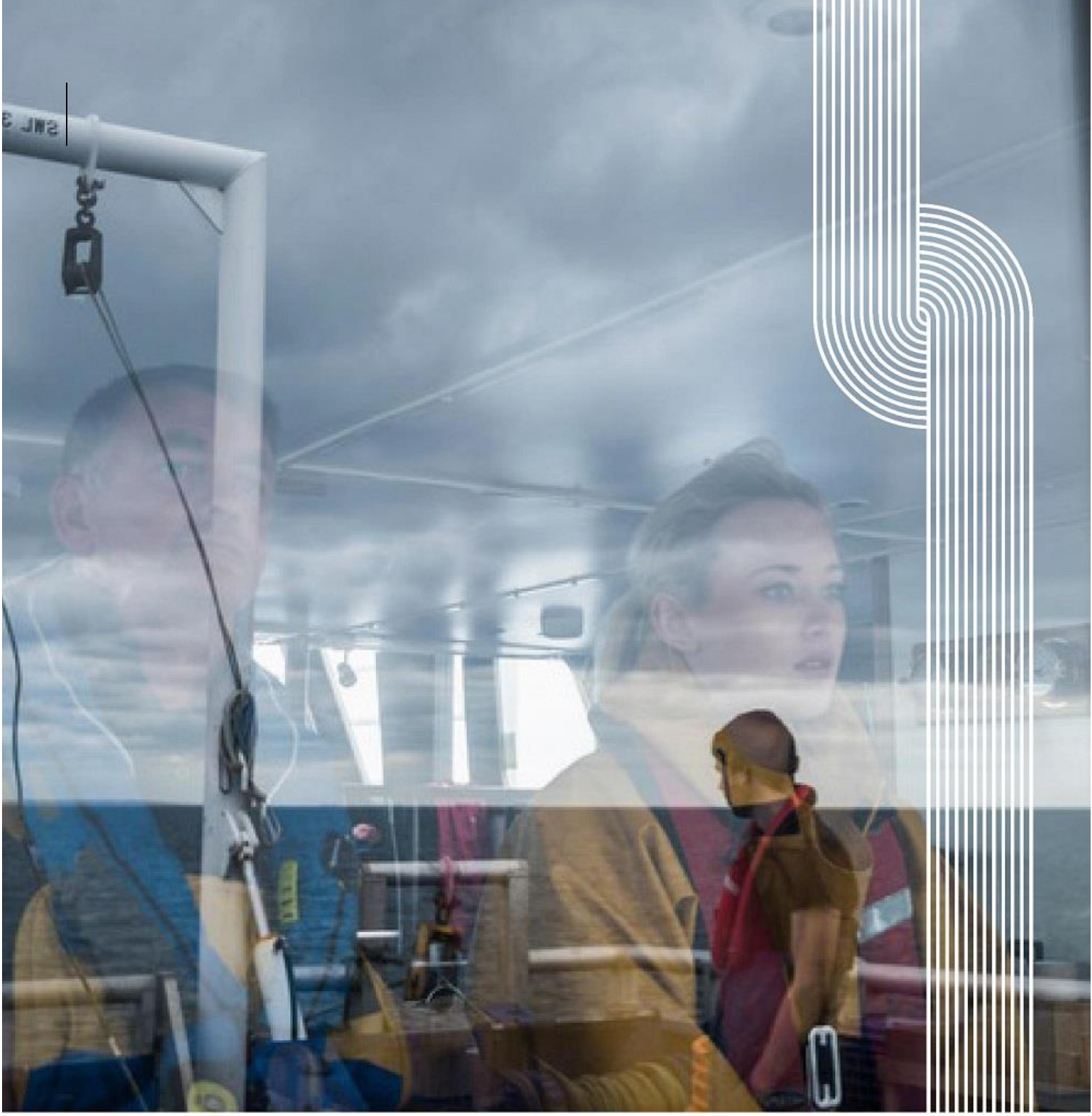

Cefor Fire trend analysis

per December 2021

The Nordic Association of Marine Insures

Cefor

Fires – still burning

For a number of years, Cefor has been publishing analyses[1] of fire trends on vessels, with a particular focus on container and car/RoRo vessels. Several initiatives[2] have since been launched to reduce the fire risk on board such vessels. While the claims frequency for most types of casualties has had a downward trend, this has not been the case for fires. Fires have continued to have a big impact in 2021, too. The analysis below shows that the largest impact on fire frequency and cost continues to originate from container and car/RoRo vessels.

