



Sjøfartsdirektoratet
Norwegian Maritime Authority



FOCUS ON **RISKS** 2018

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Circulation: 1000

Print: Merkur Grafisk AS

Cover photo:

Steinar Haugberg/NMA





Effort and focus bring results

The Norwegian Maritime Authority keeps statistics on marine accidents. The accidents are registered as shipping accidents or work incidents on board ships. The number of accidents varies somewhat from year to year. Since 2006 we have seen a general increase in registered shipping accidents, but the number has decreased substantially this past year. The long-term trend is clear: The accidents are less serious and the number of fatalities is reduced. In other words, it has become safer to work onboard Norwegian ships. Efforts to prevent accidents have given results.

A few years ago, we experienced a considerable increase in so-called contact damages. Accidents involving ships running into bridges or quays. The results for ferries were especially bad; passenger injuries, damage to cars, damage to ferries, smashed up ferry quays and cancellations. Now the trend has turned and the number of such incidents has been substantially reduced. This is not coincidental. The ferry shipowners, both individually and in cooperation, have through goal-oriented focus and effort, managed to turn the trend. The result being not only fewer accidents, but also that the ferries manage to keep to their schedules - giving the shipowners a better reputation and economy.

The general development and the ferry-example show that it is possible to reduce the number of accidents and unwanted incidents. It is important that we learn both when something goes wrong, but also when positive things happen. Focus brings results.

Even though we are heading in the right direction, we still have a ways to go before it is just as safe to work at sea as it is to work on land. The number of accidents are still too high. Too many people get hurt or at worst, lose their lives. The work to reduce the number of accidents even further must therefore continue.

The reason for establishing the Norwegian Maritime Authority in 1903, and the main reason for its existence today, is mainly the same. Our job is to reduce the number of shipping accidents and improve safety at sea. We are at work on different fronts to achieve this. For instance, the Norwegian Maritime Authority carries out inspections of records on newbuildings

and reconstructions, do periodic inspections, certifications and audits, develop rules and regulations and work to change attitudes.

The work of the Norwegian Maritime Authority is important for the safety at sea, but the industry itself is nevertheless the most important participant in the work to further decrease the number of accidents.

Our investigations show that accidents are often caused by the shipowner's lack of safety management. The Norwegian Maritime Authority therefore finds it important to remind the shipowners of their own responsibility to carry out systematic work to prevent accidents from happening.

The International Safety Management Code (ISM) is a good tool to achieve this. The code encourages you to think about all aspects of the operation, both onboard the ships and in the organisation on shore, and to have a management system for health, environment and safety.

From 1 January 2017 a new regulation on safety management onboard smaller vessels entered into force. "Regulation No. 1770 on safety management for small cargo ships, passenger ships and fishing vessels, etc." has been prepared in close cooperation with the industry.

The Norwegian Maritime Authority would like all shipowners to succeed in their work to get such a system into place, as well as compliance with the system. Therefore, we have prepared guidance material with good examples of how this can be done. The Norwegian Maritime Authority also offers counselling, support and risk assessment tools for those who are interested.

In order to keep up the pressure on safety and safe operation, we have decided to keep safety management as our focus area also in 2018, with a special focus on the smallest vessels.

*Olav Akselsen,
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Overall risk scenario 2017

The risk assessment performed by the Norwegian Maritime Authority (NMA) is based on 25 hazardous and casualty events on different vessels. Six of these events are considered high risk: grounding, collision, capsizing, fire, falls overboard and crush/impact injuries.

In the spring of 2017, the NMA updated the analyses on which its risk assessment is based. Based on this assessment, six events in particular stand out.

Over the last ten years, the NMA has seen an increase in the reported number of marine casualties. Fortunately, it is the less serious accidents that have seen an increase. The number of incidents of serious damage to ships and total losses has remained stable during the period.

Parts of the maritime industry have faced major financial challenges in recent years. Many ships have had to be laid up, and for those still in operation the wait between jobs has become longer. In this perspective, it is vital to continue the good safety practices that have already been implemented.

It is important to remain focussed on this even though the wait between jobs is longer, both for the ships and the crews. Safety must always be the top priority, both in terms of the day-to-day work and in the operation of the ship. Remember, safety is an ongoing issue.

The maritime industry is constantly evolving. Many of the changes taking place inherently contribute to improved safety. Other changes are testing the framework laid down by the regulations, and a fresh approach needs to be taken in order to maintain a high level of safety. In addition to ensuring that innovation plays a part in maintaining or improving the established level of safety within the fleet, the NMA is seeking to ensure that Norwegian innovation becomes the international standard. This will provide both a higher level of safety and new opportunities for the industry.

Groundings

Over the last ten years, the NMA has registered an average of 87 groundings of Norwegian commercial vessels per year. The peak year was 2011, with 99 registered occurrences. This



Photo: Steinar Haugberg/NMA



Photo: Jonathan E. Sison/ Seafarers Photo Contest

number has subsequently fallen somewhat, and in 2017 it was 84. Most groundings result in minor damage to the vessel. The number of groundings resulting in total loss has remained relatively stable during the period, and the number of groundings causing serious damage has fallen.

Three fatalities have been registered in connection with the 870 groundings of Norwegian commercial vessels over the last ten years. Two of these occurred in 2016. During the ten-year reference period, we have seen several examples of groundings that have led to environmentally harmful discharges, but the majority of these are relatively small amounts of diesel or lubricating oil. A few discharges of several thousand litres have been registered. The largest discharge from Norwegian vessels in connection with groundings in this period is 12,000 litres of marine gas oil.

The causal analyses indicate that human factors in particular are crucial factors in ships running aground. Lack of vigilance and errors of judgement play a large role. Underlying causes related to hours of work and rest are also highlighted. Some groundings are a result of a failure in the vessel's steering and propulsion systems.

The number of recommendations issued in relation to groundings was relatively stable in the period 2012–2014, but 2015 and 2016 saw a slight increase. On average, 964 recommendations were issued per year in connection with grounding, and the total for 2016 was 1,115.¹ The vast majority of recommendations issued in connection with this type of accident relate to faults in navigation equipment and propulsion and auxiliary machinery.

