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**A POST-INSPECTION ANALYSIS
OF THE CURRENT PROBLEMS DIAGNOSED
ON FISHING VESSELS AIMING
AT IMPROVING SHIPPING SAFETY**

ABSTRACT

This paper is an analysis of the problems connected with inspecting fishing vessels in the years 2009–2011, done under the supervision of the Maritime Office in Gdynia, and aiming at improving the safety standards and heightening the shipping safety.

Keywords:

fishing vessels, sea fishery, sea safety, maritime accidents.

INTRODUCTION

The geographical and historical situation of Poland by the Baltic Sea was the main factor for the development of the sea fishery. Another very important factor was a considerable contribution of people inhabiting the seaside regions. In consequence, taking into account the increasing demand for fishing products, a branch of industry called fishing industry has grown over the years in Poland.

In the context of the activities aiming at obtaining natural resources from the Baltic Sea (fishing), there have been coined two terms, namely, fishing industry and fishery. Fishing industry is concerned with fish breeding and their temporary upkeep in natural and artificial reservoirs, and fish ponds as well as exploitation of inland water resources (rivers, lakes), whereas sea fishery consists in fishing in enclosed sea areas, offshore and open sea. It creates a certain system connected with fishing vessels (their management, supervision over their exploitation, and overhaul): the products of their work (caught fish) and industry involving their processing, transportation and market sale. Seeing that, a considerable effort and means are necessary to sustaining this system, however, it has been long recognised that high intake of fish is beneficial for humans health.

With regard to the nature of this business, people work in a very unfriendly sea environment, which frequently takes place at winter time. Hence, sea fishery has been classified as a dangerous profession, taking into consideration its high risk of potential accidents and breakdowns.

The analysis of accidents and breakdowns in terms of sinking, collisions, grounding, and other that are connected with exploitation of fishing vessels, carried out by EMSA [17] between the years 2007–2011, shows that there have been 300 of accidents and breakdowns in total in the area of the European Union. Except for the occurrences of sinking, it refers to the reported fishing vessels of GT 50 and above. Therefore, it is presumed that the number of these accidents and breakdowns is even higher when we include small vessels.

The issues of accidents and breakdowns of small vessels are not as resounding as those infrequently spectacular disasters involving big vessels. Yet, having analysed literature resources, it can be seen that the international organizations such as IMO (the International Maritime Organization) increasingly devote more attention to these issues.

Classification societies proceed with improving the regulations regarding small vessels, but it needs to be stated clearly that even the best organised fleets are plagued by naval accidents and breakdowns.

Maritime administration as well as classification societies try to solve the problems of small vessels safety through [4, 5, 6, 13, 14, 15, 33, 34, 35, 39]:

developing safety standards, managing safe exploitation of ships, preventing contamination of natural environment, ensuring that procedures concerning exploitation of vessels are carried out safely, providing safe work conditions, establishing prevention measures against all possible dangers, improving skills of the employees inland and on ships, and acting in agreement with the binding laws and regulations. The authors of this work feel that these are the goals which every Ship Owner should aim at.

Fishing vessels can be classified as small vessels, hence, the question arises how to define a small ship. In literature resources, no precise definition has been found. However, there exist some conventional or formal criteria which state that small vessels are these whose length is less than 100 metres [7, 24, 25].

Classification societies divided ships into groups according to their length and whether they possess deck or not (closed or open deck). Nevertheless, in compliance with § 7 Act 1 point 5 and 6 constituted by the Minister of Infrastructure on 3rd August 2005 on the issue of minute details about conditions of safe shipping, fishing vessels were divided into the following categories: category C1 — fishing vessels more than 75 m long, including the ships processing their fishing goods, C2 — fishing vessels 75 m long and less, including the ships processing their fishing goods. Yet, taking into account § 2 point 2, fishing vessels were grouped according to their length and the type of sea navigation, so fishing vessels up to 15 m for the national sea navigation limited to 6 Mm, national and offshore, fishing vessels from 15 m up to less than 24 m long and fishing vessels between 24 m and 45 m long for international sea navigation.

