European Maritime Safety Agency

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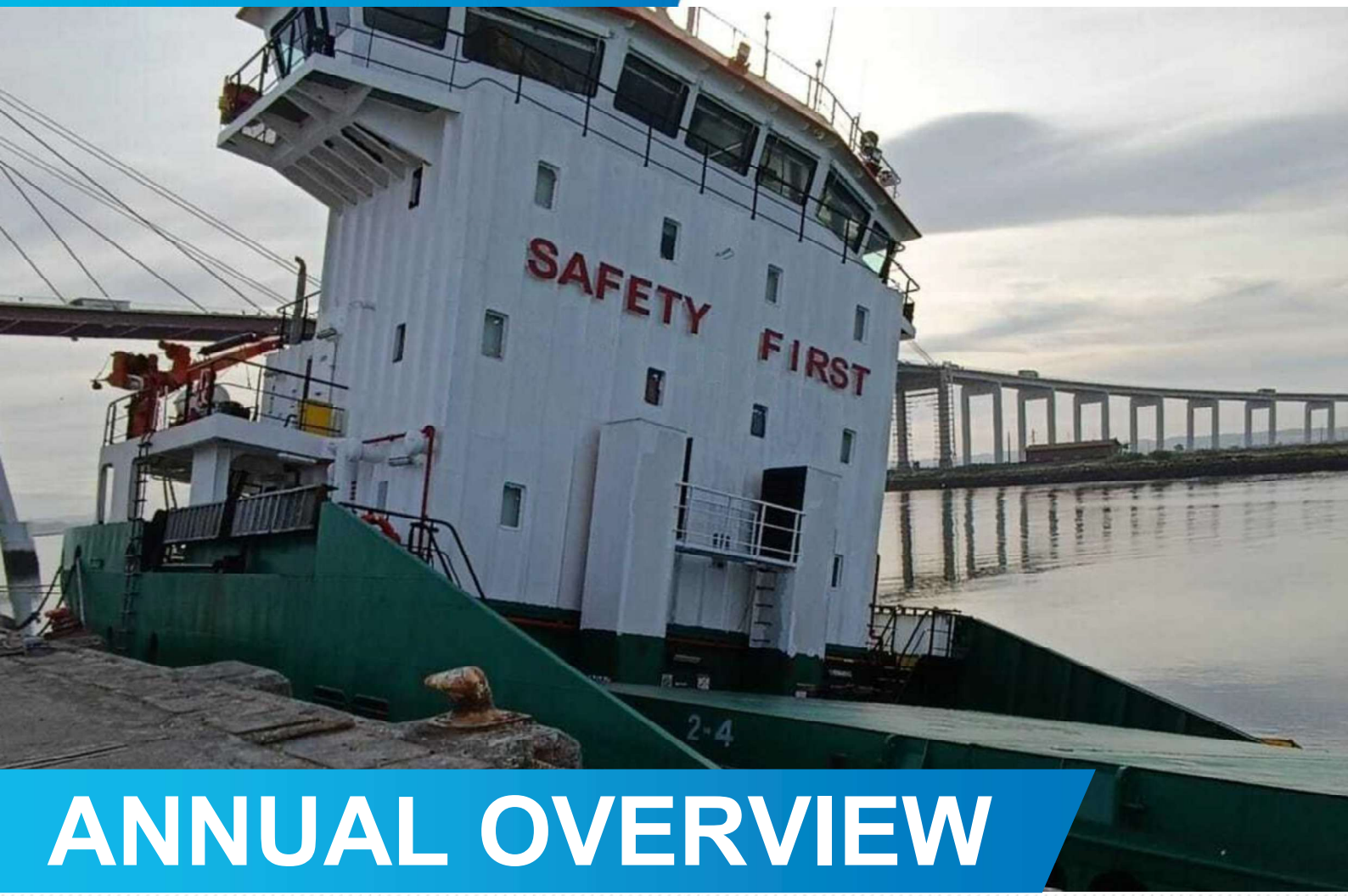

ANNUAL OVERVIEW OF MARINE CASUALTIES AND INCIDENTS 2025

Date: 15th of July 2025

EMSA

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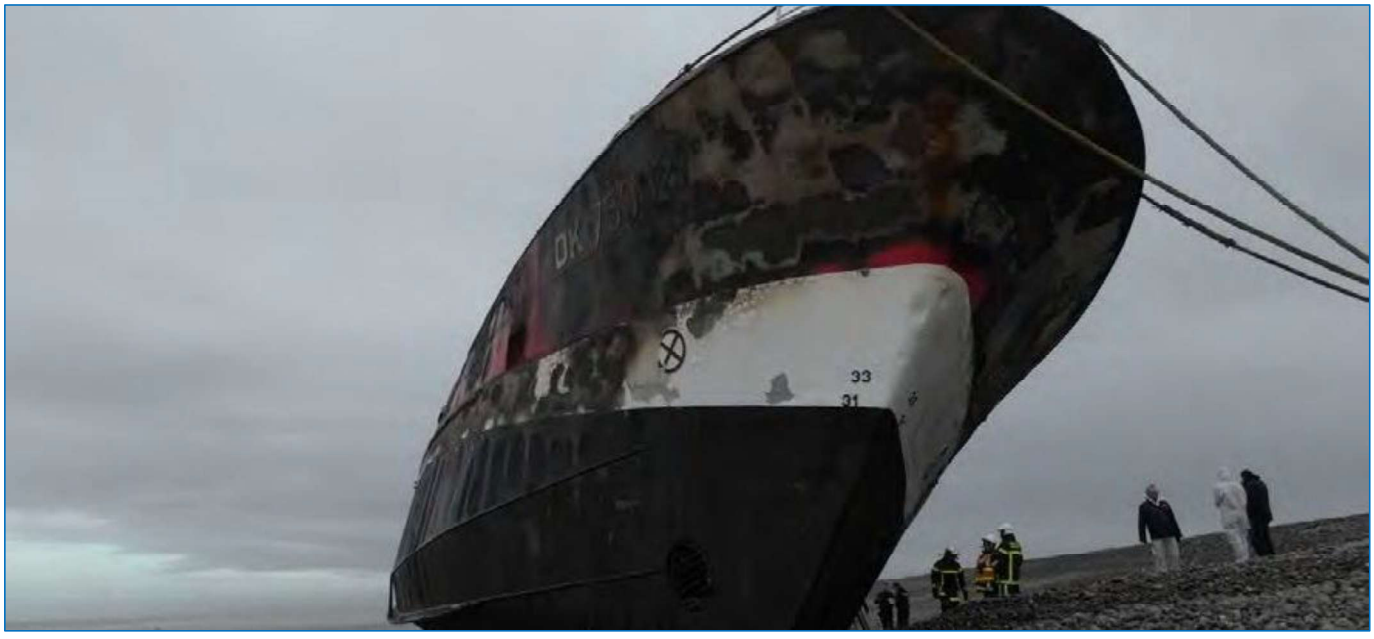

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EXECUTIVE SUMMARY

This publication presents statistics on marine casualties and incidents which involved ships flying the flag of one of the EU Member States, or occurred within EU Member States' territorial sea or internal waters as defined in UNCLOS, or involved substantial interests of EU Member States, as reported by Member States in the EU database for maritime incidents EMCIP (European Marine Casualty Information Platform).

In this document, EU and EU Member States are the 27 EU Member States plus the EEA EFTA States (Iceland and Norway) to which the Directive applies.

The figures from this report cover the period from **1st of January 2015 to 31st of December 2024**. To ensure reliable figures, EMSA and the reporting Member States regularly implement actions aimed at enhancing the data quality of the dataset.

In 2024, most of the indicators, such as the number of occurrences, ships lost, fatalities or injuries, are near or below the average values for the entire period from 2015 to 2024.

In 2024, 2,659 marine casualties and incidents were reported (Figure 2.1–1), which represent a decrease of 50 compared to 2023 and an increase of 24 compared to 2022. The total number of marine casualties and incidents reported from 2015 to 2024 was 26,751 with an annual average of 2,675. The annual average of marine casualties and incidents from 2015 to 2024 was equal to the pre-pandemic average from 2015 to 2019. The number of casualties and incidents in 2024 was 0.6% lower than the annual average in the analysed period.

After a peak of 106 very serious casualties reported in 2018 and a total of 77 in 2019, annual very serious marine casualties were on average 57 from 2020 to 2024, with a minimum of 51 in 2024, indicating a downward trend.

In 2024, 2,864 ships were involved in marine casualties and incidents (Figure 2.2–1), a decrease of 74 ships compared to 2023, and an increase of 29 ships compared to 2022.

To establish objective comparisons among the different ship types, ratios were calculated between the number of marine casualties and incidents involving each ship type and its corresponding fleet size. These ratios, called ship occurrence indicators (see Appendix 4), represent the number of marine casualties and incidents in one year per one thousand EU Member States flagged ships within the scope of Directive 2009/18/EC. The fleet data available allows to calculate occurrence indicators for fishing vessels with a length overall above 15 meters, cargo ships, passenger ships and service ships, all of them with an IMO number and flying an EU Member State flag.

The average ship occurrence indicator from 2015 to 2024 was 131 (Figure 2.2–5), with a peak of 139 in 2019, a minimum of 115 in 2020 and 131 in 2024. In 2024 both passenger ships and cargo ships had the highest average ship occurrence indicators, 247 and 147 respectively. The indicators in 2024 have stabilised compared to the previous year. Fishing vessels and service ships had the lowest average indicators from 2015 to 2024, with values of 63 and 65 respectively.

Regarding the area where casualties and incidents occur, from 2015 to 2024, internal waters (port area and other) accounted for more than half of the reported marine casualties and incidents followed by events occurring in territorial sea and high sea (Figure 2.3–1). Data for 2024 are consistent with the trends for the entire period from 2015 to 2024.

Looking at the segment of the voyage where incidents happened, from 2015 to 2024, the departure phase presented the lowest percentage of ships involved in marine casualties and incidents, 2.33%, while *en route* segment (combining mid-water and transit codes in EMCIP taxonomy) represented the highest percentage, 65.8% (Figure 2.3–5).

Territorial seas of the EU Member States in North Atlantic, with an average of 22.8% of the total marine casualties and incidents, and territorial seas of the EU Member States in Mediterranean Sea, with an average of 17.8% of the total marine casualties and incidents, were the geographical areas with the highest number of occurrences reported in EMCIP. However, for passenger ships the greatest number of occurrences in territorial seas of the EU Member States happened in the Mediterranean and Baltic Sea (Figure 2.3–7).

Following a decline in the traffic density across Europe in 2020 due to the pandemic, which affected more passenger ships than cargo ships and fishing vessels, traffic density values had been recovering since 2021. Combined analysis of traffic densities and heat maps of casualties and incidents in Europe (Figure 2.3–12), evidenced that most marine accidents occurred in high-density traffic areas, but it should be noted that traffic density is high in many areas in Europe.

Between 2015 and 2024, EU Accident Investigative Bodies launched 1,123 investigations (Figure 2.4–1) and made public 950 safety investigation reports (Figure 2.4–3). In 2024, 60 investigations were reported to have been launched, meaning a decrease of 34.1% in comparison with 2023. It is worth noting that the number of investigations launched has been declining year by year since 2018.

From 2015 to 2024, a total of 609 lives were lost in 416 marine casualties (Figure 2.5–1), with a decreasing trend observed over the period. In that period, the maximum number of lives lost in passengers was reached in 2024 with a total of 6 fatalities. In 2024, 78.4% of the victims were crew members whereas the average of fatalities of crew members from 2015 to 2024 was 86.5%.

The primary cause of fatalities for occurrences with persons in 2024 was fall caused by stumbling and slipping (Figure 2.5–4). Collision was the primary cause of fatalities for occurrences with ships (Figure 2.5–5). These were also the primary causes of fatalities for the entire 2015 to 2024 period.

From 2015 to 2024, there were a total of 7,479 injuries resulting from 6,534 marine casualties and incidents (Figure 2.5–6). The average of injuries per year during this period was 748, with a minimum of 609 injuries reported in 2020. In 2024, 84.7% of the injured were crew members while the proportion of injured crew members over the entire period from 2015 to 2024 was 84.8%.

In 2024, the main events resulting in injuries were body movement under or with physical stress (generally leading to an internal injury) for occurrences with persons (Figure 2.5–9) and collision and contacts for occurrences with ships (Figure 2.5–10). From 2015 to 2024, the predominant events causing injuries were falls caused by stumbling and slipping for occurrences with persons, and collisions for occurrences with ships.

The trend of fatalities indicator (Figure 2.5–2) showed a decrease over the years, reaching its lowest value for crew members in 2024. Conversely, the injuries indicator (Figure 2.5–6) has increased in the last two years, after a decreasing trend.

In 2024, 13 ships were lost representing a 18.8% decrease compared to 2023 (Figure 2.5–11). Additionally, 785 ships were damaged marking a 12.1% increase from 2023 (Figure 2.5–12). The number of ships considered unfit to proceed increased by 0.9% to 222 ships (Figure 2.5–13). Shore assistance was required for 779 ships (Figure 2.5–14), while 370 ships required towing (Figure 2.5–15) resulting, respectively, in an increase of 4.1% and a decrease of 7.0% compared to 2023. Furthermore, 24 ships, mainly fishing vessels, were abandoned (Figure 2.5–17) reflecting a 11.1% decrease compared to 2023. There were also 278 Search and Rescue (SAR) operations (Figure 2.5–16), showing a 16.0% decrease from 2023.

In 2024, 48 pollutions related occurrences were reported, representing a 12.7% decrease compared to 2023 (Figure 2.5–18).

From the analysis conducted in safety investigations, it was determined that, from 2015 to 2024, 64.5% of accident events were linked to human action (Figure 2.7–5) and 50.5% of the contributing factors were related to human behaviour (Figure 2.7–7). When considering both, 78.8% of the investigated marine casualties and incidents involve human element (Figure 2.7–17). These trends are common for all ship types (Figure 2.7–18).

Over the period from 2015 to 2024, the total number of safety recommendations issued, and actions taken reported was 2,426 and 43.6% of them were dealing with ship related procedures (Figure 2.8–1).

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Chapter 1 INTRODUCTION

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1.1 Background

The main purpose of accident investigation is to improve maritime safety and prevent pollution by ships to reduce the risk of future marine casualties, by:

- understanding why marine casualties and incidents occur;
- preventing or lessening the seriousness of marine casualties or marine incidents in the future; and
- developing lessons learned after accidents at sea.

At international level, the IMO adopted the Casualty Investigation Code in 2008 through resolution MSC.255(84) and made it mandatory. The Code put forward standards and recommended practices for safety investigations into marine casualties or marine incidents.

At EU level, Directive 2009/18/EC[1,2] (AI Directive) established the fundamental principles governing the investigation of accidents in the maritime transport sector. It aims at facilitating the expeditious holding of safety investigations and proper analysis of marine casualties and incidents to determine their causes, ensuring the timely and accurate reporting of safety investigations and proposals for remedial action.

Following the entry into force of the AI Directive EU Member States shall, among other obligations:

- establish independent, impartial and permanent accident investigative bodies;
- require to be notified of marine casualties and incidents. This obligation covers casualties and incidents that:
  - involve ships flying the flag of one of the Member States; or
  - occur within Member States' territorial seas and internal waters; or
  - involve other substantial interests of the Member States;
- investigate casualties depending upon their severity: casualties which are classified as very serious shall be investigated; serious casualties shall be assessed in order to decide whether or not to undertake a safety investigation;
- publish investigation reports; and
- notify the European Commission of marine casualties and incidents via EMCIP.

EMCIP is the European Marine Casualty Information Platform, a centralised database for EU Member States to store and analyse information on marine casualties and incidents. EMCIP is filled out with data by the competent national authorities. Data in EMCIP forms the basis of the Annual Overview of Marine Casualties and Incidents. In the last two years EMSA reviewed data quality in EMCIP, checking with the EU Member States the possible sibling occurrences, the long-lasting drafts, and some data inconsistencies. Data was updated by the EU Member States.

In this publication, the terms Europe, EU and EU Member States are the 27 EU Member States plus the EEA EFTA States (Iceland and Norway) to which the Directive applies.

In comparison with previous year:

- figures have been adapted to the new period of analysis, covering last 10 years;
- point 3 of chapter 2 has been organized in four new subtitles;
- new images with heatmaps of marine casualties and incidents, organized by year, severity and ship type have been added, facilitating the analysis of marine traffic data vs marine casualties;
- boxes with three points in the right bottom corner of each figure have been substituted by blue borders in the figures.

This document has the following quick navigation elements: enhanced colour navigation bars in page sides; links to the table of content when clicking in a heading; links to the table of figures when clicking in a figure caption; links to abbreviations and definitions in Appendix 1 when clicking in an abbreviation, and links to headings when clicking in one of their references.

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1 Directive 2009/18/EC of the European Parliament and of the Council of 23 of April 2009 establishing the fundamental principles governing the investigation of accidents in the maritime transport sector and amending Council Directive 1999/35/EC and Directive 2002/59/EC of the European Parliament and of the Council.

2 Directive 2009/18/EC has been amended by Directive (EU) 2024/3017 of the European Parliament and of the Council of 27 November 2024. Directive (EU) 2024/3017 shall be adopted and published by the Member States by 27 June 2027. This new Directive is not modifying the fundamental principles governing the investigation of accidents in the maritime transport sector.

A double check quality procedure has been implemented to guarantee data quality and validation.

This publication accomplishes the minimum accessibility requirements and is fully readable using read out loud systems for pdf files, promoting inclusion.

Figures are limited by blue borders. By clicking inside each figure, the user can: download a comma separated value (csv) file with the data in the figure, show the figure alone in a new pdf file or download the figure in a high resolution Joint Photographic Expert Group (jpg) raster file.

EMSA will deliver this new edition in pdf format, without paper publication, promoting sustainability. To enable all the capabilities, open it with a full compatible pdf reader, as Adobe Acrobat Reader.

1.2 Scope

EMSA was given the mandate to publish a yearly overview of marine casualties and incidents under the Agency's founding Regulation (EC) No 1406/2002, as amended.

This publication contains statistics on marine casualties and incidents which: involve ships flying a flag of one of the EU Member States; occur within EU Member States' territorial sea or internal waters as defined in UNCLOS; or involve other substantial interests of EU Member States.

This publication covers the period from **1st of January 2015 to 31st of December 2024**, using data extracted from EMCIP on **1st of May 2025**. Draft and deleted casualties and incidents are not considered. The figures presented in this publication are likely to be slightly different to those presented in previous annual overviews of marine casualties and incidents, those presented by EMSA throughout the year, or those in the next editions to be published, because data can be subject to changes over time as EU Member States add or update information on older cases. The figures are presented in this publication to provide a general overview of the safety of maritime transport when it comes to European interests. However, the publication is limited by the quantity and nature of information presently contained in EMCIP and it is, therefore, not intended as a complete overview and comprehensive technical analysis. Should further information about specific cases be required, readers are invited to contact the national competent investigative bodies (whose contact details can be found in Appendix 6 of this publication).

1.3 Reading guide

This publication is organised to cover the main aspects of maritime safety as given in the Directive and as included in EMSA's remit. In this edition, Chapter 2 covers general figures and the activities of the EU investigative bodies, comparing data for the whole fleet and the main ship types: cargo ships, fishing vessels, passenger ships, service ships and other ships. EMCIP includes data of ships and craft not under the scope of AI Directive when such ships and craft collided with one or more ships under scope of the Directive. However, it is not possible to do a complete analysis on these ship types because only few accidents were reported to EMCIP, so conclusions for those ship types are biased and can be misinterpreted. Those ship types were included in this document as other ships.

Chapter 2 is divided into the following sections:

- Reporting of marine casualties and incidents;
- Ships involved in marine casualties and incidents;
- Location of marine casualties and incidents;
- Safety investigations and investigation reports;
- Consequences of marine casualties and incidents;
- Nature of marine casualties and incidents;
- Events and conditions that led to marine casualties and incidents; and
- Safety recommendations and actions taken.

More information on EMSA's activities related to marine accidents can be found at:

- https://www.emsa.europa.eu/we-do/safety/accident-investigation.html; and
- https://portal.emsa.europa.eu/emcip-public/#/dashboard.

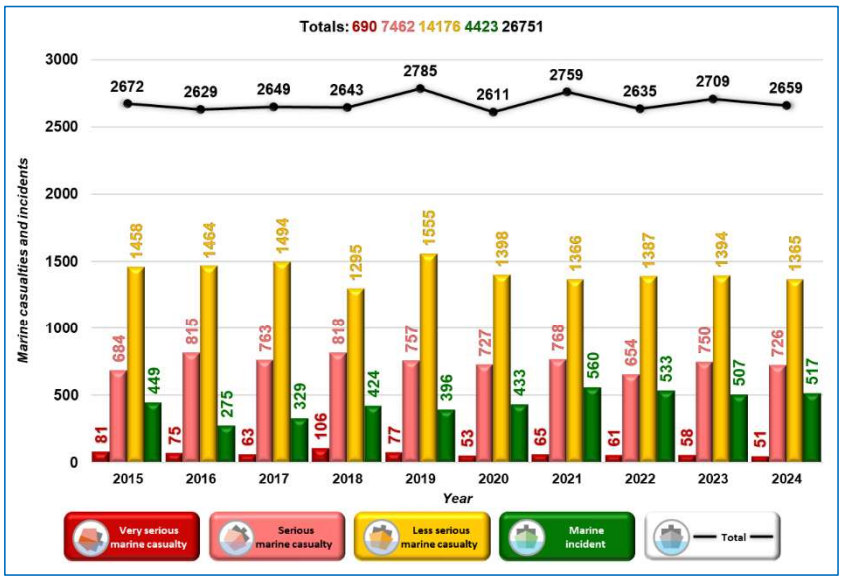
A list of abbreviations and definitions as well as extra information on the casualty categories used in publication can be found in Appendix 1. The codification model used by EMCIP is in Appendix 2. The list of ship types used in EMCIP are shown in Appendix 3. The methodology to determine EU ship occurrence indicators is in Appendix 4 and the methodology to determine fatalities and injuries indicators per category of person on board EU ships is in Appendix 5. The list of investigative bodies in EU can be found in Appendix 6.

Chapter 2 INFORMATION ON MARINE CASUALTIES AND INCIDENTS

2.1 Reporting of marine casualties and incidents

This section provides general information about the number of marine casualties and incidents and their severity for the different ship types considered. All definitions are in Appendix 1.

Figure 2.1–1 Evolution of number of marine casualties and incidents, organized by severity



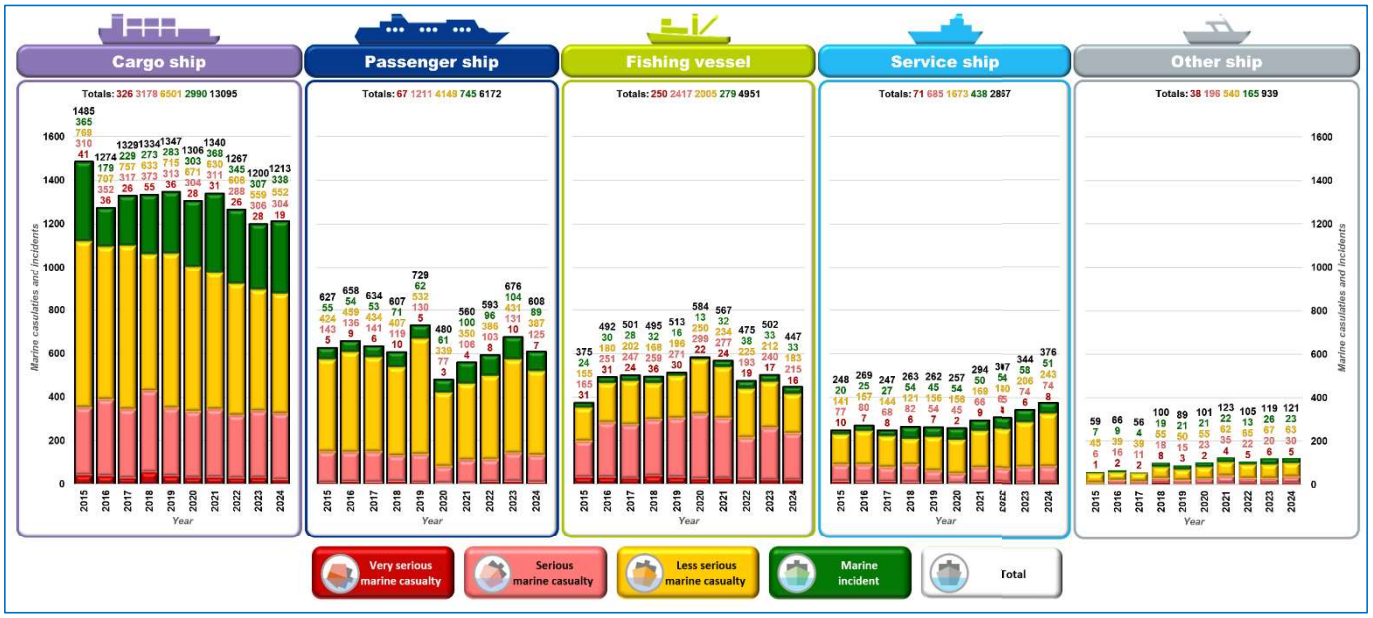
From 2015 to 2024, the total number of reported marine casualties and incidents was 26,751, with a yearly average of 2,675 casualties and incidents. 53.4% of these reported marine casualties and incidents were less serious, 28.4% were serious, 2.7% were very serious, and only 15.5% were marine incidents.

In 2024, the total number of reported marine casualties and incidents was 2,659. In relation to the severity in year 2024, 51.3% of the reported marine casualties and incidents were less serious, 27.3 % were serious, 1.9% were very serious and 19.5% were marine incidents.

The number of incidents is expected to be higher than the number of casualties, however the number of reported incidents was lower over the years.

The evolution of the number of marine casualties and incidents can be organized also by ship type (cargo ship, passenger ship, fishing vessel, service ship or other ship), by counting for each ship type the number of marine casualties and incidents involving at least one ship of that type. Collisions involve more than one ship, and if they are of the same type only one is counted. Therefore, from 2015 to 2024, the 28,024 total marine casualties and incidents organized by ship type for the different ship types is higher than the total 26,751 total marine casualties and incidents and lower than the 29,196 total number of ships involved in marine casualties and incidents.

Figure 2.1–2 Evolution of number of marine casualties and incidents, organized by severity and ship type



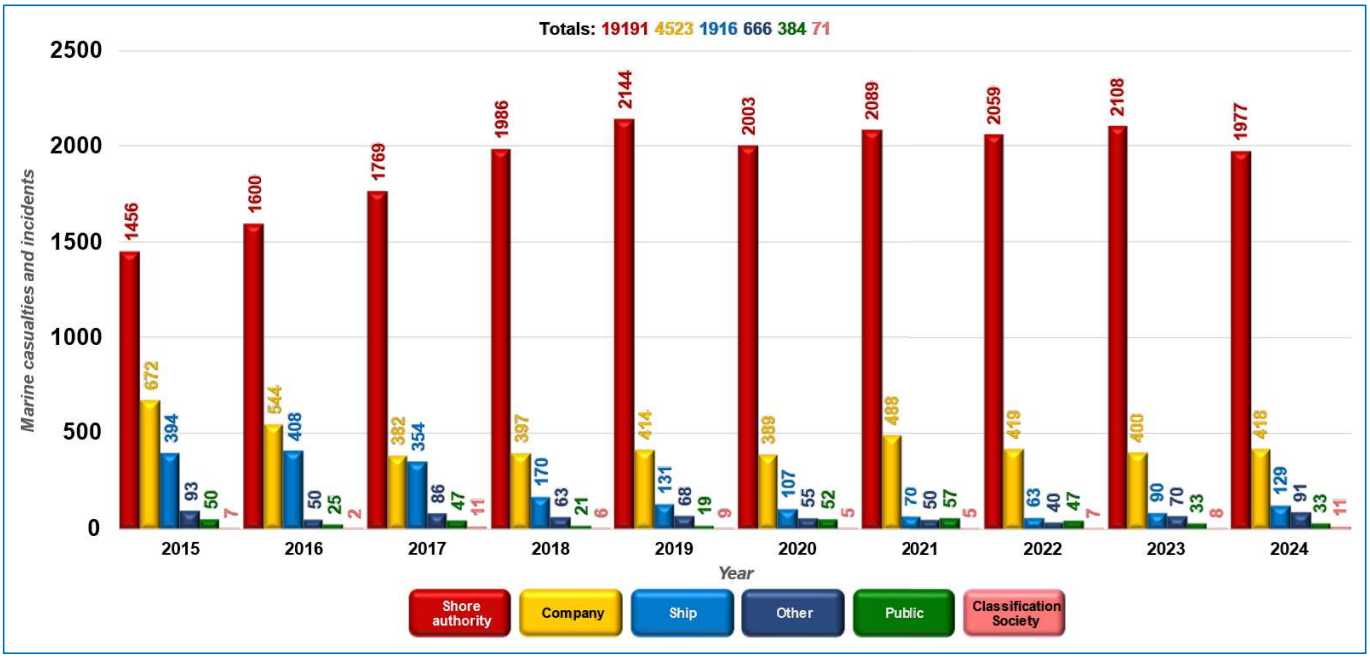
Vessel types are ordered, from highest to lowest number of marine casualties and incidents, as: cargo ship, passenger ship, fishing vessel, service ship and other ship.

Severities are ordered, from highest to lowest number of marine casualties and incidents, for all ship types and years as: less serious, serious, marine incidents and very serious.

Comparing data in 2024 with data in 2023, there was an increase of casualties for cargo ships and service ships, and a decrease of casualties and incidents for passenger and service ships.

Notifying entities categories are the following ones: shore authority, company, ship, classification society, public and other. More than one entity can notify a single marine casualty or incident but only one entity is reported in EMCIP as notifying entity.

Figure 2.1–3 Evolution of number of marine casualties and incidents, organized by notifying entities



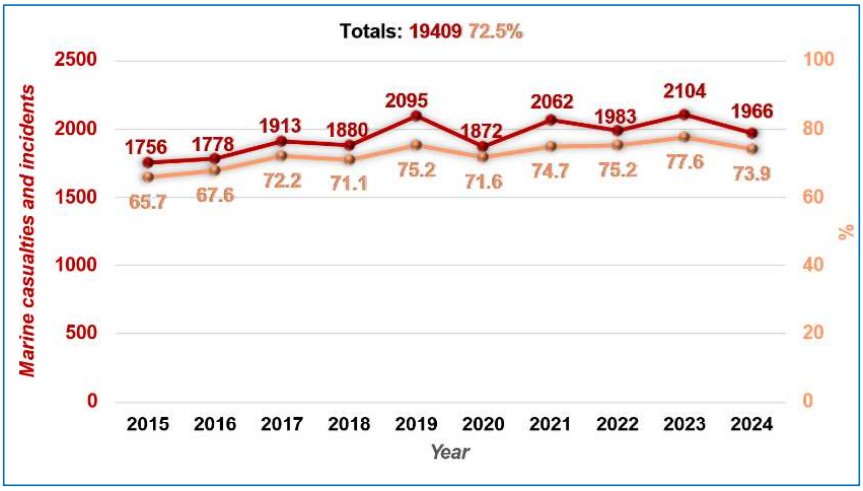
Shore authorities were the main notifying entities reporting in 2024 and over the period from 2015 to 2024, followed by companies and ships.

From 2015 to 2024, 19,409 casualties and incidents, 72.5% of the total 26,751 marine casualties and incidents reported in EMCIP, had an EU State as coastal State.

In 2024 an EU State was reported as coastal State in 1,966 marine casualties and incidents, 73.9% of the total 2,659 marine casualties and incidents reported in EMCIP. This value is over the average 1,941 marine casualties and incidents with an EU State reported as coastal State from 2015 to 2024.

The number and percentage of marine casualties and incidents with an EU State reported as coastal State have a growing trend, with a decrease in 2024.