The context in 2021: big drop in overall claims frequency continues, but fires still an issue

Graph 1 shows that the claims frequency for all types of claims in excess of USD 500,000 decreased strongly from the peak in 2007/2008. In 2020 and 2021, there was a significant further drop which has to be viewed against the conditions in the shipping market, including effects of the Covid-19 pandemic (see Cefor trend analyses issued in 2021[3]). For fire/explosion claims there is no similar trend. While the occurrence of fire/explosion claims generally has much higher volatility, graph 1 also reveals that the frequency of fires has oscillated around the same average level. The year 2021 does not show any trend change in the frequency of fires. Contrary to other types of casualties, it stays at about the same level as in 2019 and 2020, confirming that fires behave differently from other types of casualty. A particularly worrying trend is the increase in the frequency of fires over USD 500,000 on container-carrying vessels (graph 2).

Graphs 1 and 2 include all types of fires. To improve loss prevention, it is relevant to distinguish between engine room fires and fires starting in the cargo area of a vessel.

Although the fire/explosion frequency is low in percentage terms compared to other claim types, the cost of such claims is typically high and therefore affects the overall annual claim cost (see ocean hull trends chapter in the Cefor Annual Report 2021, to be published 7 April 2021).

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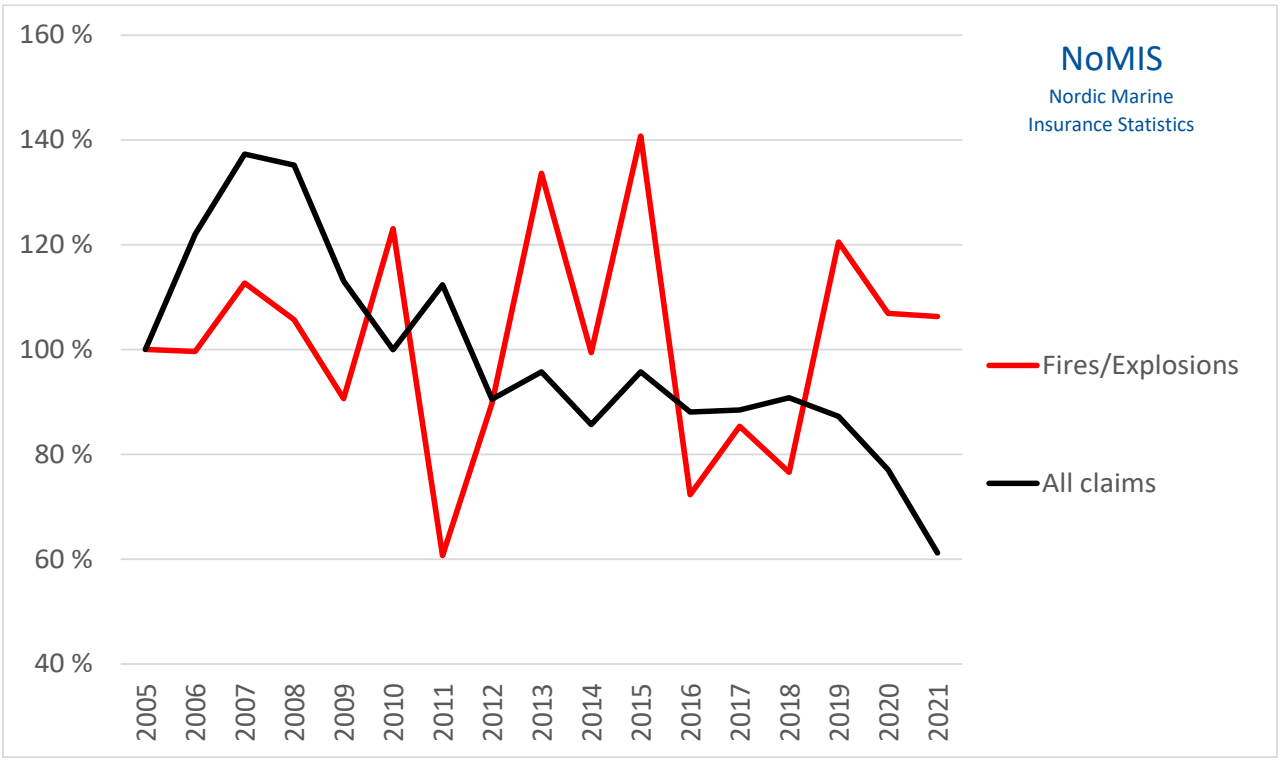
[1] https://cefor.no/statistics/analysis-with-special-focus/