Exploitation of these vessels requires constant analysis of the factors conditioning their safety. The question is: what does safety with regard to a small ship really mean? It is seen as the possibility of an accident being excluded. However, is it possible to define it in numbers? More often it has been described in terms of risk (as the product of probability of an incident and its results) [7, 9, 10].

Risk is the actual measure of ship's safety, and it is particularly concerned with the safety of ship's stability, which is the ability to prevent the ship from falling or flooding resulting from an excessive tilt that may be leading to its sinking [7, 9, 10].

The endeavours to raise the safety standards are obviously very expensive, but there is no price to pay if it comes to the improvement of safety and people's life.

Surely, we would like to exploit vessels at the highest level of safety which translates into their being safe in navigation and having been made in agreement with the rules of environment preservation which would ensure the safety of the vessels and people sailing on them.

Since Poland is a member of the European Union and the works over the ratification of Torremolinos Convention [15, 16] has lasted for years, Poland should put into practice Torremolinos general safety standards. The convention deals with fishing vessel safety, which details safety requirements for the new sea fishing vessels 24 m and more long (but up to present there is still a variety of reasons for some countries for not accepting the convention). The activities of the European Union in this matter and on IMO agenda should contribute to putting this law to use. Till then, however, the directive 97/70/WE [4] should be realised.

Nevertheless, what can be inferred from the post-inspection experience and an increasing number of accidents connected with fishing vessels is that they require constant supervision which means that the EU standards are still not fully respected. Needless to say, it is a common phenomenon that on small ships water accumulates on board which is dangerous for preserving appropriate ship stability. Apart from that, the following factors have an immense influence on safety: water tightness of the hull scupper drains and bulwark, and the working condition of reflexive valves in these bulwarks [7].

Not respecting the guidelines of stability and limitations of exploitation can lead to a disaster. Moreover, there is an array of irregularities associated with technical documentation and gaps in training, especially training on the subject of ship's stability.

That is why the authors of this work were motivated to carry out the analysis of the current problems which have been put on the agenda after inspections of fishing vessels, and to indicate weak points in ship exploitation. The main goal is not by all means to point out errors and people to blame but to offer help either through authorisation of the Maritime Office or Classification Societies.

LEGAL CONDITIONING CONCERNING THE FISHING SMALL VESSELS AND BOATS SAFETY

Maritime safety of ships by structure, permanent devices and equipment planting, classification and composition of the ship's crew, safe the sea navigation and saving the seafaring life is determined in the Maritime Safety Act, 9 November 2000 [39].

Unfortunately, in the Art. 4.1 of the Acts were written down then included regulations aren't applicable for fishing vessels.

In 1997 in Torremolinos the first international act in the margin of 24 m long and larger fishing boats safety [15] was accepted. In spite of ratification by many states the convention isn't coming into effect, because put the not very realistic criteria for not only a number of states [15], but 50% of the fleet of fishing boats 24 m long and larger too [15, 16].

Until the Council directive 97/70/EC from 11.12.1997 implemented the Torremolinos safety standards for fishing boats 24 m long and bigger [4] for the European Union countries and Poland.

In case of inspections effecting the cutters and fishing boats navigation safety, the Director of Maritime Office in Gdynia got authorizing by The Minister of Infrastructure ruling from 3 August 2005 which define detailed conditions of the navigation safe planting for sea ships in § 7 sec. 2, by: setting the number and kind rescue devices and based on the § 21 sec. 1 and 3 for establishing: the firefighting equipment kind, the number and arranging and the drawing up a plan the fire protection for fishing units duty [11].

Based on the law, mentioned above, the Director of Maritime Office in Gdynia brought recipes into effect in the Director of Maritime Office in Gdynia Announcement No. 5 form from 28 June 2007, which included: the guidelines about the amount, the kind and arranging rescue and the minimal set of navigation, radio and of signal equipment for fishing boats, [13] and by The Director of Maritime Office in Gdynia Announcement No. 3 from 7 May 2007 the guidelines for Ship-owners about: the kind, the amount and arranging the firefighting equipment and firefighting shipboards [11] and also: the plans of the fire protection of sea ships drawing up and storing for fishing vessels up to 24 m length.