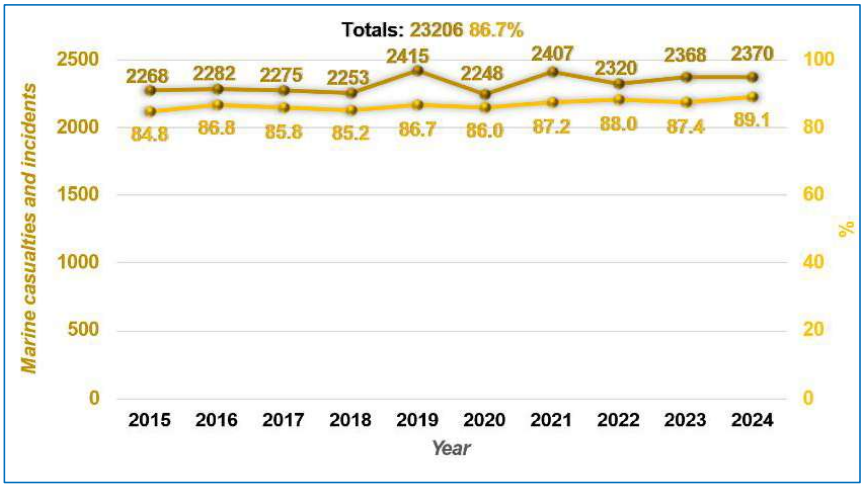
Figure 2.1–4 Evolution of number of marine casualties and incidents involving an EU State as coastal State



The number of marine casualties and incidents involving at least one EU Member State flagged ship from 2015 to 2024 was 23,206, 86.7% of the total 26,751 marine casualties and incidents reported in EMCIP in that period.

In 2024, there were 2,370 casualties and incidents involving at least one EU Member State flagged ship, 89.1% of the total 2,659 casualties and incidents reported in EMCIP. These 2,370 casualties exceed the average 2,321 casualties and incidents involved at least one EU Member State flagged ship from 2015 to 2024. There is a growing trend in the number and percentage of marine casualties and incidents with an EU State reported as coastal State.

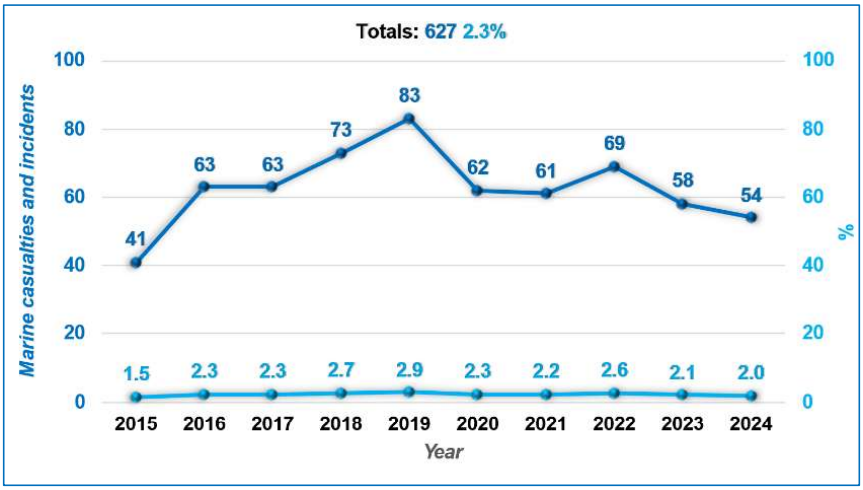
Figure 2.1–5 Evolution of number of marine casualties and incidents involving at least one EU Member State flagged ship



From 2015 to 2024, the total number of marine casualties and incidents involving at least one EU substantially interested State (other than coastal or flag State) was 627, 2.3% of the 26,751 reported marine casualties and incidents. The average value in that period was 62,7.

In 2024, the number of marine casualties and incidents involving at least one EU substantially interested State (other than coastal or flag State) was 54, being 2.0% of the marine casualties and incidents reported in the year. This number of marine casualties and incidents is under the average value in the analysed period and is continuing the decreasing trend in the last 5 years.

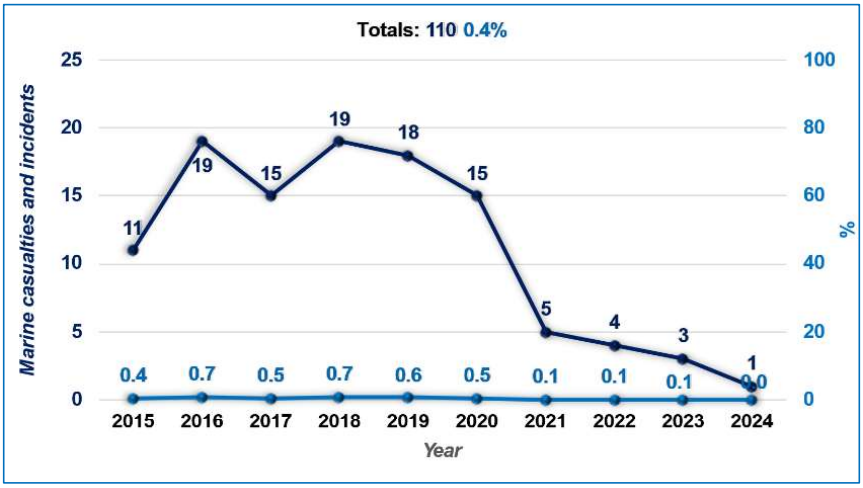
Figure 2.1–6 Evolution of number of marine casualties and incidents involving at least one EU substantially interested State



Some marine casualties were reported to EMCIP because there was at least one EU substantially interested State but there were not EU Member States flagged ships or EU coastal States involved. In these marine casualties and incidents, EU States are not usually the leaders of the investigation but the reporters in EMCIP.

From 2015 to 2024, the total number of marine casualties and incidents reported only because there was at least one EU substantially interested State involved was 110, 0.4% of the 26,751 reported marine casualties and incidents. The average value in that period was 11,0. 2024 shows a minimum, with only one occurrence reported, following the decreasing trend since 2018.

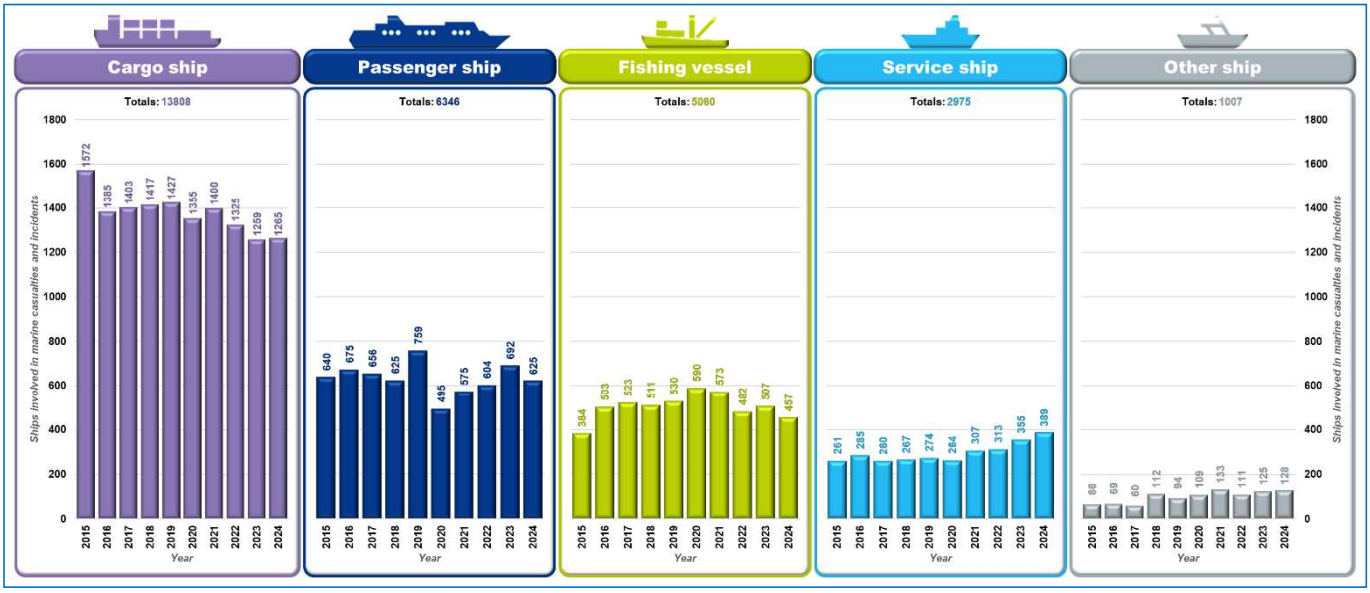
Figure 2.1–7 Evolution of number of marine casualties and incidents reported only because there was at least one EU substantially interested State involved



2.2 Ships involved in marine casualties and incidents

This section focuses on the ships involved in marine casualties and incidents. Ships have been classified in five categories: cargo ships, fishing vessels, passenger ships, service ships and other ships.

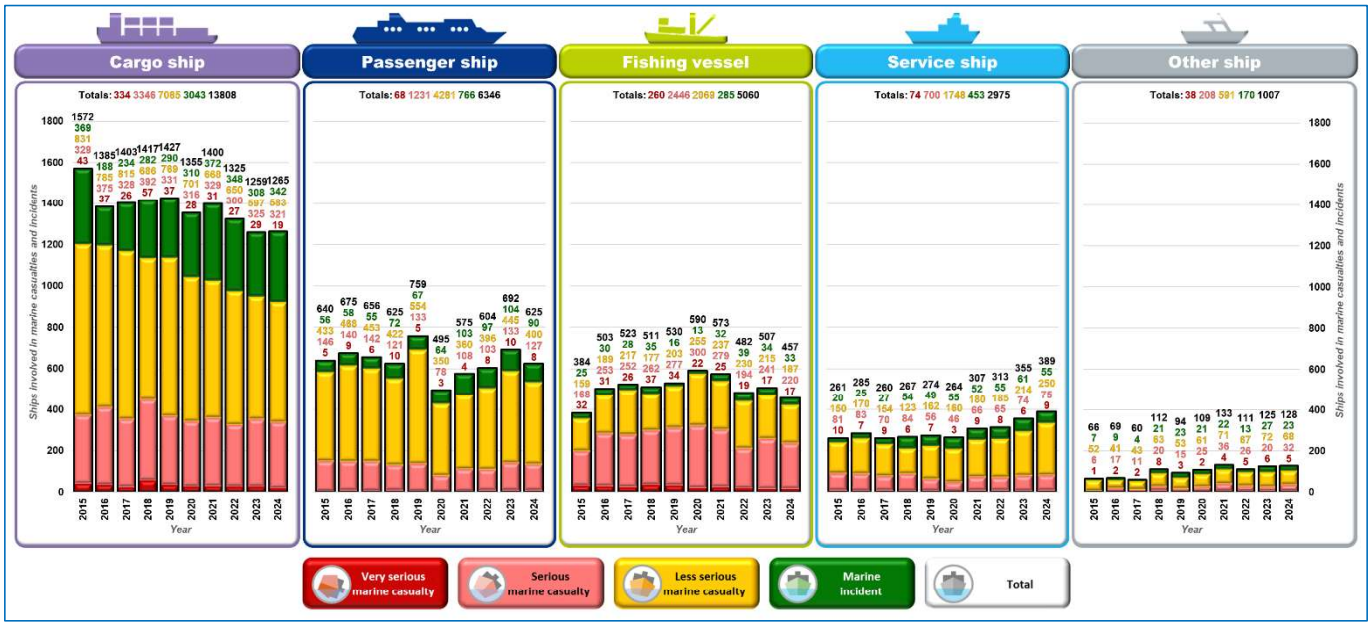
Figure 2.2–1 Evolution of ships involved in marine casualties and incidents, organized by ship types



There were 29,196 ships involved in the 26,751 marine casualties and incidents reported from 2015 to 2024: 13,808 cargo ships, 6,346 passenger ships, 5,060 fishing vessels, 2,975 service ships and 1007 other ships.

The number of ships involved in reported marine casualties and incidents in 2024 were 2,864: 1,265 cargo ships, 625 passenger ships, 457 fishing vessels, 389 service ships and 128 other ships. In 2004, there was an increase in the number of cargo and service ships and a decrease in the number of passenger ships and fishing vessels. Service ships and other ships categories were, in 2024, over the average values in the analysed period.

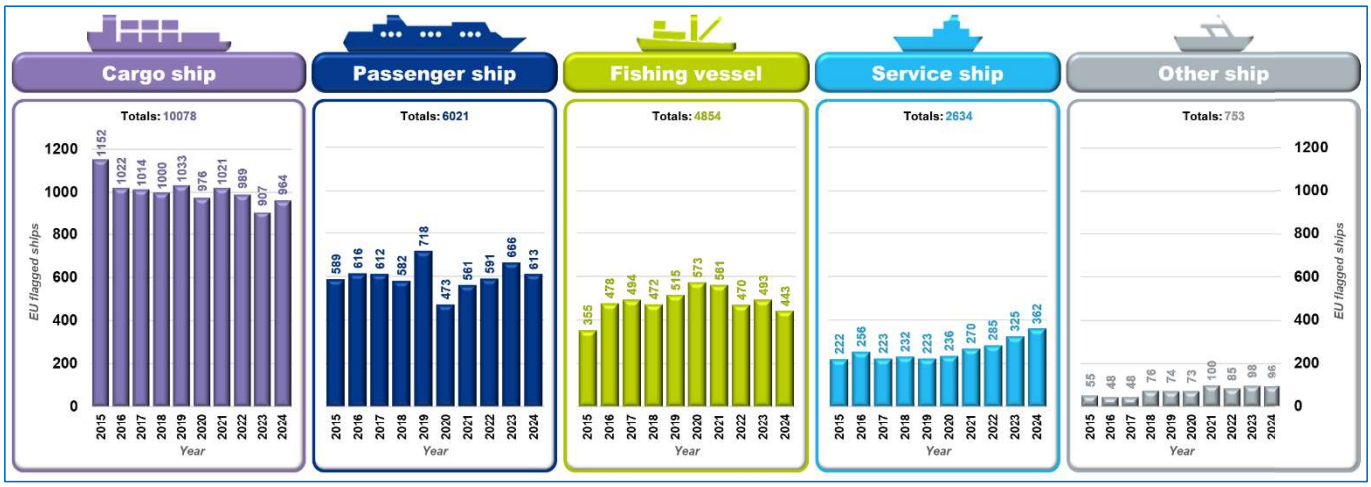
Figure 2.2–2 Evolution of ships involved in marine casualties and incidents, organized by severity and ship types



It is important to clarify that this Figure 2.2–2 represents the number of ships involved in marine casualties and incidents while Figure 2.1–2 represents the number of marine casualties and incidents. Despite this difference both figures display similar trends.

The following figure is counting the number of ships involved in marine casualties and incidents, as in Figure 2.2–1, but now only the EU Member States flagged ships involved in reported marine casualties and incidents are considered.

Figure 2.2–3 Evolution of EU Member States flagged ships involved in marine casualties and incidents, organized by ship type



Trends for EU Member States flagged ships are consistent with those for all ships, presented in Figure 2.2–1.

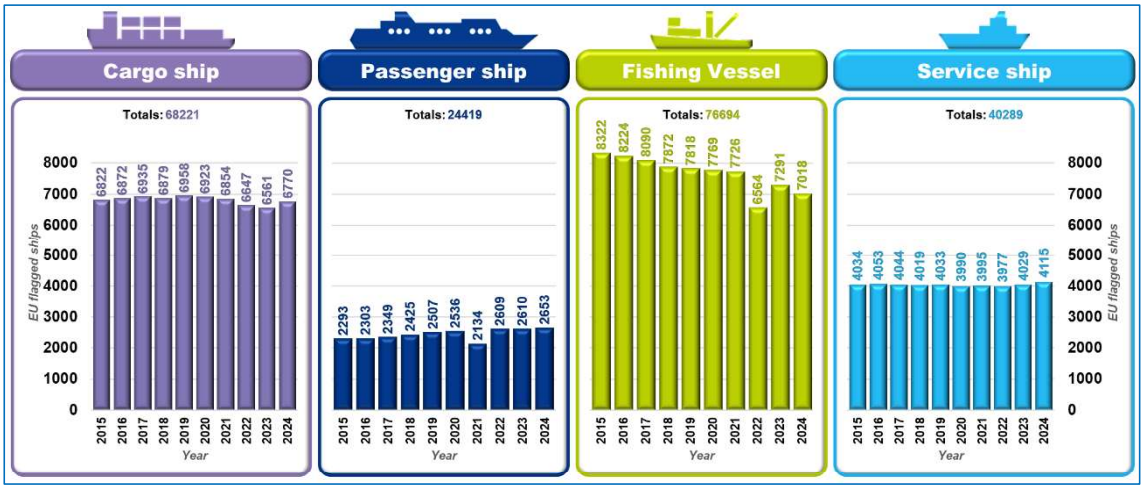
To evaluate the accident rate for a ship type it is necessary to consider the number of reported casualties and incidents for that ship type and the number of ships of that type in the fleet. The evaluation of the accident rate is done by means of the EU ship occurrence indicator obtained following the methodology described in Appendix 4.

EU ship occurrence indicator provides an estimate of how many marine casualties and incidents occurred per one thousand ships of a determined ship type in the EU fleet in a specific period.

Ships categorized as other ship are not considered in the EU ship occurrence indicator because there is not a consistent data source for the fleet of this too heterogenous ship type.

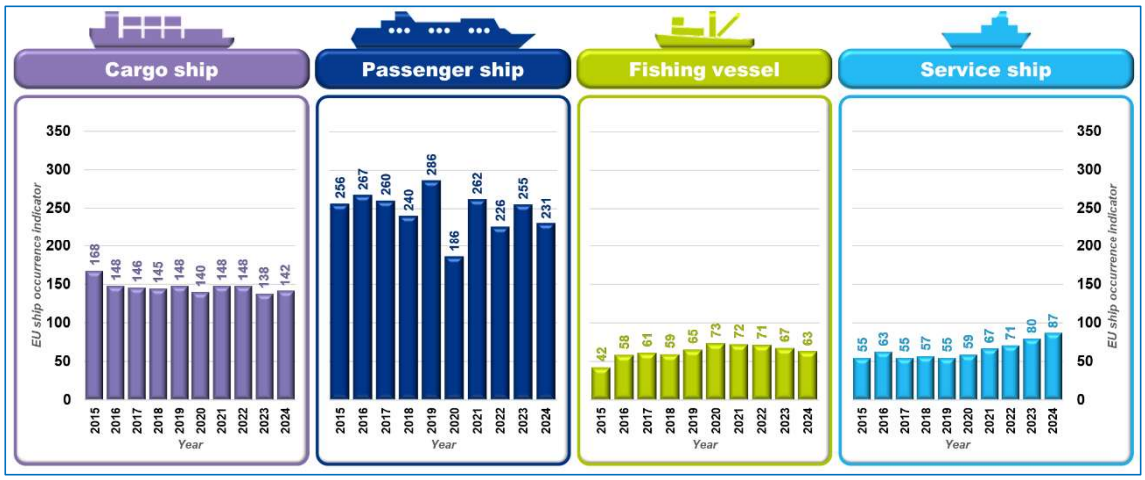
Fleet data is fully available for EU Member States flagged fishing vessels under the scope of Directive 2009/18/EC (LOA greater than 15 meters) and EU Member States flagged ships not being fishing vessels with IMO number, and only this kind of ships are considered for the analysis of the ships involved in reported marine casualties and incidents for the indicator calculation.

Figure 2.2–4 Evolution of EU Member States flagged ships, organized by ship type



For the first since 2019, EU Member States flagged cargo ships fleet grew up in 2024. EU Member States flagged passenger ships fleets have been continuously growing from 2015 to 2024, with an anomaly in 2021. EU Member States flagged fishing vessels fleet has been continuously decreasing, with a 15.7% decrease between 2015 and 2024 and an anomaly in 2022. EU Member States flagged service ships fleet has been almost constant in the period from 2015 to 2024.

Figure 2.2–5 Evolution of EU ship occurrence indicator, organized by ship type



EU ship occurrence indicator changes the order of the different ship types, compared with Figure 2.1–1. Passenger ships exceed cargo ships and service ships remain at same level than fishing vessels.

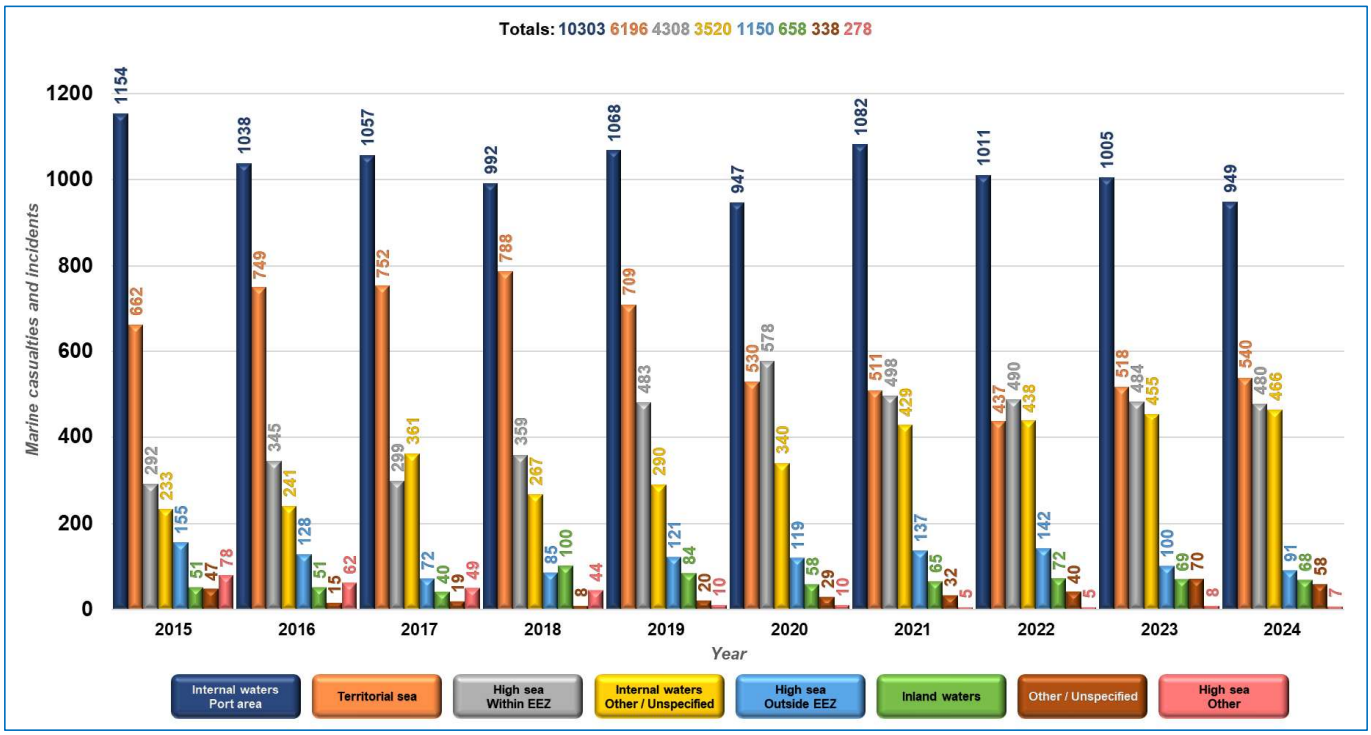
2.3 Location of marine casualties and incidents

This section analyses the location of marine casualties and incidents considering navigational area, voyage segment and geographical area. Traffic density around Europe is also analysed together with the heatmaps of marine casualties and incidents.

2.3.1 Navigational area

Navigational areas can be catalogued following EMCIP taxonomy as: high sea[3] (other, outside EEZ or within EEZ), inland waters, internal waters (other/unspecified or port area), other/unspecified and territorial sea.

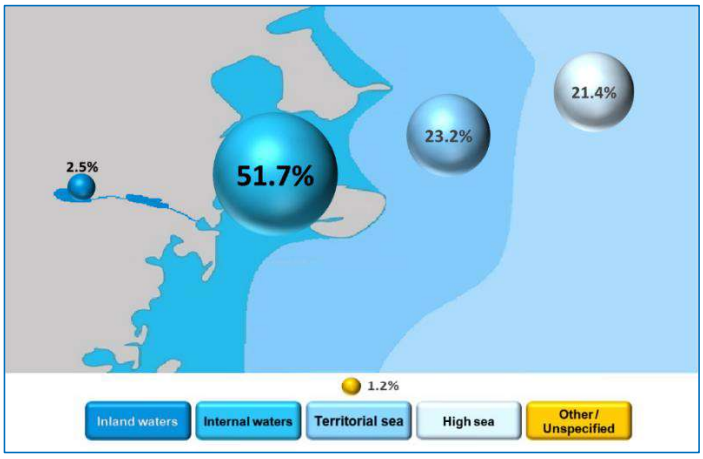
Figure 2.3–1 Evolution of marine casualties and incidents, organized by navigational area



[3] By agreement of the PCF and the EMCIP Governance Group, the term open sea was changed in 2023 to high sea in EMCIP taxonomy.

From 2015 to 2024 port area in internal waters has been the navigational area with the higher number of marine casualties and incidents. The second navigational area has been territorial sea, excepting in 2020 and 2022 that was overpassed by high sea within EEZ. High sea within EEZ and other or unspecified internal waters are also navigational areas with an important number of maritime casualties and incidents.

Figure 2.3–2 Percentage of marine casualties and incidents, organized by navigational area



From 2015 to 2024, 51.7% of the reported marine casualties and incidents took place in the internal waters area, followed by territorial sea area with 23.2% and high sea area with 21.4%. Furthermore, the sub-category Internal waters in port area recorded the highest number of occurrences.

In 2024, the main navigational area was internal waters, with 53.2% of the reported marine casualties and incidents, including its main sub-category internal waters - port area with 35.7% of the occurrences. High sea and territorial sea navigational areas represented respectively 21.7% and 20.3% of the reported marine casualties and incidents.

Marine casualties and incidents from 2015 to 2024 are analysed by navigational area and ship type in the following figures.

Figure 2.3–3 Marine casualties and incidents, organized by navigational area and ship type

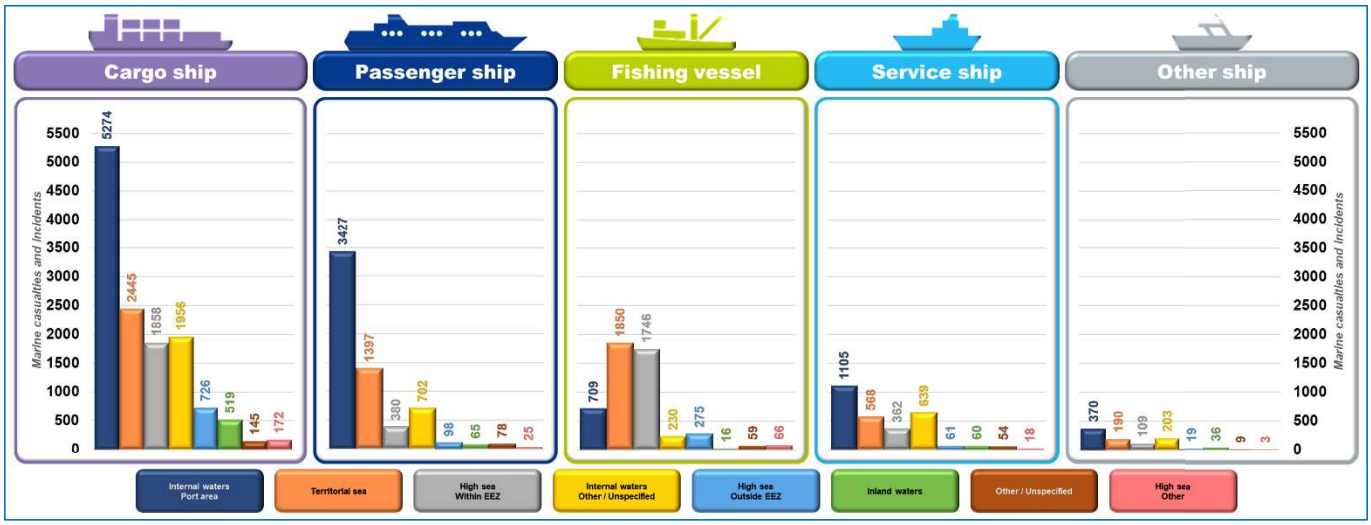
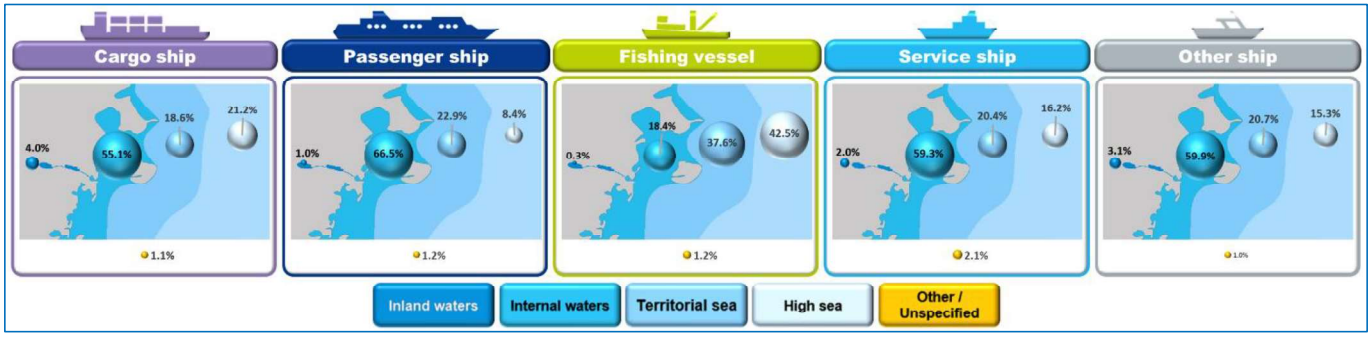


Figure 2.3–4 Percentage of marine casualties and incidents, organized by navigational area and ship type



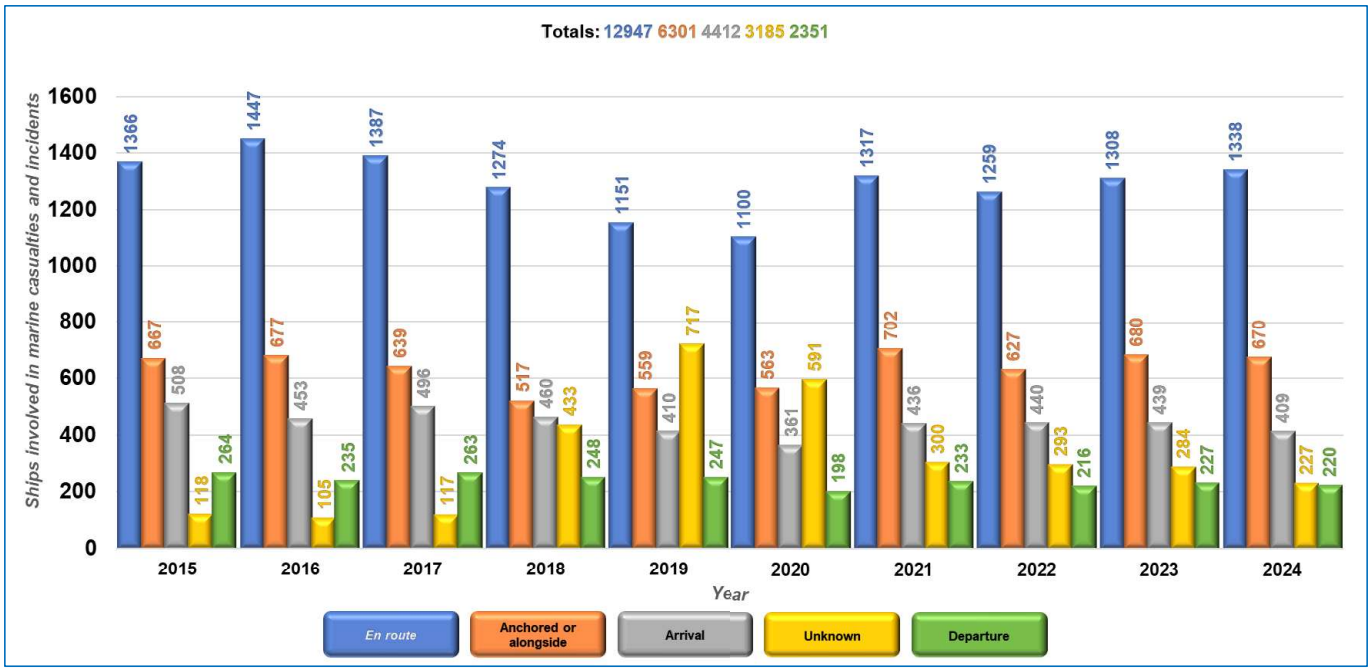
Marine casualties and incidents are counted with the same criteria than in Figure 2.1–2. From 2015 to 2024, the higher number of occurrences took place in internal waters area, followed by territorial sea area and high sea area, excepting for fishing vessels, with the highest number of occurrences in high sea, followed by territorial sea and inland waters.