[2] Recent initiatives: 1) International Maritime Organisation (IMO), ongoing work by Subcommittee on Ship Systems and Equipment (SSE) to improve fire protection:
https://www.imo.org/en/OurWork/Safety/Pages/FireProtection-default.aspx
https://www.imo.org/en/MediaCentre/MeetingSummaries/Pages/SSE-Default.aspx
2) LASH FIRE: Research project to reduce the risk of fires onboard RoRo vessels https://lashfire.eu/
3) EMSA/OP/17/2021: Study for investigating cost efficient measures for reducing the risk from cargo fires on container vessels (Cargosafe)

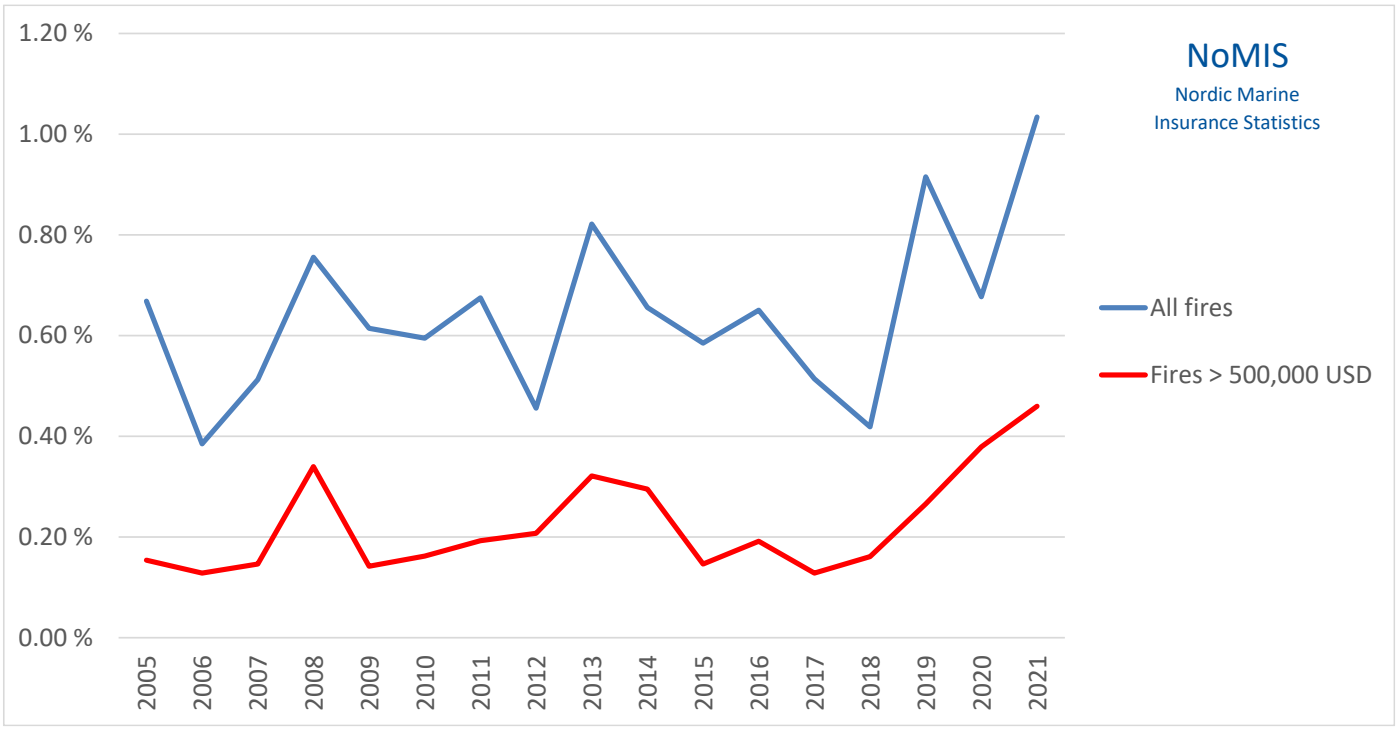
[3] Cefor hull claims trend analyses:
https://cefor.no/statistics/nomis/2020/nomis---as-of-december-2020/ and
https://cefor.no/statistics/nomis/2021/2021-cefor-june-hull-trends-report/

