safeguard the environment. Shipping is the most environment-friendly form of transport by far. Almost 90% of all freight transportation in the world is done by boat. Even though only around 2.2% of the global CO₂ emissions comes from the operation of ships, the potential for reductions in shipping is substantial. According to a survey by the International Maritime Organization (IMO), the overall CO₂ emissions from this industry constitute around 786 million tonnes. This is more than the emissions from many large industrialised countries, such as England or Germany.

Shipping is also a large source of other forms of emissions. High emissions of sulphur oxides (NO_x) and nitrogen oxides (NO_x), which contribute to acid rain and poor air quality, are examples of this. In order to make the industry greener, the IMO has adopted many important regulations these last years.

For many years, the environmental focus in shipping was all about avoiding oil spills or other spillages from accidents or reducing the damaging effects on the environment following such accidents. The double-hull requirement is an example of that. In recent years, the focus has shifted to reduction of

emissions, discharges and other negative environmental effects from the daily operation.

We have gotten new regulations for ballast water management, stricter regulations for ship recycling and for garbage management on board, more stringent requirements for emissions of SO_x and NO_x, requirement for more energy-efficient ships and requirement for more efficient operation of ships, and according to the IMO's Greenhouse Gas Strategy, these emissions must be cut by 50% by 2050.

The decisions made in IMO are very important for our common environment and will make life easier for many people on our planet. Through meticulous work, the emissions from shipping will go down and the environmental impacts will be reduced. But I am also convinced that stricter environmental requirements are a good thing for the Norwegian shipping industry. Norwegian shipping companies are already at the forefront with regard to using environment-friendly solutions. At the same time, the Norwegian supplier and equipment industry is world leading in the field of environmental protection. More stringent environmental requirements will also put the environment higher up on the agenda for companies where this has not been a focus area up until now.

In addition to decisions in IMO, national and regional authorities have also adopted decisions that set out stricter environmental requirements for the shipping industry. In addition, we know that the environment preoccupies many consumers and the media. In short, protection of the environment is on the national and international agenda. The NMA has therefore decided that environmental protection will be the focus area for 2019.

This means that we will focus on environment-related questions in our supervisory work. This is important to ensure that the intended health and environmental benefits are realised, but also to ensure a level playing field. Towards the end of this report, you will find the checklist that our surveyors will use in connection with surveys and inspections. Our goal with this environmental focus is to influence the industry to think and act environment-friendly and also to increase awareness about all the new rules and regulations on the area.

*Olav Akselsen,
Director General of Shipping and Navigation*

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Focus area for the Norwegian Maritime Authority in 2019

Time for environment-friendly shipping

In 2009, the Norwegian Maritime Authority (NMA) will focus on environment-related issues at our inspections. Our goal is to influence the industry to think and act environment-friendly, and also to increase the focus on new requirements in this area.

INTERNATIONAL REGULATIONS

Environmental issues concerning Norwegian ships engaged on foreign voyages are primarily regulated through the International Maritime Organization (IMO). Ships engaged on domestic voyages mainly also follow international regulations. Special Norwegian regulations apply in certain sea areas in Norway. In addition to the IMO requirements, there are requirements set by the EU. Both IMO and EU requirements have been included in Norwegian regulations.

MARPOL is the International Convention for the Prevention of Pollution from Ships and includes 6 Annexes, providing regulations for the prevention of pollution by oil, by noxious liquid substances in bulk, by packaged harmful substances, by sewage, by garbage and by air pollution. The regulations apply to all ships, unless expressly provided otherwise.

Some sea areas are protected under MARPOL. In our waters, the North Sea, the Skagerrak and the Baltic Sea are defined as «Emission Control Areas» (ECAs). The area is bordered in the north by the 62nd parallel. In this area, particularly strict requirements related to emissions of sulphur oxides (SO_x) apply. From 2021, the requirements will also apply to nitrogen oxides (NO_x).

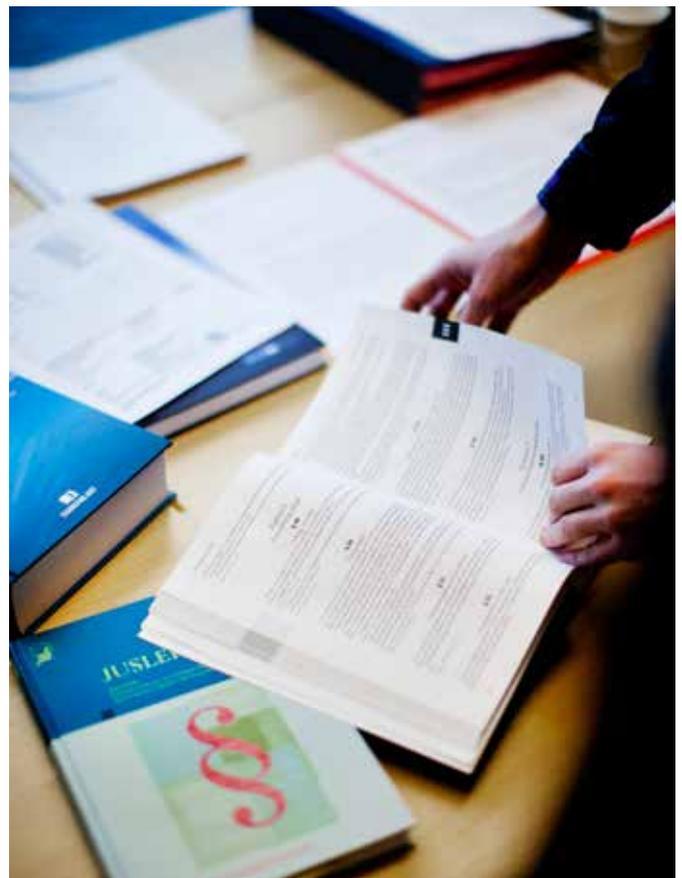
The North Sea and the Baltic Sea are classified as “Special Areas” (SAs), which implies stricter requirements for the disposal of garbage and discharge of oil into the North Sea, as well as disposal of garbage and discharge of oil and sewage into the Baltic Sea.

The EU is preparing its own regulations in areas where IMO regulations are non-existent or not good enough. The EU prefers solutions through the IMO providing international regulations, but that is not always possible. The EU regulations states requirements for greenhouse gas emissions, sulphur content in fuel, organic tin compounds and double-bottomed oil tankers.

OIL SPILL TO SEA

As a basic rule, all discharge of oil to sea is prohibited. Nevertheless, discharge is allowed when oil blends have passed through a filtering system that meets certain requirements, the oil/oil blend content without dilution does not exceed 15 ppm and the vessel is underway.

For tankers, it is also significant where the oil originates from. Specific regulations apply to vessels in «Special Areas» and to



EXTENSIVE REGULATIONS: Environmental regulations concerning Norwegian vessels primarily come from the International Maritime Organization (IMO). In addition, there are specific EU requirements and special Norwegian regulations that apply to certain sea areas in Norway.

PHOTO: HÅKON NORDVIK

vessels of less than 400 gross tonnage. In polar waters, all discharge of oil is prohibited.

UNTREATED SEWAGE

In Norway, both MARPOL regulations and national regulations apply to the discharge of sewage. The MARPOL regulations are applicable from the Swedish border to Lindesnes for vessels engaged on international voyages, whereas special Norwegian regulations are applicable along the entire coast of Norway. The MARPOL regulations on sewage apply to ships of 400 gross tonnage and upwards engaged on foreign voyages, or ships with more than 15 persons on board engaged on foreign voyages. Sewage that has been comminuted and disinfected can be discharged three nautical miles from land or more, provided

certain additional technical requirements are met. Untreated sewage must not be discharged less than 12 nautical miles from land. In both cases, the ship must proceed en route at a speed of at least 4 knots, and discharge must be at a moderate rate. However, the discharge shall not contain floating solids nor cause visible discolouration of the sea.

The special Norwegian regulations are applicable to all vessels operating in Norwegian waters. These regulations allow ships to discharge sewage at least 300 meters from the nearest land from Lindesnes and northwards. From Lindesnes to the Swedish border, the MARPOL requirements apply to all relevant vessels covered by these regulations. The legislation allows for the municipalities to establish their own rules. In the inner Oslofjord, there are therefore regulations established by the municipality that are stricter than the 300-metre limit.

In the Baltic Sea, sewage treatment plants are required that also remove the fertilizers nitrogen and phosphorus. The IMO's guidelines for sewage treatment plants on board a ship stipulate the requirements for such facilities. Ships operating in the Baltic Sea may of course also use tanks with adequate capacity or onshore sewage reception facilities.