2.3.2 Voyage segment

Five voyage segments are considered: anchored or alongside, arrival, departure, *en route* (combining mid-water and transit codes in EMCIP taxonomy) and unknown.

Ships involved in marine casualties and incidents organized by voyage segment are presented in the following figure.

Figure 2.3–5 Evolution of ships involved in marine casualties and incidents, organized by voyage segment



From 2015 to 2024, *en route* was the voyage segment with the highest average (44.3%). Anchored or alongside, when the ship was not sailing, was the second highest voyage segment on average (21.6%) while departure voyage segment had the lowest average (8.1%), followed by unknown voyage segment (10.9%).

Ships involved in marine casualties and incidents from 2015 to 2024, organized by voyage segment and ship types are presented in the following figure.

Figure 2.3–6 Ships involved in marine casualties and incidents, organized by voyage segment and ship type

Distributions and trends highlighted in Figure 2.3–5 apply to all ship types, with only one notable exception: fishing vessels. For fishing vessels, the average of ships involved in casualties and incidents in *en route* voyage segment, when fishing operations occur, reached 65.8%, followed by unknown voyage segment with 18.5%.

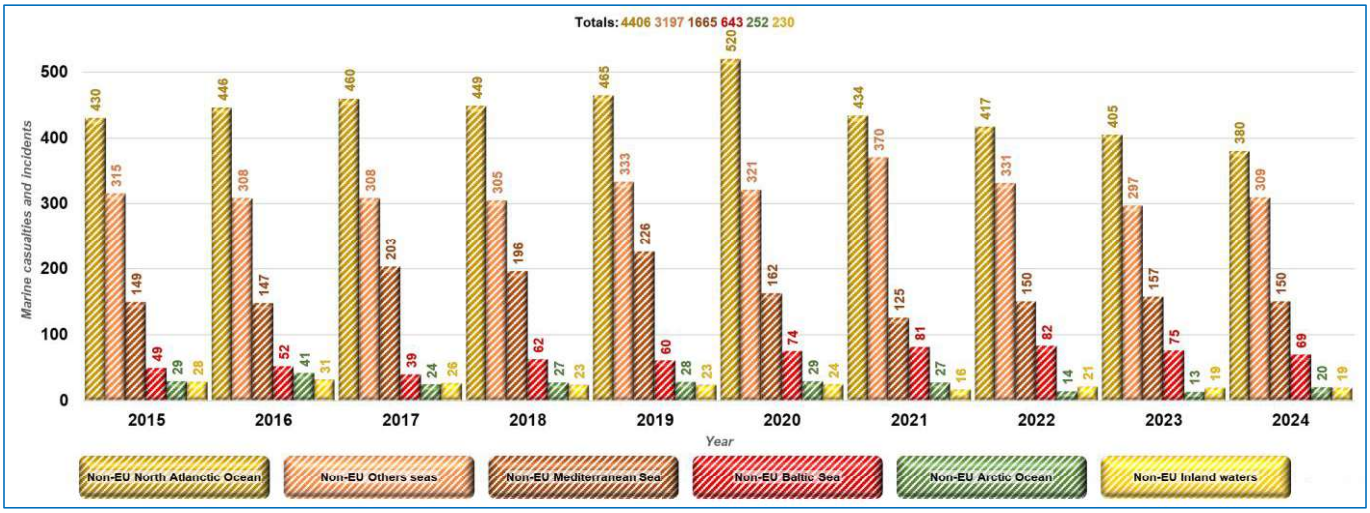
2.3.3 Geographical area

Five marine geographical areas are considered in Europe: North Atlantic Ocean, Mediterranean Sea, Baltic Sea, Artic Ocean and Inland waters. In all these five regions it is possible to find territorial seas of the EU Member States, called EU waters, and waters outside EU limits. All other marine geographical areas are considered as other seas.

To facilitate the analysis, the evolution of marine casualties organized by geographical area is presented in two figures, one for geographical areas inside EU limits and one for geographical areas outside EU limits.

Figure 2.3–7 Evolution of marine casualties and incidents, organized by geographical area in EU limits

Figure 2.3–8 Evolution of marine casualties and incidents, organized by geographical area in non-EU limits



From 2015 to 2024, the total number of marine casualties and incidents was 26,751, of which 16,358 (61.1%) were in geographical areas inside EU limits and 10,393 (38.9%) in geographical areas outside EU limits.

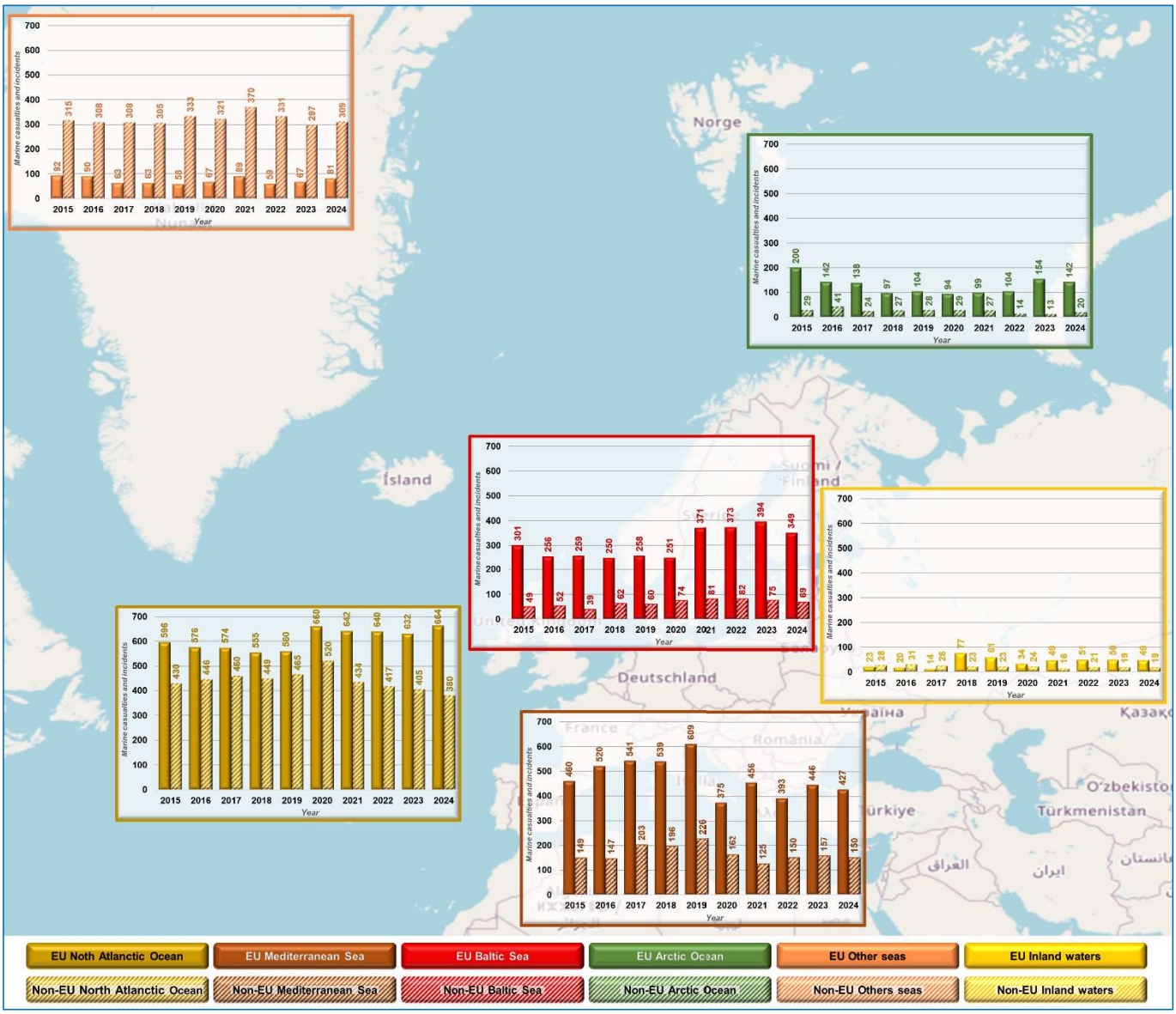
Casualties and incidents in EU limits are ranked from highest to lowest as follows: North Atlantic Ocean (37.3%), Mediterranean Sea (29.1%), Baltic Sea (18.7%), Artic Ocean (7.8%), Other seas (4.5%) and Inland waters (2.6%).

Casualties and incidents in non-EU limits are distributed from highest to lowest is: North Atlantic Ocean (42.4%), Other seas (30.8%), Mediterranean Sea (16.0), Baltic Sea (6.2%), Artic Ocean (2.4%) and Inland waters (2.2%).

After a significant reduction of marine casualties and incidents in the Mediterranean Sea in 2020, the casualties and incidents have increased since 2021, although it did not return to 2019 level. Since 2021 there has been a significant rise in the number of marine casualties and incidents in the EU limits of the Baltic Sea.

Data in figures Figure 2.3–7 Evolution of marine casualties and incidents, organized by geographical area in EU limits and Figure 2.3–8 are summarized in the following map.

Figure 2.3–9 Map of marine casualties and incidents, organized by geographical area



The following maps presents data analysed by geographical area and ship type. Marine casualties and incidents are counted with the same criteria than in Figure 2.1–2.

Figure 2.3–10 Marine casualties and incidents, organized by geographical area and ship type

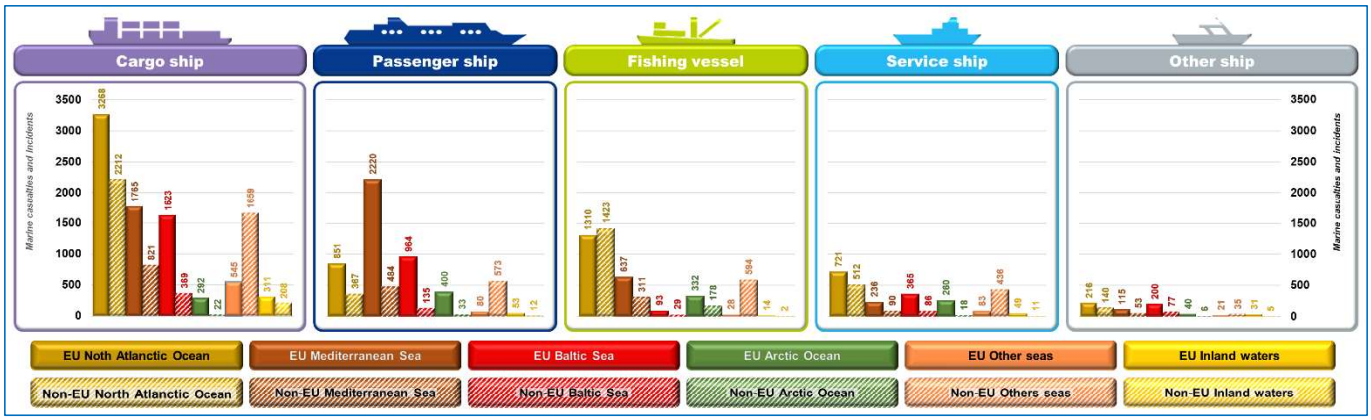
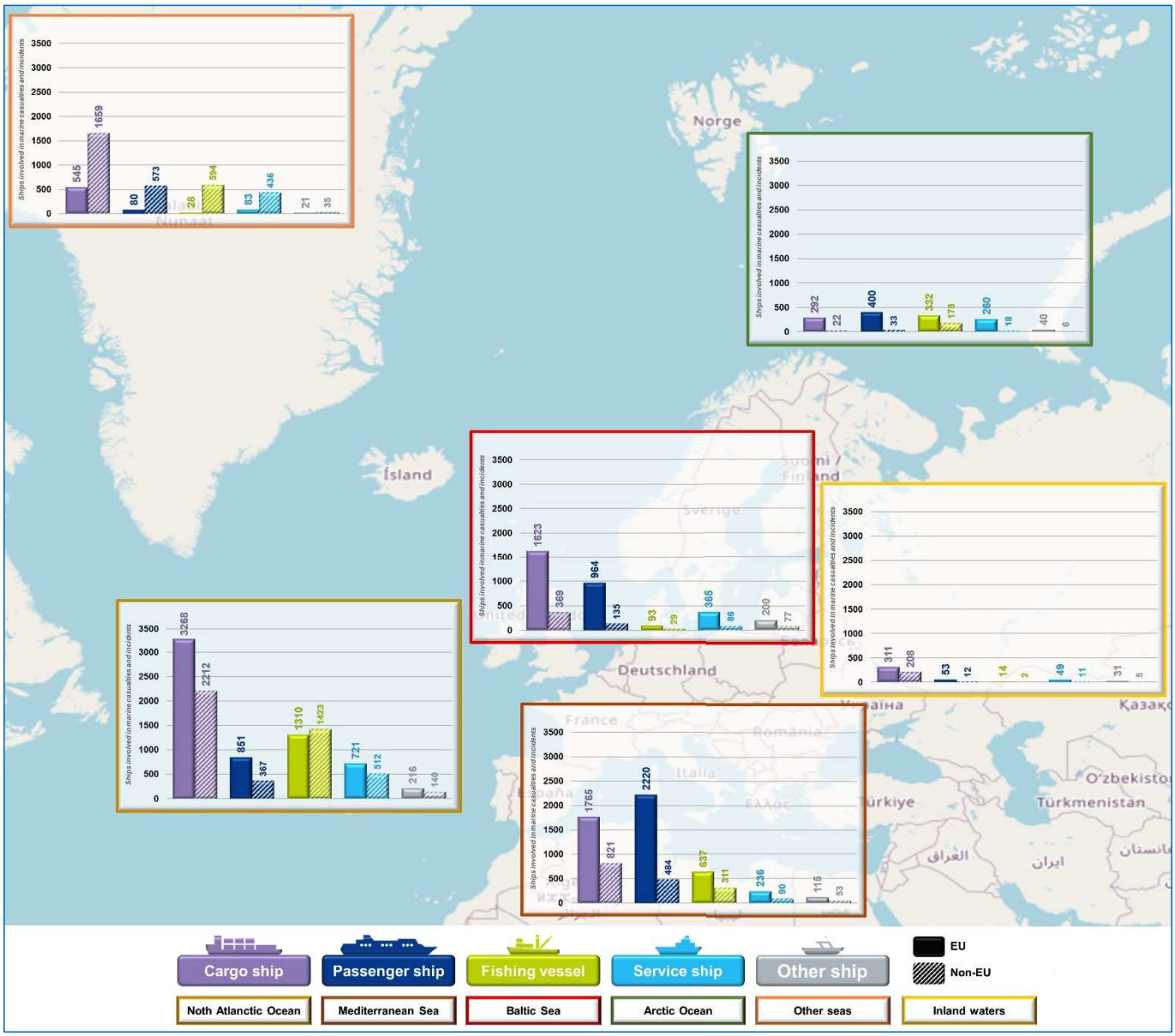


Figure 2.3–11 Map of marine casualties and incidents, organized by geographical area and ship type



Marine casualties and incidents for all ship types, excepting passenger ships, exhibit a similar distribution and follow comparable trends as shown in Figure 2.3–7 Evolution of marine casualties and incidents, organized by geographical area in EU limits and Figure 2.3–8. Passenger ships casualties and incidents were higher in Mediterranean and Baltic Seas.

2.3.4 Traffic density and heat map of maritime casualties and incidents in Europe

This section analyses traffic density around Europe combined with heat maps of marine casualties and incidents.

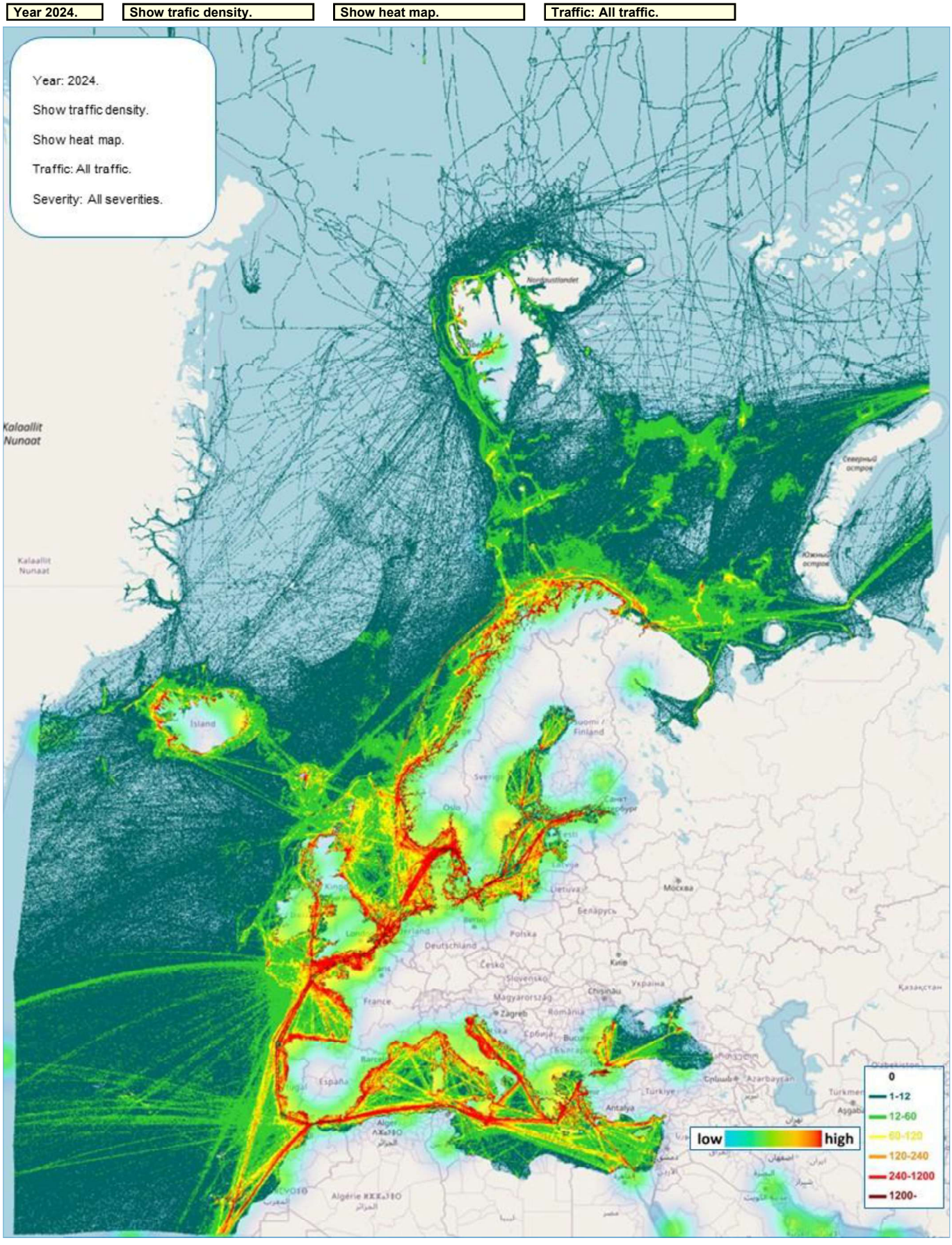
In the top of Figure 2.3–12, there are five drop-down lists with yellow background where the reader can choose: the year for the analysis (from 2019[4] to 2024), if traffic density or heat map will be shown, traffic to be considered for traffic density and heat maps (all traffic, cargo ships, passenger ships or fishing vessels) and severity to be considered in the heat maps (all severities, very serious, serious, less serious or marine incidents),

After selecting the options in the drop-down lists, it is necessary to click outside them to refresh the data in the figure.

Depending on the selection some drop-down lists can be disabled.

4 Traffic density and heat maps are available in EMCIP since 2019.

Figure 2.3–12 Traffic density and heat map of marine casualties and incidents in Europe



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After a slight decrease in 2020 compared to 2019, global traffic density around Europe did not show many differences when comparing for the years since 2020.

The traffic density of cargo ships around Europe remained relatively stable between 2019 and 2024. Compared with the global traffic density, traffic density for cargo ships was high but there were notable differences particularly evident in the Northern areas where most navigation was related to fisheries.

Traffic density around Europe for passenger ships was significatively lower than traffic for cargo ships or fishing vessel. In 2020, the traffic density decreased for passenger ships, due to the impact of COVID 19 pandemic, but it rebounded after 2022.

Fishing vessels navigation areas are different than for the other ship types. Traffic density around Europe for fishing vessels remained relatively unchanged between 2019 and 2024.

The number of marine casualties and incidents in passenger ships was relatively high for their traffic density.

Most maritime accidents in Europe occurred in high-density traffic areas, but it should be noted that traffic density is high in many areas in Europe.

2.4 Safety investigations and investigation reports

This section describes the activities undertaken by the investigative bodies of EU Member States regarding the safety investigations performed and reports published.

Art. 2.4 of Reg.(EC) 1406/2002 as amended, provides that the EMSA shall carry out analysis of safety investigation reports with a view to identifying added value at Union level in terms of any relevant lessons to be drawn. Based on the content of the investigation reports in EMCIP, EMSA has already carried out four analytical studies on marine casualties and incidents involving, respectively, fishing vessels, Ro-Ro ships, container ships and navigational accidents. These studies are available on the EMSA website at:

Fishing vessels:	https://www.emsa.europa.eu/publications/reports/item/3253
Ro-Ro ships:	https://www.emsa.europa.eu/publications/reports/item/3388
Container ships:	https://www.emsa.europa.eu/publications/reports/item/4276
Navigational accidents:	https://www.emsa.europa.eu/publications/reports/item/4830

EMCIP data has been also used by EMSA to carry out the analysis on potential COVID-19 related maritime safety issues and emerging risks available in https://www.emsa.europa.eu/publications/reports/item/5184.

Before 1st of May 2025, a total of 1,123 safety investigations were initiated for casualties occurred from 2015 to 2024.

Figure 2.4–1 Evolution of number of safety investigations launched, organized by severity

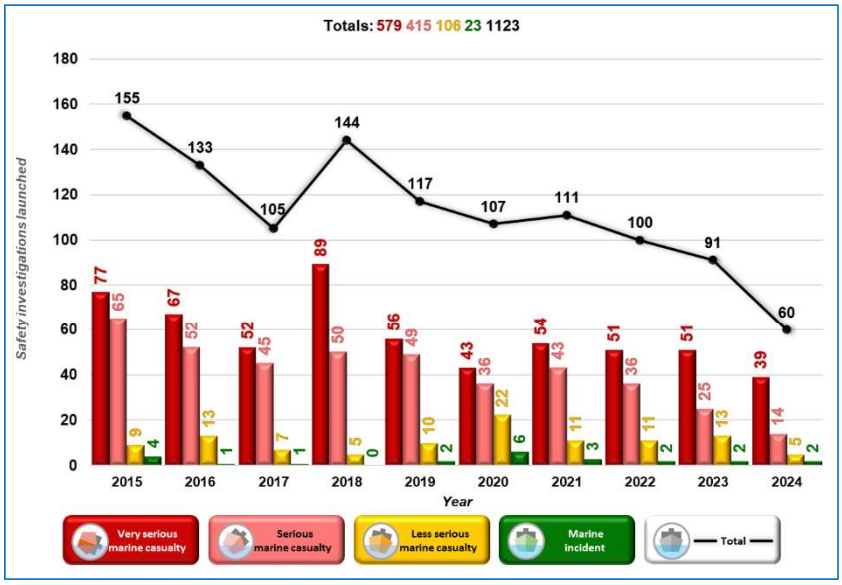


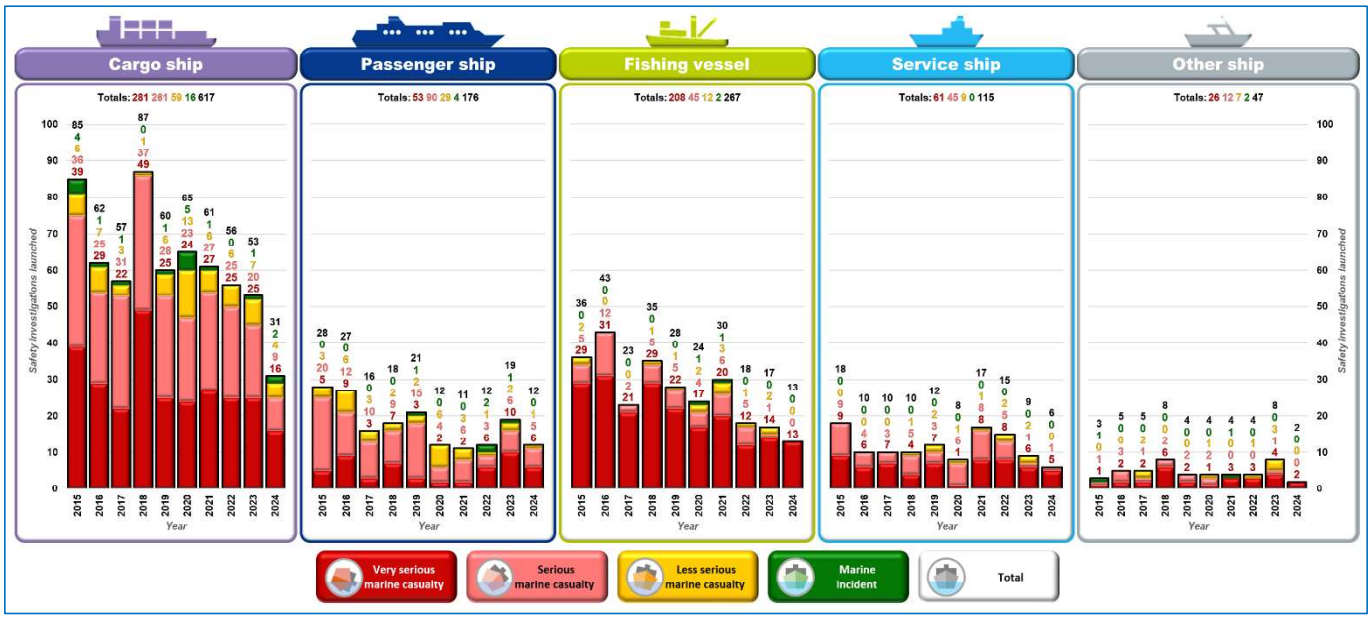
Figure 2.4–1 illustrates the evolution of safety investigations launched by severity, which can be compared to the total number of reported marine casualties and incidents by severity shown in Figure 2.1–1. Overall, there has been a decreasing trend in the number of safety investigations over the analysed period, except for year 2018.

From 2015 to 2024 a safety investigation was launched for 83.9% of the very serious marine casualties, for 5.6% of the serious marine casualties, for 0.7% of the less serious marine casualties and for 0.5% of the marine incidents.

In 2024 a safety investigation was conducted for all the very serious marine casualties, only for 3.4% of the serious marine casualties, for 9.4% of the less serious marine casualties and for 2.0% of the marine incidents.

The evolution of the number of safety investigations launched, categorized by severity and ship type, is shown in Figure 2.4–2, and can be compared with the overall number of reported marine casualties and incidents, categorized by severity and ship type, in Figure 2.1–2.

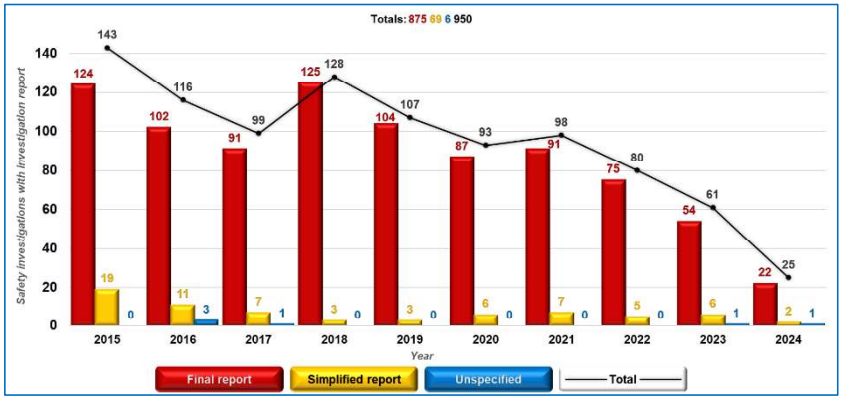
Figure 2.4–2 Evolution of number of safety investigations launched, organized by severity and ship type



From 2015 to 2024 the percentage of safety investigations launched before the 1st of May 2025 compared with the marine casualties and incidents was, on average and by ship type:

- Cargo ship: 86.2% of the very serious marine casualties, 8.2% of the serious marine casualties, 0.9% of the less serious marine casualties and 0.5% of the marine incidents;
- Passenger ship: 79.1% of the very serious marine casualties, 7.4% of the serious marine casualties, 0.7% of the less serious marine casualties and 0.5% of the marine incidents;
- Fishing vessel: 83.2% of the very serious marine casualties, 1.9% of the serious marine casualties, 0.6% of the less serious marine casualties and 0.7% of the marine incidents;
- Service ship: 85.9% of the very serious marine casualties, 6.6% of the serious marine casualties and 0.5% of the less serious marine casualties; and
- Other ship: 68.4% of the very serious marine casualties, 6.1% of the serious marine casualties and 1.3% of the less serious marine casualties and 1.2% of the marine incidents.

Figure 2.4–3 Evolution of number of safety investigations with investigation report, organized by report type

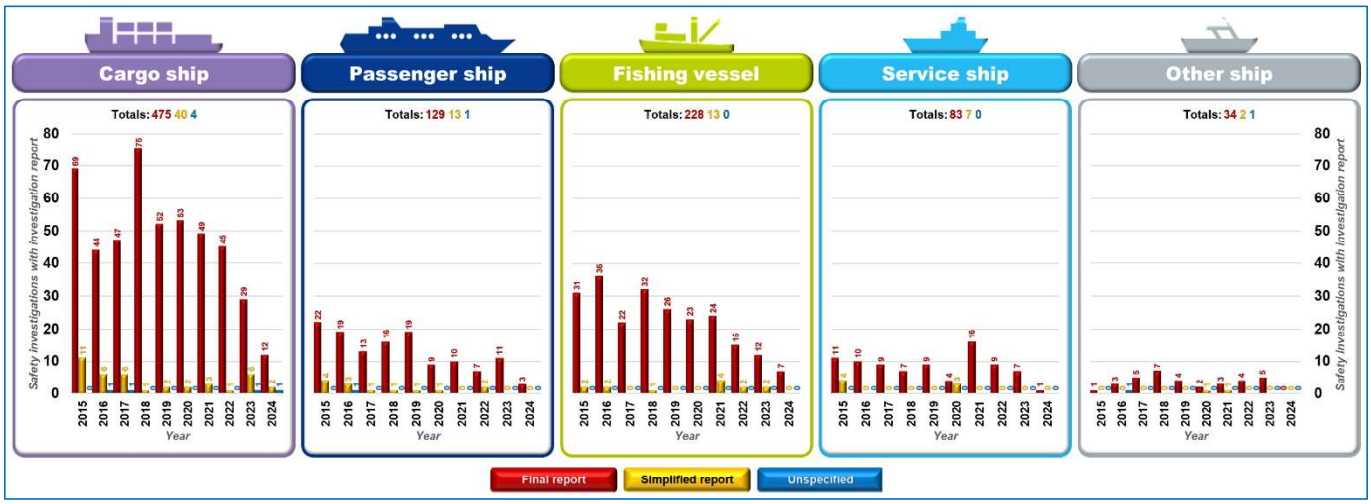


Organizing safety investigations by report type, 92.1% of the investigation reports were classified as final reports from 2015 to 2024, 7.3% were simplified reports and only small number were unspecified.

In 2024, the number of final and simplified reports was lower compared to other years in the analysed period. Nevertheless, it is to note that the data for the analysis was extracted the 1st of May 2025 and some investigation reports from 2024 can be still pending.

When comparing the investigation report types for the different ship types, it shows that cargo ships have the greater number of investigation reports, mainly final reports, followed by fishing vessels, passenger ships, service ships and finally other ships.

Figure 2.4–4 Evolution of number of safety investigations with investigation report, organized by report type and ship type



2.5 Consequences of marine casualties and incidents

This section presents information about the consequences of casualties to ships, persons, and the environment.