Graph 1: Frequency of claims > USD 500,000, all claims versus fires/explosions, all vessel types

Index 2005 = 100%, by accident year



Graph 2: Frequency of fires on container vessels[4], by accident year

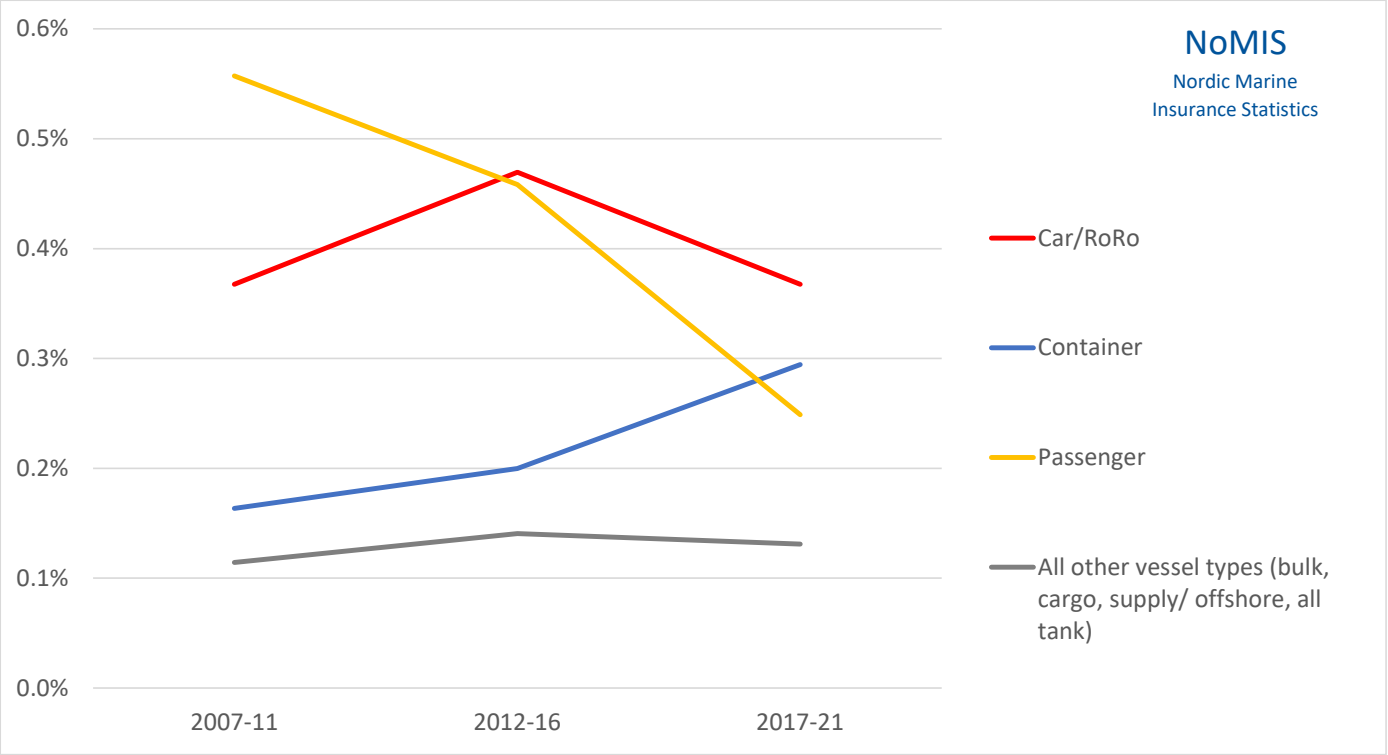


[4] Includes all types of container-carrying vessels (fully cellular container vessels and combination carriers such as RoRo with container-carrying capacity)