As for fishing boats 24 m long and bigger inspections in the safety of the navigation are conducted basing on the Council directive recalled already earlier 97/70/EC from 11 December 1997 establishing the harmonized security system for fishing boats 24 meters long and above [4]. Moreover in case of fishing boats for lengths 24–45 m and above 45 m according to § 7 sec. 3 Regulation The Minister of Infrastructure from 3 August 2005 on detailed conditions of navigation safe for the sea ships [35] the Director of Maritime Office in Gdynia determines: the kind and the number of rescue devices in compliance with the requirements of SOLAS Convention and with IMO provisions [13, 18, 32, 35].

Every inspection in the margin of fishing vessels navigation safety is preceded by the technical inspection in order to send and to certify the class by the classification institution (The Polish Shipping Register) based on the classification and the structure sea smaller vessels part I–VII regulations) [24, 25].

THE MARITIME ADMINISTRATION SUPERVISION ASPECTS FOR THE FISHING VESSELS

The Director of Maritime Office in Gdynia is the maritime administration local body, according to the Act from 21 March 1991, about sea areas of the Republic of Poland and the maritime administration (The Journal of Acts from 2003 No. 153, pos. 1502, with later changes), [38] and it is the singled people and support squad appointed to The Director of the Sea Office exercise of competence as the local Maritime Administration body. On the base § 4 Maritime Office in Gdynia statute, which is attached to The Minister of Infrastructure Regulation No. 13 from 21 March 2011 on giving the status for The Maritime Office in Gdynia (The The Minister of Infrastructure Department Journal No. 3, pos. 17) with internal ordering The Director of Maritime Office in Gdynia No. 17 from 8 July 2011 were the Maritime Office in Gdynia work regulations was brought into effect (which the annex to the previous Regulation). Simultaneously the The Director of Maritime Office in Gdynia internal ordering No. 23 from 14 October 2005 in case The Sea Office in Gdynia regulation brought into live lost power.

This order came into effect with 15 July 2011. These regulations in the bright way are defining all employees of The Maritime Office in Gdynia duties and competence. There are formed divisions as part of the Maritime Office in Gdynia organization and among them: the Maritime Inspectorate Division, into composition which the Inspectorate of the Flag State Control (FSC). He is included the main tasks of the Inspectorate of the Flag State Control which are among others: carrying out an inspection in the margin of navigation safety, the inspections outcomes analysis and enforcing inspecting orders, issuing the navigation safety certificates, the Ship-owners applications in case the crew composition necessity in the safe navigation establishing aspect examination, alarm schedules approving, the fire protection plans approving, the cooperation with Services of Search and Rescue (SAR) plans approving, being in charge of accepted classification societies duties, the inquiries on ships in maritime accidents matters involvement, giving the 'Ł' type called safety sheets for the up to 15 m fishing boats and safety sheets for fishing vessels up to 24 m length, and moreover. These documents are being issued in the five-year-old life cycle with annual term confirmations. The Maritime Office in Gdynia duties are very expanded and in this case the close coordination with classification societies and Ship-owners are demanded.

**GENERAL TALLY OF ACCIDENTS AND BREAKDOWNS
OF CUTTERS AND FISHING VESSELS SUPERVISED
BY THE MARITIME OFFICE IN GDYNIA**

Marine practice shows that accidents and breakdowns of fishing vessels can never be completely eliminated. In this work there has been made a short analysis of major accidents and technical breakdowns which took place on fishing vessels in the years 2009–2011 and which amounted to 15 in total. They are presented in figure 1 and encompassing the period of time given below.