2.5.1 Consequences to persons

2.5.1.1 Fatalities

Figure 2.5–1 Evolution of fatalities, organized by category of the person on board

From 2015 to 2024, there were 415 casualties resulting in fatalities with a total number of 609 reported fatalities, with an average of 61 fatalities per year. The statistics show a decreasing trend over this period.

The highest number of fatalities was reached in 2015 with a total of 106 fatalities and the lowest number value was in 2024 with a total of 37 fatalities.

Attending to the category of the person on board, crew members represented 86.5%, other kind of person on board 8.1% and passengers 5.4% of the total fatalities.

To have a better understanding of the risk of a fatality on board, it is useful to consider an indicator that divides the number of fatalities in each category of person on board by the number of persons in that category.

Every year EMSA publish the seafarers' statistics in EU. These statistics are based in the STCW Information System and provide data only for seafarers with STCW certification. This is the source of information for this analysis so, excepting for the fishers, only crew with STCW certification considered by the EU Member States is included for the analysis. It should be considered that:

- Number of fishers in EU are only estimations. Fishers in EU-27 member States were obtained from the reports of the Scientific, Technical and Economic Committee for Fisheries (STECF). EEA fishers' data was obtained from local statistical databases.
- Official data for passengers in 2024 was not published by Eurostat before this document was written. Data of passengers in 2023 has been used as an approximation for 2024 indicator.
- When this document was written data about seafarers and fishers for 2024 in EU was not yet available and data of 2023 has been used.
- It was not possible to determine the number of other kinds of person on board, so it was not considered in the analysis.

Figure 2.5–2 Evolution of fatalities indicator, organized by category of the person on board

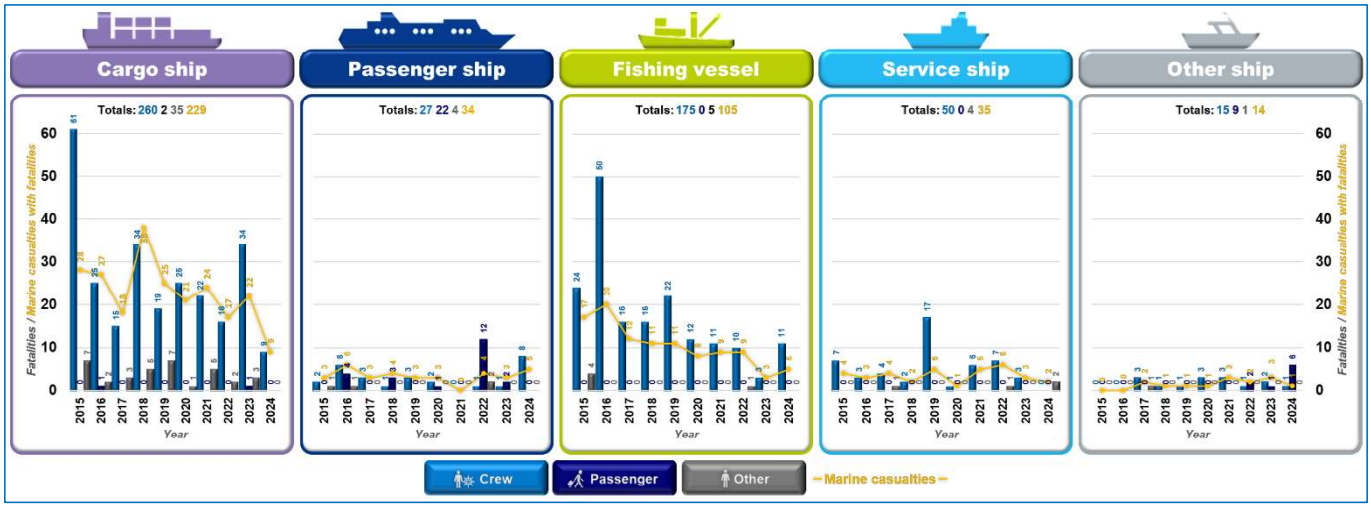
Fatalities indicator, as described in Appendix 5, provides an estimate on the number of the fatalities occurred per one thousand million passengers or one million crew member on board EU fleet. The trend of Figure 2.5–2 is like in Figure 2.5–1.

On average, the risk of a fatality was 11,483 times lower for passengers compared to crew members, with a minimum of 1,725 times lower in 2022.

In 2024, the indicator reached its lowest level for crew members and was high for passengers.

The following figure analyses the evolution of the number of fatalities in marine casualties and incidents for each ship type.

Figure 2.5–3 Evolution of fatalities, organized by category of the person on board and ship type



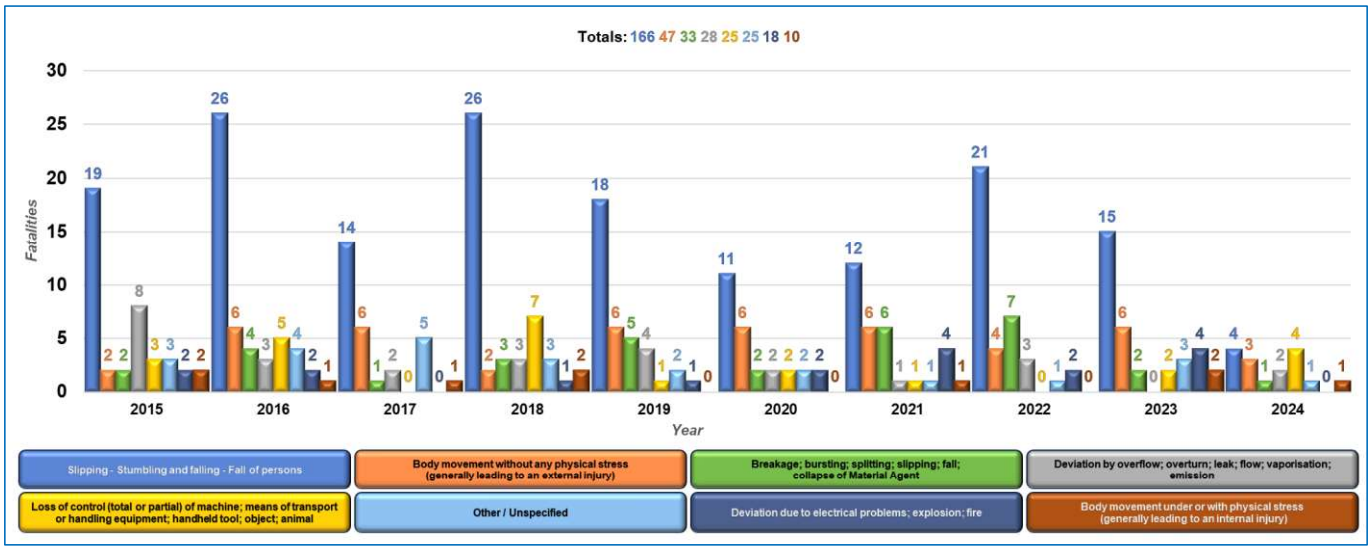
Overall, fatalities are decreasing over the years, through 2015 to 2024, for all ship types, but this trend has not been constant.

Occurrences with persons are classified by deviation and occurrences with ships are classified by casualty event type, as explained in definitions of Appendix 1.

Photo credit by GAMA (Portugal)

Fatalities in occurrences with persons are organized by deviation in the following figure.

Figure 2.5–4 Evolution of fatalities in occurrences with persons, organized by deviation

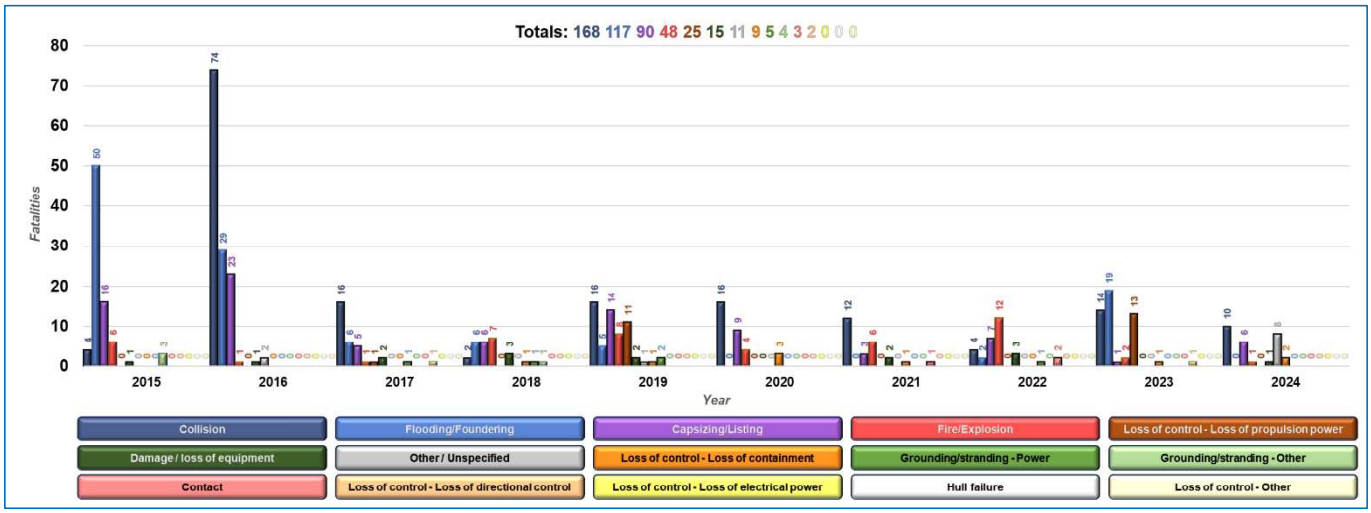


The total number of reported deviations for fatalities in occurrences involving persons between 2015 and 2024 was 352.

Fall of person caused by stumbling and failing due to slipping, was by far the main deviation causing 166 fatalities, 57.2% of the total. The second deviation was body movement without any physical stress (generally leading to an external injury) causing 47 fatalities, 13.4% of the total. The third deviation was caused by overflow, overturn, leak, flow, vaporisation or emission, causing 33 fatalities, 9.4% of the total.

Fatalities in occurrences with ships are organized by casualty event type in the following figure.

Figure 2.5–5 Evolution of fatalities in occurrences with ships, organized by casualty event type



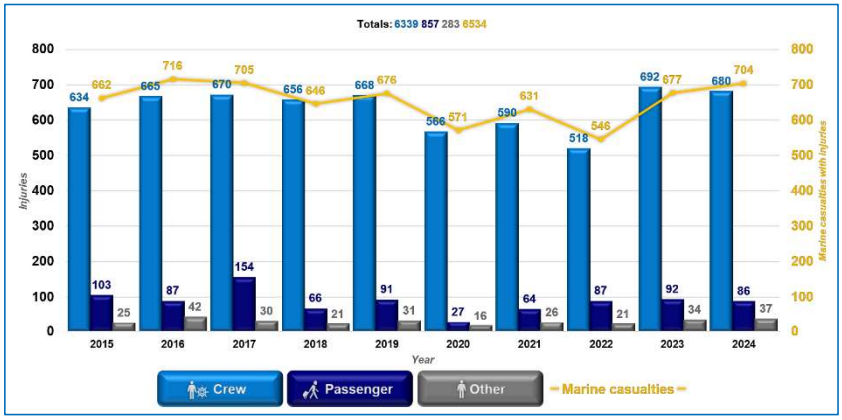
The total number of reported casualty event types for fatalities in occurrences with ships from 2015 to 2024 was 497.

Fatalities mainly occurred during casualty events collision and flooding or foundering, representing respectively 33.8% and 23.5% of the fatalities. Casualty events capsizing or listing were the next with the 18.1% of the fatalities. It is noted that collisions were exceptionally low in years 2015, 2018 and 2022 whereas fires and explosions were exceptionally high in 2022.

A marine casualty can have more than one occurrence with persons, more than one occurrence with ships or a combination of occurrences with persons and occurrences with ships. In consequence, the sum of fatalities from Figure 2.5–4 and Figure 2.5–5 is different than the sum of fatalities in Figure 2.5–1.

2.5.1.2 Injuries

Figure 2.5–6 Evolution of injuries, organized by category of the person on board



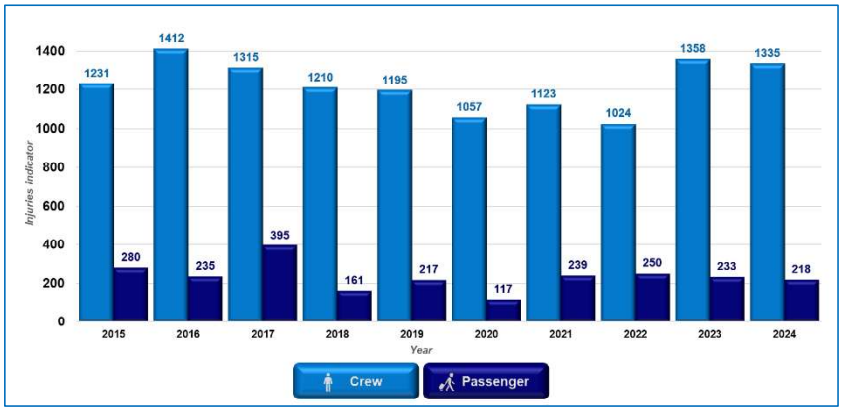
From 2015 to 2024, there were 6,534 casualties and incidents resulting in 7,479 reported injuries. The statistics showed a decreasing trend until 2022, after which, the number of injuries increased in 2023, reaching levels like those seen in 2016 and 2017.

The average in this period was 748 injuries per year. The highest value was reached in 2017 with 854 injuries and the lowest value was in 2020 with 609 injuries.

Attending to the category of the person on board crew members represented 84.7%, passengers 11.5% and other kind of person on board 3.8% of the total injuries.

To better understand the risk of an injury on board, it is useful to apply an indicator, that divides the number of injuries in each category of person on board by the number of persons in that category, using the procedure described in 2.5.1.1.

Figure 2.5–7 Evolution of injuries indicator, organized by category of the person on board



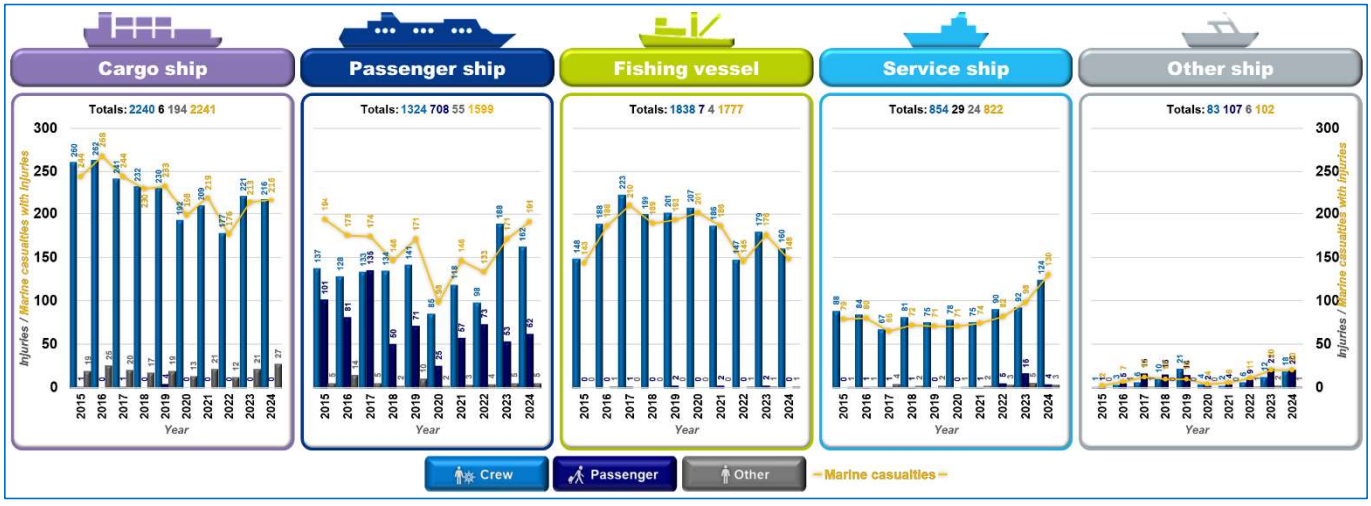
Injuries indicator is obtained by applying the methodology described in Appendix 5, providing an estimate on how many injuries occurred per one thousand million passengers or one million crew member on board EU fleet. The trend of Figure 2.5–7 is like Figure 2.5–6.

On average, the risk of injury was, 5,228 times lower for passengers than for crew members, with a minimum of 3,329 times lower in 2017 and a maximum of 9,034 times lower in 2020.

The injuries indicator for passengers has been almost constant since 2021.

The following figure analyses the evolution of the number of fatalities in marine casualties and incidents for each ship type.

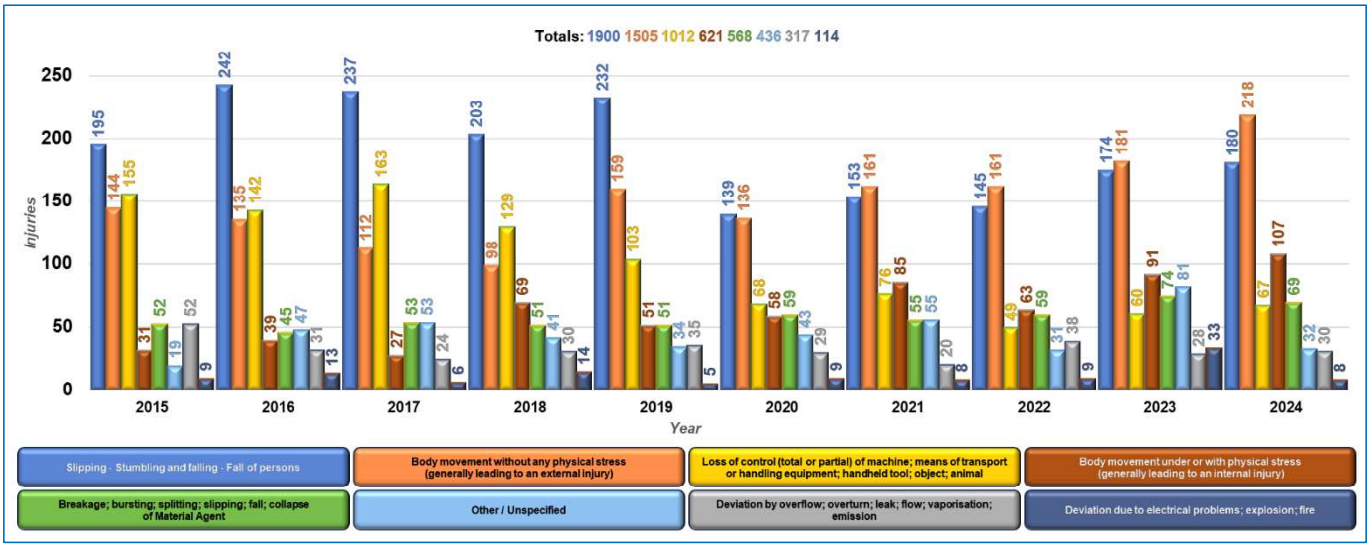
Figure 2.5–8 Evolution of injuries, organized by category of the person on board and ship type



The average number of injuries is decreasing over the years from 2015 to 2024 for all ship types, but the tendency is not constant. Almost all injuries in passenger category were detected, as expected, in passenger ships

Injuries in occurrences with persons are organized by deviation in the following figure.

Figure 2.5–9 Evolution of injuries in occurrences with persons, organized by deviation

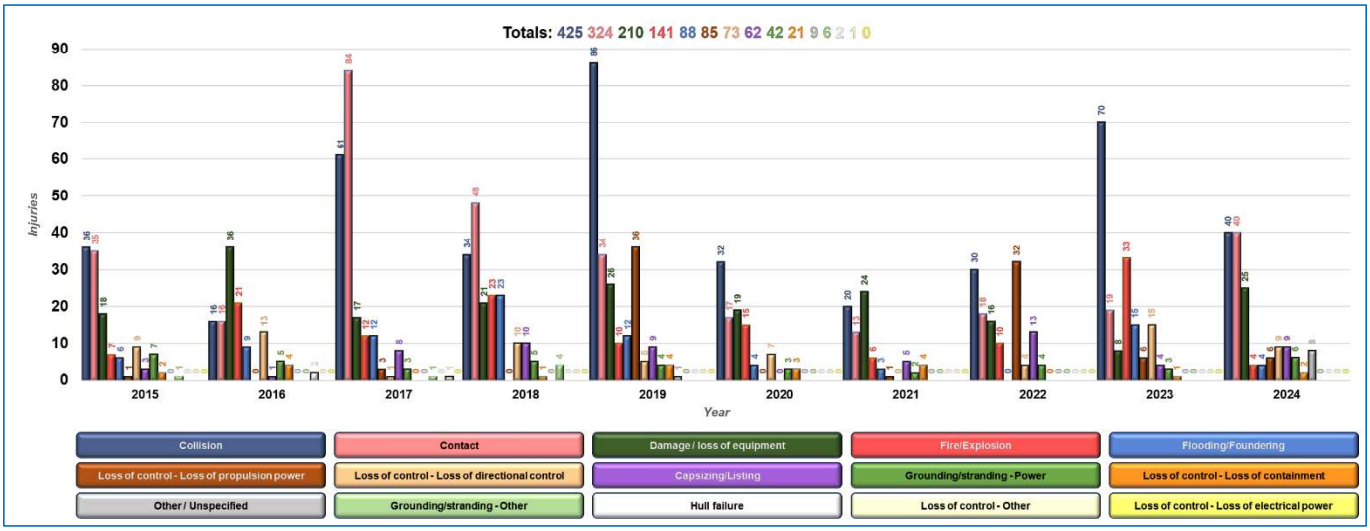


The total number of reported deviations for injuries in occurrences with persons from 2015 to 2024 was 6,473.

Fall of person caused by stumbling and failing due to slipping, was the main deviation causing 1,900 injuries, 29.4% of the total. The second deviation was body movement without any physical stress (generally leading to an external injury), causing 1,505 injuries, 23.3% of the total. The third deviation was loss of control (total or partial) of machine, means of transport or handling equipment, handheld tool, object or animal, causing 1,012 injuries, 15.6% of the total.

Injuries in occurrences with ships are organized by casualty event type in the following figure.

Figure 2.5–10 Evolution of injuries in occurrences with ships, organized by casualty event type



The total number of reported casualty event types for injuries in occurrences with ships from 2015 to 2024 is 1,489.

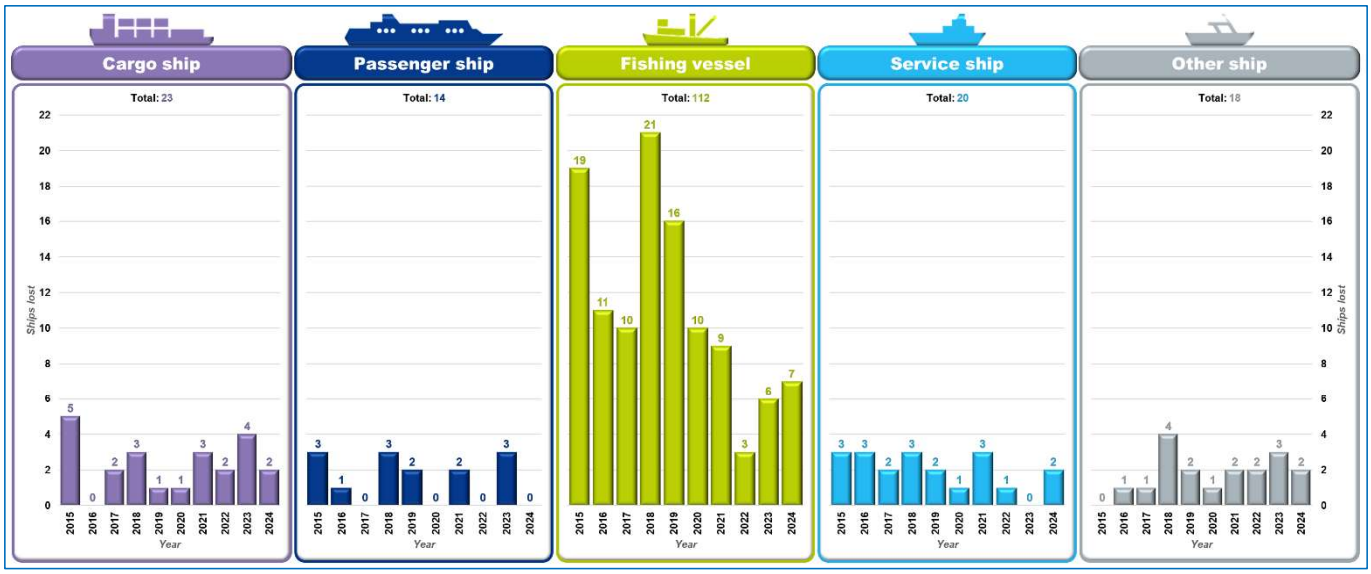
Injuries occurred during collisions and contacts, represent 28.5% and 21.8% of the total injuries, respectively. Damage or loss of equipment is the next casualty event with 14.1% of the total injuries, followed by fire or explosion with 9.5% of the total injuries.

There were exceptionally high values for the injuries related to contacts in 2017 and the injuries related to collisions in 2017, 2019 and 2023. In 2024, the number of injuries in collisions was like the number of injuries in contacts.

2.5.2 Consequences to ships

Consequences to ships, categorized by ships lost, ships damaged, ships considered unfit to proceed, ships requiring shore assistance, ships requiring towage, Search and Rescue (SAR) operations and ships abandoned, are analysed in the following figures.

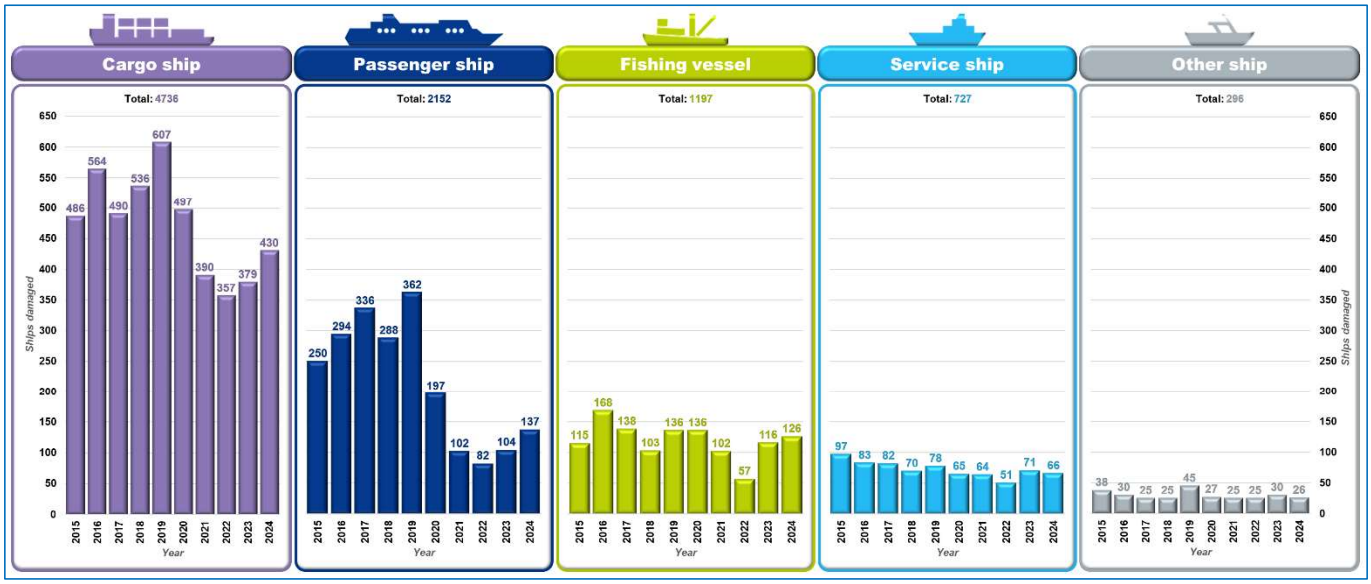
Figure 2.5–11 Evolution of ships lost, organized by ship type



The total number of ships lost from 2015 to 2024 was 187. Only 13 ships were lost in 2024, under the medium value of 19 ships lost in the analysed period.

Fishing vessels accounted for 59.9% of the total ships lost from 2015 to 2024, making them the most lost ship type. In 2022 there was an exceptional reduction in the number of lost fishing vessels. In 2024, the number of fishing vessels lost was higher than in 2023 and 2022, although it did not reach the level prior to 2022.

Figure 2.5–12 Evolution of ships damaged, organized by ship type

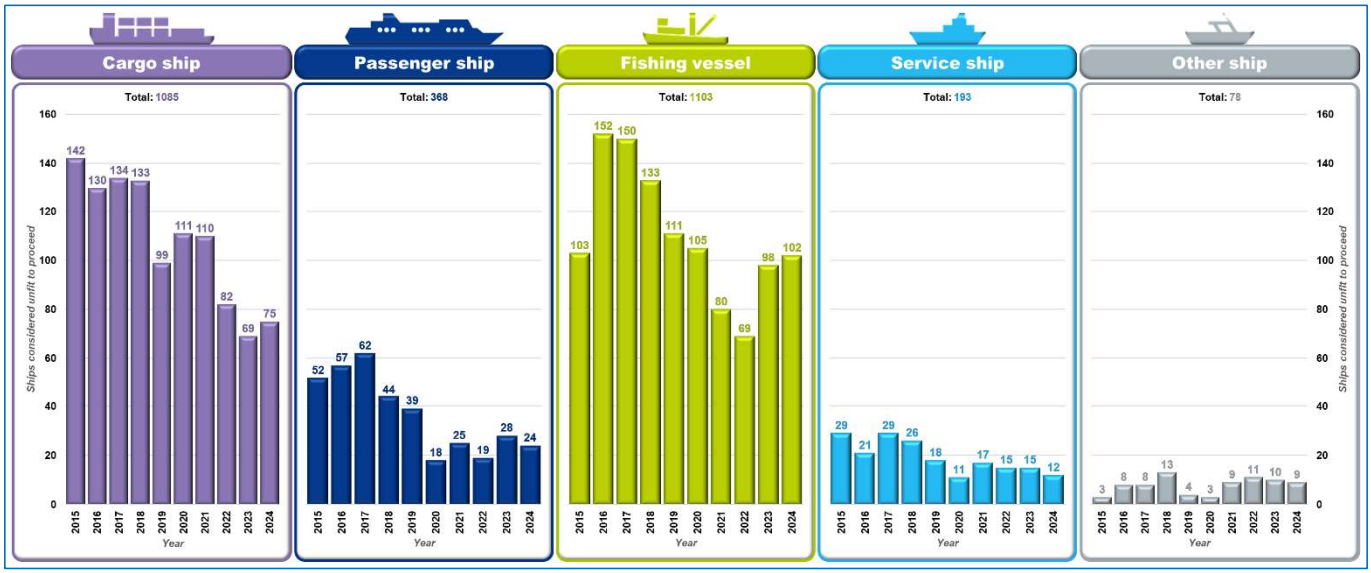


The total number of ships damaged from 2015 to 2024 was 9,108.

After a decreasing trend in the number of ships damaged, there was an increase in 2023 that continued into 2024.

52.0% of the damaged ships were cargo ships, 23.6% passenger ships, 13.1% fishing vessels, 8.0% service ships and 3.3% other ships.