DUMPING OF GARBAGE AT SEA PROHIBITED

Disposal of garbage at sea is prohibited. The regulations apply to all types of ships. An exception is made for food waste and detergents that are not harmful to the environment. Stricter rules apply in so-called «Special Areas».

Grated food waste that can pass through a strainer of 25 millimetre may be discharged no closer than 3 nautical miles from land. Food waste that has not been grated may be discharged no closer than 12 nautical miles from shore. The same applies to cargo residues that are not harmful to the environment. Detergents which are not harmful to the environment may also be disposed.

IMO - International Maritime Organization

MARPOL - International Convention for the Prevention of Pollution From Ships

ECA - Emission Control Areas

SO_x - Svoveloksid

NO_x - Nitrogenoksid

SA - Special Areas

VOC - Volatile Organic Components - flyktige organiske forbindelser

EEDI - Energy Efficiency Design Index

SEEMP - Ship Energy Efficiency Management Plan

IOPP sertifikat - International Oil Pollution Prevention Certificate



Within «Special Areas», the disposal of food waste and other organic waste is only allowed when more than 12 nautical miles from the nearest land or ice shelf. There are several conditions for the discharge of cargo residues, and specific regulations apply for the Antarctic.

Moreover, there are important provisions related to waste diaries and garbage reception facilities.

EMISSION LIMITS

Emissions of nitrogen oxides (NO_x), sulphur oxides (SO_x), volatile organic compounds (VOC from tankers) and ozone depleting substances are regulated by MARPOL. In order to reduce the emissions of carbon dioxide (CO₂), there are additional provisions regarding incinerator plants and energy efficiency.

Nitrogen oxides are formed in engines by combustion of fuel. The NO_x emissions reduction requirements usually do not have retroactive effect, since compliance could result in disproportionately high costs. Engines installed in ships today must comply with the MARPOL Tier II requirements. If a ship constructed in 2016 or later is calling at ports on the coast of North America (which is an ECA), it must comply with the Tier III requirements. In the North Sea and the Baltic Sea, Tier III will apply to ships constructed in or after 2021. In the world heritage fjords, more stringent requirements are proposed towards year 2025, when all vessels of more than 1000 gross tonnage are required to comply with the Tier III requirements.



ENVIRONMENT-FRIENDLY: The NMA has already received positive feedback on our involvement in new environment-friendly and innovative projects, such as the electric ferry «Ampere» and the tourist vessel the «Vision of the Fjords» (photo).

PHOTO: HELGE SUNDE/SAMFOTO/NTB SCANPIX

Sulphur oxides are formed by combustion of sulphurous fuel. Emissions may be reduced by using fuels with a low sulphur content or by cleaning the exhaust gases before they are emitted. Today, the legal content of sulphur in fuel is usually 3,5%. From 2020 this limit will be reduced to 0,5%. In Emission Control Areas and in harbours of the EU and EEC, the emission limit is 0,1%. Use of fuel with a higher sulphur content is allowed if the exhaust gases are cleaned in accordance with prevailing requirements. For the world heritage fjords, a limit of 0,1% of sulphur emissions is suggested.

Both EU and IMO are working on new rules to improve energy efficiency (CO₂ efficiency) on board ships. So far, an Energy Efficiency Design Index for new ships (EDDI) has been developed by the IMO and implemented globally. The purpose of the Energy Efficiency Design Index is to ensure that ships are constructed so that they use less energy and cause less emission. There is a plan for making these regulations more stringent over the next years.

For existing vessels directed by IMO, an energy efficiency management plan (SSEMP) is required for all vessels of 400 gross tonnage and upwards. For vessels of more than 5000 gross tonnage, it is for instance required that data concerning use of fuel is collected and reported to the authorities. Collection of data starts in 2019. EU has a similar arrangement for reporting fuel

data. Data in this context shall be collected from 2018 and reported to the EU Commission from 2019.

ORGANISMS IN BALLAST WATER

In order to prevent the spread of alien species and pathogenic organisms via ballast water, the IMO has established regulations for ballast water systems and the use of such systems. The international Ballast Water Convention came into force in September 2017, and the requirements are incorporated into Norwegian legislation in the Regulations on ballast water management on ships and mobile offshore units.

The Regulations apply to Norwegian ships and mobile offshore units engaged on foreign voyages, as well as fishing vessels with trade area Bank Fishing I or greater trade area. Additionally, the provisions apply to foreign ships and mobile offshore units operating in Norwegian waters.

Ballast water shall be treated by means of an approved ballast water management system on board. The regulations stipulate requirements for the treatment of ballast water before discharge. It is also possible to use a shore-based or mobile treatment system. Ships not required to hold an IOPP Certificate shall comply with the requirements for ballast water treatment technology at the latest by 8 September 2024.

Environmental violations by ships: The companies risk heavy fines

Pollution of the marine environment is a growing problem. Every year, the Norwegian Maritime Authority (NMA) deals with cases where there is reason to suspect illegal pollution from a ship, including both cases where oily mixtures have been discharged to sea, and cases where the vessel is suspected of having exceeded the air pollutant emission limits.

In 2017, the NMA made eight individual decisions to issue fines for violation of environmental regulations. Four of these involved sulphur violations, while the remaining four had to do with discharge of oily mixtures to sea. The violation fines amounted to between 150,000 and 400,000 NOK.

It is set out in section 31 of the Ship Safety and Security Act that “pollution of the external environment by the discharge or dumping from ships, or by the incineration of harmful substances, or pollution in any other way in connection with the operation of the ship is prohibited, unless otherwise decided by law or regulation laid down pursuant to law”.

Furthermore, it is stipulated in section 4 of the Regulations of environmental safety for ships and mobile offshore units that MARPOL Annex I, which deals with prevention of pollution by oil from ships and mobile offshore units, applies to all Norwegian ships and to foreign ships in Norwegian territorial waters.

PROHIBITION WITH EXCEPTIONS

In other words, all discharge of oil or oily mixtures from ships to sea is basically prohibited. However, there are some regulatory exceptions from this prohibition. The most important exception is pollution directly resulting from damage to a ship, provided all reasonable precautions have been taken before and after the incident.

This could typically be discharge following a grounding incident. The exceptions also include discharge considered necessary for the purpose of securing the safety of the ship, the health of those on board or in order to save human life, as well as the exception of section 31 of the Ship Safety and Security Act.

COULD BE DEVASTATING

The discharge of oily mixtures to sea could have major consequences for organisms in the immediate vicinity of the discharge, and components of the oily mixture could remain in the environment for a long time.

The environmental damage depends on the quantity discharged and the composition of the mixture. Heavy fuel oil spills will have far more severe environmental consequences than for instance marine diesel spills. Nonetheless, all discharge to sea is considered a serious violation.

The great majority of incidents involving discharge of oily mixtures to sea from ships, are connected with fuel bunkering, but also other operations-related discharges from ships occur.

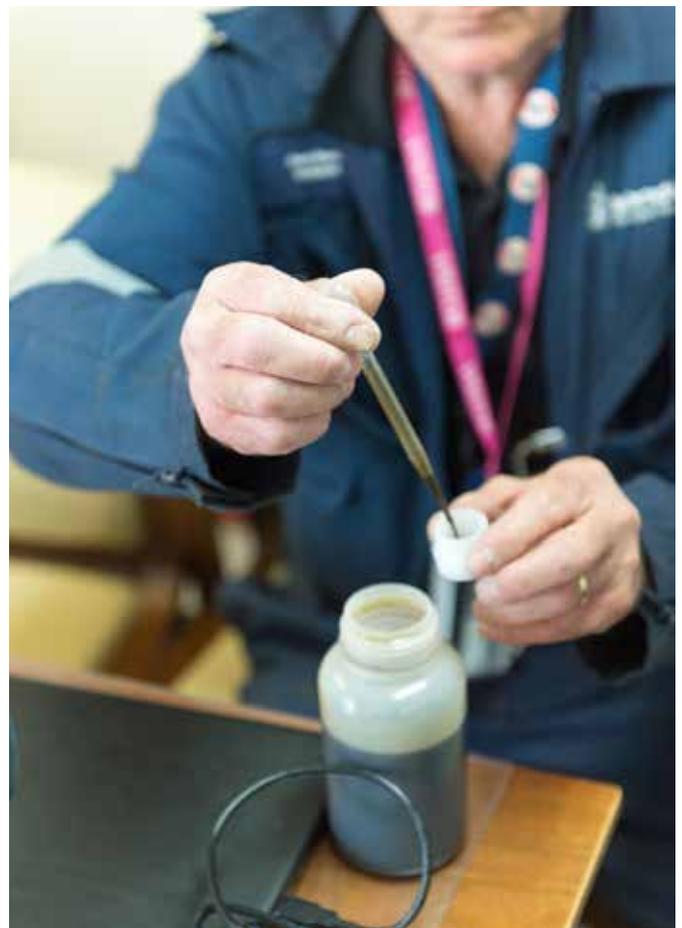
STRICTER SULPHUR REQUIREMENTS

New and stricter rules related to sulphur content of fuels entered into force on 1 January 2015. The maximum allowed sulphur content of fuel oil used by ships sailing within the ECA (Emission Control Area) in the North Sea (south of the 62nd parallel) was then reduced from 1.50 per cent to 0.10 per cent.