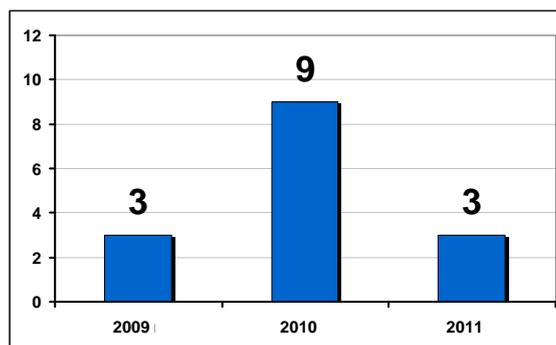


Fig. 1. General ranking of accidents and breakdowns on fishing vessels supervised by the Maritime Office in Gdynia in the years 2009–2011

Source: own study.

The structure of accidents and breakdowns on fishing vessels as presented in figure 2 indicates that most of them have been caused by technical problems and this amounts to **43%** of all the accidents and breakdowns on fishing vessels. The second biggest group ranked according to the amount of accidents is vessel sinking constituting **23%**. These accidents result in the largest loss as human life is lost, and it was reported that **7 people** lost their life. These are enormous losses, especially that in most cases these accidents could have been avoided.

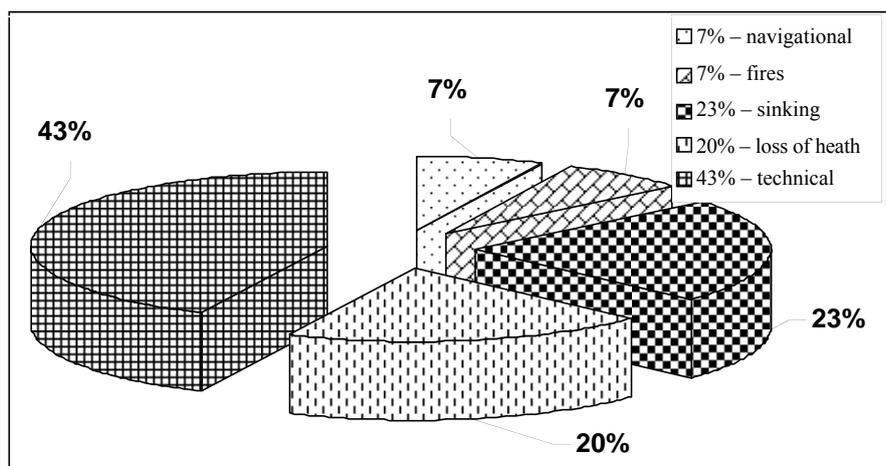


Fig. 2. The structure of accidents and breakdowns on fishing vessels supervised by the Maritime Office in Gdynia in the years 2009–2011

Source: own study.

It can be assumed that fires happen rarely, which can be inferred from the fact that in the investigated period there was only 1 fire recorded on the vessel **JAS-12** in 2010 which is less than **7%** of all the accidents and breakdowns that happened on fishing vessels. The accident occurred as a result of an inadequate identification of fire danger by the crew of the cutter and the cause of the fire was an inappropriate exploitation of a heater.

Such a small number of fires can be primarily linked to respecting fire regulations by fishing ship crews, including certain requirements concerning training of fishing vessel crews. These trainings fulfil also requirements of STCW convention (the elementary training for fishermen, senior fishermen and motorists, and higher level training for officers of the deck and engine departments and skippers).

Navigational accidents and breakdowns were mainly the consequence of a poor situational judgement during the manoeuvres of entering and leaving a port, which was **7%** of all the accidents and breakdowns on fishing vessels.

In general, the analysis of the accidents and breakdowns, as well as the relevant literature resources, shows that the cause for majority of them, which has been estimated at **70%–80%**, is exploitation which comprises human errors and organizational shortcomings. Hence, it would have been better to focus on improving technical standards and organizational managing of these vessels as it often happens that there is a lack of updated technical documentation, and also reliance on experience that is passed from generation to generation is presently not a deciding factor for the safety of sea fishery.

Suffice it to say, the best form of schooling is training, drills and exercises. Bearing in mind that the average age of the fishing vessels oscillates between **35–40 years**, and infrequently even more than that, it would be advisable to consider improving methodology of fishing vessels crew training in practice, and in particular carrying out in-service training on stability along with the participation of a classification society member and representatives of the Maritime Office, then on the application of emergency resources, abandon the ship and fire emergency drills, which should be practised periodically and recorded in logbooks of these fishing vessels (deck logbook, mechanical logbook, deck-mechanical logbook).