Figure 2.5–13 Evolution of ships considered unfit to proceed, organized by ship type

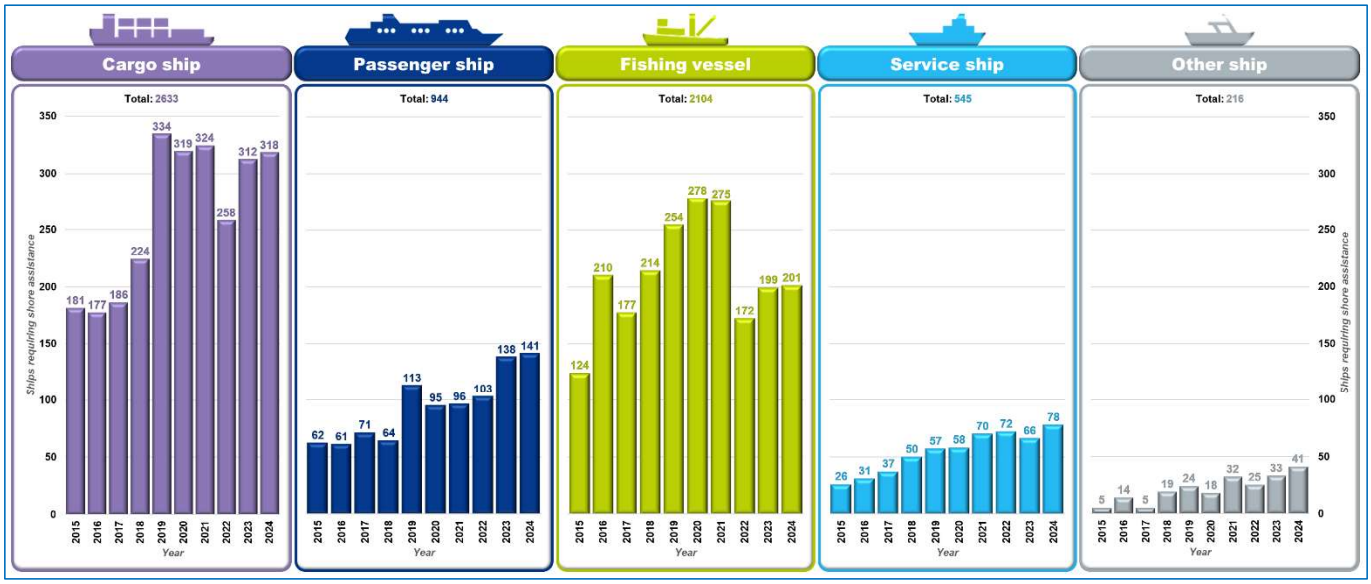


Between 2015 and 2024, 2,827 ships were considered unfit to proceed.

There was a general decreasing trend in the number of ships considered unfit to proceed except for passenger ships, and fishing vessels.

Fishing vessels were close to cargo ships as regards the number of ships considered unfit to proceed, overpassing them in 2023 and 2024. From 2015 to 2024, 38.4% of the ships unfit to proceed were cargo ships, 39.0% fishing vessels, 13.0% passenger ships, 6.8% service ships and 2.8% other ships.

Figure 2.5–14 Evolution of ships requiring shore assistance, organized by ship type

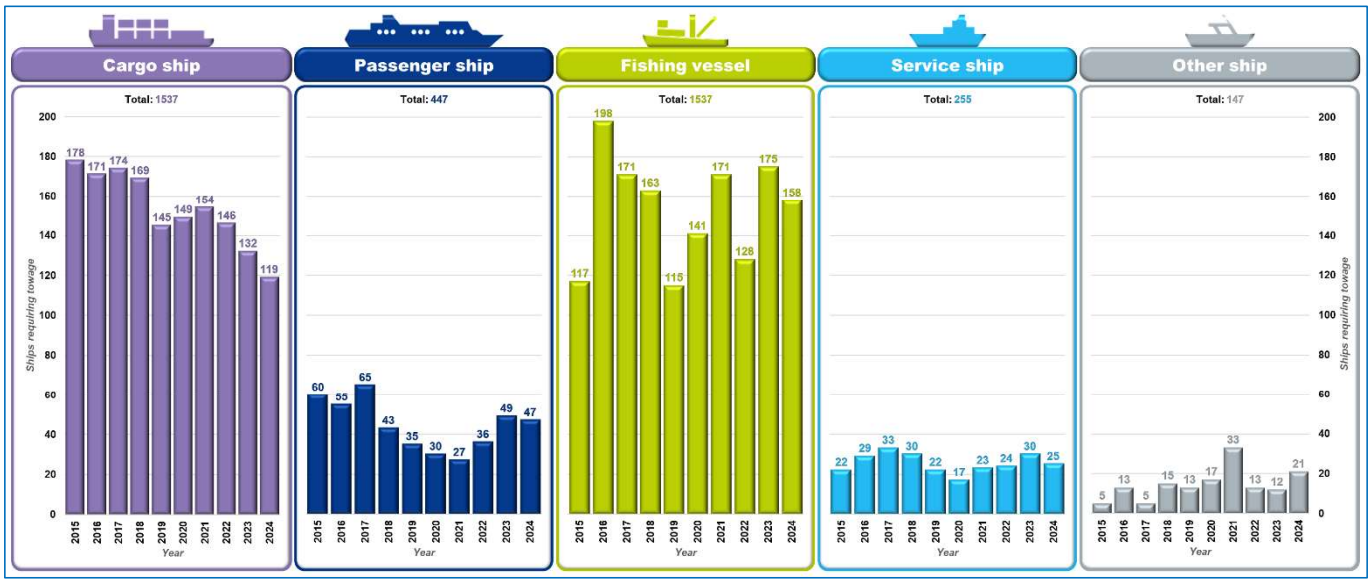


The total number of ships requiring shore assistance from 2015 to 2024 was 6,442.

There was an increasing trend in the number of ships requiring shore assistance for all the ship types since 2015.

Cargo ships and fishing vessels were the ship types requiring more shore assistance. From 2015 to 2024, 40.9% of the ships requiring shore assistance were cargo ships, 32.7% fishing vessels, 14.6% passenger ships, 8.5% service ships and 3.3% other ships.

Figure 2.5–15 Evolution of ships requiring towage, organized by ship type

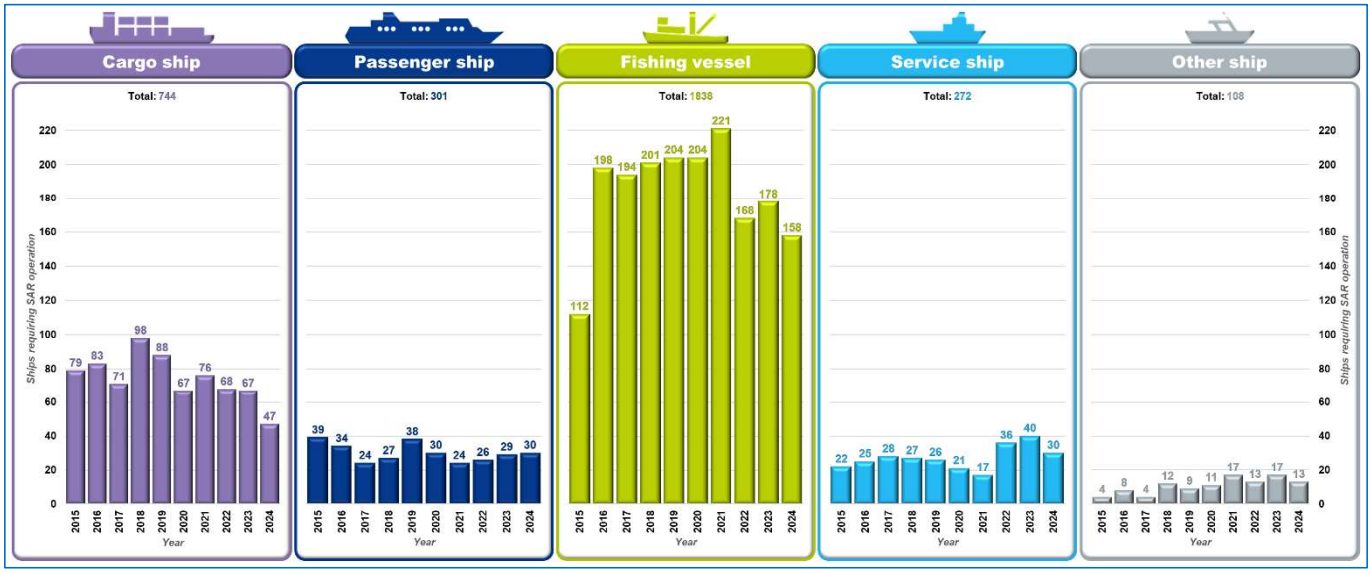


The total number of ships requiring towage from 2015 to 2024 was 3,923.

From 2015 to 2024 there was a decreasing trend in the number of ships requiring towage for cargo ships.

Fishing vessels and cargo ships were the ship types requiring more towage. From 2015 to 2024, 39.2% of the ships requiring towage were cargo ships, also 39.2% fishing vessels, 11.4% passenger ships, 6.5% service ships and 3.7% other ships.

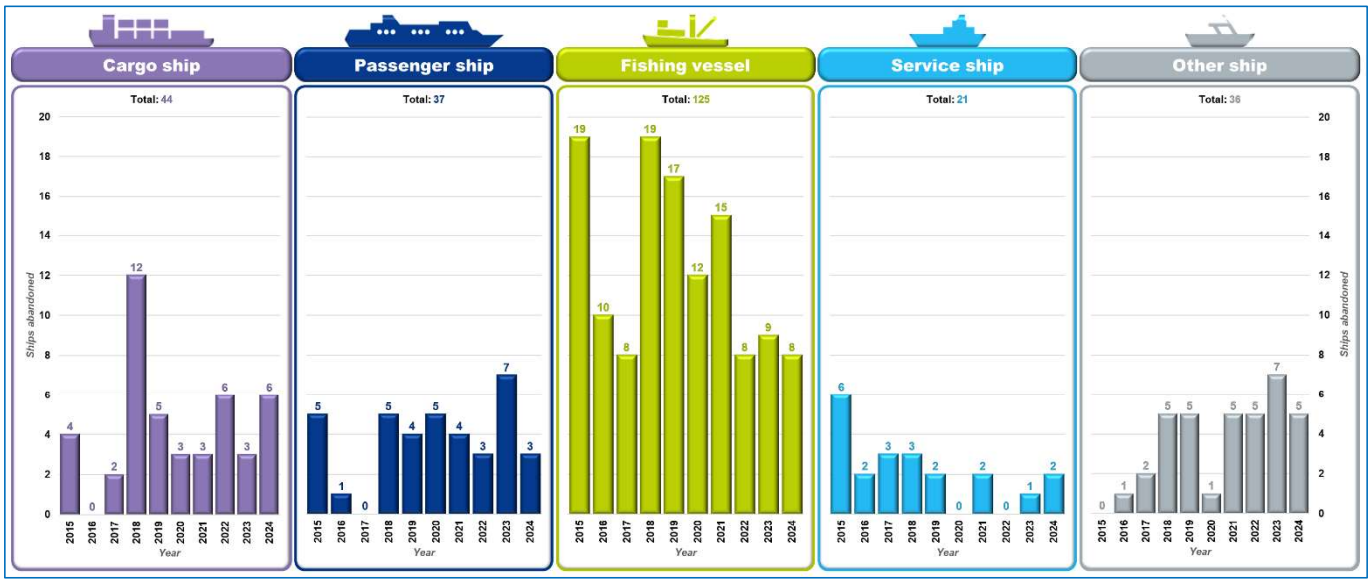
Figure 2.5–16 Evolution of ships requiring Search and Rescue (SAR) operations, organized by ship type



The total number of ships requiring Search and Rescue (SAR) operations from 2015 to 2024 was 3,263. There was not a clear trend in the number of ships requiring SAR operations in that period.

Fishing vessels was the ship type with the higher number of SAR operations, with 56.3% of the total, followed by cargo ships with 22.8%, passenger ships with 9.2%, service ships with 8.4% and other ships with 3.3%.

Figure 2.5–17 Evolution of ships abandoned, organized by ship type



The total number of ships abandoned from 2015 to 2024 was 263, without a clear trend in that period

On average, that 47.5% of the abandoned ships were fishing vessels, 16.7% cargo ships, 14.1% passenger ships, 13.7% other ships and 8.0% service ships.

2.5.3 Consequences to the environment

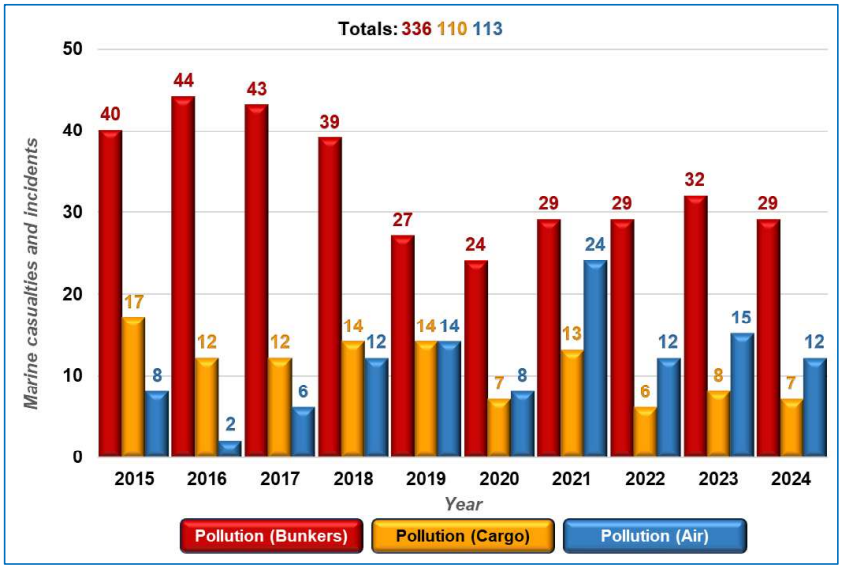
From 2015 to 2024, 559 cases of pollution were reported. Marine pollution by ship's bunkers (fuel) and other pollutants (e.g., cargo residues, lubricating or hydraulic oils) corresponded to the 60.1% of all pollutions.

Figure 2.5–19 shows the evolution of pollution organized by type of pollution and ship type.

From 2015 to 2024, there were 306 (54.7%) cases of pollution for cargo ships, 88 (15.7%) for fishing vessels, 75 (13.4%) for passenger ships, 74 (13.3%) for service ships and 16 (2.9%) for other ship types.

The number of marine casualties and incidents resulting in pollution was almost constant in the last three years.

Figure 2.5–18 Evolution of pollution, organized by type of pollution



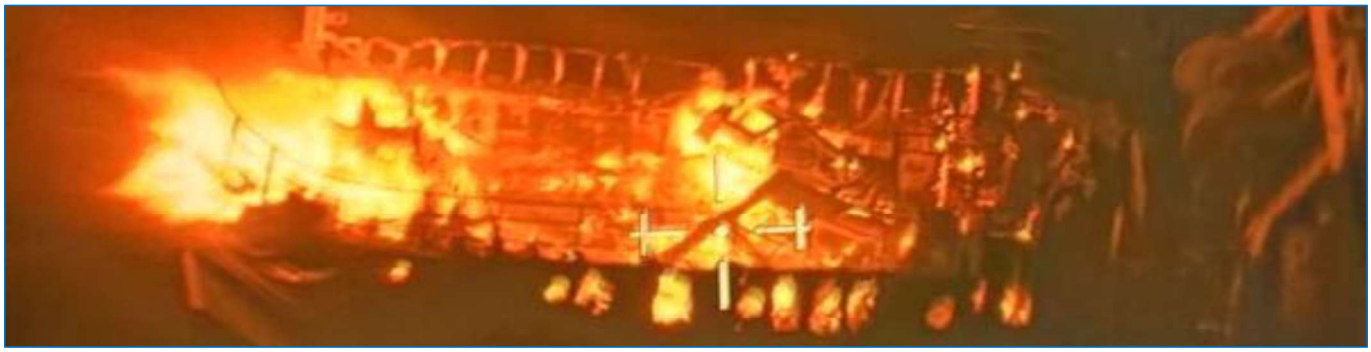
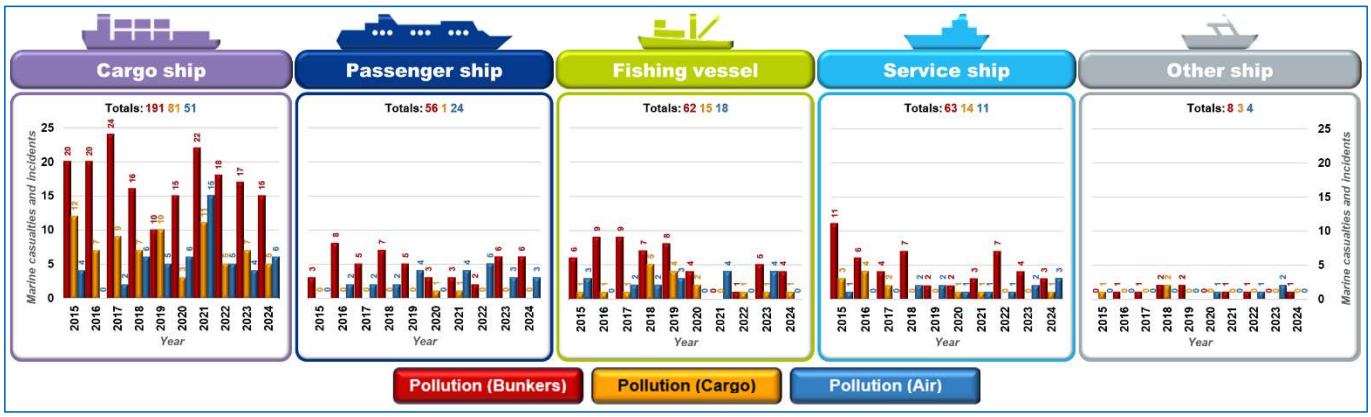


Photo credit by BEAmer (France)

Figure 2.5–19 Evolution of pollution, organized by type of pollution and ship type



There were 173 oil pollution responses reported from 2015 to 2024, with a maximum of 36 responses in 2023 and a minimum of 4 responses in 2016.

There was a reduction in the oil pollution responses, there is a reduction from 2018 to 2022 but there was a significant increase in 2023 that continued in 20024.

Reviewing the evolution of oil pollution responses by casualty event, in Figure 2.5–21, loss of control with loss of containment was the casualty event with more oil pollution responses in the period from 2015 to 2024, with a total of 95 responses, growing from one in 2015 to a maximum of 20 responses in 2024.

Damage and loss of equipment has also grown significantly during the last years, reaching a maximum of 15 responses in 2023 and a reduction to 7 responses in 2024.

Figure 2.5–20 Evolution of oil pollution responses

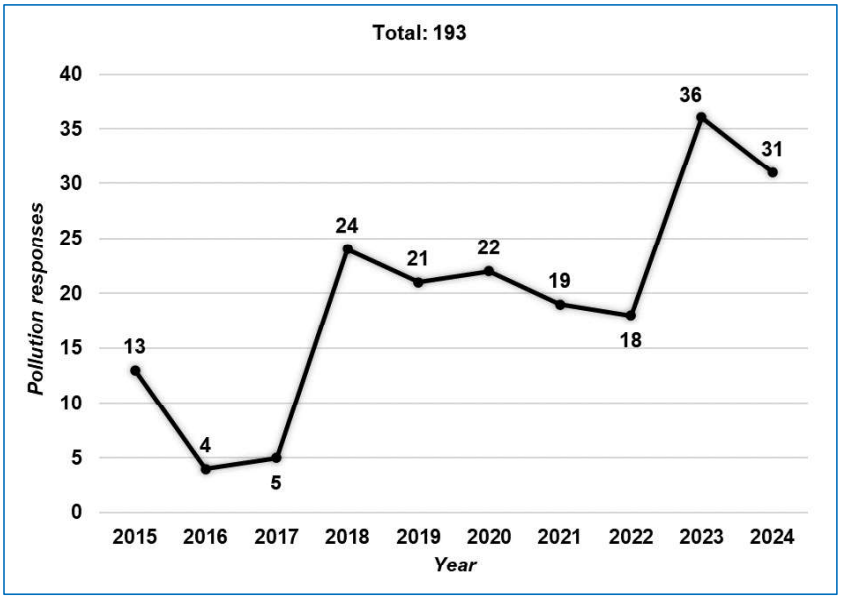
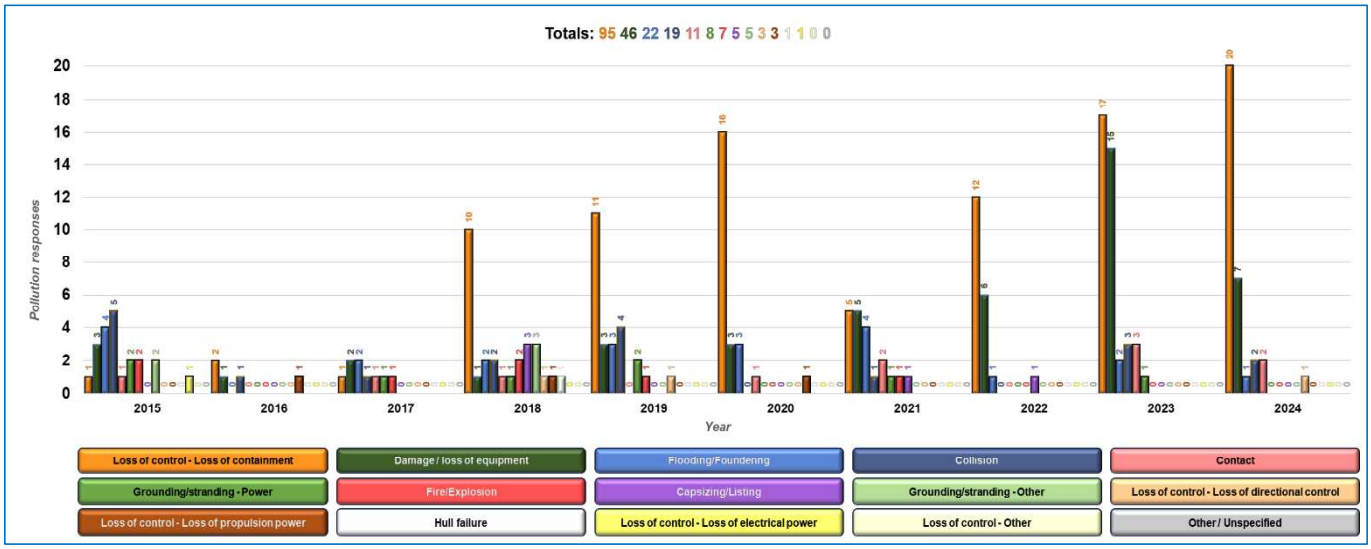


Figure 2.5–21 Evolution of oil pollution responses, organized by casualty event



2.6 Nature of marine casualties and incidents

This section analyses marine casualties and incidents organized by their nature as: occurrences with persons or occurrences with ships.

Figure 2.6–1 Evolution of marine casualties and incidents, organized by nature type

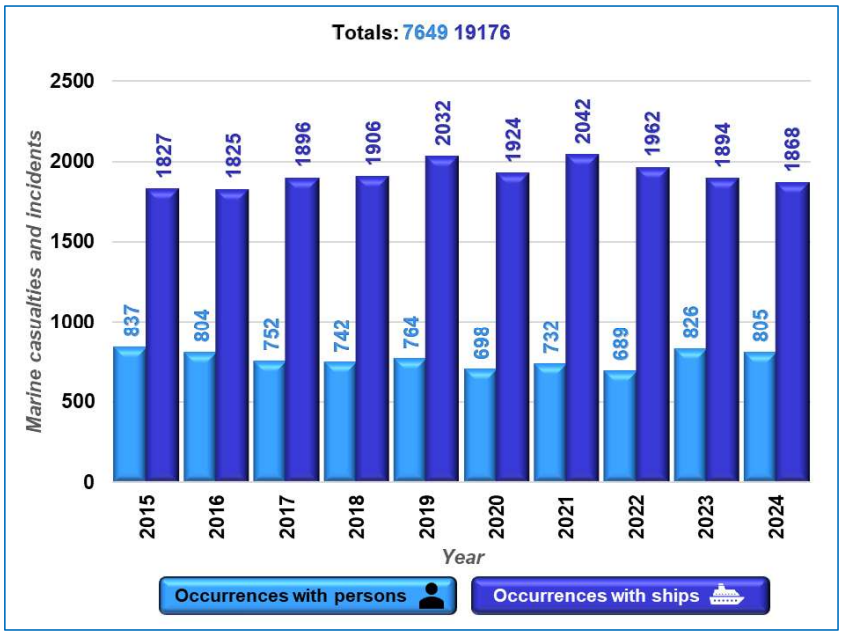


Figure 2.6–1 counts marine casualties and incidents with at least one occurrence with persons or at least one occurrence with ships.

Some marine casualties and incidents have one or more occurrences with persons and one or more occurrences with ships, and for this reason the total count of 26,825 occurrences shown in Figure 2.6–1 is greater than the 26,751 total count of occurrences (Figure 2.1–1).

Accidents with persons not related to ship operations have not been considered in the analysis, as well as accidents with ships with non-accidental events.

Occurrences with ships are decreasing during the last three years. Occurrences with persons had a minimum of 689 occurrences in 2022 increasing until 826 occurrences in 2023 and 805 occurrences in 2024.

2.6.1 Occurrences with persons

Figure 2.6–2 Evolution of marine casualties and incidents with occurrences with persons, organized by severity

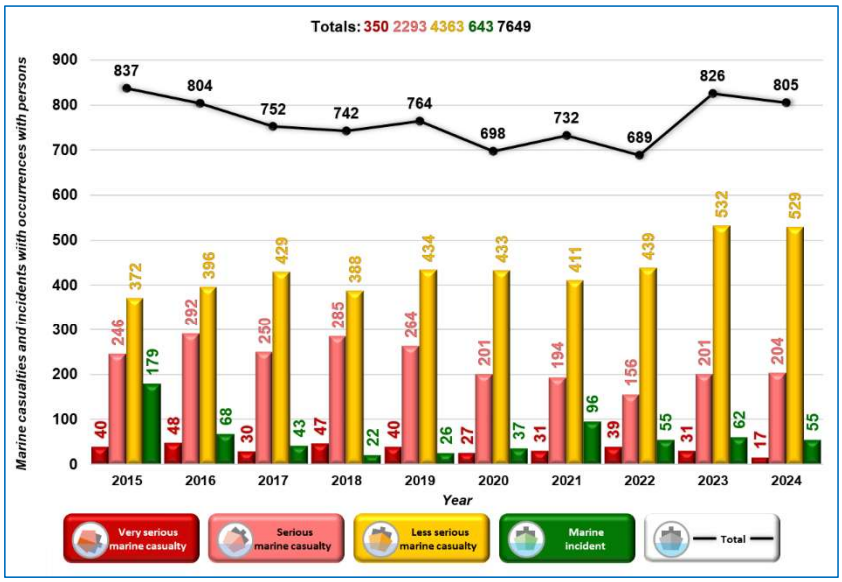


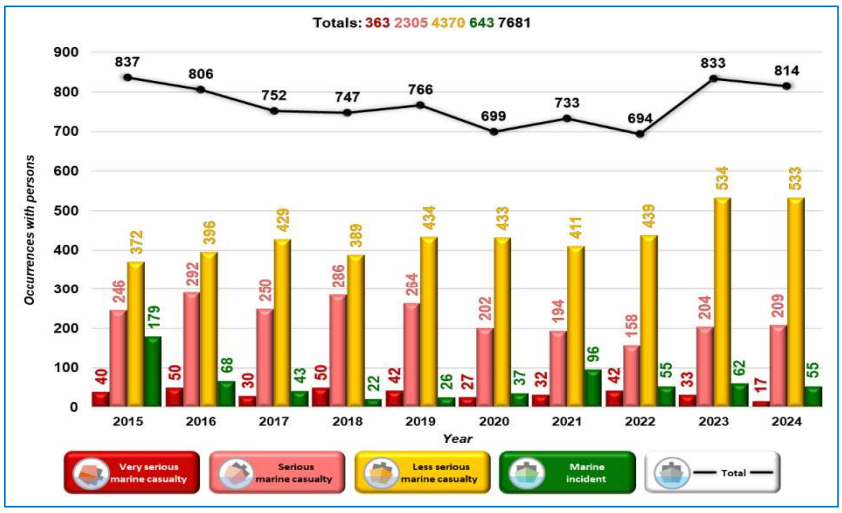
Figure 2.6–2 counts marine casualties and incidents with at least one occurrence with persons. There were 7,649 marine casualties and incidents with at least one occurrence with persons, showing the following distribution by severity: 57.0% were less serious marine casualties, 30.0% were serious marine casualties, 8.4% were marine incidents and 46% were very serious marine casualties.

The number of less serious casualties with at least one occurrence with persons did not show a clear trend from 2015 to 2024, but there was a significant increase in 2023, reaching the maximum of 826, increase that was continued in 2024 with 805 marine casualties and incidents.

The number of serious casualties with at least one occurrence with persons had a decreasing trend from 2015 to 2022, with an increase in 2023 that was continued in 2024.

The number of very serious casualties and marine incidents with at least one occurrence with persons did not show a clear trend from 2015 to 2024 but there was a significant decrease in 2024.

Figure 2.6–3 Evolution of occurrences with persons, organized by severity

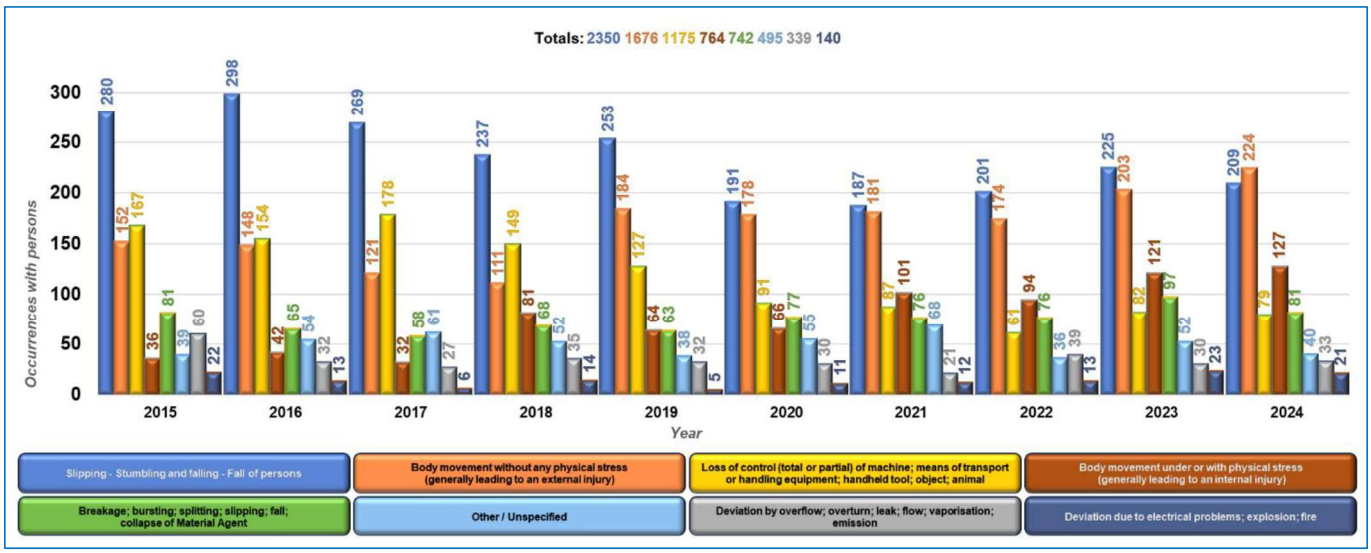


The total number of occurrences with persons from 2015 to 2024 was 7,681, which is greater than the total 7,649 marine casualties with occurrences with persons in Figure 2.6–2, because some marine casualties had more than one occurrence with persons.

The distribution of occurrences with persons by severity, in Figure 2.6–3, is almost the same than in Figure 2.6–2.

The total number of occurrences with persons is organized by deviation in Figure 2.6–4. This data correlates with data in Figure 2.5–4 and Figure 2.5–9.