In a survey on maritime safety conducted by the NMA in the spring of 2016, 21% of deck officers replied that they sometimes, quite often or very often work more than 16 hours a day. A total of 33% stated that they breach the provisions on hours of work and rest at least once a month. The survey also showed that many companies have room for improvement when it comes to their voyage planning practices.

Groundings were a key reason behind the NMA's decision to have rest periods and manning as a focus area in 2016. Results from inspections show an increase in the number of findings related to conditions that are key causal factors in groundings.

Fires

The period 2007–2013 saw an increase in the number of fires, peaking in 2013 with 35 registered incidents. Since then, the number has fallen somewhat. In 2016, the NMA registered 25 fires on Norwegian commercial vessels. The average for the last ten years is 24 per year.

Four fatalities were registered in the same period. Two of these occurred on the coastal ship Nordlys in 2011. A fire on a large passenger ship is one of the scenarios we fear the most. However, these occurrences are very rare, and the larger vessels are also well equipped to handle most situations. Smaller vessels are more vulnerable, and are more often lost as a result of fires.

Most fires start in the ship's engine room, and our causal analyses point to hydrocarbon leaks and electrical faults as the main causes. Poor maintenance and inspections are considered to be underlying reasons for faults arising or not

¹ Note that some non-compliances will be appropriate for several types of accidents. An example of this is non-compliances related to access to hazardous zones. In our assessments, we have linked these findings to both falls and crush/impact accidents. Many orders to rectify are therefore placed in more than one accident category. The sum of the orders to rectify mentioned here may therefore be greater than the total number of orders to rectify issued by the NMA.



being found. The age of a ship will partly determine its maintenance needs.

In the period 2012-2016, the NMA saw a slight downward trend in the number of orders to rectify issued in relation to fires. Just under half of the non-compliances were of such a serious nature that they had to be rectified before the vessel was allowed to proceed. Most orders to rectify are issued for faulty fire-extinguishing equipment, but faults in electrical installations and non-conformities related to drills and instructions often result in orders to rectify.

In the survey on maritime safety conducted by the NMA in the spring of 2016, 56% of engineers replied that they agreed fully or somewhat with the statement that 'time and resources for maintenance and inspection of vessel and equipment are sufficient'. Moreover, 22% were of the opinion that 'on my vessel, minor modifications/maintenance is sometimes carried out by people without the necessary expertise (with the exception of training situations)'.

Fire and explosion was the NMA's focus area in 2014.

Collisions

Over the last ten years, the NMA has registered on average 19 collisions per year. We have seen a downward trend in these numbers over the last few years, but this trend was broken in 2015 when 25 incidents were registered, compared to 9 the year before. This level continued in 2016, when 25 such incidents were registered.

One fatality has been registered in connection with collisions involving Norwegian ships in the last ten years. Like groundings, most incidents are minor, resulting for the most part in purely cosmetic damage to the ship. On average, we register less than one collision leading to total loss per year. However, at worst, collisions could ultimately have major consequences for human life, the environment and material assets. This is part of the reason the scenario 'Collision at sea off the coast of Western Norway' is covered by the Norwegian Directorate for Civil Protection (DSB) in their report 'National Risk Analysis'.

The causal analyses for collisions point to many of the same causes as for groundings. However, they also point to the traffic situation in the waters in question as well as the interaction between vessels.

Orders to rectify linked to collisions have shown a slight downward trend in the period 2012-2015, but increased slightly in 2016. On average, 1,457 orders per year have been issued in this group. In 2016, 1,581 orders to rectify were issued that could be linked to collisions. Non-compliances related to stability and construction are the most common findings. As for grounding, many orders to rectify are also issued for deficiencies in machinery and navigation equipment. This is to be

expected as there is a large overlap between collision-related and grounding-related orders to rectify.

In the survey on maritime safety, 18% of deck officers replied that they never have the opportunity to have two navigators on the bridge, either due to manning levels or to regulations on hours of work and rest.

Capsizings

The number of capsizings/listings has seen a small reduction in the reference period. From a peak of nine in 2009, between one and five incidents have occurred per year in the last seven years.

Despite this, capsizing has the second highest number of fatalities of all accidents in the period 2007-2016, just behind occupational accidents. During the reference period, a total of 29 persons lost their lives in a total of 16 capsizings. Almost half of these perished in two major accidents; the Bourbon Dolphin in 2007 and the Langeland in 2009. The Bourbon Dolphin accident had substantial consequences, and the NMA, in cooperation with the industry, has implemented several measures aimed at preventing similar incidents. Most vessels that capsize are small cargo and fishing vessels. There is only one case of a passenger ship capsizing; the King Øystein ferry, which capsized in 1984 because its load shifted as vehicles were driven on board. There were no fatalities due to the capsizing of Norwegian commercial vessels in 2016.

When a ship capsizes, it is likely to founder. Very few cases of environmentally harmful discharges are reported for capsized ships since only acute discharges are registered in the database. Foundered vessels carrying hazardous substances represent a danger to the environment, and clean-up costs are high.

The causal analyses point to cargo being incorrectly loaded or secured as key reasons for capsizing. This impairs the vessel's stability, and when combined with external forces and flooding, a critical situation could develop. Some vessel types, such as tugs and some fishing vessels, are exposed to strong external forces when in operation. The NMA's analyses point to a lack of knowledge on stability in general and the vessel's operational limitations in particular as important underlying causes.

The number of orders to rectify issued fell during the period 2012-2015, but in 2016 saw a sharp increase. The average number of issued orders in the period is 818 per year. In 2016, we registered 910 capsizing-related orders to rectify. Findings related to watertight integrity and non-conformities with regard to the vessel's stability documentation are common factors. One important factor is failure to update the vessel's stability documentation following modifications and alterations.

In the survey on maritime safety, 23% of the respondents disagreed with the statement that they have sufficient time for training on board.