In the area north of the 62nd parallel, the maximum limit is 3.50 per cent. In these areas, a maximum limit of 0.10 per cent applies when the vessel is at berth.

The NMA carries out document control on board both Norwegian and foreign ships calling at Norwegian ports. Upon suspicion of violations of the law or in accordance with other predefined criteria, the NMA's surveyors carry out a physical control of the fuel in use.

Initially, the control is carried out using a portable analyser, provided that such a device is available to the surveyor. If the portable fuel analyser indicates that the sulphur content of the fuel is too high, a physical sample will be taken of the fuel, which will be forwarded to a laboratory for analysis. This is also done in



SULPHUR TESTS: New and stricter rules on sulphur content of fuels entered into force on 1 January 2015. Here a surveyor from the NMA is conducting a sulphur test.

PHOTO: TORBEIN K. GAMST/NMA



The NMA issued four fines for discharge of oily mixtures to sea. The violation fines amounted to between 150,000 and 400,000 NOK.
PHOTO: AUDUN BRÅSTAD/KYSTVERKET

cases where the surveyor does not have access to a portable analyser during the inspection.

MORE EXPENSIVE FOR THE COMPANIES

The stricter sulphur rules that entered into force in 2015 have made it more costly for the companies to sail within an ECA.

The price difference between low sulphur fuel and fuel with a higher sulphur content could be substantial, which could cause distortion of competition if violations of the legislation were not sanctioned.

In addition, the rules are laid down to protect the environment, which is a common good. A lack of compliance with the legislation by the industry would have considerable negative consequences for the environment.

FIRST EXAMPLE

The most severe discharge incident sanctioned by the NMA in 2017 involved discharge of approximately 2000 litres of hydraulic oil from a Norwegian-flagged construction vessel at berth. The vessel was laid-up at the time of the incident.

Following the discharge, cracks were found in three low pressure hoses and air bubbles in four high pressure hoses. It has been reported that the cracks were caused by salt and sun exposure, and that the discharge was the result of the cracks in the outer layer of the hoses.

In this case, it was stressed that the company had not inspected these particular hoses sufficiently, and that such inspection would have revealed the need to replace the hoses. The shipping company was issued a violation fine of 300,000 NOK for the discharge.

EXAMPLE TWO

Another interesting case that resulted in a violation fine concerned a Russian-flagged fishing vessel that discharged just over 100 litres of marine diesel at berth in Tromsø. The incident took place in connection with fuel bunkering.

In this case, it was assumed that the crew members on board had not monitored and supervised the bunkering operation sufficiently, and that this was a contributing cause to the discharge.

Furthermore, as an aggravating factor, emphasis was put on the fact that the discharge had not been reported to Norwegian authorities. The shipping company was issued a violation fine of 150,000 NOK for this incident.

THIRD EXAMPLE

The most severe case in 2017, however, concerned a violation of the sulphur regulations at berth outside the ECA (north of the 62nd parallel) and involved a Russian-flagged fishing vessel calling at Ålesund from Murmansk on 5 January 2017.

The NMA was on board the vessel the next day. During the inspection, the surveyors discovered that the vessel was using fuel with a sulphur content of 1.84 per cent, and that the vessel did not have fuel with a lower sulphur content on board. The shipping company was issued a violation fine of 400,000 NOK.

EXAMPLE FOUR

Another sulphur case from 2017 concerned a cargo vessel of 30,669 gross tonnage under Marshall Islands flag. The NMA carried out a sulphur inspection on the vessel when it was berthed in Fredrikstad in April 2016. At that time, the vessel had just completed a voyage from Brazil to Norway, crossing the border into the Emission Control Area (ECA) on the way.

The NMA's surveyor took a sample of the fuel. The analysis showed a sulphur content of 0.14 per cent, which is clearly over the legal limit values. The shipping company was issued a violation fine of 200,000 NOK.



EMISSIONS: The cruise ships are currently responsible for more than 90 % of the sulphur emissions (SO_x) in the world heritage fjords. The new requirements will entail changes and a need to adjust for the cruise industry and for local industry players sailing exclusively in these fjords.

PHOTO: NTB SCANPIX

Norwegian tourist fjords to be protected:

Stricter emission and discharge requirements from next year

As of the new year, the Norwegian Maritime Authority (NMA) introduces new, stricter requirements for what and how much ships may emit and discharge when visiting the “world heritage fjords” in Norway. The new requirements will entail changes and a need to adjust for the cruise industry and for local industry players sailing exclusively in these fjords.

The proposal for new requirements was circulated for review on 4 June, with deadline for comments on 14 September. The NMA is now reviewing the consultative statements with the goal of bringing some of the amendments into force as early as 1 January 2019.

“The amendments are meant to contribute to reducing the high volumes of emissions to air and discharges of sewage and grey water to sea in the short term, whereas the full effect of the measures directed at emissions to air is expected to be reached in 2025,” says Head of Department Bjørn Pedersen at the NMA.

ON UNESCO'S WORLD HERITAGE LIST

The new emission and discharge requirements will mainly apply to the Geirangerfjord, Nærøyfjord and Aurlandsfjord, which were all inscribed on Unesco's world heritage list in 2005. The Sunnøylvsfjord and Tafjord are also on the list. Through the world heritage status, Norway has committed to taking care of these fjords.

In 2017, the NMA presented the results of a mapping of the current emission levels in these fjords. The report concluded that there is a need for stronger measures in order to reduce the emissions of nitrogen oxides (NO_x) and sulphur oxides (SO_x) in particular. However, the discharge of wash water from exhaust gas cleaning, sewage and so-called grey water is also a source of pollution of the fjords. Grey water means wash water from dishwashing, wash-basins and other sinks, showers, laundry and similar.

NITROGEN OXIDES (NO_x) AN ISSUE

The emissions of NO_x have been identified as a periodic issue in the world heritage fjords. In order to reduce the emissions of NO_x, the NMA is proposing a new provision with special rules regarding emissions of NO_x from ships of 1000 gross tonnage and upwards in these fjords. The emissions may be reduced using SCR catalysts (Selective Catalytic Reduction) or e.g. ECR (Exhaust Gas Recirculation).

“The NMA is proposing to introduce the new requirements in stages, at increasingly strict levels from 2020, 2022 and 2025. We believe that such a phase-in of the requirements for NO_x reductions will give the industry sufficient time to adapt,” says Bjørn Pedersen.

The requirements are based on the three tiers, I, II and III, set out in MARPOL (the International Convention for the Prevention of Pollution from Ships) regulation VI/13. These requirements in particular will affect the cruise industry.

The report from Menon, which forms the basis for the stricter requirements, states that the number of ships visiting the world heritage fjords will most likely be reduced. Some companies will choose not to go to Norway, while others will choose to visit other Norwegian fjords. Some will probably reemploy their fleet and send ships satisfying the requirements, while still others will choose to install cleaning systems in order to satisfy the emission and discharge requirements applicable in the world heritage fjords.

“We are expecting a reduction in the number of ships in any case, and the first to go will be the oldest and the ones that pollute the most,” Pedersen believes.

REDUCING SULPHUR EMISSIONS

The cruise ships are currently responsible for more than 90 % of the sulphur emissions (SO_x) in the world heritage fjords. The Nærøyfjord area, including the Aurlandsfjord, is today located within the North Sea Emission Control Area (ECA), where ships are already required to use fuel with a sulphur content not exceeding 0.10% by weight. The North Sea ECA applies south of the 62nd parallel, and the Geirangerfjord area is situated north of this.

The NMA is proposing that the same strict requirement for maximum sulphur emissions apply in the Geirangerfjord as well.

“The use of heavy fuel oil without any form of cleaning results in massive emissions of sulphur. This is currently legal in the Geirangerfjord area, which is very unfortunate,” says Pedersen.