The brief analysis of accidents and breakdowns on fishing vessels presented above has its references in publications issued by international organizations (such

as IMO — International Maritime Organization and EMSA — European Maritime Safety Agency). The report made by EMSA [17] for the year 2010 says that as far as fishing vessels within the European Union is concerned, the situation is improving in the light of the given record of **18** cases of sinking in 2009 in comparison to **29** in 2008 and **27** in 2007 [17].

On the basis of the EMSA report, 16 members of fishing vessel crews have been missing or drowned in 2009. It was emphasised that **sinking of the Polish fishing cutter WLA-127 on 30th April 2009 was one of the most tragic accidents**. The cutter (built in 1972) was approved for international sea fishery limited to the Baltic Sea area; the wind at 7°B.

Another tragic accident happened on the cutter **WLA-97** which sank around 6 Mm west off the Baltic Beta oil rig. Six members of the crew were rescued from water. Fortunately, this time there were no fatalities.

Yet, in the accident of the open-deck fishing motorboat **PUC-10**, which was approved for national/local sea fishery up to 6 Mm off the coast and in the weather conditions in which the wind was at 5°B, which sank on 14th December 2010, two fishermen went missing and their bodies have not been found so far.

THE MOST FREQUENT SHORTCOMINGS/ERRORS RECORDED DURING INSPECTIONS OF CUTTERS AND FISHING VESSELS IN THE YEARS 2009–2011

Taking into account the accidents and breakdowns occurring on fishing vessels, their advanced age and a small number of newly built or purchased, inspections of fishing vessels are so important. Analysing all the comments and instructions resulting from inspections carried out by the Inspectorate of Maritime Shipping Safety (Flag State Control — FSC) of the Maritime Office in Gdynia, concerning fishing vessels in the years 2009–2011, they can be divided into characteristic groups which entails that they occur frequently, and in consequence, have an influence on the safety of navigation of these fishing vessels. The authors of this work grouped the instructions in the following way:

- constructional — technical;
- concerning emergency resources and pyrotechnics (signal resources);

- concerning certificates and documents of classification society;
- associated with radio communication and navigation;
- referring to training and qualification of crews, and documentation concerning exploitation of fishing vessels.

The most frequent instructions of constructional — technical relevance:

- obstructed reflexive valve holes in the bulwark, or their covering;
- lack of legalization and malfunction of hand fire extinguishing equipment;
- frequent makeshift wiring installation;
- insulation of exhaust collectors of combustion engines either of generator sets or main propulsion diverging from standards;
- lack of cleanliness of bilges and their systematic draining;
- inadequate fixing of platforms in machine rooms;
- lamp luminaire missing;
- lack or worn out scuttle panel packing;
- inadequate marking of valves cutting off fuel from the outgoing fuel tanks;
- poor fixing of loosely arranged spare parts in the machine rooms;
- marking of emergency lighting missing;
- lack of up to date megatest (the measurement of the insulation state of wiring and electrical devices);
- wellington boots and dielectric gloves not being legalized;
- substandard state of accumulators and not registering their service;
- inland power wiring mechanically damaged;
- lack of an appropriate marking of a cutter (a boat) comprising names, home port as well as marks indicating the draught;
- lack of signing the emergency routes and exits from the machine rooms;
- obstruction of emergency exits with redundant objects;
- broken seals on the security valves of pressure vessels and compressors;
- lack of current magnetic compass deviation.

The instructions concerning emergency resources and pyrotechnics (signal resources) make the second group of relevance:

- lifebelts ill-equipped with lamps or there is a lack of expiry dates for the lamp cells;
- lifebuoys ill-equipped with lights;
- poor supervision over the rescue overalls (rescue suits) and lack of the attestation of the rescue overalls of the date of production longer than three years (recommendations);
- no marking on lifebuoys;
- lack of the attestation of life rafts and hydrostatic release units;
- lack of appropriate life rafts fastening;
- keeping outdated red rocket parachute flares and orange floating smokes;
- lack of the ship's bell.