Fall-related accidents

The number of fatalities from fall-related accidents in the period 2007-2016 was relatively stable, with an average of just over four per year over the ten-year period. Around two-thirds of these were accidents where the person fell overboard. Most falls overboard occur on fishing vessels, but other vessel types are also represented. Fatalities from falls overboard have shown a slight downward trend in the period. Fall-related accidents without fatalities also showed a downward trend in the period, but falls overboard in general are showing a worrying increase. However, this increase may be due to a greater willingness to report.

Falls overboard take place on various types of vessels. The NMA receives many reports about fall-related accidents from fishing vessels in particular. The majority of fatalities in connection with falling overboard happen in open waters, but a significant amount also occur in ports. The causal analyses point to several key causes, where unsafe work practices and lack of protection play a large role. Good routines for implementing and updating risk analyses are also crucial.

Negative findings from inspections connected with fall-related accidents have been on the increase in recent years. This can probably be linked to the focus area 'Safe workplace on board' in 2015. Most of the issued orders to rectify relate to accident prevention measures, including implementation of risk assessment. Another recurring issue is lack of emergency equipment on board for man overboard situations.

In the survey, 27% responded that they agree fully or partly that it is sometimes necessary for the crew to expose themselves to danger in order to get the job done. On the question of use of protective equipment, almost 80% responded that their colleagues wear protective equipment. An even higher number of respondents, 87%, said that they point it out to their colleagues if they are not using the proper protective equipment.

Impact and crush injuries

The number of impact and crush injuries was in rapid decline at the start of the period 2007-2016, from an average of approximately 129 incidents in the first five years to an average of around 88 in the last five years. On average, impact and crush injuries have led to 1.4 fatalities per year in the last ten years. This is also a type of accident where the NMA sees many serious injuries.

An important cause of impact and crush injuries is use of heavy work equipment such as winches and cranes, where the employee is pulled in or pressed against something with great force. Underlying causes are related to intense work pressure and lack of understanding of the risks. Some employees work alone, which means that there is nobody around to administer first aid if an accident occurs. The NMA



Photo: Jonathan E. Sison/ Seafarers Photo Contest

points to better and systematic work with risk assessments along with proper training on board as important measures, in addition to better adaptation of work stations.

The number of orders to rectify related to impact and crush injuries has gone up in the last five years. These statistics will also be impacted by the NMA's focus area in 2015. Most orders to rectify relate to safety equipment and accident prevention measures.

In the survey on maritime safety, 10% of the respondents disagreed fully or partly with the statement 'on my vessel, tasks involving risks are always executed in accordance with the relevant procedures'. A total of 31% of respondents stated that they have to breach the procedures in order to get the job done.

Focus area 2018:

Safety management on smaller vessels

A lack of operational work procedures and weaknesses in organisation, management and communication are often cited as causal factors in reports following marine casualties. In 2018, the Norwegian Maritime Authority' surveyors will therefore put special focus on safety management on smaller vessels, with the emphasis on operational conditions.

In several of its investigation reports, the Accident Investigation Board Norway has noted the need for supplementary rules regarding safety management systems on vessels. The Norwegian Maritime Authority (NMA) believes that systematic safety management is a crucial instrument for preventing accidents. To highlight the importance of this, the NMA has chosen safety management with an emphasis on operational conditions as the focus area for 2018.

The term 'operational safety' is understood to mean safety related to vessel operations that are regarded as high risk.

Greater focus on safety culture and safety management systems and less detailed controls in our supervisory work are also in keeping with international developments.

Why operational safety?

Capsizing and falls overboard are important risk factors on smaller vessels. These incidents typically occur in connection with vessel operations in which a worker moves towards the outer edge of the vessel – for example, during towing, anchoring, loading and unloading with a crane, fishing with trawl nets, etc.

The new Regulations on safety management for small ships require general emergency preparedness plans to be in place and risk assessments to be conducted.

During 2018, the NMA will conduct inspections to check whether incidents that are historically important risk factors have undergone a risk assessment and have been included in the safety management system on board the vessels.

Systematic efforts

Safety management entails establishing a system to achieve and maintain a high level of safety so that risk can be more easily controlled. Simply put, it is about improving the end result by laying the proper groundwork. Operations can be

made safer and more effective by developing an organisational structure where management, planning, allocation of responsibility, routines, procedures and resources are described. Working systematically with this and learning from one's own and others' experiences will in time create a good safety culture on board. To continually improve safety management, unwanted incidents must be reported and followed up systematically, and the system itself must be evaluated on a regular basis.

How to successfully establish a safety management system

The safety management system must be adapted to the company and its activities. This is why it can be wise to begin with a specific description of the company's main activities, including the number of employees, work duties, equipment and materials. It is critical that workers on board vessels are given ownership of the system. It can be beneficial for the individual procedures to be written by the personnel who perform the specific work duty as part of the day-to-day operations; they are the ones who are most familiar with the work. Then there must be a check to ensure that the procedures meet existing regulatory requirements and that they do not conflict with other rules within the system. ►



Photo: Espen Bratlie, Samfoto/NTB Scanpix

The NMA has observed that there is an entrenched belief in some parts of the industry that a safety management system must, by definition, be an extensive, cumbersome system. This is not the case. The challenge often lies in making the system as simple and easy-to-understand as possible. In other words, the system must be directly aimed at preventing injury to people and damage to materials, facilities and the environment. The system should be easy to maintain and practical to use in day-to-day operations. If systems are too extensive, especially with regard to operational work descriptions, they can have the opposite of the intended effect.

The main parts of the management system should describe the principal activities, which often include:

- operational tasks
- maintenance
- internal and external communication
- risk assessment
- emergency preparedness
- resources and expertise
- non-conformance management
- document control
- quality control (evaluation and internal control)

Within each thematic area, there must be an assessment of whether an adequate description of how the activity is to be carried out, managed and controlled already exists. The final step is to check whether relevant regulatory requirements are covered in the procedures to ensure that the safety management system satisfies the minimum requirements of the regulatory framework.