He refers to the report which concludes that such a requirement will have few consequences for the cruise companies. They can use either fuel with a low sulphur content or heavy fuel oil with scrubber systems. In the longer term, they may use other fuel solutions, such as LNG.

SEWAGE AND GREY WATER

The NMA proposes that ships of 400 gross tonnage and upwards or which are certified to carry more than 15 persons will not be allowed to discharge sewage in the world heritage fjords. The proposal applies to ships engaged on both domestic and foreign voyages.

Strict requirements for the discharge of sewage could have financial implications for small local vessels and ferries. Some of these have tanks for the retention of sewage, whereas others have not.

The vessels which up until now have been allowed to discharge sewage into the fjord 300 metres from nearest land, will now have to deliver sewage to reception facilities ashore or exit the world heritage fjords to discharge it.

The NMA also proposes that ships of 2500 gross tonnage and upwards, which are certified to carry more than 100 persons, will not be allowed to discharge grey water in the world heritage fjords. The background for this is that the discharge of grey water may lead to algae bloom and other damage to the natural environment.

“To a large extent, cruise ships already have cleaning systems or tanks for the retention of grey water. We are limiting the prohibition to large passenger ships, as the production of grey water increases significantly with the number of persons on board,” says Pedersen.

NOT ZERO EMISSION, BUT...

The new legislation will in addition include a number of provisions regarding, among other things, the use of exhaust gas cleaning systems and how quickly the ships have to switch to cleaner fuel after the ship is securely moored or anchored. “The requirements of the new legislation are expected to reduce the emissions to air and discharges to sea significantly in the

coming years. These are not requirements which will lead to zero emissions in the world heritage fjords, but is nonetheless a huge step forward towards a significantly more environment-friendly technology than we have today,” says Pedersen.

SPEED RESTRICTIONS

In addition to the proposals that have now been circulated for review, the NMA, together with the Norwegian Coastal Administration, was asked to consider the possibility of introducing a maximum speed for ships in defined zones in the world heritage fjords.

On assignment from the NMA, DNV GL prepared a report that shows that speed restrictions for ships in the fjords will result in reduced fuel consumption and significantly reduced emissions to air. Based on this report, the NMA is recommending that a maximum speed of 12, 8 and 5 knots be introduced on specified passages in the Geirangerfjord area. In the same way, the NMA is recommending limiting the speed to 10 and 8 knots on certain passages in the Nærøyfjord area. The NMA's recommendation has been sent to the Ministry of Climate and Environment, which has forwarded it to the Ministry of Transport.

“We are recommending that the speed restrictions be made applicable to all ships of 20,000 gross tonnage and upwards, regardless of the type of fuel used,” relays Head of Department Bjørn Pedersen.



COMMITTED: The new emission and discharge requirements will mainly apply to the Geirangerfjord, Nærøyfjord and Aurlandsfjord, which were all inscribed on Unesco's world heritage list in 2005. Through the world heritage status, Norway has committed to taking care of these fjords.

PHOTO: LOIC POIDEVIN/NTB SCANPIX



EXPOSURE: The Norwegian Maritime Authority is extremely pleased with the way the drone performed during the tests. The Authority hopes that this new way of exposing illegal sulphur content also will prove to be preventive.

PHOTO: NORDIC UNMANNED

Promising tests with drones

Drones may prove to be a useful and effective tool in the battle against illegal sulphur emissions in the shipping industry. Tests carried out so far, in the Karmsund straight by Haugesund and in the entrance to Bergen harbour in June, demonstrated this.

This is the preliminary conclusion of Principal Surveyor Svein Erik Enge of the Norwegian Maritime Authority. He coordinates the project, which is carried out in cooperation with the Coast Guard.

In Bergen, a drone with measuring instruments was operated from the bridge of the Coast Guard vessel "KV Tor". In the course of a week or so at the beginning of June, the drone was manoeuvred into exhaust discharge from several ships in the area, and details of sulphur content immediately appeared on a data screen on board the Coast Guard vessel. The highest concentration was measured on the Portuguese cruise ship "Astoria" as it was entering the harbour of Bergen.

CAREFULLY MONITORED

The drone should never come closer to a vessel than 50 meters and it should always be accompanied with a mob-boat at a fair distance behind the ship.

If the measurements made by the drone show that the exhaust, and thus the fuel, has a sulphur content of more than the legal limit of 0,1 percent, the Coast Guard will notify one of the inspectors at the Norwegian Maritime Authority on shore. The inspector will then board the vessel and carry out an inspection the next time the ship docks.

Svein Erik Enge was particularly eager to find out if it was at all possible to steer the drone into the exhaust of the ship, but everything went according to plan:

- I am extremely pleased with how the drone performed during this operation, says Enge.

The Norwegian Maritime Authority hopes that this new method of exposing illegal sulphur content also will prove to be preventive.

CAN BE USED FOR MANY DIFFERENT THINGS

The drone used for testing is owned by the Coast Guard, whereas the sensors are rented by the Norwegian Maritime Authority to carry out a certain number of measurements.

Each year, the Coast Guard and the Coastal Administration will purchase five new drones to be placed on board five different coast guard vessels. Various types of sensors can easily be attached to and detached from the drone, depending on the type of mission:

The Norwegian Maritime Authority is hunting sulphur sinners, whereas the Coast Guard needs a camera for measuring propagation and thickness of oil spills at sea.

The Norwegian Radiation Protection Authority is also part of the trial project to consider measuring any radiation from nuclear-powered ships or ships carrying radioactive waste.



Issues 2018

No	Check-list / Vessel group
1.1	Annex I – Oil
1.1.1	Training and routines regarding bunkering: All vessels
1.1.2	Handling bilge water: Vessels over 15 meters
1.1.3	SOPEP-drills: Vessels over 400 gross ton
1.2	Annex II – Harmful liquids in bulk
1.2.1	Inspection of cargo residue discharge: Cargo vessels over 400 gross ton
1.2.2	Procedure for discharge of cargo residues: Cargo vessels over 400 gross ton
1.2.3	Discharge of fish remains: All fishing vessels built after 1986
1.3	Annex IV – Sewage
1.3.1	Discharge of sewage: All vessels
1.3.2	World Heritage Fjords: All vessels
1.4	Annex V – Garbage
1.4.1	Inspection of garbage record book: Vessels over 400 gross ton or which are certified to carry more than 15 passengers Inspection of deck log: All vessels of more than 50 gross ton
1.4.2	Garbage – placards on the bridge: All vessels of more than 12 meters
1.4.3	Routines and practices for garbage management: All vessels
1.4.4	Sorting at source: All vessels
1.4.5	Loss of fishery: All fishing vessels
1.4.6	Obligation to report garbage: All vessels in transit to a harbour within the EEA area, except those in regular scheduled traffic, fishing vessels and leisure boats approved for max 12 passengers
1.5	Annex VI – Air
1.5.1	Routines for gauging: Vessels over 400 gross ton
1.5.2	Scrubbers: Vessels over 400 gross ton
1.5.3	Optimisation of operation system: Vessels over 400 gross ton
1.5.4	Oil fuel quality: Vessels over 400 gross ton
1.5.5	Inspection of EIAPP-certificate: Ref. sdir.no/fokus2019 for information about which vessels types this applies to
1.5.6	World Heritage Fjords: Vessels over 400 gross ton
1.6	Working environment, safety and health
1.6.1	Use of chemicals on board: All vessels
1.6.2	Disposal of chemicals and special waste: All vessels

The check-list in its entirety, with supplementary information on the various items, can be viewed at Sdir.no/fokus2019

Paris MoU focuses attention on sulphur emissions: New requirements enforced from day 1

Through port State controls, the Paris Memoranda of Understanding (MoU) will carry out a so-called Concentrated Inspection Campaign (CIC) this autumn in order to check the companies' compliance with applicable emission requirements.

This year's campaign will be held from 1 September to 30 November. If the vessel is subject to a port State control during this period, the inspector will go through a separate checklist with eleven questions. The campaign will be carried out jointly with the Tokyo MoU. The checklist was made available in August to give the industry time to prepare.

The aim for the Tokyo and Paris MoUs is to carry out approximately 10,000 inspections during the campaign period.

(The checklist can also be found in this report, on the next page). In connection with the coming into force of even stricter requirements for sulphur emissions on 1 January 2020, the Paris MoU will start an information campaign. The campaign will commence on 1 January 2019, and is meant to send a clear signal to the industry that the port State controls will enforce the new sulphur emission requirements from day 1.

NAVIGATION IN 2017

In the period from 1 September to 30 November 2017, port State control officers carried out a Concentrated Inspection Campaign on safety of navigation, including ECDIS (Electronic Chart Display and Information System). The campaign was carried out jointly with the Tokyo MoU.