Figure 2.6–4 Evolution of occurrences with persons, organized by deviation



2.6.2 Occurrences with ships

Figure 2.6–5 Evolution of marine casualties and incidents with occurrences with ships, organized by severity

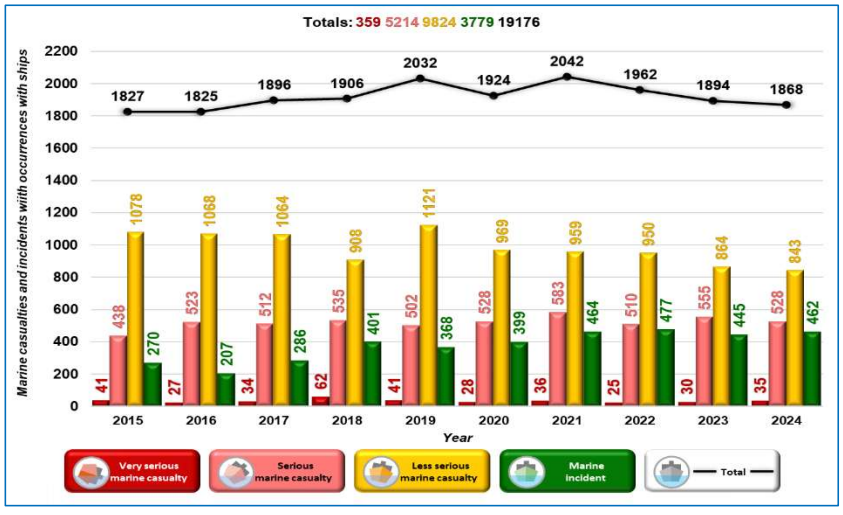


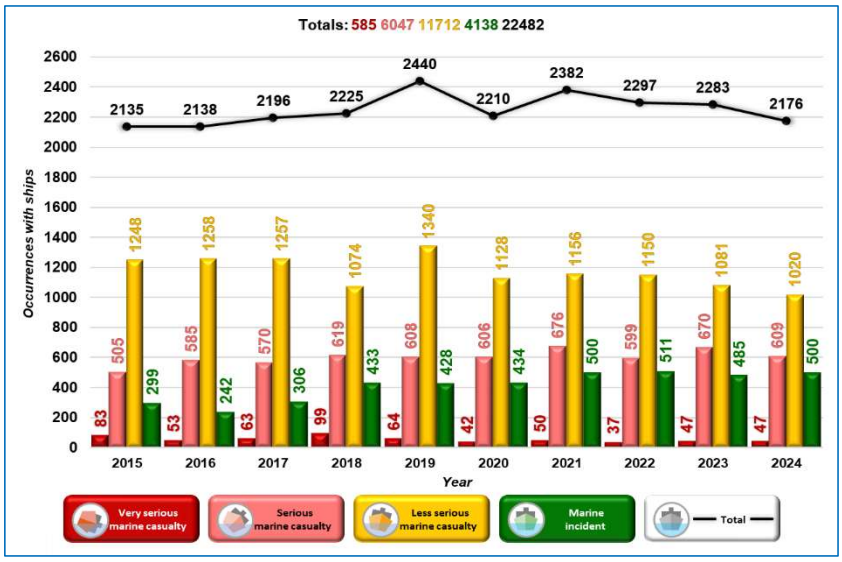
Figure 2.6–5 counts marine casualties and incidents with at least one occurrence with ships. From 2015 to 2024, there were 19,176 marine casualties and incidents with at least one occurrence with ships, showing the following distribution by severity: 51.2% were less serious marine casualties, 27.2% were serious marine casualties, 19.7% were marine incidents and 1.9% were very serious marine casualties.

The number of less serious casualties with at least one occurrence with ships was almost constant from 2015 to 2018, and after a decrease in 2018, it grown again in 2019. There has been a decreasing trend from 2019 to 2024.

The number of serious casualties and marine incidents with at least one occurrence with ships had an increasing trend from 2015 to 2021. There has been a decreasing trend from 2021 to 2024.

The number of very serious casualties with at least one occurrence with ships had a slow decreasing trend from 2015 to 2024 with an exception in 2018.

Figure 2.6–6 Evolution of occurrences with ships, organized by severity



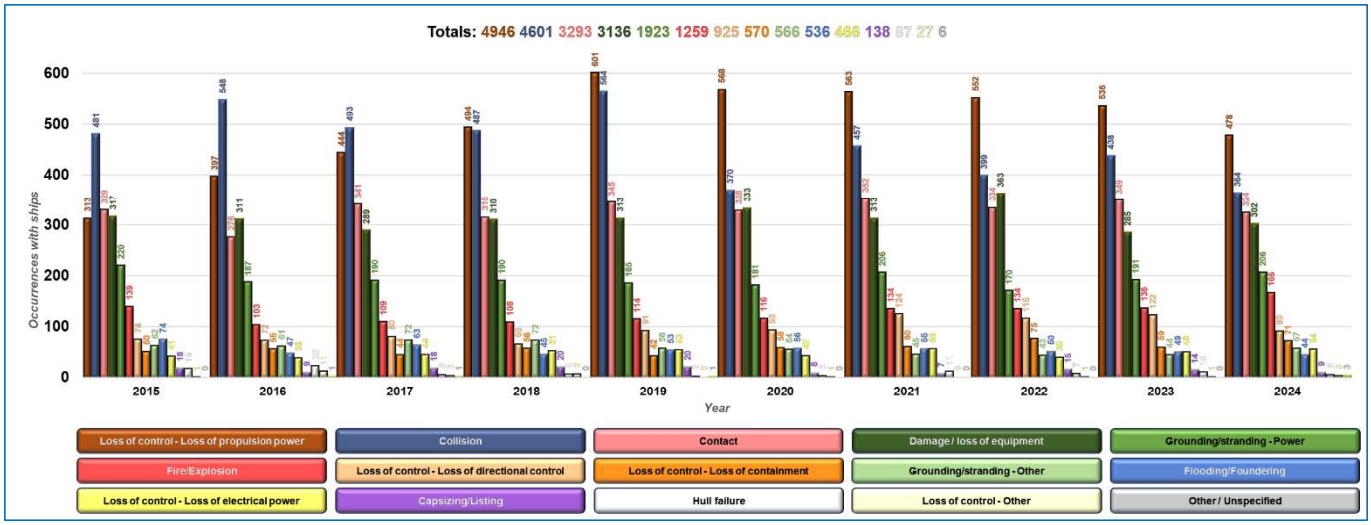
From 2015 to 2024, there were a total of 22,482 occurrences with ships, which is higher than the 19,176 marine casualties with at least one occurrence with ship, shown in Figure 2.6–5, as some marine casualties involved multiple occurrences with ships.

The distribution of occurrences with ships by severity, in Figure 2.6–6, is nearly identical to that in Figure 2.6–5.

Occurrences with ships are organized by casualty even type in Figure 2.6–7. Loss of control due to loss of propulsion power was the main casualty event type from 2015 to 2024, with 22.0% of the occurrences and the second, very close to the first position, with 20.5% of the occurrences was collision. The third casualty event was contact, with 14.6% of the occurrences.

From 2015 to 2017, there were more casualty events loss of control due to loss of propulsion power than collisions, in occurrences with ships. That trend changed from 2018 to 2024.

Figure 2.6–7 Evolution of occurrences with ship, organized by casualty event type



2.7 Events and conditions that led to marine casualties and incidents

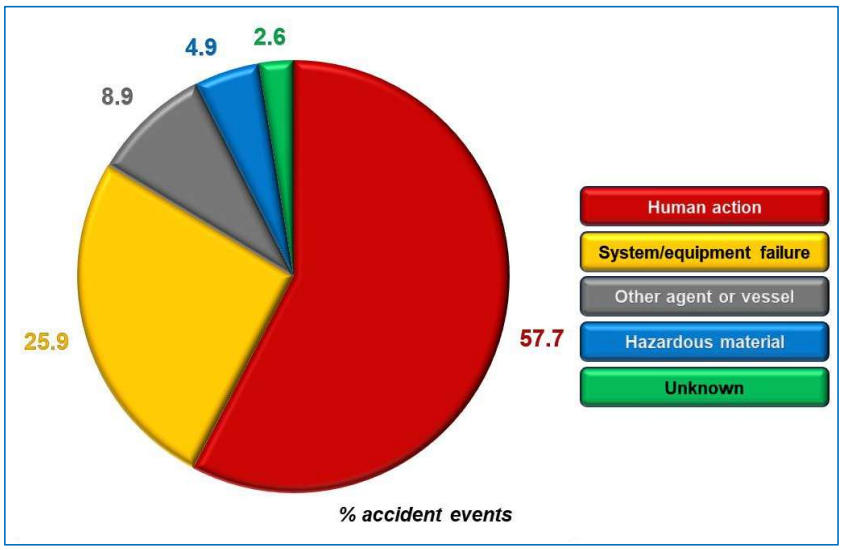
Safety investigators looked for the factors contributing to marine casualties and incidents in the analysis phase. Such causes are made up of accident events (underlying factors) and contributing factors. The reporting scheme used in EMCIP follows this approach. A detailed model of EMCIP can be found in Appendix 2.

In this section all the accident events and contributing factors in the analysed period, 2015 to 2024, are considered and for simplification they are not analysed by year.

2.7.1 Accident events

Each marine casualty and incident reported in EMCIP can have one or more accident events. More than one accident events can be associated to a casualty event. As explained in Appendix 2, the five accident event types are: human action, system or equipment failure, other agent or vessel, hazardous material and unknown.

Figure 2.7–1 Percentage of accident events, organized by accident event types



The percentage of accident events from 2015 to 2024 is obtained from the count of every single accident event of each type reported in EMCIP.

From 2015 to 2024, Human action was the main accident event type with 57.7% of the total, followed by System/equipment failure with 25.9%, Other agent or vessel with 8.9%, Hazardous material with 4.9% and Unknown with 2.6%.

The percentage of accident events from 2015 to 2024 for the different ship types shows similar trends for all ship types with small variations in the percentages. Human factor has been the main accident event type, and System/equipment failure has been higher for passenger ships and fishing vessels than for the other ship types.

Figure 2.7–2 Percentage of accident event types, organized by accident event types and ship types

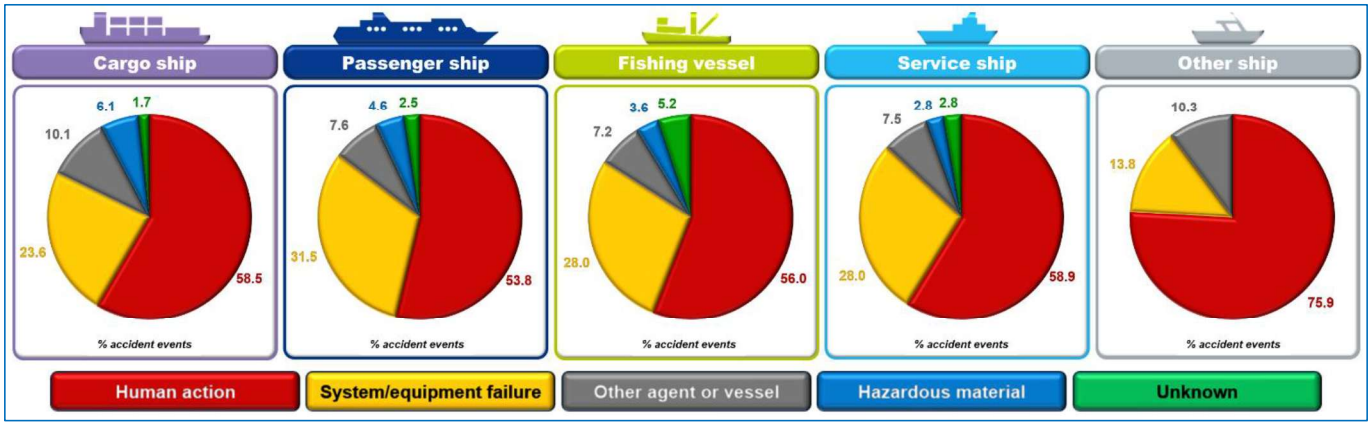
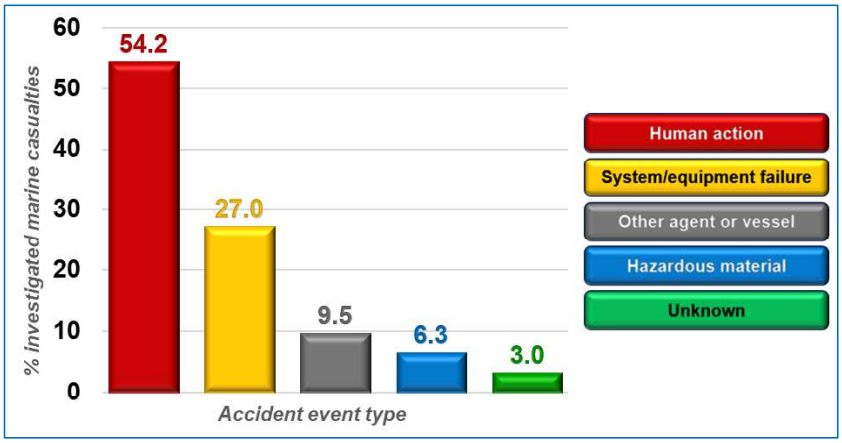


Figure 2.7–3 Percentage of accident events related to the investigated marine casualties and incidents, organized by accident event types

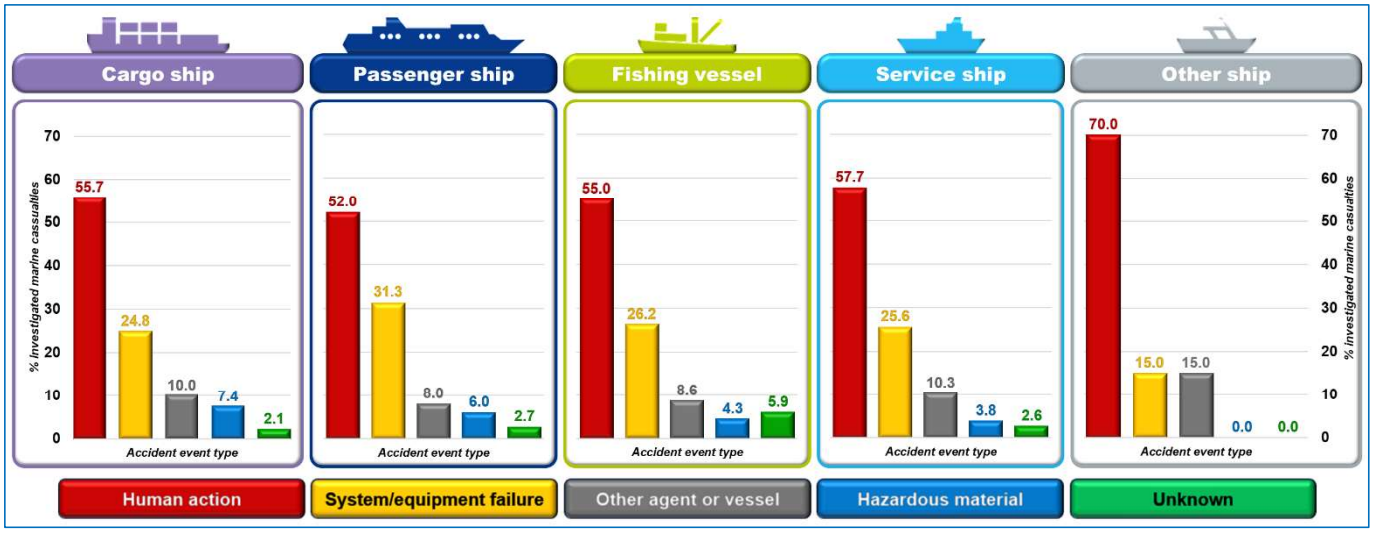


The percentage of investigated marine casualties and incidents having at least one accident event type is analysed from 2015 to 2024 and organized by accident event types in Figure 2.7–3. In this case percentage is related to marine casualties and incidents instead of accident events.

The trends observed are consistent with those shown in Figure 2.7–1.

The percentage of accident events related to the investigated marine casualties and incidents from 2015 to 2024 is shown separately for every ship type in Figure 2.7–4, and has the same trends than Figure 2.7–2.

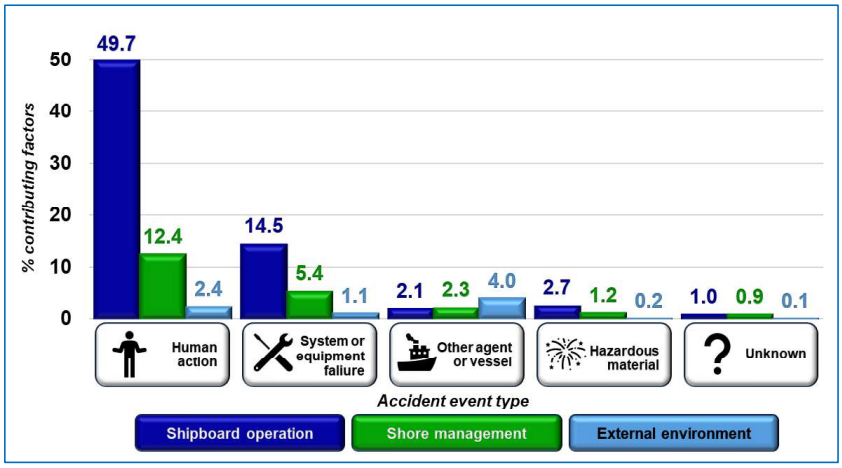
Figure 2.7–4 Percentage of accident events related to the investigated marine casualties and incidents, organized by accident event types and ship types



2.7.2 Contributing factors

Each accident event can have one or several contributing factors. As explained in Appendix 2, contributing factors have the following three types: external environment, shore management and shipboard operation.

Figure 2.7–5 Percentage of contributing factors, organized by contributing factor types and accident event types



The percentage of contributing factors from 2015 to 2024 is organized by contributing factor types and accident event types in Figure 2.7–5. Shipboard operation was the most significant contributing factor type, representing 70.0% of all the contributing factors.

Human action was the predominant accident event type, accounting for 64.5% of all the contributing factors, followed by system/equipment failure with 21.0%.

These percentages are analysed for every ship type for the period from 2015 to 2024 in Figure 2.7–6 Almost the same trends are found for all the ship types.

Figure 2.7–6 Percentage of contributing factors, organized by contributing factor types, accident event types and ship types

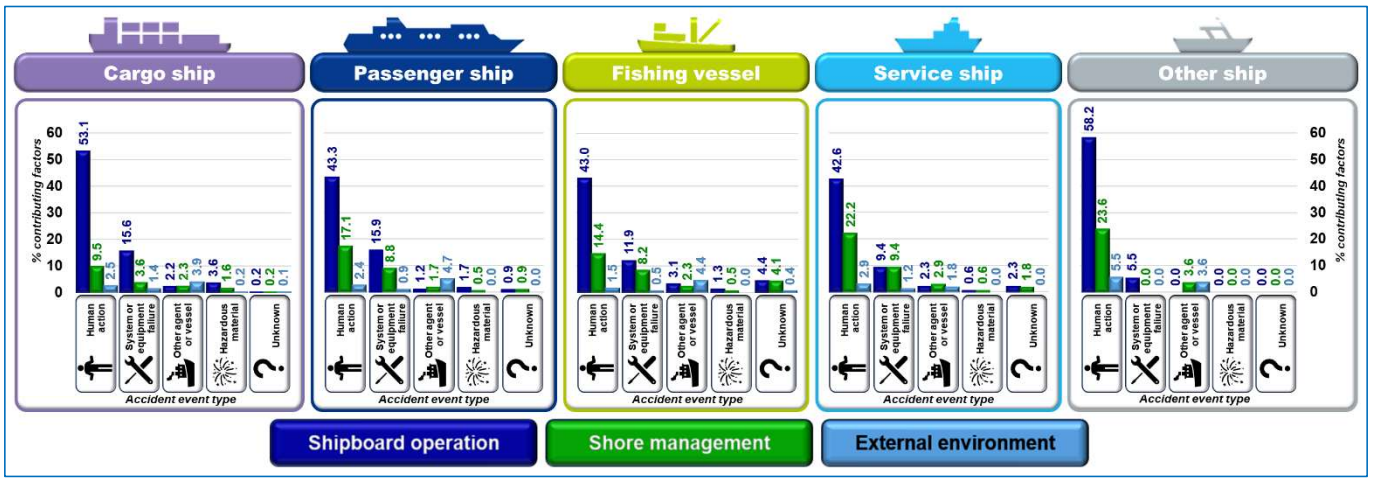
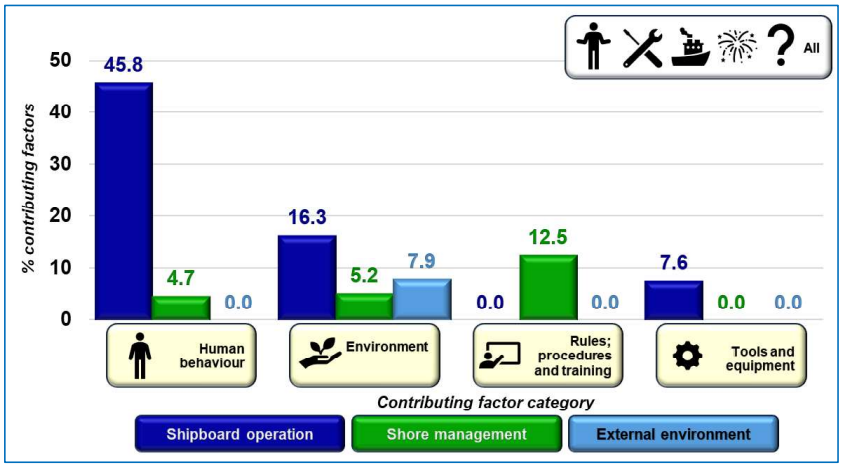


Figure 2.7–7 Percentage of contributing factors, organized by contributing factor categories and contributing factor types

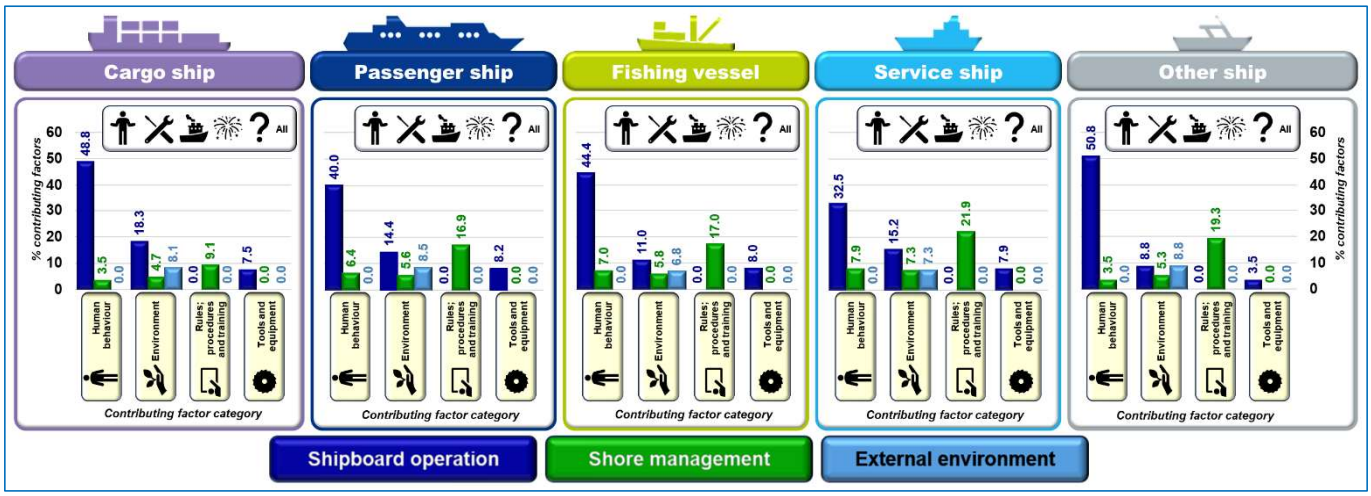


As detailed in Appendix 2, the analysis of the 185 possible contributing factors is grouped into four contributing factor categories for simplification: human behaviour; environment; rules, procedures and training; and tools and equipment.

For the period from 2015 to 2024, human behaviour was, in number and not necessarily in contribution, the most significant contributing factor category, with 50.5% of the contributing factors. This was followed by environment with 29.4% of the contributing factors.

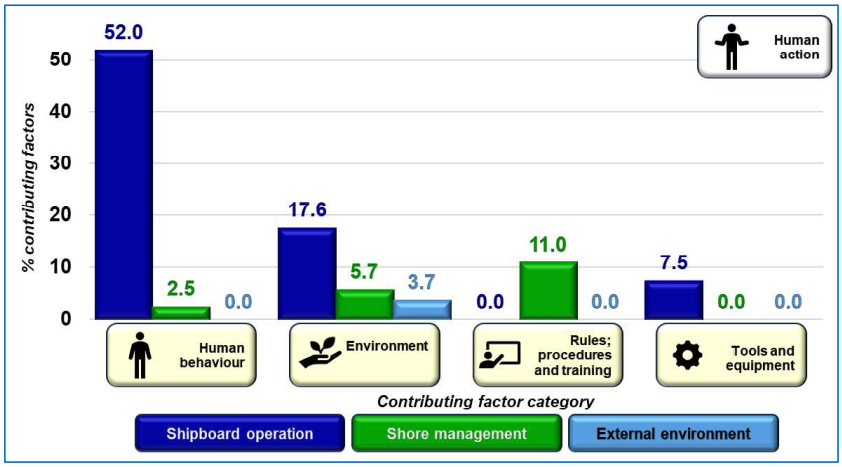
The analysis obtains a similar trend for all the ship types.

Figure 2.7–8 Percentage of contributing factors, organized by organized by contributing factor categories, contributing factor types and ship types



The previous analysis can be done individually for the four main accident event types.

Figure 2.7–9 Percentage of contributing factors involved in human action accident events, organized by contributing factor categories and contributing factor types



Considering only the human action accident events from 2015 to 2024, human behaviour was the main contributing factor category, with 54.5% of the contributing factors.

human action was followed by environment with 27.0% of the contributing factors, rules, procedures and training with 11.0% of the contributing factors, and tools and equipment with 7.5% of the contributing factors.

Similar trends were observed in the individual analysis of each ship type, in Figure 2.7–10.

Figure 2.7–10 Percentage of contributing factors involved in human action accident events, organized by contributing factor categories, contributing factor types and ship types

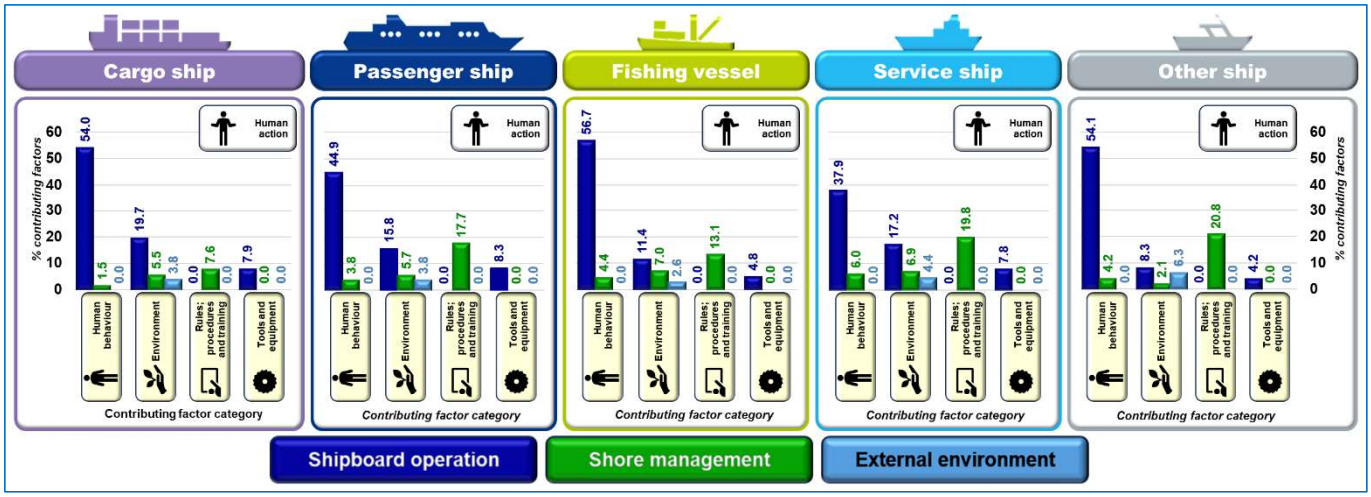
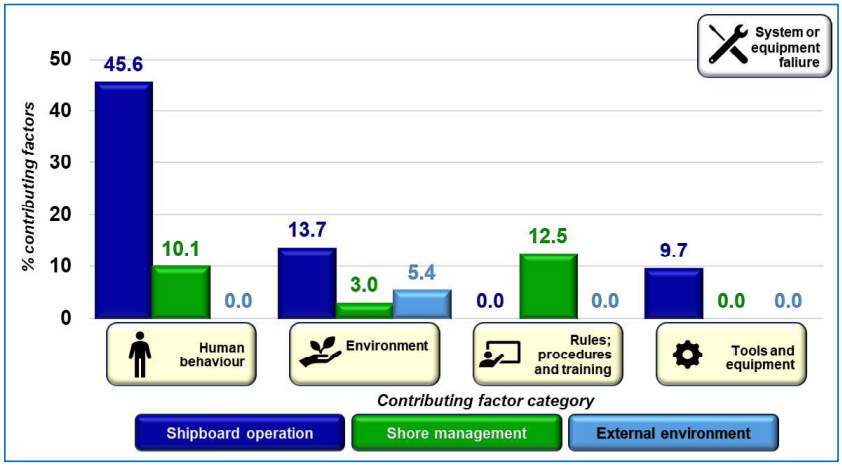


Figure 2.7–11 Percentage of contributing factors involved in system/equipment failure accident events, organized by contributing factor categories and contributing factor types



Considering only the system/equipment failure accident events from 2015 to 2024, human behaviour was the main contributing factor category, with 55.7% of the contributing factors.

Human behaviour was followed by environment with 22.1% of the contributing factors, rules, procedures and training with 12.5% of the contributing factors, and tools and equipment with 9.7% of the contributing factors.

Similar trends were observed in the individual analysis of each ship type, in Figure 2.7–12.

Figure 2.7–12 Percentage of contributing factors involved in system/equipment failure accident events, organized by contributing factor categories, contributing factor types and ship types

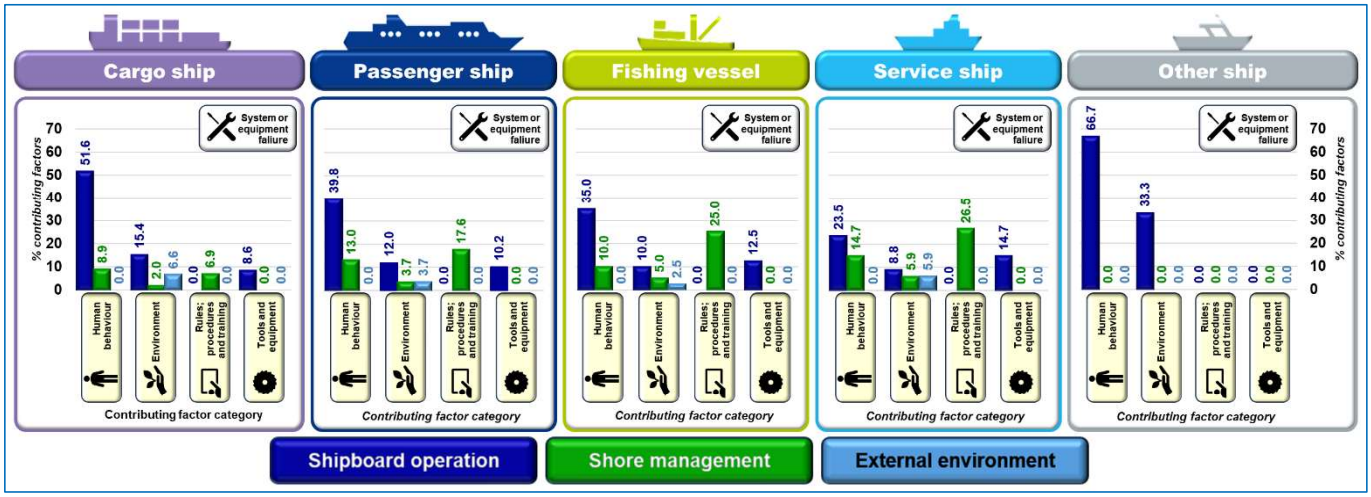
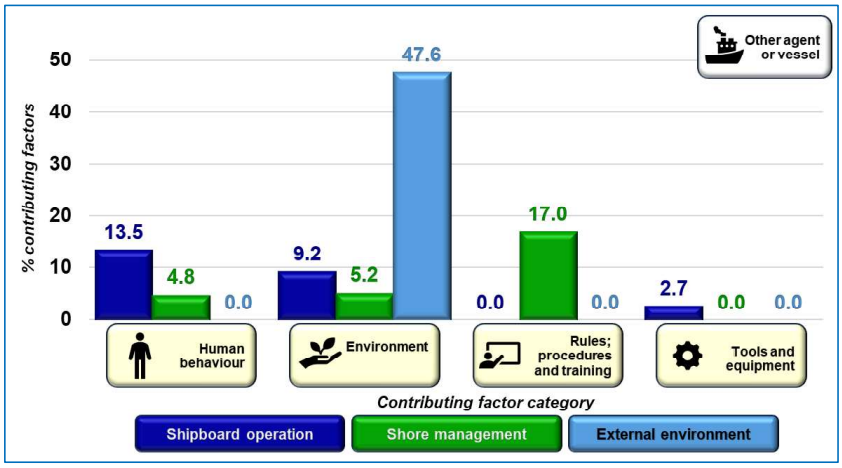


Figure 2.7–13 Percentage of contributing factors involved in other agent or vessel accident events, organized by contributing factor categories and contributing factor types



Considering only the other agent or vessel accident events from 2015 to 2024, environment was the main contributing factor category, with 62.0% of the contributing factors.