The most common instructions concerning certificates and documents of classification society:

- lack of current class certificate for a vessel;
- lack of confirmation of review of intermediate that would acknowledge the class;
- inadequately applied instructions given by a classification society.

Next group of instructions is associated with radio communication and navigation:

- shortage of radiotelephones VHF on vessels (which mainly concerned open-deck ships sailing on enclosed areas limited to 6Mm and national limited to 6Mm which should be equipped with portable VHF according to [13]);
- lack of training on the subject of GMDSS (currently just single cases, however, lack of keeping appropriate records in deck-mechanical log books) according to [34];
- lack of reliable fastening of an emergency radio buoy EPIRB which would be in accordance with marine practice (the fastening on the open-deck with the hydrostatic release unit).

Also a very important group of instructions is the one referring to training and qualification of crews, and documentation concerning exploitation of fishing vessels. The most common instructions are given below:

- lack of up to date training in terms of individual emergency techniques and fire damage control;
- lack of updated marine maps;
- insufficient records in deck logbooks, mechanical logbooks as well as deck-mechanical and radio logbooks, also inaccurate oil record notebook entries or oil record books;
- documentation on exploitation that would record fire drills and emergency drills missing which should be improved relentlessly in the future [31].

The structure of inaccuracies localized by inspectors of the Maritime Office in Gdynia during inspections of cutters and boats allows for a data compilation which has been expressed in percentage points which is presented in figure 3.

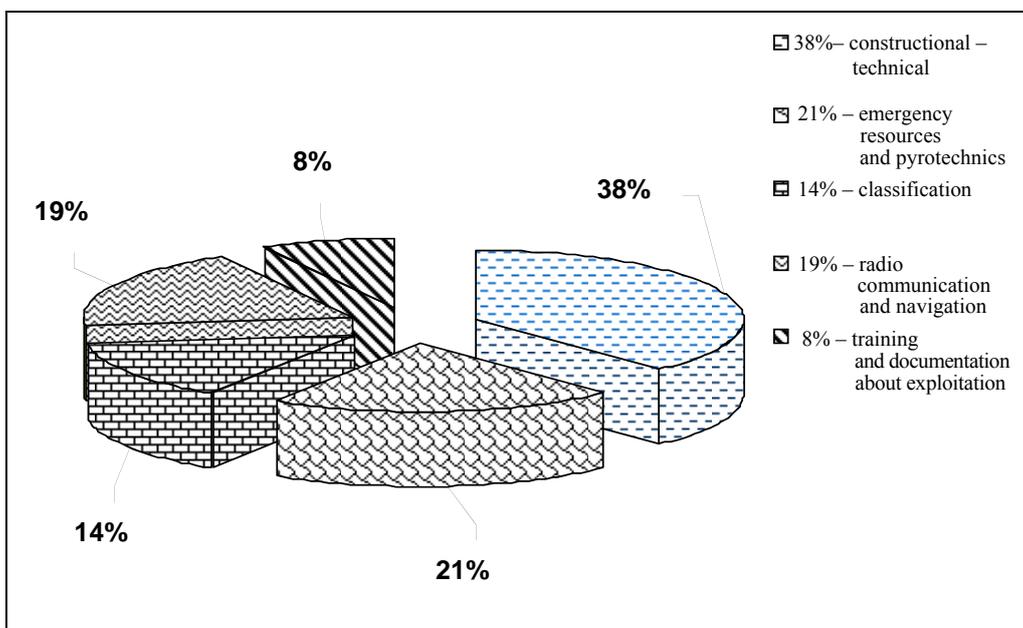


Fig. 3. Percentile ranking of inadequacies found on cutters and fishing vessels in the years 2009–2011

Source: own study.

As far as the number of positive inspections on fishing vessels (without any instructions) is concerned, taking into account just the year 2011, only 7 out of 50 inspections being analyzed, which constitutes 14%, were without any instructions, which is shown in figure 4.