"The safety of navigation requirements were generally met on board the ships inspected. Nevertheless, the lack of voyage planning is an area of concern," Paris MoU states in a press release.

A total of 4027 vessels were inspected using the campaign checklist. 47 of these were detained for CIC-related deficiencies. 25 of the detained ships were ordinary cargo ships.



PORTUGAL: In May representatives from the 27 member states of Paris MoU gathered for the annual committee meeting, this time in Portugal.

Photo: Paris MoU

Questionnaire for the Inspection Campaign on MARPOL ANNEX VI

No	QUESTIONS	YES	NO	N/A
1	Are bunker delivery notes, with details of fuel oil for combustion purposes, kept available on board for the required period of 3 years? <i>Annex VI, regulation 18.5 and 18.6</i>			
2	Do bunker delivery notes indicate that fuel oils delivered and used on board is not exceeding the maximum allowed sulphur content, as appropriate? <i>Annex VI, regulation 14.1.2 and 14.4.3</i>			
3	Do ships which are using separate fuel oils to comply with the maximum sulphur content of 0.1% m/m in fuel oil while operating in SO _x emission control areas, have a written procedure showing how fuel oil change-over is to be done for achieving compliance with the above requirements when entering SO _x emission control areas? <i>Annex VI, regulation 14.6</i>			
4	Are alternative arrangements, (e.g. scrubbers) installed on board according to regulation 4.1 approved by the flag State? <i>Annex VI, regulation 4.1</i>			
5	Do ships which are using separate fuel oils to comply with the maximum sulphur content of 0.10% m/m in fuel oil and entering or leaving SO _x emission control areas, record detailed information showing that the ship has completed/initiated the change-over in the logbook prescribed by the Administration? <i>Annex VI, regulation 14.6</i>			
6	Do ships which have rechargeable systems containing ozone- depleting substances (refer to the supplement to the IAPP Certificate, item 2.1), have the ozone-depleting substances record book maintained? <i>Annex VI, regulation 12.6</i>			
7	Where an Approved Method in accordance with Annex VI, regulations 13.7.1-13.7.5 (refer to the supplement to the IAPP Certificate, item 2.2.1) is installed, has such an installation been confirmed by a survey using the verification procedure specified in the Approved Method File, including appropriate notation on the ship's International Air Pollution Prevention Certificate of the presence of the Approved Method? <i>Annex VI, regulation 13.7.1.1</i>			
8	For ships equipped with a shipboard incinerator or thermal waste treatment device installed as an alternative arrangement, is the ship's crew responsible for the operation of the equipment familiar with, properly trained in, and capable of implementing the guidance provided in the manufacturer's operating manual? <i>Annex VI, regulation 16.8</i>			
9	Are the master and crew familiar with essential shipboard procedures in the approved VOC Management Plan relating to the prevention of air pollution from ships? <i>Annex VI, regulation 15.6</i>			
10	Does the ship keep on board a Ship Energy Efficiency Management Plan (SEEMP)? <i>Annex VI, regulation 22 paragraph 1</i>			
11	Was the ship detained as a result of the Inspection Campaign?			

Note: Questions 1 to 10 answered with a "NO" MUST be accompanied by a relevant deficiency on the Report of Inspection. If the box "NO" is ticked off for questions marked with an "*", the ship may be considered for detention.

The NMA's risk assessment

Overall risk scenario 2018

The Norwegian Maritime Authority (NMA) carries out a risk assessment on a yearly basis. The risk assessment is based on available statistical data on accidents and findings from inspections. These data are compared and used to assess the risks associated with defined hazardous and accidental incidents.

The assessment is performed on fishing vessels, passenger ships and cargo ships, as well as subgroups of these. For mobile offshore units, the report "Risk level in the Norwegian petroleum activity", published by the Petroleum Safety Authority Norway, forms the basis. Risk assessment is only carried out for Norwegian vessels. In other words, foreign vessels in Norwegian territorial waters are not included.

The NMA's risk assessment must be viewed in the light of on the fact that requirements and survey regimes will differ between various vessel groups. The assessment is carried out for each group of vessels as a unit.

RISK-BASED SUPERVISION YIELDS RESULTS

The overall results indicate a slightly positive trend. This applies in particular to passenger ships, except high-speed craft and cargo ships engaged on short sea voyages. We see a reduction in the number of serious incidents and a positive development for the number of inspection findings.

For smaller vessel groups, the number of reported accidents has increased. There is also an increase in the number of orders to rectify. Several orders to rectify may be connected with the introduction of new regulations on construction and supervision and safety management. Furthermore, in 2016 and 2017, the NMA has focused on safe operation of smaller vessels and increasing the number of inspections of the vessel group.

The overall number of inspections during the vessel's operational phase has been more or less constant the last five years. At the same time, we see a growing number of orders to rectify for each inspection carried out by the NMA. This is mainly due to an increased focus on smaller vessels and the introduction of new regulations.

FEWER FATALITIES AND TOTAL LOSSES

Looking at the last 30 years, the total loss rate and fatality rate have decreased. Especially the number of fatalities has shown a strong downward trend throughout the period. Fatalities as a result of accidents on Norwegian ships amounted to 230 between 1988 and 1992, whereas the number has been reduced to 36 in the last five-year period. That means an average of seven fatalities per year over the last five years. Just more than half of those who lost their lives were fishers.

The number of total losses fell significantly until 2003, and has gradually stabilised at an average of 16 total losses per year. Even though the number may vary considerably from one year to another, the overall trend is stable. The vast majority of vessels lost are smaller vessels, often under 15 metres.

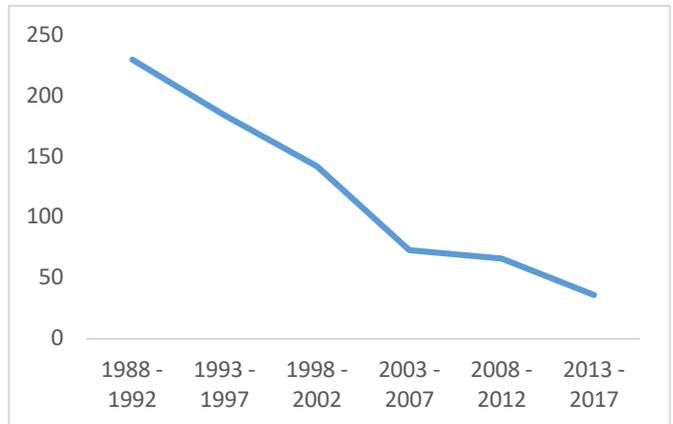


Figure 1: Development of number of fatalities, Norwegian-registered commercial vessels 1988-2017

POSITIVE DEVELOPMENT FOR PASSENGER SHIPS

In the analysis, passenger ships are divided into the following subcategories: ferries, high-speed craft, large passenger ships of 1,500 gross tonnage and upwards, and other passenger ships.

Compared to other vessel groups, the number of Norwegian passenger ships lost and fatalities on board is relatively small. On average, the NMA has registered one fatal accident and one total loss per year for passenger ships during the last ten-year period. The majority of the vessels lost are vessels of less than 24 metres, and most losses are due to grounding or fire. During the last ten years, there has not been a single fatality related to a vessel loss. Most fatalities are isolated accidents, and in particular falls overboard. A major exception is the fire on board the coastal ship Nordlys in 2011, where two persons lost their lives. Half of the fatalities in the last ten-year period were passengers, whereas the other half were crew members on board the vessel.

For ferries engaged on domestic voyages, fall-related accidents and impact/crush injuries are considered to have the highest risk. Other incidents considered high-risk are contacts and groundings. From 2009 to 2014, we observed an increasing number of contacts and groundings on arrival at port, but the trend has reversed.