Environment was followed by human behaviour with 18.3% of the contributing factors, rules, procedures and training with 17.0% of the contributing factors, and tools and equipment with 2.7% of the contributing factors.

Similar trends were observed in the individual analysis of each ship type, in Figure 2.7–14.

Figure 2.7–14 Percentage of contributing factors involved in other agent or vessel accident events, organized by contributing factor categories, contributing factor types and ship types

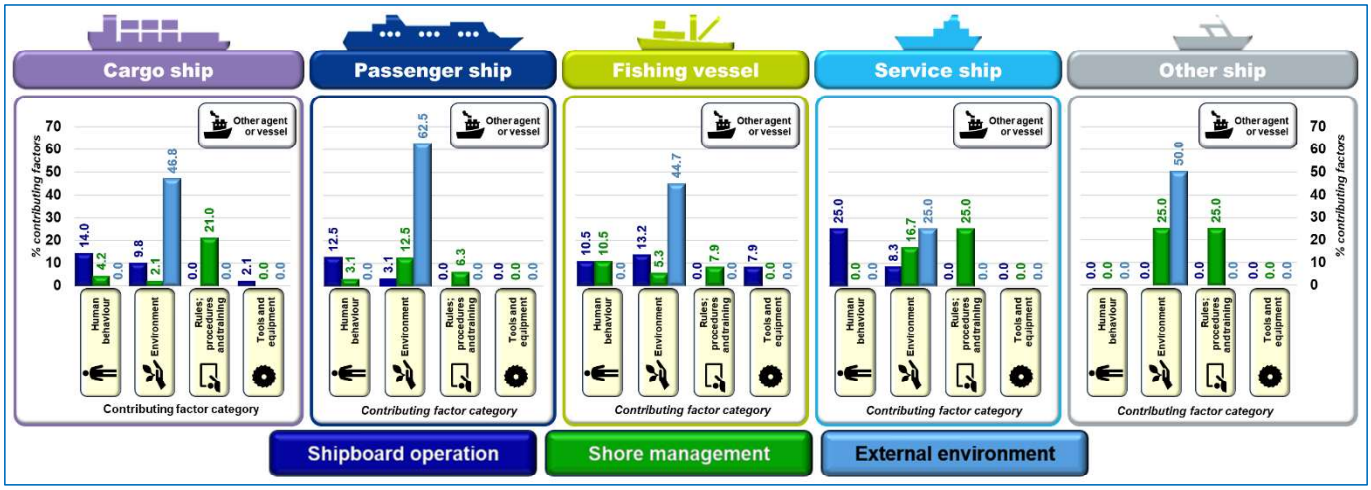
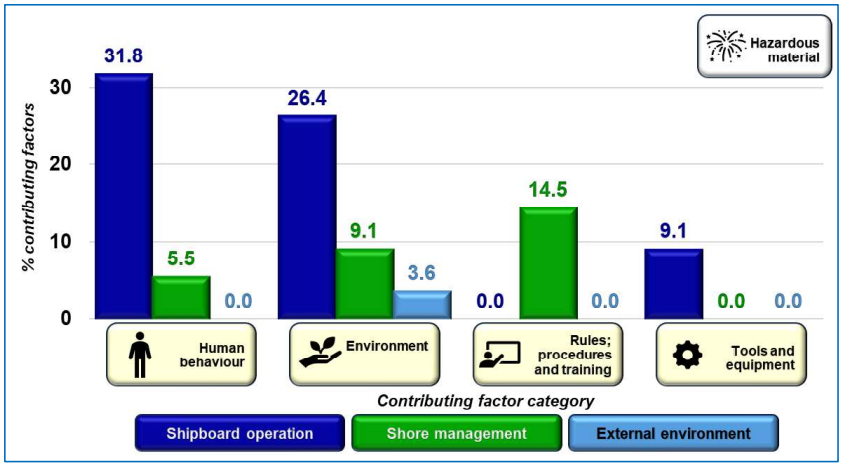


Figure 2.7–15 Percentage of contributing factors involved in hazardous material accident events, organized by contributing factor categories and contributing factor types



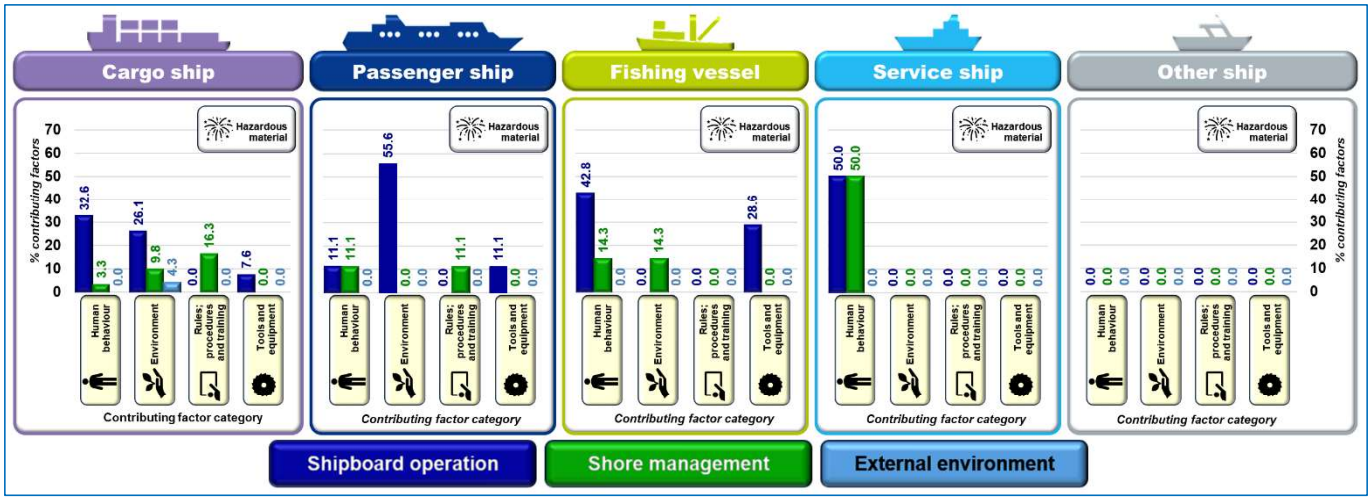
Considering only the hazardous material accident events from 2015 to 2024, environment was the main contributing factor category, with 39.1% of the contributing factors.

This was followed by human behaviour with 37.3% of the contributing factors, rules, procedures and training with 14.5% of the contributing factors, and tools and equipment with 9.1% of the contributing factors.

Individual analysis of each ship type is in Figure 2.7–16,

There were not contributing factors for hazardous material accident events in other ship type an there were only human behaviour contributing factors for service ship type.

Figure 2.7–16 Percentage of contributing factors involved in hazardous material accident events, organized by contributing factor categories, contributing factor types and ship types



Unknown accident events are few and the analysis of their contributing factors is not relevant, so it was not included.

2.7.3 Influence of human element

Contributing factors categorized as human behaviour and contributing factors related to human action accident events are considered as influenced by human element.

Considering all these contributing factors it is possible to determine the percentage of contributing factors influenced by human element.

For the analysed period from 2015 to 2024, the average percentage of this influence of human element in the analysed contributing factors was 78.8%.

Among the ship types, fishing vessels had the lowest influence from the human element at 73.0%, while ships classified as other types exhibited the highest influence at 89.5%.

Cargo ships showed 80.3% of human influence, passenger ships 78.5% and service ships 74.7%.

Figure 2.7–17 Percentage of contributing factors influenced by human element

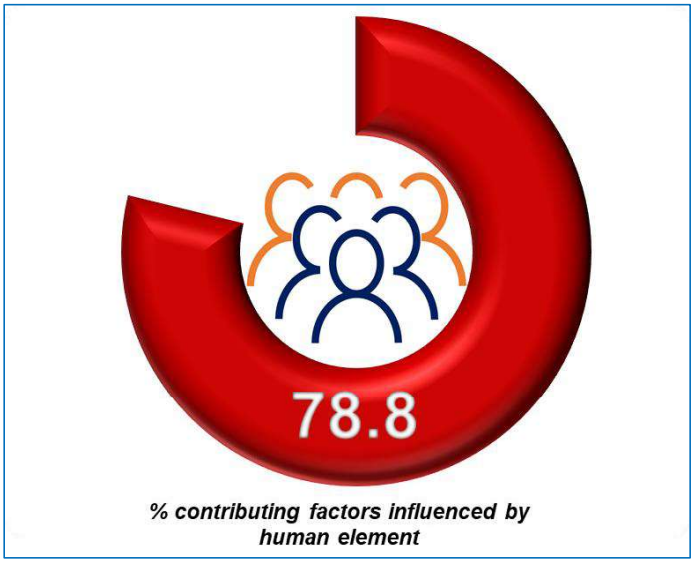
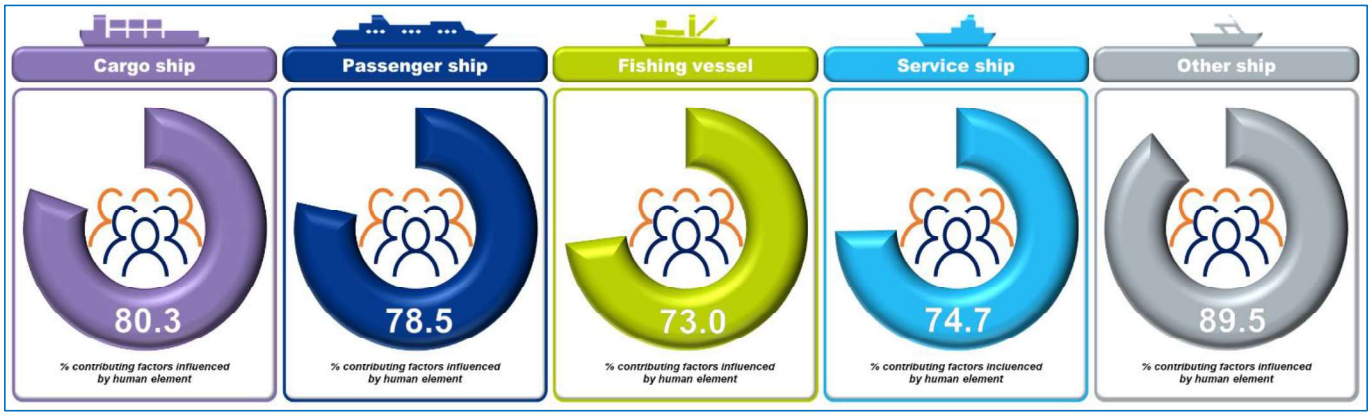


Figure 2.7–18 Percentage of contributing factors influenced by human element, organized by ship types

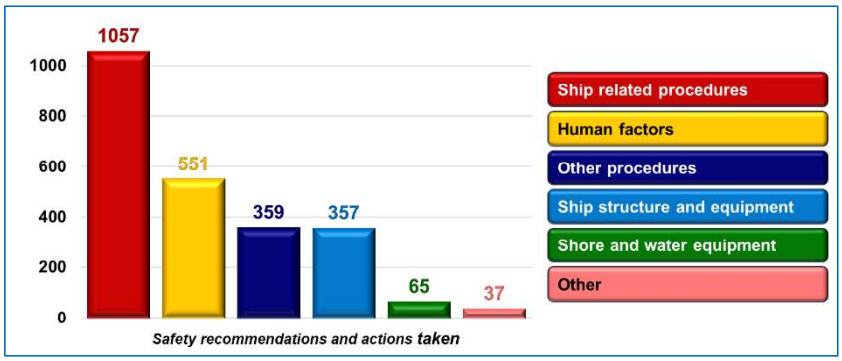


2.8 Safety recommendations and actions taken

This section analyses the safety recommendations and actions taken reported in EMCIP. Safety recommendations are organized by focus areas and addressee types.

Safety recommendations and actions taken can be organized in the following six focus areas: human factors, other procedures, ship related procedures, ship structure and equipment, shore and water equipment and other. Each focus area is divided in subcategories area excepting the focus area other.

Figure 2.8–1 Evolution of safety recommendations and actions taken, organized by focus area

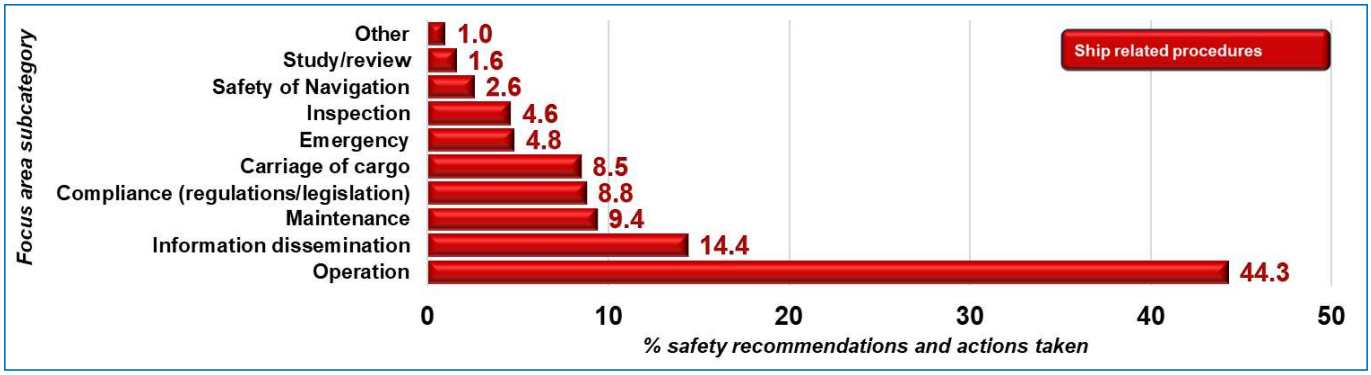


From 2015 to 2024 a total number of 2,426 safety recommendations and actions taken were reported in EMCIP.

Ship related procedures was the main focus area reported for the safety recommendations and actions taken reported since 2015, with 43.6% of the safety recommendations and actions taken. It was followed by human factors with 22.7%, other procedures with 14.8%, ship structure and equipment with 14.7%, shore and water equipment with 2.7% and other with 1.5%.

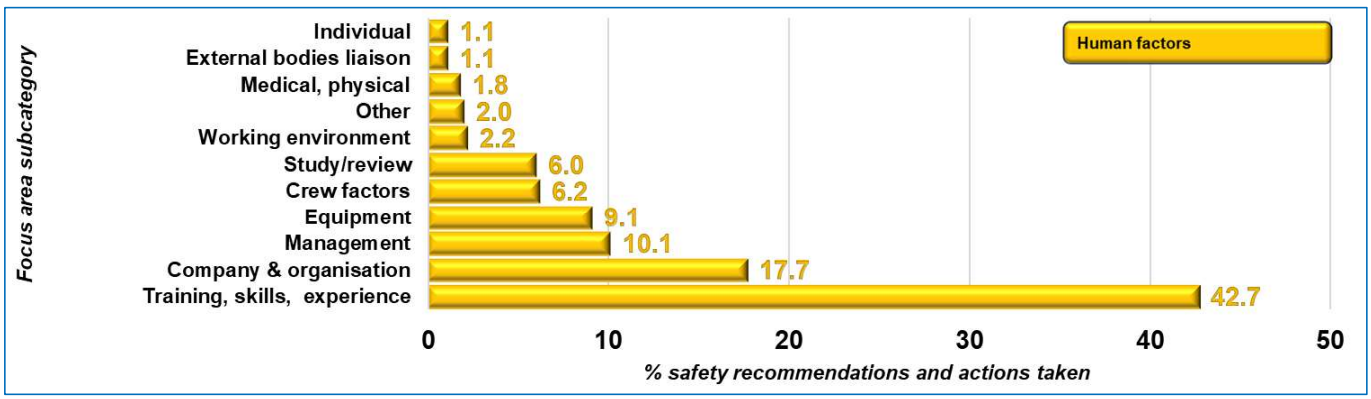
For the ship related procedures focus area, 44.3% of the safety recommendations and actions taken were in the subcategory operation, as shown in the following figure.

Figure 2.8–2 Percentage of safety recommendations and actions taken for the ship related procedures focus area, organized by subcategories



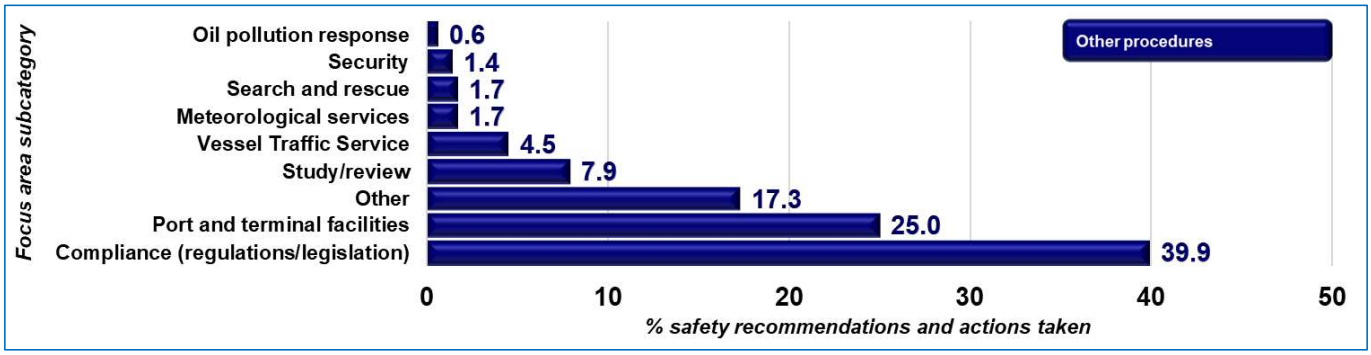
Regarding the human factors focus area, 42.7% of the safety recommendations and actions taken were in the subcategory training, skills and experience, as shown in the following figure.

Figure 2.8–3 Percentage of safety recommendations and actions taken for the human factors focus area, organized by subcategories



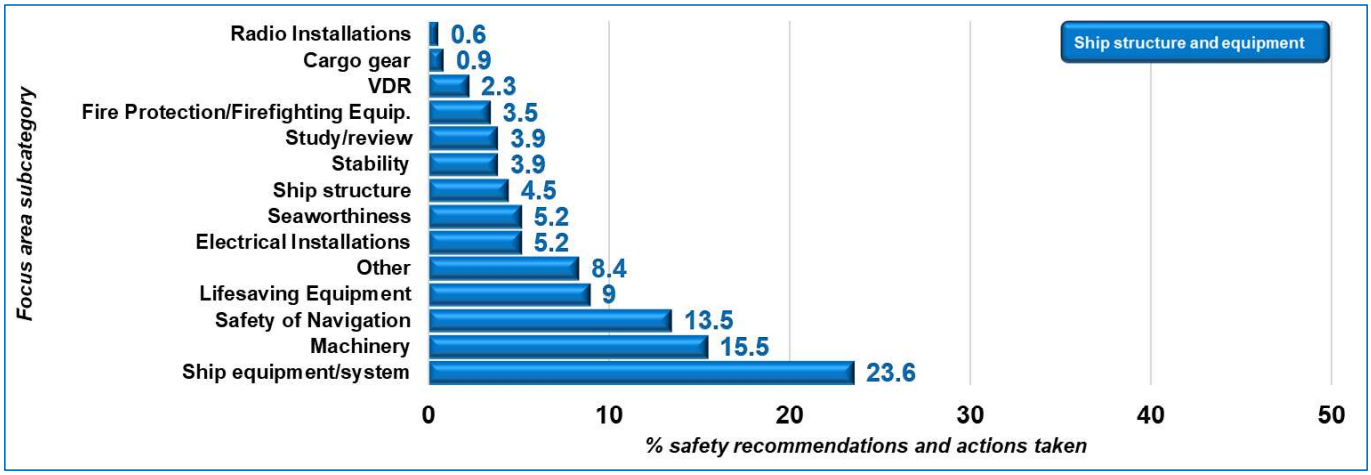
For the other procedures focus area, in the following figure, 39.9% of the safety recommendations and actions taken were in the subcategory compliance (regulations/legislation).

Figure 2.8–4 Evolution of safety recommendations and actions taken for other procedures focus area, organized by subcategories



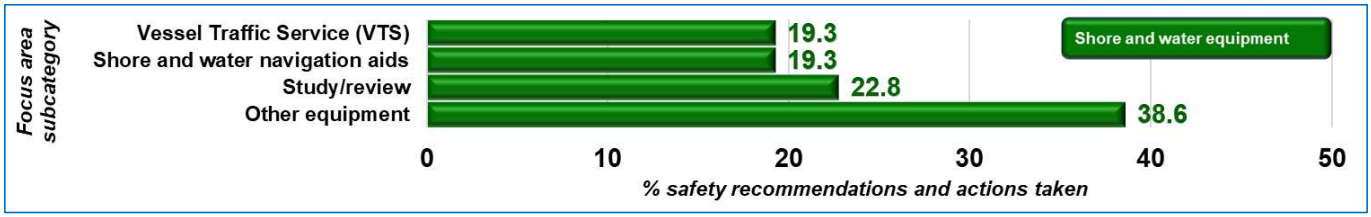
Concerning the ship structure and equipment focus area, 23.6% of the safety recommendations and actions taken were in the subcategory ship equipment/system, as shown in the following figure

Figure 2.8–5 Evolution of safety recommendations and actions taken for ship structure and equipment focus area, organized by subcategories



Finally, for the shore and water equipment focus area, in the following figure, 38.6% of the safety recommendations and actions taken were in the subcategory other equipment.

Figure 2.8–6 Evolution of safety recommendations and actions taken for shore and water equipment focus area, organized by subcategories



Safety recommendations and actions taken are addressed to the following addressee categories: cargo terminal, classification societies, crew, maritime Administration, oil pollution response authority, other, owner associations, owner/company, port authorities, Port State Control, SAR or shipyard/industry.

The percentage of safety recommendations and actions taken, organized by addressee categories, is shown in Figure 2.8–7. Owner/company was the main addressee, with 52.4% of the safety recommendations and actions taken, followed by maritime Administration, with 19.2% of the safety recommendations and actions taken.

Figure 2.8–7 Percentage of safety recommendations and actions taken, organized by addressee categories

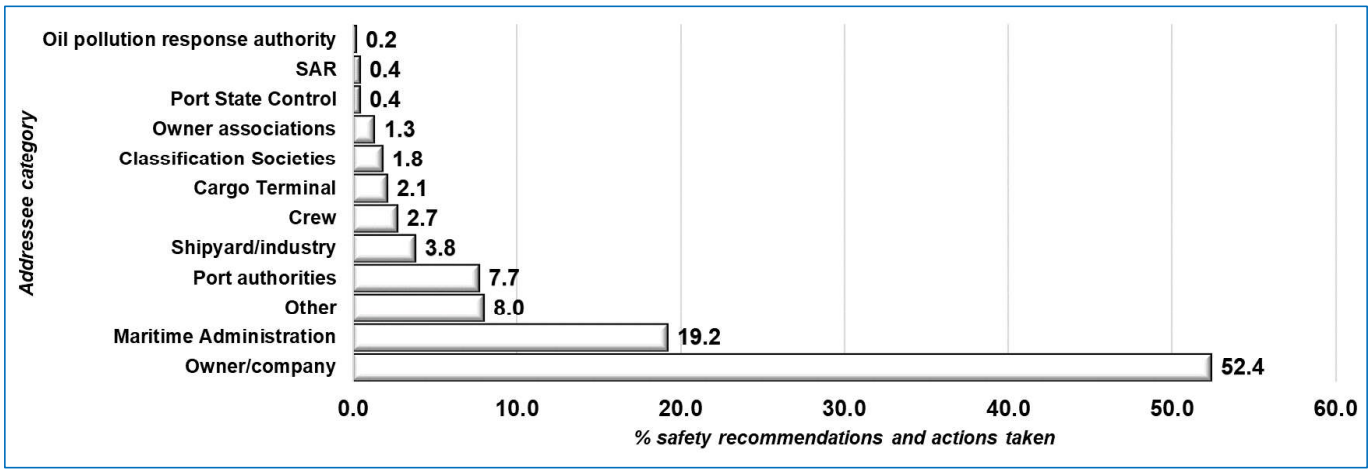


Photo credit by SID (Lithuania)

APPENDICES

Appendix 1. List of abbreviations and definitions

Abbreviations

AI: Accident Investigation

DG MARE: EC's Directorate General for Maritime Affairs and Fisheries

EC: European Commission

EEA: European Economic Area

EEZ: Exclusive Economic Zone

EFTA: European Free Trade Association

EMSA: European Maritime Safety Agency

EMCIP: European Marine Casualty Information Platform

EU: European Union. For the analysis means EU-27 Member States and EEA EFTA States

EU-27: Refers to the 27 Member States of the EU

Eurostat: Statistical office of the EU

IMO: International Maritime Organization

LOA: Length Over All

MARINFO: Information for the maritime industries of Europe

MEPC: IMO's Marine Environment Protection Committee

MSC: IMO´s Maritime Safety Committee

PCF: Permanent Cooperation Framework, defined in Article 10 of Directive 2009/18/EC.

SAR: Search and Rescue

STCW: International Convention on Standards of Training, Certification and Watch keeping for Seafarers

STECF: Scientific, Technical and Economic Committee for Fisheries

UNCLOS: United Nations Convention on the Law at Sea

Definitions

Definitions from the IMO Casualty Investigation Code and the Directive 2009/18/EC

Specific terms used in this publication are also used for marine safety investigation purposes and have the following meanings:

1. **Coastal State**:
   means a State in whose territory, territorial sea and internal waters as defined in UNCLOS, a marine casualty or incident occurs.
2. **EMCIP**:
   is the European Marine Casualty Information Platform, a centralised database for EU Member States to store and analyse information on marine casualties and incidents.
3. **Flag State**:
   means a State whose flag a ship is entitled to fly.
4. **Less serious marine casualty**:
   casualty to ships which do not qualify as very serious marine casualty or serious marine casualty:
5. **Marine casualty**:
   means an event, or a sequence of events, that has resulted in any of the following which has occurred directly in connection with the operations of a ship:
   - .1 the death of, or serious injury to, a person;
   - .2 the loss of a person from a ship;
   - .3 the loss, presumed loss or abandonment of a ship;
   - .4 material damage to a ship;
   - .5 the stranding or disabling of a ship, or the involvement of a ship in a collision;
   - .6 material damage to marine infrastructure external to a ship, that could seriously endanger the safety of the ship, another ship or an individual; or
   - .7 severe damage to the environment, or the potential for severe damage to the environment, brought about by the damage of a ship or ships.

   However, a marine casualty does not include a deliberate act or omission, with the intention to cause harm to the safety of a ship, an individual or the environment.
6. **Marine incident**:
   means an event, or sequence of events, other than a marine casualty, which has occurred directly in connection with the operations of a ship that endangered, or, if not corrected, would endanger the safety of the ship, its occupants or any other person or the environment.
   However, a marine incident does not include a deliberate act or omission, with the intention to cause harm to the safety of a ship, an individual or the environment.
7. **Marine safety investigation**:
   means an investigation or inquiry into a marine casualty or marine incident, conducted with the objective of preventing marine casualties and marine incidents in the future. The investigation includes the collection and analysis of evidence, the identification of causal factors and the making of safety recommendations as necessary.
8. **Marine safety investigation report**:
   means a report that contains:
   - .1 a summary outlining the basic facts of the marine casualty or incident and stating whether any deaths, injuries or pollution occurred as a result;
   - .2 the identity of the Flag State, owners, operators, the company as identified in the safety management certificate, and the classification society (subject to any national laws concerning privacy);
   - .3 where relevant the details of the dimensions and engines of any ship involved, together with a description of the crew, work routine and other matters, such as time served on the ship;
   - .4 a narrative detailing the circumstances of the marine casualty or incident;
   - .5 analysis and comment on the causal factors including any mechanical, human and organizational factors;
   - .6 a discussion of the marine safety investigation's findings, including the identification of safety issues, and the marine safety investigation's conclusions; and
   - .7 where appropriate, recommendations with a view to preventing future marine casualties or incidents.

9. **Material damage**:
in relation to a marine casualty means:

.1 damage that:
.1.1 significantly affects the structural integrity, performance or operational characteristics of marine infrastructure or a ship; and
.1.2 requires major repair or replacement of a major component or components; or
.2 destruction of the marine infrastructure or ship.

10. **Serious marine casualty**:
this term shall be understood in accordance with the updated definition contained in Circular MSC-MEPC.3/Circ.3 of the IMO Maritime Safety Committee and Marine Environment Protection Committee of 18th of December 2008; it says:
Serious marine casualties are casualties to ships which do not qualify as very serious marine casualty and which involve a fire, explosion, collision, grounding, contact, heavy weather damage, ice damage, hull cracking, or suspected hull defect, etc., resulting in:
- immobilization of main engines, extensive accommodation damage, severe structural damage, such as penetration of the hull under water, etc., rendering the ship unfit to proceed, or
- pollution (regardless of quantity); and/or
- a breakdown necessitating towage or shore assistance.

11. **Serious injury:**
means an injury which is sustained by a person, resulting in incapacitation where the person is unable to function normally for more than 72 hours, commencing within seven days from the date when the injury was suffered.

12. **Severe damage to the environment**:
means damage to the environment which, as evaluated by the State(s) affected, or the Flag State, as appropriate, produces a major deleterious effect upon the environment.

13. **Substantially interested State**:
means a State:

.1 which is the Flag State of a ship involved in a marine casualty or incident; or
.2 which is the Coastal State involved in a marine casualty or incident; or
.3 whose environment was severely or significantly damaged by a marine casualty (including the environment of its waters and territories recognized under international law); or
.4 where the consequences of a marine casualty or marine incident caused, or threatened, serious harm to that State or to artificial islands, installations, or structures over which it is entitled to exercise jurisdiction; or
.5 where, as a result of a marine casualty, nationals of that State lost their lives or received serious injuries; or
.6 that has important information at its disposal that the marine safety investigating State(s) consider useful to the investigation; or
.7 that for some other reason establishes an interest that is considered significant by the marine safety investigating State(s).

14. **Territorial sea**:
refers to the area within which the sovereignty of a Coastal State extends, beyond its land territory and internal waters and, in the case of an archipelagic State, its archipelagic waters, to an adjacent belt of sea, described as the territorial sea. It is a belt of coastal water extending at most 12 nautical miles (22.2 km; 13.8 mi) from the baseline (usually the mean low-water mark) of a Coastal State. (UNCLOS Section 1 of Part II)

15. **Very serious marine casualty**:
means a marine casualty involving the total loss of the ship or a death or severe damage to the environment.

Other definitions can be found in:

- The 'IMO Code for the Investigation of Marine Casualties and Incidents' which shall mean the Code for the investigation of Marine Casualties and Incidents annexed to resolution A.849(20) of the IMO Assembly of 27th of November 1997. + Resolution MSC.255(84) (adopted on 16th of May 2008) Adoption of the code of the international standards and recommended practices for a safety investigation into a marine casualty or marine incident (Casualty Investigation Code) + Resolution A.1075(28) adopted on 24th of February 2014

- The scope of the Accident Investigation Directive 2009/18/EC can be found in its article 2.