Highest fire risk on large container vessels and medium-size car carriers

Graph 3 illustrates that the highest fire frequency can be observed on passenger vessels, car/RoRo vessels and container vessels. For container vessels, the frequency of fires has shown a rising trend. This is particularly true for fires with a cost of more than USD 500,000. The occurrence of these expensive fires also stays high for car/RoRo vessels, while there has been some improvement for passenger vessels. The recent improvement for passenger vessels may be seen in connection with the imposed inactivity over a longer period due to the Covid-19 pandemic.

Graph 3: Fire/explosion frequency by vessel type[5], claims > USD 500,000, by accident year



[5] In this graph, 'Car/RoRo' includes RoRo with container-carrying capacity, while 'Container' reflects fully cellular container vessels.

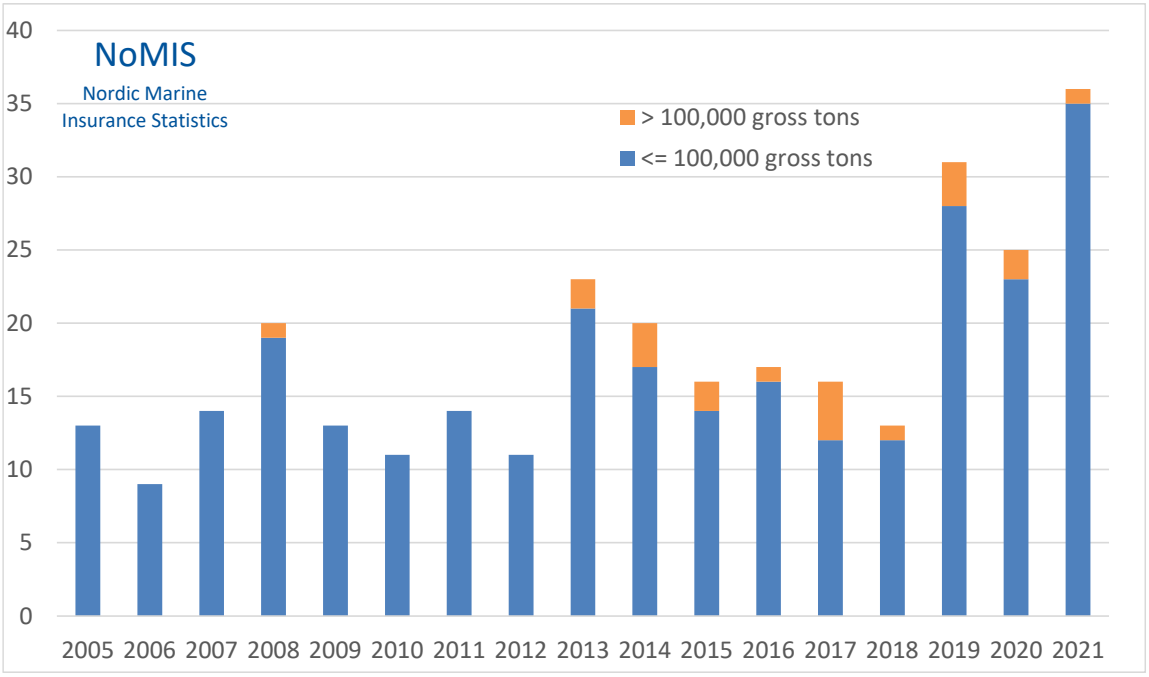
Upward trend in fire frequency on container vessels

The following statistics include all types of container-carrying vessels. These are fully cellular container vessels and combination carriers such as RoRo with container-carrying capacity. Not included are any vessel types which are not designed for carrying containers.