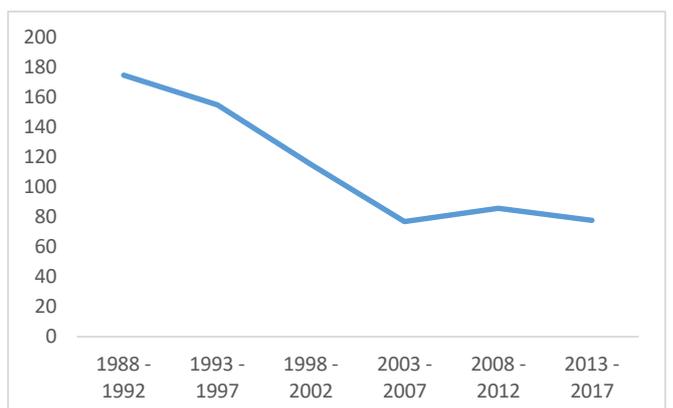


Figure 2 Development of number of total losses, Norwegian-registered commercial vessels 1988-2017

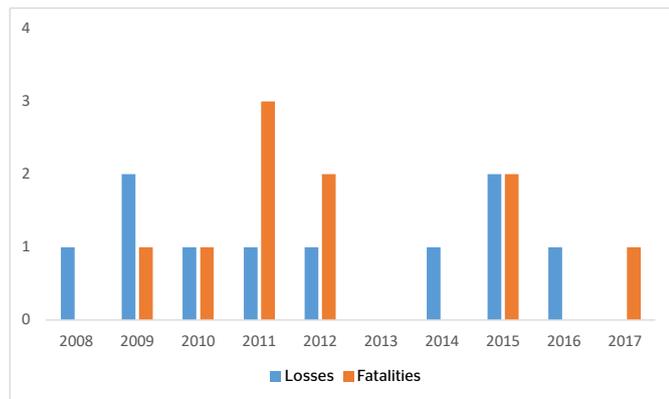


Figure 3: Total losses and fatalities, Norwegian-registered commercial vessels 2008-2017.

The risk of grounding is still considered to be high, which is primarily due to older vessels constructed before 1992. Such vessels have lower standards for watertight integrity than modern vessels, and are thus more vulnerable to damage. The industry shows a strong willingness to start using new propulsion solutions (battery, hybrid and hydrogen) on ferries engaged on domestic voyages. This creates huge technical challenges for the NMA, as well as a substantial need to develop and audit procedures and checklists related to certification.

In recent years, there has been a growth in the number of accidents involving high-speed craft, from 10 incidents in 2012 to 21 in 2017. In the same period, the number of personal accidents has fallen. The number of groundings, which according to the analysis appear to be the incidents with the highest risk, has also been reduced. No fatalities have been reported since the Sleipner disaster in 1999. Groundings, contacts and impact/crush injuries are still considered the incidents with the highest risk.

The number of large passenger ships has increased during the last years. However, the number of accidents is stable. This indicates that the companies of this vessel group ensure good safety management. Fall-related incidents on board, fire/explosion and impact/crush injuries are considered the incidents with the highest risk. The assessment has not changed from 2017 to 2018. No fatalities have been reported for this vessel group since 2015.

The vessel group of smaller passenger ships of less than 1,500 gross tonnage (except ferries engaged on domestic voyages and high-speed craft) mainly consists of small ferries, etc. The group includes a number of seasonal vessels, for instance charter and taxi craft. From 2016 to 2017, there has been a small decline in the number of ship accidents, but a small increase in the number of personal accidents. Falls overboard, fire/explosion and groundings are considered the incidents with the highest risk. The assessment has not changed from 2017 to 2018.

STABLE FOR LARGE CARGO SHIPS - MORE ACCIDENTS ON SMALLER VESSELS

In the risk assessment, cargo ships have been divided into the following subcategories: offshore vessels, short sea vessels, overseas vessels and cargo ships of less than 24 metres. Unmanned barges have not been included in the assessment. Measured in

number of vessels, the largest group is cargo ships of less than 24 metres. Measured in gross tonnage, the largest group is overseas cargo ships.

During the last decade, the NMA has registered 30 total losses and 41 fatalities on Norwegian cargo ships. The vast majority of the fatal accidents where there are one or two fatalities, but in 2009, six persons lost their lives as the Norwegian cargo ship Langeland went down south of the Koster Islands on the west coast of Sweden.

Nevertheless, most fatalities in recent times are not related to total losses, but occupational accidents. 66% of the 41 fatalities overall were due to occupational accidents, whereas 27% were related to capsizing. The remaining seven per cent were due to fire on board the vessel. Most incidents occur while the vessel is underway and operating, but a large percentage (44%) take place when the vessel is at berth or in port.

Almost every total loss registered by the NMA occur in Norwegian territorial waters. The most common causes within this group are capsizing (12), followed by groundings (7) and leaks (6). The remaining five incidents were caused by fire and other types of accidents.

On offshore vessels, the number of personal accidents has fallen. The number of ship accidents increased until 2014, but has fallen since. The last registered fatality occurred in 2010. Compared to other groups of cargo ships, the risk on board offshore vessels is considered generally low. This vessel group reports few incidents and is mostly assumed to have a high standard of safety. Impact/crush injuries and capsizing are considered the incidents with the highest risk. Only one incident involving capsizing/stability failure has been registered. That was the sinking of the Bourbon Dolphin in 2007, where a total of eight people lost their lives. Since the Bourbon Dolphin accident, a number of measures have been introduced in the Norwegian offshore industry to prevent similar incidents.

On short sea vessels, the number of personal accidents has gone down since the full-scale registration was started in 1990. The number of ship accidents has fallen correspondingly. The trend reversed in the period 2005-2013, but in recent years, we have observed a new decline. The number of total losses and

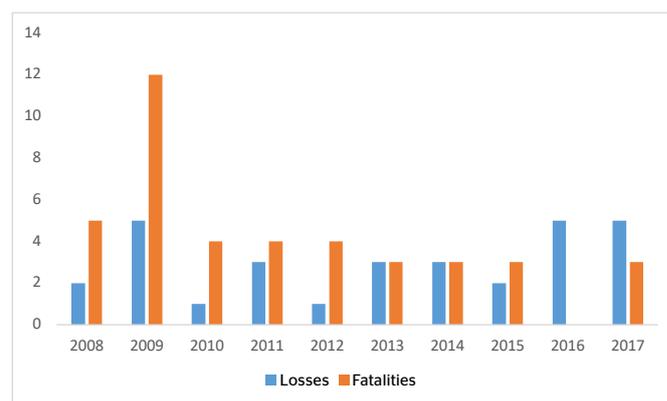


Figure 4: Total losses and fatalities, Norwegian cargo ships 2008-2017

fatalities has been significantly lower the last ten years in comparison to the previous ten-year periods. The number of injured persons is somewhat more stable. Leaks/capsizing, fall-related incidents on board and falls overboard are considered the incidents with the highest risk.

The number of accidents on overseas vessels has been stable since 2010. Until then, there was a considerable decline, particularly in the number of personal accidents, from the early 90s. This decline was partly due to a reduced number of vessels, but the number of Norwegian vessels of this vessel group has grown during the last few years. According to the analysis, personal accidents, such as fall-related incidents on board, falls overboard and impact/crush injuries are the incidents with the highest risk. Compared to other vessel groups, accidents rarely result in a total loss. The last registered total loss occurred in 2008.

The number of smaller cargo ships has increased significantly in recent years. A large percentage of the increase is related to workboats, etc., for the aquaculture industry. The number of ship accidents in the vessel group has increased from about nine per year in the period 2012-2014 to twenty the last three years. We have seen an increase in the number of several types of accidents, but groundings make up around half. The increase can probably be accounted for partly by the introduction of regulations on construction and supervision in 2015, which is assumed to affect the level of reporting. Capsizing is considered the highest risk incident, followed by impact/crush injuries and leaks.

NEW REQUIREMENTS FOR SMALLER FISHING VESSELS

In the analysis, fishing vessels are divided into vessels over and under 15 metres. During the last ten years, the NMA has registered a number of fatalities on fishing vessels which is equal to the number of fatalities on passenger ships and cargo ships combined. In addition, more than three times as many losses of fishing vessels have been registered as of other vessel groups combined. All four fatalities registered so far in 2018 have occurred on board fishing vessels.

In 2013, the NMA laid down new requirements for the inspection of fishing vessels between 8 and 10.67 metres. For existing vessels, the requirements will be gradually phased in until 2021.

The vessel group fishing vessels over 15 metres includes all types of large fishing vessels. Therefore, there is a variety of operational forms, designs and territorial waters related to this group.