Regulatory framework

Safety management is by no means new to the industry. In a maritime context, the term is often associated with the International Safety Management (ISM) Code, which lays down overarching rules for the safe operation of ships. All vessels covered by the Regulations on safety management systems for Norwegian ships and mobile offshore units must comply with the ISM Code and carry a valid Safety Management Certificate. In addition, the Ship Safety and Security Act requires all shipping companies to establish a safety management system in the company's organisation and on board each ship, in order to identify and control risks and ensure compliance with the legislation and internal safety requirements. Vessels required to have an ISM system are also covered by a separate audit regime. At present, other vessels are also required to implement safety management in the company, even though they are not subject to the ISM requirement.

Regulations as from 1 January 2017

A new set of regulations on safety management systems for small cargo ships, passenger ships and fishing vessels has been drawn up. These vessels are not required to have a

safety management system in accordance with the ISM Code. The Regulations entered into force on 1 January 2017.

There are no requirements for certification or external audits, but shipping companies must conduct an annual evaluation of the system. The NMA may conduct an unscheduled inspection of the safety management system to verify compliance with the requirements.

We view this as a joint project in which the industry and the NMA wish to share their experiences and play off of each other's strengths. The goal is to improve safety management and enhance the safety culture on board vessels. The NMA hopes that the requirements for a safety management system will result in fewer accidents and unwanted incidents. Greater overall control through improved safety management is also expected to enhance operational safety, efficiency and profitability.

Rooted in the company's management

There are some critical factors in the successful establishment of a safety management system. All levels of the organisation must be given the opportunity to contribute to the development of the system, and the company must commit to following the provisions laid down for the safety activities through a written description of procedures, responsibilities and reporting. Nonetheless, these efforts must begin with the company's management:

The management must develop a conscious strategy for implementing the system in the organisation and stimulate involvement in the issue.

- They must set goals and ambitions for safety, and ensure that the necessary resources are allocated in order to achieve the goals.
- The management must also ensure that the employees acquire sufficient knowledge about the safety efforts in the organisation and that they are familiar with the documentation describing responsibilities and procedures.
- They must motivate employees to be sufficiently safety-conscious in their everyday activities, and facilitate continuous improvement and learning.
- The management must help to create an environment in which employees can easily report unwanted incidents.

A high level of safety in the company begins with the management.



Issues 2018

Nr	Issues
1.1	The responsibilities and authority of the shipping company and the master
1.1.1	Has the Company established a safety management system?
1.1.2	If the vessel have two or more crew members, is the organization and responsibilities concerning HES described? The responsibilities of the Company, Master and the rest of the crew?
1.2	Resources and personnel - training and development of expertise
1.2.1	Is the Master familiar with the safety management system, and are procedures and routines described in the system implemented on board?
1.2.2	How does the Company and the Master ensure that the crew members have the qualifications required to hold their position and carry out their duties on board?
1.2.3	If a training manual for the vessel is required, is it up to date and readily available on board?
1.2.4	If the vessel has a deck crane, can training of the operators be documented?
1.2.5	Are there adequate routines for familiarization of new personnel and after change of crew?
1.2.6	Is the safety management system available in the working language on board?
1.3	Operation on board and risk assessments
1.3.1	Have risk assessments for dangerous operations on board been prepared? Request examples.
1.3.2	Is the Master familiar with the stability limitations of the vessel, and have circumstances which may have unfavourable influence on the stability been assessed?
1.3.3	Has the work equipment, which may pose special risk to the safety of those who work on board, been identified? What is done to reduce the risk connected to the use of this equipment?
1.3.4	For those vessels comprised by the requirements of a safety representative, inquire whether a safety representative is elected and if training is given.
1.4	Emergency preparedness
1.4.1	Request plans for fire drills and rescue exercises. When was the last exercise carried out? Is this documented?
1.5	Non-conformities, accidents and hazardous occurrences
1.5.1	Has there been any accidents or hazardous occurrences on board?
	Follow-up questions: Was the incident reported to the relevant authorities? (NMA, NAV). Were measures taken to prevent recurrence?
1.6	Maintenance and critical equipment
1.6.1	Do you have a system for maintenance management onboard? A plan describing what, when and how.
1.6.2	Has the Company identified critical equipment on board? If yes, are plans and measures described in case such equipment should fail?
1.6.3	Check the maintenance history on especially high-risk equipment which is not subject to periodic maintenance. For instance shackles and slings, straps and wires.
1.7	Relevant documentation available
1.7.1	What are the routines for ensuring that the documentation in the safety management system are available to all personnel onboard?
1.7.2	How is it ensured that an updated version of the documentation is readily available? Who is responsible for updating the documentation?
1.8	Internal review - including continuous improvement
1.8.1	Does the Company review the safety management system annually?

This list is based on the list used by our surveyors, and it is intended to be a helpful tool. The list may be updated. Check Sdir.no for the latest version.

The Norwegian fleet: Large increase in the number of Norwegian commercial vessels

By the end of 2016, 11,891 commercial vessels were listed in a Norwegian ship register. Of these, 579 were registered in the NIS and 11,312 in the NOR. This is an overall increase of 252 Norwegian-registered vessels compared to 2015. The number of NIS vessels has risen by about 8%, whereas the number of NOR vessels has increased by about 2%.

The Norwegian merchant fleet consists of vessels listed either in the Norwegian Ordinary Ship Register (NOR) or in the Norwegian International Ship Register (NIS). All Norwegian ships of 15 metres or more in overall length (cf. section 11 of the Norwegian Maritime Code) and all mobile offshore units (cf. section 507 of the Norwegian Maritime Code) must be listed in one of these registers if they are not entered in the ship register of another country (cf. section 1 of the Norwegian Maritime Code). It is also possible to register a vessel voluntarily on several other grounds.

Of the total of 11,891 commercial vessels listed in the Norwegian ship registers, 6,099 are fishing vessels, 4,058 are cargo ships, 1,229 are passenger ships, and 505 are other Norwegian-registered vessels. 'Other vessels' is an umbrella category consisting of floating cranes, barges and the like. In addition to the commercial vessels, just over 8,089 recreational crafts are entered in the NOR.

Increase in the number of commercial vessels

After several years of low, often negative, growth, the number of vessels in the NIS rose dramatically between 2015 and 2016. At the same time, the number of vessels listed in the NOR increased steadily.