In the first quarter of 2019, an unusually large number of fires on container vessels was recorded. In 2020, the number was slightly reduced, but was still above the average for the years before 2019. In 2021, the statistics show a further increase.

An increase in the absolute number of reported claims as shown in graph 4 needs to be interpreted in relation to changes in the underlying portfolio. Analysing the fires in relation to the container fleet, reflected by the claims frequency and the claim cost per vessel, this confirms an actual upward trend in the frequency of fires on container vessels and on large container vessels specifically.

Graph 4: Fires on container vessels – Number of occurrences by vessel size, by accident year

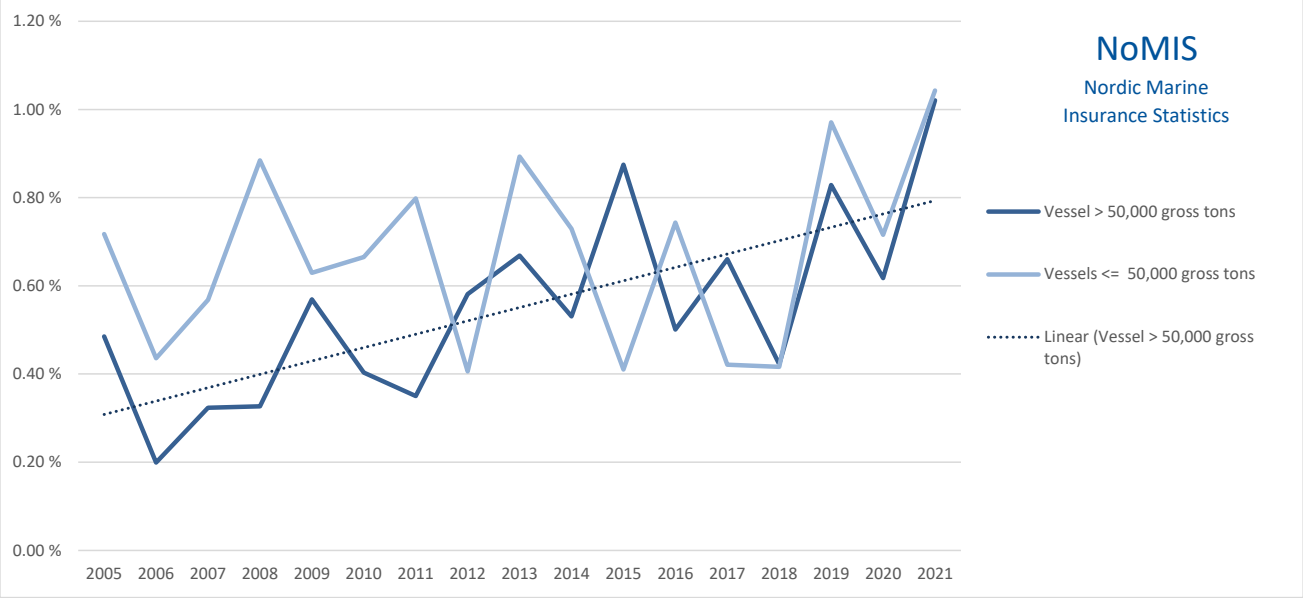


Graph 5 compares the frequency of all fires/explosions on container vessels of less than 50,000 gross tonnes (Panamax) to those above 50,000 gross tonnes. In terms of container-carrying capacity, 50,000 gross ton roughly translate into ca. 4,500 TEU. In graph 6, the number of claims occurrences is related to the number of insured vessels of that size in the NoMIS portfolio. For the larger vessels, there has been a clear trend towards more fires over the last fifteen years. From the trendline one can deduct that over the whole period from 2005 to 2021 the frequency of fires on vessels over 50,000 gross tonnes has increased by factor 2.6. In 2021, also the fire frequency on smaller vessels showed some increase. A small reduction in the frequency in 2020 does not break the general upward trend and is within the range of normal fluctuations.