In recent years, vessels to be used for snow crab fishing have also been included. In Norway, we have limited operational experience with this kind of fishery industry, which brings new and unknown risks. Moreover, some of the vessels used for this fish-

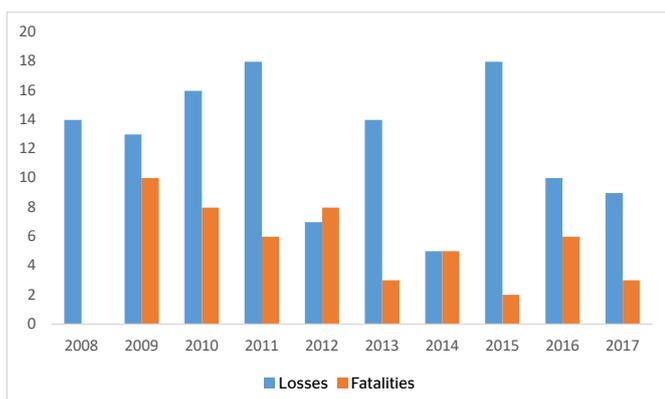


Figure 5: Total losses and fatalities, Norwegian fishing vessels 2008-2017



The Norwegian tank ship Bow Jubail hit the news for spilling oil after a collision in Rotterdam in 2018. CLIP FROM DAGENS NÆRINGSLIV

ery, are of older date. The NMA will be keeping an eye on this development. The number of accidents fell significantly from the beginning of the 2000s, but has stabilised at about 100 incidents per year since 2010. The majority are personal accidents, which make up about 75 incidents per year. Falls overboard, groundings, fire/explosion and impact/crush injuries are considered incidents with high risk.

Fishing vessels under 15 metres are the ones most commonly involved in total loss accidents. 85% of the 124 total losses occurred to smaller fishing vessels. Total losses of fishing vessels can be due to many things, but fire, grounding, capsizing and leaks are recurring factors.

The vessel group of fishing vessels under 15 metres includes all types of smaller fishing groups. There is a slight increase in the number of vessels in the fleet. The vessel group differs from other commercial vessels in that the ownership is widely dispersed. The vast majority of the vessels are owned and operated by the same person and are not part of a larger company.

Around 61% of the deaths are due to occupational accidents, whereas the remaining 29% are caused by various types of ship accidents, such as grounding and capsizing. Among the occupational accidents, fall overboard and impact/crush injury are recurring factors. On contrary to cargo ships, few fatal accidents occur on fishing vessels at berth. 86% of all fatalities on fishing vessels take place while the vessel is in operation. It is fairly unusual for more than one fisher to die in the same accident. Of the 49 accidents overall, only two incidents resulted in more than one fatality.

Fishing vessels under 15 metres are generally considered to have the highest risk of all commercial vessels. The number of accidents fell from the mid 90s, but has stabilised at about 40 incidents per year since 2010. There is probably some degree of under-reporting in this vessel group. Capsizing, groundings and falls overboard are considered the incidents with the highest risk. However, also other types of accidents are considered to have high risk compared to other vessel types.

High risk is associated with both operational modes, size of vessels and the fact that the vessel is often operated by one or two persons. Altogether, this leads to a higher likelihood of incidents and a reduced chance of saving the situation if something happens, compared to other commercial vessels.

The NMA's risk assessment

The most serious incidents

70% per cent of the total losses and 86% of the fatalities in period 2008-2017 were due to six different types of accidents.

FIRE

Fire on board a ship is a serious incident that can quickly turn into a disaster. Large ships are often provided with equipment designed to detect and extinguish a fire. Even a small fire can be dramatic.

Most fires start in the ship's engine room. Fuel leaks and electrical faults are major causes. Insufficient maintenance and inspections are attributed as underlying reasons why faults arise or are not detected.

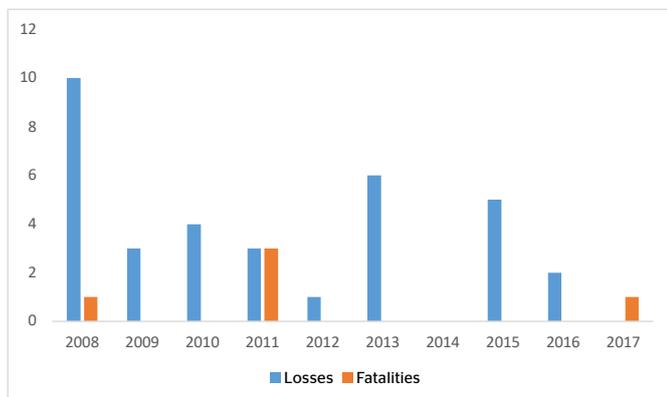


Figure 6: Total losses and fatalities, fire, 2008-2017.

Fire results in relatively few fatalities, but often causes substantial material damage. During the last ten years, we have registered 34 total losses, whereof 31 were fishing vessels.

GROUNDING

Most groundings result in limited damage. Human factors are the most important cause for why ships run aground. Lack of alertness and impaired judgement are key reasons. Underlying causes are related to inadequate safety management and insufficient rest. Some groundings occur as a result of loss of propulsion power or steering control.

During the last ten years, groundings have resulted in three fatalities. The last major incident occurred in 1999, as 16 people were killed in the Sleipner accident.

Fishing vessels represent the majority of the total losses, and account for 71% of all incidents during the last ten-year period. Nearly 60% of all incidents take place on vessels under 15 metres.



HIT GROUND: The cargo vessel *Optimar* hit ground outside *Averøya* in Norway in December 2017. All crew members were rescued. PHOTO: THE NORWEGIAN SOCIETY FOR SEA RESCUE

FALL-RELATED ACCIDENTS

Fall-related accidents can largely be divided into two main categories: falls on board and falls overboard. Uncertain work practice and lack of safety measures are important causes. Good routines for implementing and updating risk analyses are also important.

Falls overboard occur from most types of vessels, but most commonly from fishing vessels. The majority of fatalities happen in open waters.

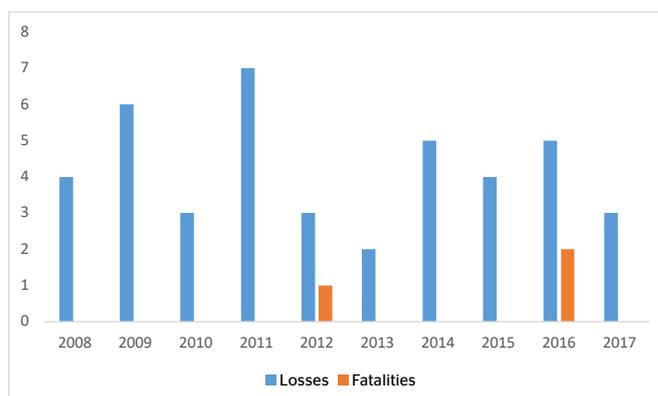


Figure 7: Total losses and fatalities, grounding, 2008-2017

During the last ten years, we have registered a total of 45 fatalities due to fall-related accidents. 38% of these were falls on board, whereas 62% were falls overboard. The majority of incidents take place on fishing vessels, where all accidents are falls overboard.

CAPSIZING

Capsizing is perhaps the most dramatic type of incident that can occur to a vessel. The time elapsing from the moment the crew members realise the severity of the situation until it escalates into a disaster, is generally short.

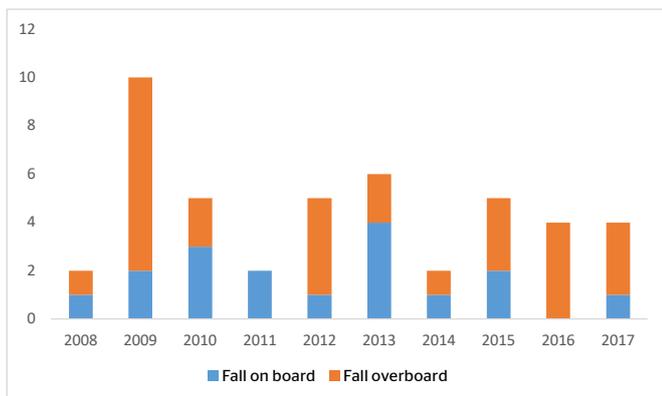


Figure 8: Fatalities, fall-related accidents, 2008-2017

Cargo being incorrectly stowed or insufficiently secured are key reasons for capsizing. This impairs the vessel's stability, and could, alone or when combined with flooding and effects from external forces, lead to a critical situation. Lack of knowledge of stability and the vessel's operational limitations are recognised as important underlying causes.

Nearly two thirds of the capsizings occur in outer coastal waters or in the open sea. During the last ten years, one third of the capsizings involved fishing vessels, whereas the rest occurred to cargo ships.

20 people have lost their lives in 13 capsizing incidents during the last decade. In the same period, no passenger ship has capsized. Cargo ships represent 55% of the fatalities, whereas the remaining fatal accidents took place on fishing vessels.