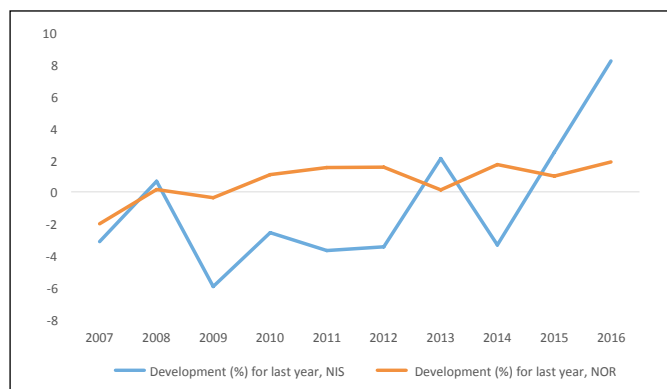


Figure 1: Percentage development from year to year



The growth in the Norwegian fleet is due primarily to an increase in the number of cargo ships. While 3,815 cargo ships were listed in a Norwegian ship register in 2015, this number rose to 4,058 in 2016. These cargo ships make up a highly diverse group of vessels, ranging from small workboats to large cargo ships. The five largest groups of vessels within the cargo ship segment are smaller workboats, general cargo ships, offshore supply ships, oil tankers and tugboats.

While the number of cargo ships has increased dramatically, fishing vessels and passenger ships have shown positive growth as well. In 2015 there were 6,083 fishing vessels registered in the NOR, and by the end of 2016 this number had

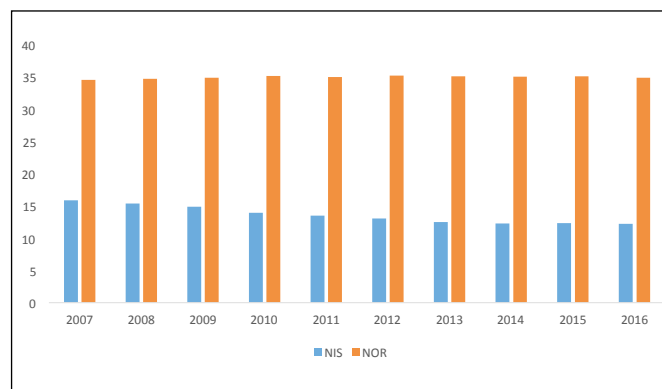


Figure 2: Development in average age per register.



risen to 6,099. The number of passenger ships increased from 1,228 vessels in 2015 to 1,229 in 2016.

The rise in the number of vessels is a result of both imports and new buildings. Between 2015 and 2016, 272 commercial vessels were deleted from the registers, while 524 new vessels were added. Thus, the net increase comes to 252 vessels.

Age of the fleet

The average age of the vessels has changed relatively little between 2015 and 2016. The average Norwegian fishing vessel was 38.7 years in 2015, and this figure increased to 39 years in 2016. For cargo ships, the average age decreased

from 22.3 years to 21.5 years, while for passenger ships it rose from 38.7 years in 2015 to 39.5 years in 2016. In practice, this means that the fleet has remained mostly the same, but that some newer vessels have been added.

The age dispersion is relatively large, and can vary significantly between the various subgroups. The ferry fleet, for instance, had an average age of 32.6 years in 2016, while catamarans had an average age of 8.7 years. There are also large differences between the two registers. Cargo ships listed in the NOR had an average age of 23 years in 2016, whereas NIS-registered cargo ships were only 12 years old on average.

Over the past ten years, the average age in the NOR has remained relatively constant, indicating that older vessels are being replaced on a regular basis. At the same time, the average age in the NIS fleet has declined somewhat, from 15.8 years in 2007 to 12.2 years in 2016.

Gross tonnage

Gross tonnage is only calculated for vessels that are required to have a tonnage certificate. Of the total of 11,891 commercial vessels, about 50% have registered gross tonnage. The overall tonnage of the Norwegian fleet was just over 18,680,000 at the end of 2016. This is an increase of about 6.51% compared to with 2015, and a full 11% compared with 2014.

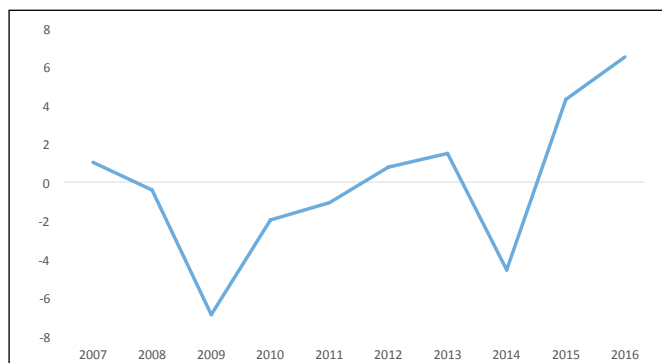


Figure 3: Percentage increase/decrease in gross tonnage of the Norwegian fleet.

Gathering the crew round the writing table to develop a new safety management system

Nordic Wild Fish quickly realised that creating a good safety management system would require everyone to be part of the team. The crew were therefore invited to gather round the writing table when they had some spare time. 'The new system works very well', mate Lars Hessen notes.

Almost exactly two years ago, Nordic Wild Fish, formerly known as Roaldnes, started working on a safety management system in line with the requirements of the International Safety Management (ISM) Code. The company is based on the island of Valderøya outside Ålesund, and with three fishing vessels - 'Roaldnes', 'Langenes' and 'Molnes' - has one of the country's largest trawler crews. The company decided to create its own safety management system instead of buying a ready-made version.

New digital tool

The company's procedures were previously kept in an HSE folder, but now they want to start afresh, with digital tools.

'We started the process by gathering skippers and mates round the writing table during their spare time so we could

do a risk assessment for every operation and every vessel. I was probably not very popular with the administration people at that time, but it was vital that everyone was involved in this from the start. After all, the skippers and mates are the ones who are most familiar with the operations', asserts Anders Bjørnerem, who is responsible for quality assurance in the company. He believes that involving the employees at an early stage is one of the reasons behind the success of the system.