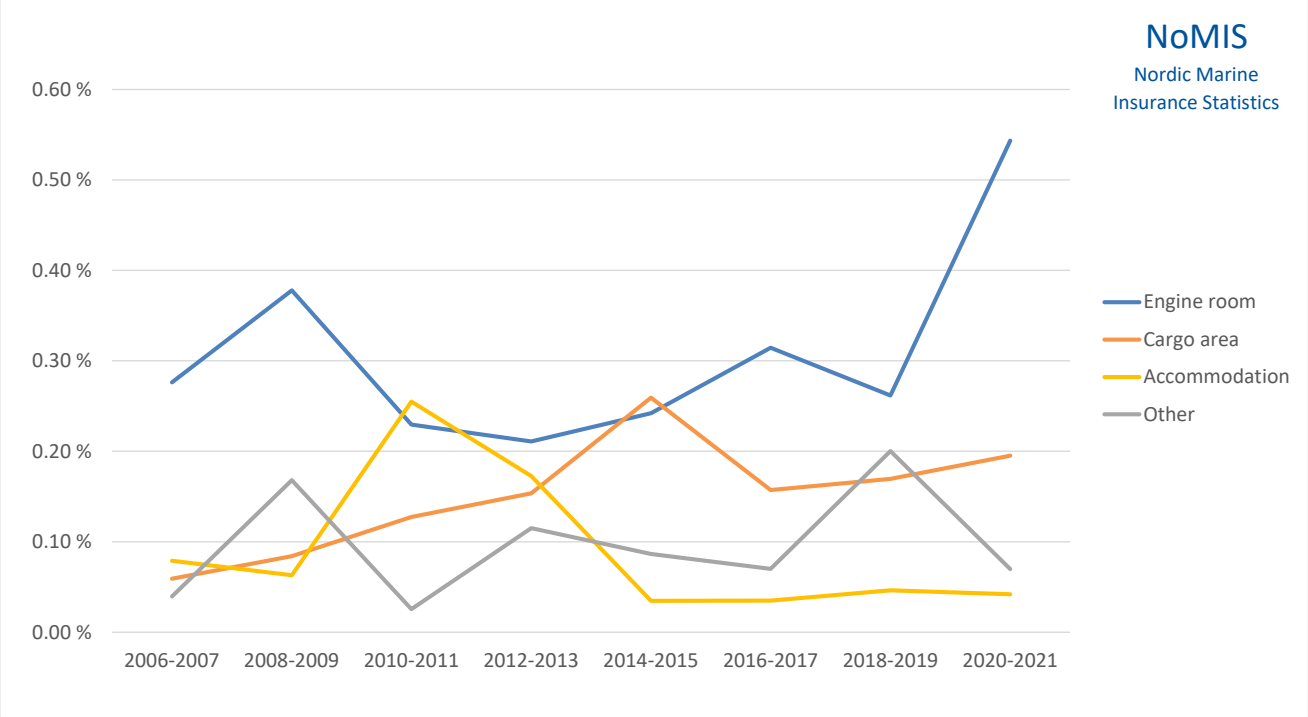
Of particular concern is the continuous increase in the frequency of fires on vessels over a certain size (graph 6), where the potential for injury to crew members and damage to cargo is especially great if the fire cannot be extinguished before spreading to other areas.

A statistically obvious explanation why the fire frequency in the container and RoRo segments increases with vessel size is related to the amount of transported cargo. With a given probability of a fire starting in one container, the probability of a fire starting in at least one of the containers will grow in almost direct proportion to the number of containers. The larger the number of containers on board, the higher the probability that at least one of the containers could contain something that self-ignites and causes a fire. Moreover, the larger the vessel, the more severe the consequences of the worst-case fire scenario on this vessel will be.

Graph 5: Frequency of fires on container vessels by size of vessel, by accident year



Graph 6: Frequency of fires on container vessels, by type of fire, by accident year



Graph6 illustrates that while the years 2020 and 2021 were heavily impacted by engine room fires, fires in the cargo area of container vessels have shown a steady increase in recent years. From a trendline perspective, flattening out individual years' deviations, one can observe a factor of roughly 2.4 increase over the whole period 2005 to 2021. As explained above, this increase needs to be seen in connection with an increase in vessel sizes which in turn increase the probability of fires in the cargo area and are more difficult to extinguish. Unlike fires in the engine room, fires starting in the cargo area are challenging to detect and extinguish.