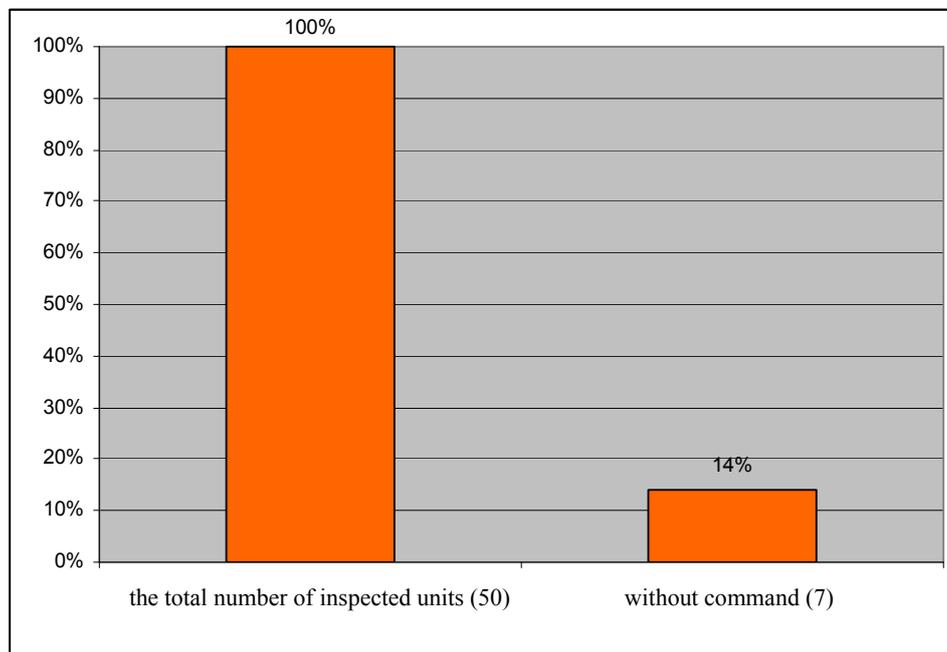


Fig. 4. Positive inspections (without any instructions) on fishing vessels in the year 2011

Source: own study.

CONCLUSIONS

This article is an analysis of the current problems recorded on fishing vessels during inspections under the supervision of the Maritime Office in Gdynia, and also there has been presented a general compilation of the accidents and breakdowns from the years 2009–2011.

The results of the analysis indicate that fishing vessels require constant supervision and offering them a wide range of assistance either by the Maritime Office or Classification Societies, especially focusing on the technical maintenance and

improvement in work management on fishing vessels, and still going further introduction of the elements of safety management system and protection of the sea environment on these vessels.

Bearing in mind that the average age of the fishing vessels is 35–40 years, and infrequently even older, we should consider improving methodology of crew training in practice, and in particular conducting in-service trainings in emergency situations such as unfavourable stability conditions, which could take place in the presence of a member of the classification society and representatives of the Maritime Office. It would be also advisable to organize in-service trainings in the application of emergency resources, abandoning the ship and fire drills, which should be systematically executed and recorded in the documents of these fishing vessels.

In the interest of Ship Owners, the deadlines for correcting the indicated inadequacies and the instructions given by Maritime Administration and a Member of Classification Society ought to be respected, which could undoubtedly improve their shipping safety.

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ANALIZA AKTUALNYCH PROBLEMÓW Z INSPEKCI JEDNOSTEK RYBACKICH W ASPEKCIE POPRAWY BEZPIECZEŃSTWA ŻEGLUGI

STRESZCZENIE

W artykule dokonano analizy problemów związanych z inspekcjonowaniem jednostek rybackich na przestrzeni lat 2009–2011, będących pod nadzorem Urzędu Morskiego w aspekcie dążenia do poprawy standardów bezpieczeństwa oraz podnoszenia na jak najwyższy poziom bezpieczeństwa żeglugi.

Słowa kluczowe:

statki rybackie, rybołówstwo morskie, bezpieczeństwo morskie, wypadki na morzu.