'The attitudes of those who are going to use the system are very important. Without them on the team there would be no point in introducing something new', notes Bjørnerem. The result of the work is a computer program that generates automatic reminders for the crew of tasks that need to be followed up, such as health certificates, equipment certification or safety courses for the crew.

'The reminder system using the HSE folder worked fine too - the biggest difference is that now everything comes directly from the computer. Automatic alerts make things very easy', adds Captain Kjell Ove Solheim. Bjørnerem agrees.



'Our crew have extensive experience and are well qualified, but it was very useful to collate their qualifications and keep a record of them', he affirms.

Pleased with the result

Even though a little extra effort was needed initially, they are glad they chose to create their own system.

'We have a small system compared to other companies, but we wanted to keep it simple.'

There are many shipping companies that have bought ready-made systems, but this can entail mounds of paperwork. Because we developed our system ourselves, we have managed to stick to a manageable format', asserts Bjørnerem. He is in no doubt that a good safety management system is a useful asset.

'For us, safety has always been the top priority, but it is nice to see things progress in this area too', says Bjørnerem. 'The spinal reflex of a shipowner is probably that it costs money, but in the long term we will save money by having effective procedures', he adds.

Much to gain from a good system

In June, the Norwegian Maritime Authority's inspector at the regulator's office in Ålesund, Anne-Marie Myklebust, conducted the first ISM audit at Roaldnes after it was subject to the requirement for a safety management system in line with the ISM Code.

'I believe that those who have put some effort into establishing an effective safety management system are already seeing the benefits, both financially and in terms of good routines', says Myklebust.



The crew on Roaldnes: Stig Inge Bergene, Helge Karsten Risøy, Kjell Ove Solheim and Lars Hessen. Photo: Nordic Wild Fish

She points out that users can get an overview of a number of things from a single tool: when it is time to renew certificates, what dangers there are on board and what has been done to reduce them. Information is also given about the maintenance of equipment and technical systems, and when to carry out drills for emergency situations.

'In five years, it will be time to renew the safety management certificate - then we will see clear differences between those with an effective system and those who bought a system purely because it is a statutory requirement', claims Myklebust. She believes that a good safety management system will provide a safer working environment for many of those in the fishing fleet.



Photo: Nordic Wild Fish



Anne-Marie Myklebust from the NMA conducted the first ISM audit at Roaldnes in June. Photo: Nordic Wild Fish

Helpful tool for conducting risk assessments

The previously separate risk assessment tools, FiskRisk and LastRisk, have been combined into a new, updated service. As from 1 July 2017, shipping companies that have fishing vessels of less than 500 gross tonnage are required to operate with a safety management system, and this tool will help vessel owners satisfy the requirement.

Users can use the tool to assess risks, prepare action plans and implement measures to improve safety on board vessels.

The aim is to make vessels a safe place to work by identifying dangers inherent in the various work duties performed on board fishing vessels and small cargo ships in the aquaculture industry. The tool's content has been prepared in cooperation with the industry.

The new version of the tool has a simpler user interface, improved functionality and a better screen display on mobile platforms, making the tool more accessible to the users.

The improvements include the ability to copy data from one vessel to another within the same company, a feature that our users have requested.

The data are stored on a secure server that only your company and vessel have read access to. It will be possible to revise previous risk assessments so that you always have updated, documented risk assessments available to the employees and safety officers, as well as to supervisory authorities in case of an inspection on board.

The tool is targeted primarily at smaller shipping companies with a limited number of vessels and enterprises with only one vessel, which have not traditionally procured commercial systems for safety management. However, there is no reason why the tool cannot also be used by large shipping companies with highly complex operations, because it is possible to adapt the content to the company's needs.

The risk assessment tool is available at this web address (in Norwegian only): <https://www.sjofartsdir.no/risikovurdering>

Basis for conducting a risk assessment

The Norwegian Maritime Authority's Regulations on the working environment, health and safety of persons working

on board ship state that work performed on vessels must be arranged and organised to ensure the safety and physical and mental health of the persons working on board. Hazards on board vessels must be identified, and an assessment of the risk represented by the hazard must be conducted. The results of the risk assessment must be documented in writing.

It is the skipper's responsibility to ensure that a risk assessment is conducted in cooperation with the crew.

Unfortunately, many novices experience accidents. The risk assessment is also to be used to instruct new crews before they begin their work. It is therefore crucial that the crew receives a thorough introduction in advance to the work duties they will perform and that they are familiar with the hazards on board.

The risk assessment may be used for the following:

1. When work operations and sub-operations on board are reviewed in a systematic manner, a better overview of the operations can be obtained. In addition, reviews and discussions of this type help to develop good attitudes towards safety among the crew and management on board the vessel. Once the problem areas have been identified, this also creates an opportunity to take preventive action. Can the work be performed in a different, safer manner? Can technical devices be created to eliminate hazards or minimise the risk?
2. When defined work duties constitute a 'high risk' for the crew, a written risk assessment/action plan, and safety instruction if appropriate, must be prepared and complied with.
3. When a new crew comes on board, the skipper and the new crew members must review the work duties that are defined as a high risk to safety and health. The skipper must also conduct such a review with crew members who have not taken part in preparing the risk assessment.

Remember!

Risk assessments that are prepared must be revised on a regular basis and always when new work-related equipment or new technology is introduced, or when the work has been reorganised in a way that could impact the safety and health of those working on board the vessel.



Marine casualties:

A decline in the number of registered occurrences

The Norwegian Maritime Authority (NMA) registered 416 occurrences in 2016 compared with 472 in 2015. Despite this decline, the NMA continues to see many serious casualties such as fatalities and total ship losses.

The majority of these casualties occur on vessels of under 15 metres in length. For this reason, the NMA has chosen to put greater focus on safety management on smaller vessels in 2018.

The NMA registers accidents on Norwegian commercial vessels and on foreign commercial vessels in Norwegian waters. An accident is registered as casualty with a ship if it

involves damage to a ship and as an occupational accident if it only involves injury to a person. Examples of casualties with a ship are groundings and collisions, and examples of occupational accidents are falls and crush injuries. Both casualties with a ship and occupational accidents may result in injuries to a person.