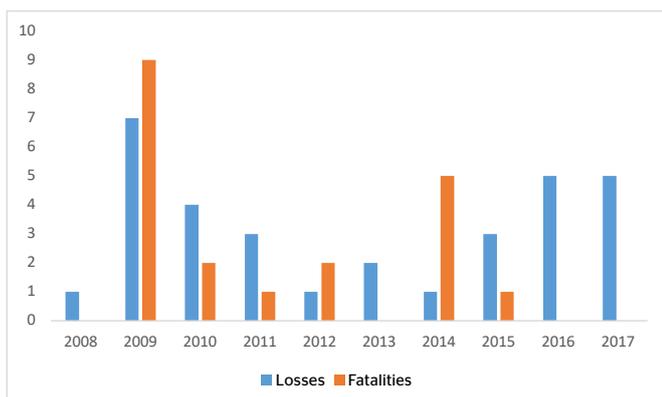


Figure 9: Total losses and fatalities, capsizing, 2008-2017

IMPACT AND CRUSH INJURIES

Together with fall-related accidents, impact and crush injuries are among the most common causes of injury. Many impact and crush injuries are caused by the use of heavy work equipment such as winches and cranes. Underlying causes are identified as intense work pressure and lack of understanding of the risks. Some people work alone, which means that there is nobody around to provide the necessary first aid should an accident happen.

During the last decade, the NMA has registered 15 impact and crush injuries with a fatal outcome on Norwegian commercial vessels. Additionally, we have registered a number of serious incidents involving severe injuries. The same number of fatal accidents was registered for fishing vessels as for cargo ships, whereas one fatal incident was registered for passenger ships.

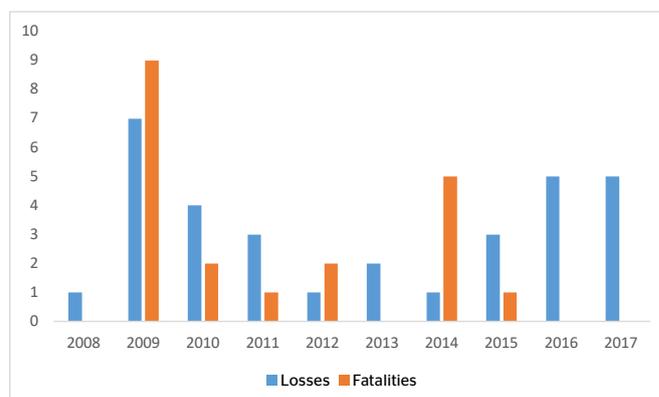


Figure 10: Fatalities, impact/crush injuries, 2008-2017

COLLISION

A collision involves two or more vessels underway. The causal analyses for collisions point to many of the same causes as for groundings. The complexity of the traffic situation and the interaction between vessels are other important factors.

The NMA has not registered any fatalities due to collisions on Norwegian commercial ships the last ten years. The last fatality caused by collision occurred in 2007. The last decade, we have registered two incidents where Norwegian vessels have collided with foreign vessels, resulting in several fatalities on the foreign vessels. Both incidents occurred in China.

Six fishing vessels were lost due to collision the last ten years, in 2010, 2011, 2012 and 2015 respectively. Most cases involved a large vessel colliding with a small fishing vessel.



The Norwegian fleet

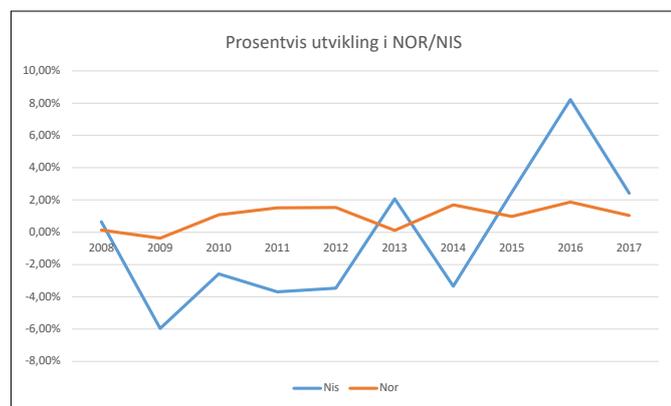
Three successive years of growth

By the end of 2017, 12,023 commercial vessels were registered in a Norwegian ship register, whereof 593 were registered in the NIS and 11,430 in the NOR¹. This constitutes an overall increase of 132 Norwegian-registered vessels compared to 2016. The number of NIS vessels has risen by around 2.4 %, whereas the number of NOR vessels has increased by around 1%. The end of 2017 marked three successive years of growth in the NIS register.

The development of the Norwegian fleet is mostly due to an increase in the number of cargo ships. Whereas 4,058 cargo ships were registered in a Norwegian ship register in 2016, the number went up to 4,243 in 2017. These cargo ships is a complex group that consists of everything from small workboats, towing vessels and freighters to offshore vessels, tankers, vehicle carriers and container ships.

Over the last ten-year period, the average age of vessels in the NOR fleet has remained relatively stable, indicating that older vessels are being replaced on a regular basis. At the same time, the average age of the vessels in the NIS fleet has decreased from 15.4 years in 2008 to 12.5 years in 2017. This is mainly due to older vessels between 20 and 35 years of age being replaced by newer vessels.

The difference in age is relatively large, and can vary a lot between the different subgroups. The ferry fleet, for instance,



COMPLEX GROUP: The development of the Norwegian fleet is mostly due to an increase in the number of cargo ships. These cargo ships is a complex group that consists of everything from small workboats, towing vessels and freighters to offshore vessels, tankers, vehicle carriers and container ships.

PHOTO: HÅKON SEIM/SEAFARERS PHOTO CONTEST

had an average age of 32.6 years in 2017, whereas catamarans had an average age of 9 years. There are also big differences between the two registers. Cargo ships registered in the NOR had an average age of 22 years in 2017, whereas NIS-registered cargo ships were only 12 years old on average.

The overall tonnage of the Norwegian fleet² continues to grow, and by the end of 2017, it amounted to just over 18,836,000 gross tonnage. This was an increase of around 0.8% compared to the previous year and represented the highest level since 2008.

¹ The NOR register also includes 8,486 recreational craft. The total number of NOR vessels is therefore 19,916.

² The gross tonnage is only calculated for vessels required to have a tonnage certificate. Of the 12,023 commercial vessels in total, around 50% have registered gross tonnage.

Who is responsible for what?

THE RESPONSIBILITIES AND ROLES OF THE NORWEGIAN MARITIME AUTHORITY

The Norwegian Maritime Authority (NMA) is an administrative and authoritative body with the superior objective to be an attractive flag state with a high level of safety for life, health, property and the environment. The NMA is subordinate to the Ministry of Trade, Industry and Fisheries and the Ministry of Climate and Environment, and its activities are governed by political decisions, allocations, commissions and international obligations.

Some of the main tasks of the NMA are supervision of Norwegian registered vessels and the companies operating these vessels, inspection of foreign ships in Norwegian ports and the registration and follow-up of accidents.

In its work to prevent accidents, the Norwegian Maritime Authority shall in the years to come, strongly emphasize that shipping companies comply with safety management systems, and will focus more on safety culture and less on detail control during inspections.

An important tool in this work is the transition to risk-based supervision, which will be a leading focus in the work of the Norwegian Maritime Authority. The consequence of risk-based inspections will be that focus is put on those areas gaining safety and the environment the most.

The NMA shall also be a visible and clear driving force in the international regulatory work, for instance through participation in organizations such as IMO, ILO, Paris MoU and EU.

THE RESPONSIBILITIES OF THE SHIPPING COMPANIES

The primary obligation of the shipping company is to ensure that the construction and operation of the ships is in accordance with the Ship Safety and Security Act and the regulations founded on this act. In order to ensure compliance with acts and regulations, the shipping company also has a duty to establish, implement and develop a document based and verifiable safety management system - both throughout the shipping company's organization and on each individual ship. The objective of the safety management system is to identify and manage risk, as well as ensure that requirements stipulated in or pursuant to acts, or in the safety management system itself, are complied with.

In those instances where the shipping company also is the employer, they have an equal obligation to ensure that the requirements of the Ship Labour Act and its regulations are complied with.

In those instances where the shipping company is not the employer, the responsibilities of the shipping company is more limited according to the Ship Labour Act.



SUPERVISION: Some of the main task of the NMA is to carry out inspections onboard Norwegian registered vessels and their shipping companies, as well as registration and follow-up of accidents..

PHOTO: HÅKON NORDVIK

THE ROLES AND RESPONSIBILITIES OF THE EMPLOYEES

The employees onboard a ship have a primary obligation to participate. The captain has a distinct responsibility to participate in the establishment, implementation and development of the safety management system and shall in addition, contribute to the adherence to the safety management system onboard and that the system functions as intended.

Others working onboard shall contribute to the adherence of the safety management system in accordance with the job description of the position they hold.