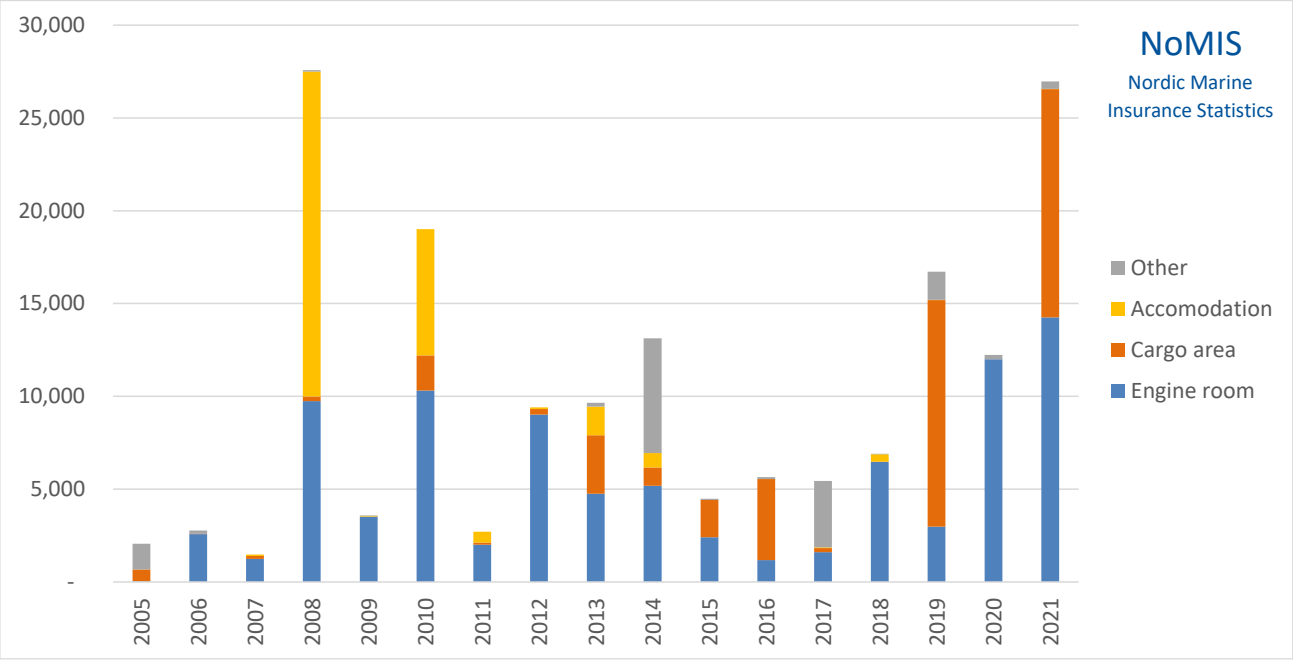
Claim cost per vessel

Fires often represent a high cost to shipowners and hence to their insurers. The statistics in this analysis reflect claims incurred under the vessels' standard hull and machinery policies as reported into the NoMIS database, i.e. the costs of physical damage to the vessels. Additional, and in some cases very high costs may incur from crew injury, business interruption and environmental damage. These costs are not included in the statistics presented here but would typically be covered by the vessels' loss of hire and P&I insurers.

Graph 7 and 8 show the claim cost per vessel for fires. A large share of the cost of fire/explosion claims on container vessels since 2012 originated from fires starting in the cargo area. Among the concerns are the risk associated with incorrect package, misdeclared and undeclared dangerous goods that are all regarded as significant contributing factors. The misdeclaration of goods may for example lead to containers which should not be exposed to heat being stored in unsuitable places where the contents might self-ignite.

In 2020 and 2021, engine room fires were especially prevalent. Also for engine room fires the probability is higher on larger vessels that such fires may lead to higher costs, as large vessels have more equipment in the engine room such as e.g. a higher number of auxiliary engines.

Graph 7: Claim cost per vessel (USD) – Fires on container vessels by location of fire, by accident year



Graph 8: Claim cost per vessel (USD) – Engine room fires versus fires in cargo area on container vessels, by accident year