The NMA registered a total of 416 accidents involving Norwegian-registered commercial vessels in 2016. This is a decrease of almost 12% compared with 2015. In the past five years, the NMA has registered 464 accidents per year on average. ▶



Photo: Espen Bratlie, Samfoto/NTB Scanpix



Of the total 416 accidents in 2016, 203 were occupational accidents and 213 were casualties with a ship. These accidents resulted in a total of 219 incidents of vessel damage and 223 injuries. Sixteen of the incidents of vessel damage were so serious that they resulted in total loss of the ship. This is a decline from 2015, when the NMA registered 22 total losses. Six of the injuries led to fatalities. This is a decrease compared with 2015, when seven people lost their lives on Norwegian commercial vessels. All of the fatalities in 2016 occurred on board fishing vessels.

Casualties with a ship

Of the 219 vessels involved in accidents in 2016, about 38% were related to groundings, 16% resulted from contact with piers, bridges, etc., and 11% were related to collisions. In other words, navigation-based occurrences constituted 66% of all vessel occurrences in 2016. Figure 1 shows an overview of the number of occurrences per casualty type.

Of the 16 total losses, those that recurred were grounding (five), capsizing (five), flooding (four) and fire (two). Ten of the

lost vessels were fishing vessels, five were cargo ships and one was a passenger ship. Twelve of the 16 vessels that were lost were under 15 metres in length.

Occupational accidents and injuries

The NMA registered a total of 223 injuries in 2016 – of which 18 stemmed from casualties with a ship and 205 were occupational accidents. This is a reduction of 19 injuries compared with 2015. The average number of injuries on Norwegian commercial vessels in the past five years is 253.

Most of the occupational accidents resulted from impact/crush injuries and falls on board vessels. In total, these types of occupational accidents constitute almost 74% of all injuries. Of the fatalities, five resulted from falls overboard, and one occurred in connection with the loss of a fishing boat. All six of those who died were Norwegian, and four were employed as fishermen. Five of the six fatalities occurred on vessels of less than 15 metres in length.

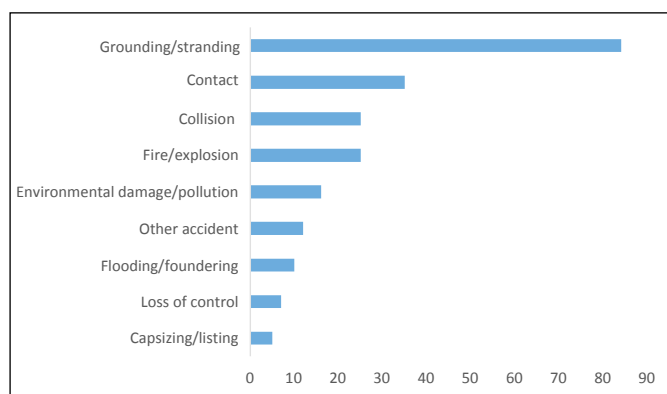


Figure 1: Number of Norwegian-registered commercial vessels involved in an accident, 2016.

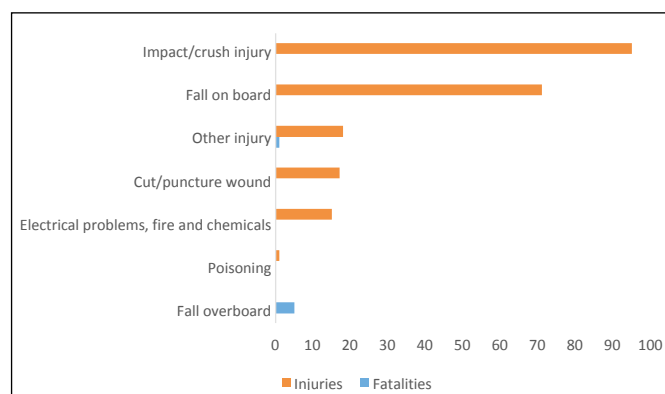


Figure 2: Number of injuries and fatalities on Norwegian commercial vessels, 2016.



Focus area for port state controls in 2017 – Navigation

While the Norwegian Maritime Authority (NMA) conducts its annual focus area activities related to flag state controls, the Paris MoU authorities are conducting a separate campaign, known as the Concentrated Inspection Campaign (CIC). In 2017, the focus will be on safe navigation, including ECDIS. The campaign will be held in cooperation with the Tokyo MoU.

The topics of the annual Paris MoU campaigns are based either on statistics that show a large number of deficiencies in an area that should be given additional focus or on new convention requirements that have entered into force relatively recently.

This year's campaign will be held from 1 September to 30 November. If the vessel undergoes a port state control during

this period, the checklist will be reviewed by the inspector. The Paris MoU authorities publish the checklist in advance to give the industry time to prepare.

The NMA advises all Norwegian-registered ships calling at foreign ports to prepare for this year's campaign by reviewing the checklist on the following page.

Satisfied with the outcome from 2016

In the period from 1 September to 30 November 2016, port state inspectors within the Paris MoU area carried out a CIC relating to the Maritime Labour Convention (MLC). The purpose of the campaign was to verify that the working and living conditions on board vessels comply with the convention, and in so doing raise awareness of this issue. ▶



Photo: Steinar Haugberg/NMA

'Good working and living conditions on board vessels have a positive impact on the crew's attitude towards safety. This is why the MLC will always be an important focus area. All in all, the Paris MoU authorities are satisfied with the outcome,' says Secretary General Richard Schiferli in a press release.

A total of 3,674 surveys were completed for the CIC during normal port state inspections. The campaign resulted in 42 detentions (1.1%) related directly to requirements under the MLC. The results are positive with regard to certificates that confirm health-related suitability for service (98.2%), verification of reports from vessel interior inspections (98%), food and provisions (97.4%) and establishment of safety committees (99.1%).

Lacked approved employment contracts

Less positive are the results for whether seamen's employment contracts satisfied the minimum requirements (6.5%) and for availability of complaint procedures on board vessels (5%).