Other information can be found on:

- https://www.emsa.europa.eu/we-do/safety/accident-investigation.html; and
- https://portal.emsa.europa.eu/emcip-public/#/dashboard

Other expressions, as per EMCIP taxonomy

1. **Accidental event** or **Accident event**:
   is an event that is assessed to be inappropriate and significant in the sequence of events that led to the marine casualty or incident.
2. **Occurrence with ships(s)**:
   are grouped under **Casualty event** that is an unwanted event in which there was some kind of energy release with impact on people and/or ship including its equipment and its cargo or environment. These events are classified in:
   - **Capsizing/Listing**:
     is a casualty where the ship no longer floats in the right-side-up mode due to negative initial stability (negative metacentric height), or transversal shift of the centre of gravity, or the impact of external forces.
     - **Capsizing**: when the ship is tipped over until disabled;
     - **Listing**: when the ship has a permanent heel or angle of loll.
   - **Collision**:
     a casualty caused by ships striking or being struck by another ship, regardless of whether the ships are underway, anchored or moored. This type of casualty event does not include ships striking underwater wrecks. The collision can be **with other ship** or **with multiple ships** or **ship not underway**.
   - **Contact**:
     a casualty caused by ships striking or being struck by an external object. The objects can be: **Floating object** (**cargo, ice, other or unknown**); **Fixed object**, but not the sea bottom; or **Flying object**.
   - **Damage to equipment**:
     damage to equipment, system or the ship not covered by any of the other casualty type.
   - **Grounding/stranding**:
     a moving navigating ship, either under command, under **Power**, or not under command, **Drift**(ing), striking the sea bottom, shore or underwater wrecks.
   - **Fire/explosion:**
     an uncontrolled ignition of flammable chemicals and other materials on board of a ship:
     - **Fire**: is the uncontrolled process of combustion characterised by heat or smoke or flame or any combination of these.
     - **Explosion**: is an uncontrolled release of energy which causes a pressure discontinuity or blast wave.
   - **Flooding/foundering**:
     is a casualty event when the ship is taking water on board.
     - **Foundering**: will be considered when the vessel has sunk. Foundering should only be regarded as the first casualty event if we do not know the details of the flooding which caused the vessel to founder. In the chain of events foundering can be the last casualty event in this case there is the need to add accidental events.
     - **Flooding**: refers to a casualty when a vessel takes water on board and can be:
       - **Progressive**: if the water flow is gradual.
       - **Massive**: if the water flow is extensive.
   - **Hull failure**:
     a failure affecting the general structural strength of the ship.
   - **Loss of control**:
     a total or temporary loss of the ability to operate or manoeuvre the ship, failure of electric power, or to contain on board cargo or other substances:
     - **Loss of electrical power**: is the loss of the electrical supply to the ship or facility;
     - **Loss of propulsion power**: is the loss of propulsion because of machinery failure;
     - **Loss of directional control**: is the loss of the ability to steer the ship;
     - **Loss of containment**: is an accidental spill or damage or loss of cargo or other substances carried on board a ship.

- **Missing**:
  a casualty to a ship whose fate is undetermined with no information having been received on the loss and whereabouts after a reasonable period of time.
- **Non-accidental events**:
  are intentional events as a result of illegal or hostile acts therefore they are not marine casualties or incidents. They are:
  - **Acts of war**: any act, against a ship or the people on board, by a State that would effectively terminate the normal international law of peacetime and activate the international law of war;
  - **Criminal acts**: any crime, including an act, omission, or possession under the laws of a State or local government, which poses a substantial threat to people on board of a ship or to property (e.g. terrorism, sabotage, piracy);
  - **Illegal discharge**: is an intentional discharge of polluting substances, oil or other noxious substances, from ships; and
  - **Other**: other intentional act that incur loss of or damage to a ship or environmental damage or harm to people on board.

  Non-accidental events are not considered as marine casualties or incidents and are not covered by the scope of the Accident Investigation Directive (2009/18/EC).

3. **Contributing factor**:
   is a condition that may have contributed to an accidental event or worsened its consequence (e.g., man/machine interaction, inadequate illumination).
4. **Occurrence with person(s)**:
   are grouped under **deviations**, which consist in the description of the event deviating from normality leading to the accident:
   - **Deviation due to electrical problems, explosion, fire - Not specified**
     - Electrical problem due to equipment failure - leading to indirect contact
     - Electrical problem - leading to direct contact
     - Explosion
     - Fire, flare up
     - Other Deviations not listed above
   - **Deviation by overflow, overturn, leak, flow, vaporisation, emission**
     - Solid state - overflowing, overturning
     - Liquid state - leaking, oozing, flowing, splashing, spraying
     - Gaseous state - vaporisation, aerosol formation, gas formation
     - Pulverulent material - smoke generation, dust/particles in suspension/emission of
     - Other Deviations not listed above
   - **Breakage, bursting, splitting, slipping, fall, collapse of Material Agent**
     - Breakage of material - at joint, at seams
     - Breakage, bursting - causing splinters (wood, glass, metal, stone, plastic, others)
     - Slip, fall, collapse of Material Agent - from above (falling on the victim)
     - Slip, fall, collapse of Material Agent - from below (dragging the victim down)
     - Slip, fall, collapse of Material Agent - on the same level
     - Other deviations not listed above
   - **Loss of control (total or partial) of machine, means of transport or handling equipment, handheld tool, object, animal**
     - Loss of control (total or partial) - of machine (including unwanted start-up) or of the material being worked by the machine
     - Loss of control (total or partial) - of means of transport or handling equipment, (motorised or not)
     - Loss of control (total or partial) - of hand-held tool (motorised or not) or of the material being worked by the tool
     - Loss of control (total or partial) - of object (being carried, moved, handled, etc.)
     - Loss of control (total or partial) - of animal
     - Other Deviations not listed above
   - **Slipping - Stumbling and falling - Fall of persons**
     - Fall of person - to a lower level
     - Slipping - Stumbling and falling - Fall of person - on the same level
     - Fall overboard of person
     - Other deviations not listed above

- **Body movement without any physical stress (generally leading to an external injury)**
  - Walking on a sharp object
  - Kneeling on, sitting on, leaning against
  - Being caught or carried away, by something or by momentum
  - Uncoordinated movements, spurious or untimely actions
  - Other Deviations not listed above
- **Body movement under or with physical stress (generally leading to an internal injury)**
  - Lifting, carrying, standing up
  - Pushing, pulling
  - Putting down, bending down
  - Twisting, turning
  - Treading badly, twisting leg or ankle, slipping without falling
  - Other Deviations not listed above
- **Shock, fright, violence, aggression, threat, presence**
  - Shock, fright
  - Violence, aggression, threat - between company employees subjected to the employer's authority
  - Violence, aggression, threat - from people external to the company towards victims performing their duties
  - Aggression, jostle - by animal
  - Presence of the victim or of a third person in itself creating a danger for oneself and possibly others
  - Other Deviations not listed above
- **Other Deviations not listed above in this classification.**

5. **Location**:
   categories describing the location where the casualty or accident occurred are:
   - Outside Territorial sea it will be regarded as **high sea**.
   - If it is in waters up to 12 nautical miles from the baseline it is **coastal waters ≤ 12 nautical miles**.
   - If it is in the waters on the landward side of the baseline of the Territorial sea it is regarded as **internal waters** (**archipelago fairway, channel/river, port area**).
   - **Inland waters,** which includes any area of water defined by EU Member States and not categorized as 'sea'- e.g., canals, tidal and non-tidal rivers, lakes, and some estuarial waters (an arm of sea that extends inland to meet the mouth of a river).
   - **Repair yard** and **unknown** are the two other possible values.
6. **Occurrence with person(s) type**:
   means the mode in which only a person(s)on board was injured or died.

   Accidents not related to ship operations, illness, suicide and homicides are not covered by the scope of the Directive 2009/18/EC.
7. **Persons on board**:
   are categorised as follow:
   - Crew members / seafarers (any person who is employed or engaged or works in any capacity on board a ship);
   - Passengers; and
   - Others, for example persons working in harbours to load or unload ships.
8. **Safety recommendation**:
   is a recommendation derived from the analysis and conclusions of the investigation and is related to particular subject areas, such as legislation, training, maintenance, etc.
   Safety recommendations are addressed to those best placed to implement them, such as ship owners, maritime authorities, etc.

   Member States shall ensure that safety recommendations are duly taken into account by the addressees and, where appropriate, be given an adequate follow-up in accordance with Community and International law.
9. **Ship type:**

   Ships are catalogued in types according to the ship's main activity:
   - **Cargo ship**: is a commercial ship designed for the carriage of various types of cargo, goods or products and up to a maximum of 12 passengers.
   - **Fishing vessel**: is a vessel equipped or used commercially for catching fish or other living resources at sea.
   - **Passenger ship**: is a ship designed to transport more than 12 passengers.
   - **Service ship**: is a ship designed for special services, like a tug or a dredger.

- **Other ship**: may be:
  - **Inland waterway vessel**: is a vessel intended solely or mainly for navigation on inland waterways.
  - **Recreational craft**: is a boat of any type, regardless of the means of propulsion, intended for sports or leisure purposes.
  - **Navy ship**: is a ship operating under the Navy or other military organization.
  - **Unknown ship type**: occurrence for which it was not possible to identify the vessel type.

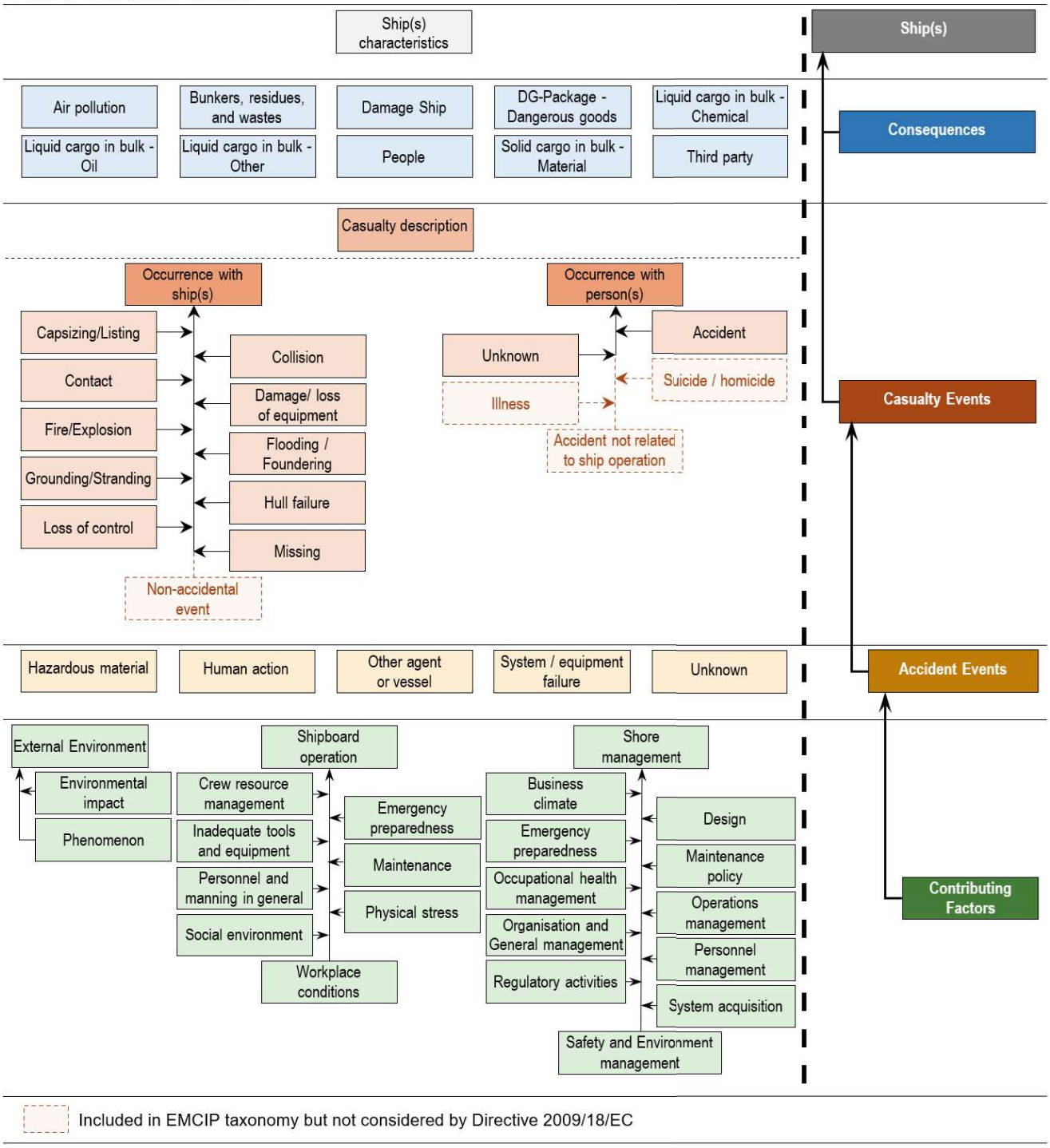
Such vessels are considered within the scope of the Directive only when they are involved in an occurrence together with a ship which is covered by the Directive (e.g., a collision between a cargo ship and a recreational craft).

10. **Nature of a marine casualty or incident**:
The nature of a marine casualty or incident is separated into two different categories:
   - **Occurrence with ship(s)**: when a ship, its equipment or cargo is affected by an accident; and
   - **Occupational accident**: where the accident affects only a person.
11. **Shore assistance**:
because of a breakdown or immobilisation of the main engines or other event, the ships concerned might need shore assistance.
12. **Towage**:
because of a breakdown or immobilisation of the main engines or other event, the ships concerned might need towage.
13. **Unfit to proceed**:
means that the ship is in a condition, which does not correspond substantially with the applicable international conventions or national legislation, presenting a danger to the ship and the persons on board or an unreasonable threat of harm to the marine environment.
14. **Voyage segment**:
determines the section of the voyage being undertaken at the time of the marine casualty or incident. It can be:
   - **Anchored or alongside**;
   - **Departure**;
   - **En route** (after the departure and before arrival, when she is underway at sea);
   - **Arrival**; or
   - **Unknown**.

Appendix 2. EMCIP model

To harmonise the reporting in a meaningful and comprehensive way, a codification of the information resulting from marine casualties was defined. This codification provides also practical advice for a systematic investigation of marine casualties and incidents and allows the development of effective analysis and preventive action. It covers the different elements that connect the consequences of an accident to its root events.

EMCIP schematic model



Such model is not only implemented at European level, but also at international level through the IMO resolution A28/Res.1075.

To support this model, a specific taxonomy related to marine casualties and incidents, composed by 630 fields, has been developed in the EMCIP database to store the various information collected during the investigation.

The main elements of the EMCIP model are:

Ship:

For each marine casualty and incident, it is necessary to add the information for as many ships as involved. Usually only one ship will be included, except in the case of collisions where at least two ships will be involved.

Information about Casualty Events and Consequences are required for each Ship.

Consequences:

After a marine casualty or incident some Consequences are expected. These Consequences are important not only for statistical reasons but also to determine the severity of the Occurrence. They are linked to each ship and are catalogued in 10 groups:

- Air pollution;
- Bunkers, residues and wastes;
- Damage Ship;
- DG-Package - Dangerous goods;
- Liquid cargo in bulk - Chemical;
- Liquid cargo in bulk - Oil;
- Liquid cargo in bulk - Others;
- People;
- Solid cargo in bulk - Material; and
- Third party.

For each group, there are different fields to include detailed data related to the Consequences.

Casualty Events:

Casualty Events are the events representing the casualty itself.

Casualty Events are divided in two main groups, to distinguish between casualties with ships and occupational accidents:

- Occurrence with ship(s); and
- Occurrence with person(s).

The possible values for Casualty Events in a second level are only 10 for casualties with ships:

- Occurrence with ship(s) – Capsizing/Listing;
- Occurrence with ship(s) – Collision;
- Occurrence with ship(s) – Contact;
- Occurrence with ship(s) – Damage/loss of equipment;
- Occurrence with ship(s) – Fire/Explosion;
- Occurrence with ship(s) – Flooding/Foundering;
- Occurrence with ship(s) – Grounding/Stranding;
- Occurrence with ship(s) – Hull failure;
- Occurrence with ship(s) – Loss of control; and
- Occurrence with ship(s) – Missing.

The possible values for Casualty Events, in a second level, are only 2 for occupational accidents:

- Occurrence with person(s) – Accident; and
- Occurrence with person(s) – Unknown.

EMCIP taxonomy has other four second level options, but those options are not considered by the Directive 2009/18/EC.

EMCIP taxonomy includes third and fourth level options, not included in the schematic model for simplicity, to improve the definition of the Casualty Events.

Accident Events

Accident Events are events not representing a casualty itself but having influence in a Casualty Event.

Accident Events are always related to a Casualty Event, and they should be considered in the context of the Casualty Event. Usually, Accident Events are unintended and unwanted.

There are 5 Accident Event Types:

- Hazardous material;
- Human action;
- Other agent or vessel;
- System/equipment failure; and
- Unknown.

Each Accident Event Type has specific taxonomy for its definition.

For the analysis of Accident Events two approaches are used in this document:

- Percentage of Accident Event Types; and
- Percentage of investigated Marine Casualties reporting at least once an Accident Event Type.

The percentage of Accident Event Types gives information about the influence of each Accident Event in the total amount of Accident Events. The procedure it is:

- In a sample extracted from EMCIP, for each Accident Event Type, the times that the Accident Event Type appears is counted. For the Accident Event Type number *i* a value N_i is obtained.
- The total number of appearances of Accident Event Types in the sample extracted from EMCIP, *T*, is obtained as the sum of all the values Ni for all the Accident Event Types.
- The percentage of each Accident Event Type is then obtained dividing the correspondent value N_i by *T*.
- The sum of all the percentages will be 100%.

The percentage of investigated Marine Casualties reporting at least once an Accident Event Type, gives information about the influence of each Accident Event Type in the investigated Marine Casualties, that means the percentage of investigated Marine Casualties influenced by each Accident Event Type. The procedure to obtain it is:

- In a sample extracted from EMCIP, for each Accident Event Type, the number of investigated Marine Casualties where the Accident Event Type appears at least once is counted. For the Accident Event Type number *i* a value M_i is obtained.
- The percentage of each Accident Event Type is then obtained dividing the correspondent value *Mi* by the total number of investigated Marine Casualties in the sample extracted from EMCIP.
- The sum of all the percentages can be greater than 100% because each investigated Marine Casualty can be influenced by one or more Accident Event Type.

Contributing Factors

Contributing Factors are the factors that help to cause the Accident Events.

Contributing Factors are always related to an Accident Event and are catalogued in three main types:

- External Environment;
- Shipboard Operation; and
- Shore Management.

The possible 21 values for Contributing Factors in a second level are:

- External Environment - Environmental impact;
- External Environment - Phenomenon;
- Shipboard Operation - Crew resource management;
- Shipboard Operation - Emergency preparedness;
- Shipboard Operation - Inadequate tools and equipment;
- Shipboard Operation - Maintenance;
- Shipboard Operation - Personnel and manning in general;
- Shipboard Operation - Physical stress;
- Shipboard Operation - Social environment;
- Shipboard Operation - Workplace conditions;
- Shore Management - Business climate;
- Shore Management - Design;
- Shore Management - Emergency preparedness;
- Shore Management - Maintenance policy;
- Shore Management - Occupational health management;
- Shore Management - Operations management;
- Shore Management - Organization and General management;
- Shore Management - Personnel management;
- Shore Management - Regulatory activities;
- Shore Management - System acquisition; and
- Shore Management - Safety and Environment management.

EMCIP taxonomy also includes third and fourth levels for Contributing Factors. The total possible Contributing Factors to choose are 185 (37 External Environment, 72 Shipboard Operation and 76 Shore management).

Such a great taxonomy increases the difficulty of the analysis. In this document the Contributing Factors categories are simplified by structuring them in only four categories:

- Human behaviour:
  - Shipboard operation: Crew resource management, Emergency preparedness, Maintenance, Personnel and manning in general
  - Shore management: Design and System acquisition
- Environment (internal or external):
  - External environment.
  - Shipboard operation: Physical stress, Social environment and Workplace conditions
  - Shore management: Business climate, Personnel management and Safety and Environment management
- Rules, procedures and training:
  - Shore management: Emergency preparedness, Maintenance policy, Occupational health management, Operations management, Organisation and General management and Regulatory activities
- Tools and equipment:
  - Shipboard operation: Inadequate tools and equipment

This new categorization of Contributing Factors facilitates the analysis.

Safety Recommendations

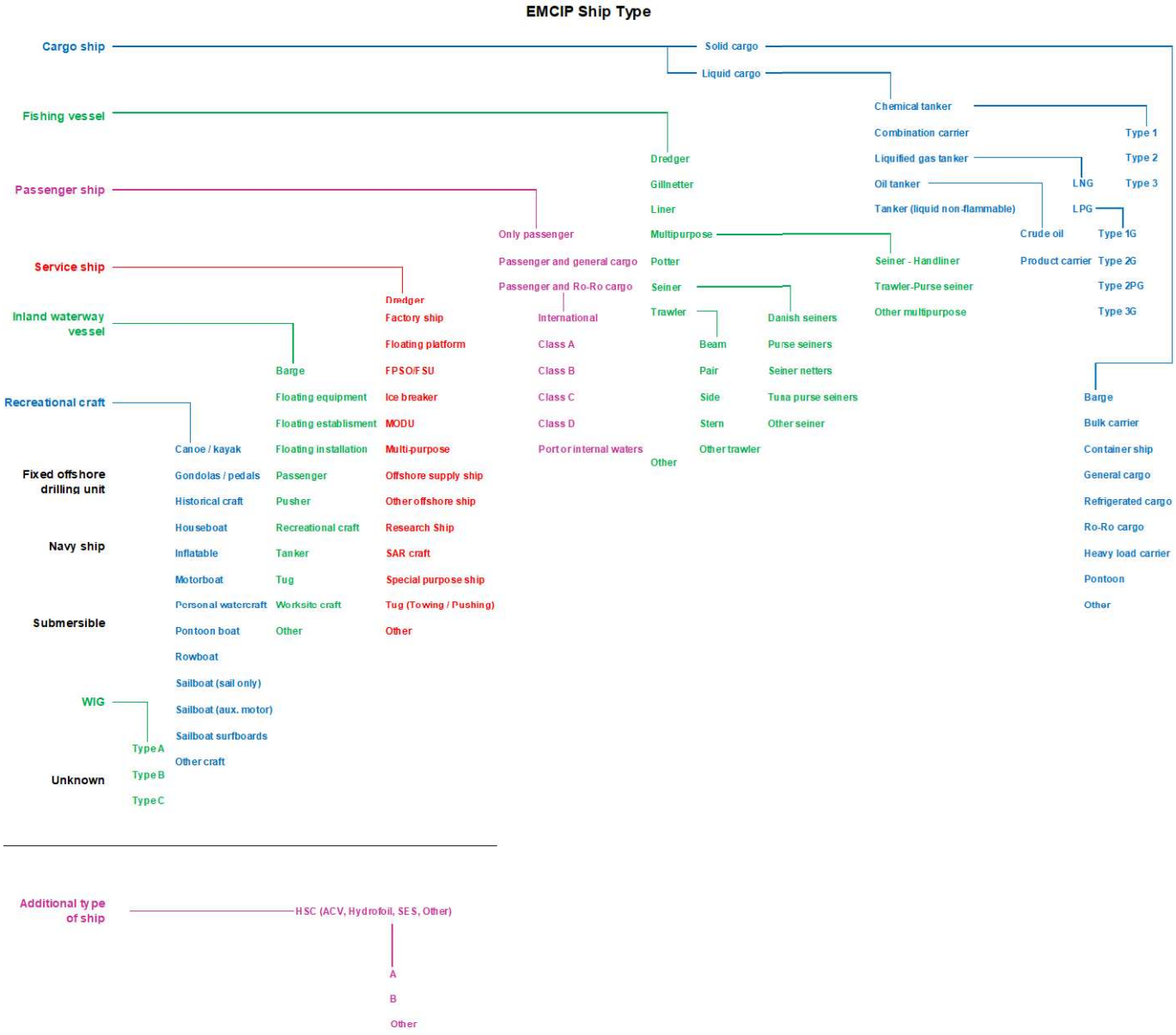
Issued by the investigative bodies, their objective is to ‘cut the links’ between the Contributing Factors, Accident Events and Casualty Events.

Safety Recommendations are related to the Marine Casualties and must be addressed to those that are best placed to implement them, as stablished in Directive 2009/18/EC.

EMCIP taxonomy includes Safety Recommendations, but they are not included in the schematic model for simplicity.

When safety issues have been properly identified during a safety investigation, and followed by relevant Safety Recommendations, a proper consideration by the addressee should prevent similar casualties.

Appendix 3. EMCIP ship types



Appendix 4. Methodology to determine EU ship occurrence indicator

Introduction

EU ship occurrence indicator ($OccID$) is a ratio between the number of reported casualties and incidents for a given ship type and the corresponding EU fleet size.

This indicator aims to provide information about the number of reported casualties and incidents per thousand ships in the fleet. As an example, if one year the indicator for a ship type is 100 it means than for every 1,000 ships of this type in the fleet, 100 had and casualty or incident that year.

$OccID$ is not intended to come up with a judgement whether one ship type is safer than other, as a 'safe system' cannot be simplistically defined by the lack of unwanted events.

Methodology

For the ship type i and the year y, $OccID$ is obtained applying the following simple mathematical formula:

$$OccID(i,y) = Integer\left(1000\frac{Number\ of\ accidents\ or\ incidents\ (i,y)}{Fleet\ size\ (i,y)}\right)$$

Data for marine occurrences (casualties or incidents) to determine the numerators of the above equation come from EMCIP, while the denominators are obtained using data from:

- MARINFO[5] for cargo, passenger and service ships provided with IMO number. Ships are catalogued in types following the list of EMCIP ship types in Appendix 3.
- EU Fleet database[6] for fishing vessels. The tool is managed by DG MARE and provides detailed information on fishing vessels registered in the EU (only EU-27).
- EEA fleet data was obtained from local statistical databases. [7] [8]

Further elements should be considered:

- There is not full data available for other ships so, this ship type cannot be considered in the analysis.
- For cargo, passenger, service, and other ships, the analysis considers only the casualties and incidents reported in EMCIP involving ships provided with an IMO number to guarantee consistency with MARINFO.
- Only fishing vessels above 15 meters LOA (as per scope of the Directive 2009/18/EC) are considered for fishing vessel fleet.
- The analysis considers all the EMCIP occurrences matching the methodology without discriminating between Occurrence with ships(s): and Occurrence with person(s).

[5] https://portal.emsa.europa.eu/web/dona/country-profile
[6] https://webgate.ec.europa.eu/fleet-europa/index_en
[7] https://px.hagstofa.is/pxen/pxweb/en/Atvinnuvegir/Atvinnuvegir__sjavarutvegur__skip/SJA05001.px/
[8] https://www.fiskeridir.no/English/Fisheries/Statistics/Fishermen-fishing-vessels-and-licenses

Appendix 5. Methodology to determine fatalities and injuries indicators

Introduction

Fatalities indicator and injuries indicator ($FatID$ and $InjID$) are ratios between the number of fatalities or injuries reported for a given category of person on board and the estimated number of persons on that category in the fleet in Europe. To convert ratios in integers they are multiplied by one million for crew members and one thousand million for passengers.

These indicators aim to provide information about the number of reported fatalities and injuries per million crew members and thousand million passengers on board. As an example, if one year this fatalities indicator in passenger ships is 5 for crew members, it means that for every million crew members on board passenger ships there were 5 crew member fatalities that year, but if it 5 for passengers means that for every thousand million passengers on board passenger ships there were 5 passenger fatalities that year.

$FatID$ and $InjID$ are not intended to come up with a judgement whether a category of person on board is safer than other.

Methodology

For the category of the person on board i and the year y, fatalities indicator ($FatID$) is obtained applying the following simple mathematical formula:

$$FatID(i,y) = Integer\left(k\frac{Number\ of\ fatalities\ (i,y)}{Estimated\ number\ of\ pesons\ in\ the\ category\ (i,y)}\right)$$

k = 10^6 for crew members and k = 10^9 for passengers.

For the category of the person on board i and the year y, injuries indicator ($InjID$) is obtained applying the following simple mathematical formula:

$$InjID(i,y) = Integer\left(k\frac{Number\ of\ injuries\ (i,y)}{Estimated\ number\ of\ pesons\ in\ the\ category\ (i,y)}\right)$$

k = 10^6 for crew members and k = 10^9 for passengers.

Data for the number of fatalities or injuries to determine the numerators of the above equation come from EMCIP, while the denominators are obtained using data from Eurostat with the following limitations:

- Every year EMSA publishes the seafarers' statistics in EU[9]. These statistics are based in the STCW Information System and provide data only for seafarers with STCW certification. This is the source of information for the analysis so, excepting for the fishers, only crew with STCW certification considered by the EU Member States (EU-27 and EEA EFTA States) is used for the analysis.
- Fishers in EU are only estimations.
- Fishers in EU-27 member States were obtained from the reports of the Scientific, Technical and Economic Committee for Fisheries (STECF) [10].
- EEA fishers data was obtained from local statistical databases. [11] [12]
- Data for seafarers and passengers in 2023 was not published when this document was finished. Indicators for year 2023 are calculated as an estimation with seafarers and passengers' data in 2022.
- It is not possible to determine the number of persons in the category other kinds of person on board, so it is not considered in the analysis.

[9] https://www.emsa.europa.eu/publications/reports.html
[10] https://stecf.ec.europa.eu/reports_en
[11] https://px.hagstofa.is/pxen/pxweb/en/Atvinnuvegir/Atvinnuvegir__sjavarutvegur__skip/SJA05001.px/
[12] https://www.fiskeridir.no/English/Fisheries/Statistics/Fishermen-fishing-vessels-and-licenses

Appendix 6. List of national investigative bodies in the EU

Member State	Name of the national investigative body	Acronym	Website
Austria	Safety Investigation Authority of Austria	BAV/SUB	http://www.bmvit.gv.at/
Belgium	Federal Bureau for the Investigation of Maritime Accidents	FEBIMA	www.febima.be
Bulgaria	Maritime Accident Investigation Unit	MTITC	http://www.mtitc.government.bg
Croatia	Air, Maritime and Railway Traffic Accidents Investigation Agency	AIN	www.ain.hr
Cyprus	Marine Accident and Incident Investigation Committee	MAIC	www.maic.gov.cy/mcw/dms/maic/maic.nsf/
Czech Republic	Ministry of Transport, Czech Maritime Administration Navigation Department	MT_ND	http://www.mdcr.cz
Denmark	Danish Maritime Accident Investigation Board	DMAIB	http://www.dmaib.com
Estonia	Safety Investigation Bureau of Estonia	ESIB	www.ojk.ee
Finland	Safety Investigation Authority of Finland	SIA	http://www.onnettomuustutkinta.fi
France	French Marine Casualties Investigation Board	BEAmer	http://www.bea-mer.developpement-durable.gouv.fr/
Germany	Federal Bureau of Maritime Casualty Investigation	BSU	http://www.bsu-bund.de
Greece	Hellenic Bureau for Marine Casualties Investigation	HBMCI	http://www.hbmci.gov.gr
Hungary	Transportation Safety Bureau of Hungary	TSB	http://www.kbsz.hu
Iceland	Icelandic Marine Accident Investigation Board	ITSB	www.rnsa.is
Ireland	Marine Casualty Investigation Board	MCIB	http://www.mcib.ie
Italy	General Directorate for Railway and Maritime Accident Investigation	DIGIFEMA	http://www.mit.gov.it
Latvia	Transport Accident and Incident Investigation Bureau	TAIIB	http://www.taiib.gov.lv
Lithuania	Safety Investigation Division	SID	https://sia.lrv.lt/en/
Luxembourg	Administration of Technical Investigations	AET	https://aet.gouvernement.lu/en.html
Malta	Marine Safety Investigation Unit	MSIU	https://msiu.gov.mt/
The Netherlands	Dutch Safety Board	DSB	www.safetyboard.nl
Norway	Norwegian Safety Investigation Authority	NSIA	http://www.nsia.no
Poland	State Marine Accident Investigation Commission	PKBWM/SMAIC	www.pkbwm.gov.pl
Portugal	Maritime Accident Investigation Office and Aeronautical Meteorology Authority	GAMA	www.gama.mm.gov.pt
Romania	Marine Accidents Investigation Department	MAID	http://www.mt.ro
Slovenia	Maritime Accident and Incident Investigation Services	MAIIS	https://www.gov.si/en/
Spain	Standing Commission for Maritime Accident and Incident Investigation	CIAIM	https://www.transportes.gob.es/organos-colegiados/ciaim
Sweden	Swedish Accident Investigation Authority	SHK	http://www.havkom.se

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ABOUT THE EUROPEAN MARITIME SAFETY AGENCY

The European Maritime Safety Agency is one of the European Union's decentralised agencies. Based in Lisbon, the Agency provides technical assistance and support to the European Commission and Member States in the development and implementation of EU legislation on maritime safety, pollution by ships and maritime security. It has also been given operational tasks in the field of oil pollution response, vessel monitoring and long-range identification and tracking of vessels.

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EMSA