A majority of the 3,674 vessels inspected under the CIC were cargo ships/multi-use ships with 1,062 inspections (28.9%) and bulk carriers with 789 inspections (21.5%). The flag nations that dominated among the 3,674 CIC inspections were Panama with 433 inspections (11.8%), Malta with 328 inspections (8.9%) and Liberia with 314 inspections (8.5%).

No.	Item	Yes	No	N/A
Q.1*	Is ship's navigation equipment in accordance with its applicable safety certificate (SEC,PSSC, CSSC)? (01101 01103 01105 -S74/CI/R12)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q.2*	Does the ECDIS have the appropriate up-to-date electronic charts for the intended voyage and is there a suitable back-up arrangement? (10112 - S74/CV/R19.2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q.3	Is there evidence that all watchkeeping officers comply with STCW requirements for ECDIS? (01201 – STCW/A-II/1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q.4*	Can watchkeeping officers demonstrate familiarization with ECDIS? (10133 – STCW/A-VIII/2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q.5*	Can ship's VDR/SVDR record data fully? (10114 - S74/CV/R18)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q.6*	Is second and/or third stage remote audible alarm of BNWAS recognized? (10138- S74/CV/R19.2.2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q.7	Is the ship's Automatic Identification System transmitting correct particulars? (10113 - S74/CV/R19.2.4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q.8	Does the passage plan cover the whole voyage? (10127 - S74/CV/R34,STCW/A-VIII/2)	<input type="checkbox"/>	<input type="checkbox"/>	
Q.9*	Does all crew know and respect the official working language as established and recorded in the ship's logbook? (10136 - S74/CV/R14)	<input type="checkbox"/>	<input type="checkbox"/>	
Q.10*	Is the crew familiar with the procedure of emergency operation of steering gear? (02105 - S74/CII-1/R29, 10126 - S74/CV/R26)	<input type="checkbox"/>	<input type="checkbox"/>	
Q.11*	Are the exhibition of navigation/signal lights in accordance with the requirements of COLREG72? (10109 – COLREG72/CIII: 04103 - S74/CII-1/R42.2/R43.2:	<input type="checkbox"/>	<input type="checkbox"/>	
Q.12	Is the ship detained as a result of this CIC?	<input type="checkbox"/>	<input type="checkbox"/>	

Notes: If "No" is selected, for questions marked with an "*" PSCO should use his/her professional judgement regarding the seriousness of the deficiency as to whether the ship may be considered for detention. The detail of any deficiencies including serious deficiencies, if any, should be appropriately entered on the PSC Report Form B.

Where there is no box in the N/A column, then either box "Yes" or "No" should be selected as appropriate.



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 (NFD), 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.

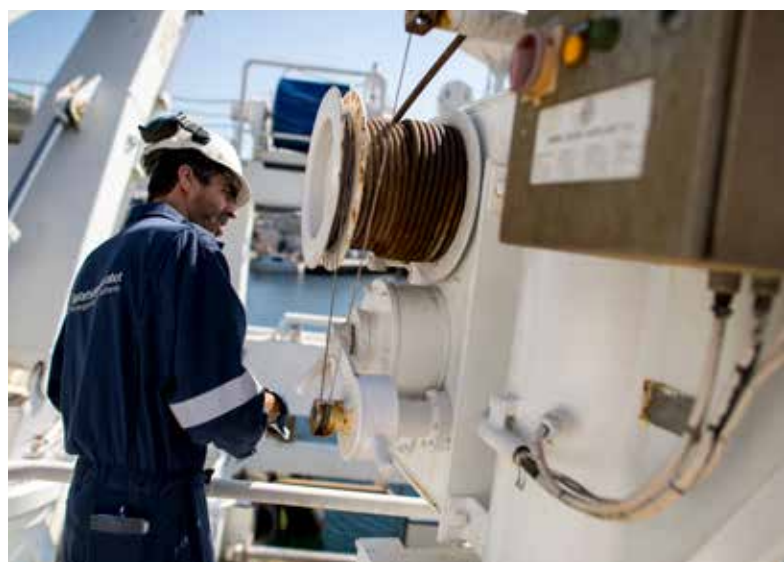
In its work to prevent accidents, the Norwegian Maritime Authority shall in the years to come, strongly emphasize that shipping companies comply with safety management systems, and will focus more on safety culture and less on detail control during inspections.

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.



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..

Foto: Steinar Haugberg

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.

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.

REPORTS AND INVESTIGATIONS:

WHEN ACCIDENTS HAPPEN

The Norwegian Maritime Authority uses data from reported accidents to prepare statistics. The data is compared to reports from the police and Norwegian rescue services. In addition, media is monitored regarding matters concerning accidents.

THE NORWEGIAN MARITIME AUTHORITY

Shipping disasters and the less severe work accidents must be reported verbally to the Rescue Coordination Center or to the Norwegian Maritime Authority as soon as possible. All severe accidents and incidents must be reported in writing to the Norwegian Maritime Authority within 72 hours. You may also report electronically by logging into Altinn.

Incidents refer to accidents that have caused an immediate danger to someone's life, a shipwreck or substantial damage to the environment. Through the receipt of information about near miss accidents, the Norwegian Maritime Authority gets information that can be used to improve safety on board.

Together with information from other available sources, the reports are the basis for registration into the accident database at the Norwegian Maritime Authority.

THE ACCIDENT INVESTIGATION BOARD

The most severe accidents are investigated by the Accident Investigation Board (AIBN). The purpose of the investigation is to determine what happened and why. The objective is to avoid similar accidents in the future.

In accordance with legislation, the AIBN shall investigate all accidents at sea involving Norwegian passenger vessels, as well as accidents involving other Norwegian vessels, including fishing vessels, when crew, captain or other people on board have or are presumed to have lost their lives or have been severely injured.

Furthermore, the AIBN shall investigate accidents involving foreign vessels in Norwegian territorial waters, as well as accidents involving foreign vessels in other waters when the flag state gives their permission or it is in accordance with international law that Norwegian jurisdiction is exercised. The Accident Investigation Board may also investigate other accidents, including those involving leisure crafts, if identification of the cause-effect relation can contribute to increased safety at sea.

All reports from the AIBN are available to the general public.