Przemysław RAJEWSKI, Cezary BEHRENDT
Maritime University of Szczecin

THE STRUCTURE OF MAIN ENGINE POWER INSTALLED ON POLISH FISHING VESSELS OPERATING FROM POLISH PORTS

Key words

Fishing, main engine of fishing vessels, fishing boats propulsion, structure main engine power of fishing vessels, main engine installed on polish fishing vessels.

Summary

Scientists of the Institute of Technical Operation of Marine Power Plants, Maritime University of Szczecin, are doing research on "The fishing craft modernisation program for the reduction of power consumption and minimisation of environmental impact" funded by an EU grant. The first step to reach the final aim – the reduction of the adverse effects of fishing craft on the marine environment – was to identify the age/size structure and distribution of Polish fishing vessels' main engines. This has enabled the preparation of the range and method of record keeping of fishing vessels' power systems.

Introduction

The actual power outputs of the main engines installed in operated vessels have been examined and sorted into particular vessel length groups. Main engines installed in Polish fishing vessels operating in the Baltic Sea are in many cases chosen at random.

One factor that, to a large degree, is responsible for the inadequate average value of vessel engine power is the practice, established in *Zalew Wiślany*

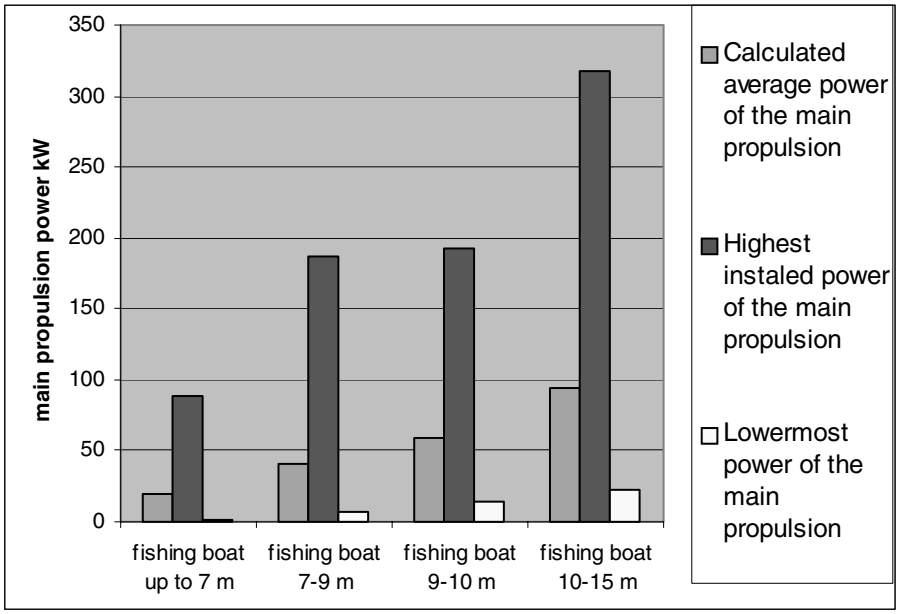

Fig. 1. The structure of the main propulsion power installed on Polish fishing boats

waters, of competitive marking of fishing grounds. The practice in fact resembles a specific race among fishermen struggling to reach a desired area first. The particular fishing ground belongs to the company or individual fisherman that, setting out from the common starting line at the pre-set time, will be the first to mark a particular fishing ground. As eel or zander catches are quite profitable, the result is that boats have been equipped with high power engines that are needed for this one 'racing' day. During regular everyday operation, only a fraction of the available engine power is used. The situation is different in the group of larger vessel traditionally called fishing cutters. Most of the older vessels have similar main engines, because they were built to the same design. The most modern engines are mounted in the largest cutters with an overall length exceeding 30 metres. An analysis of the presented charts supported by partial review shows that in vessels built or modernised main engines, without specialised consulting, are selected at random. Preliminary inspections of the vessels' technical equipment carried out at the first stage of this study have shown that no specific criteria were applied during vessel modernisation. For instance, the propeller was replaced with one that was just "on hand," having characteristics different from those the particular vessel really required. When interviewed, some owners mentioned that, after modernisation, their vessels suffered from worsened parameters of the hull-engine-propeller system and that they expected some technical advice to improve the vessel's performance.

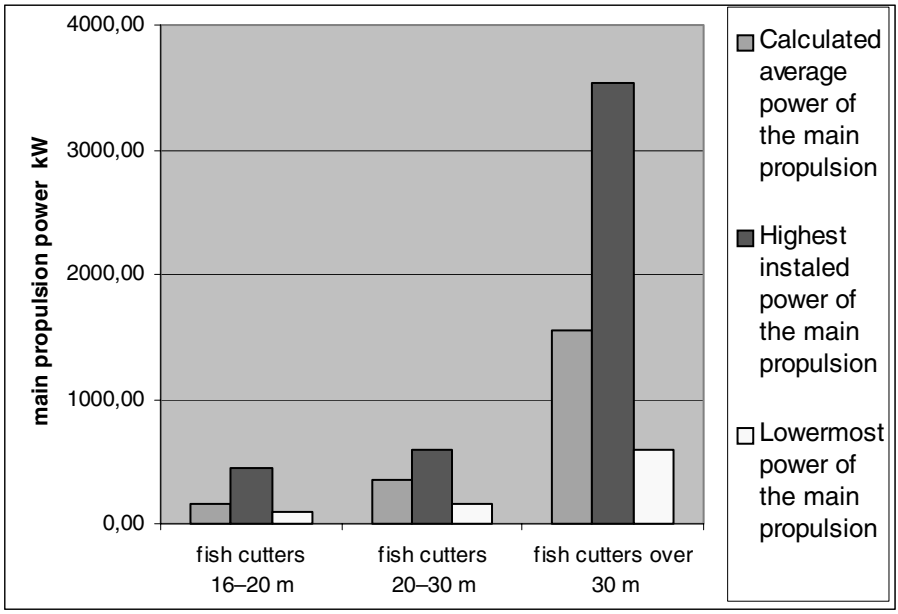

Fig. 2. The structure of the main propulsion power installed on Polish fishing cutters

1. The failure rate of Polish fishing vessels based in Polish ports

Fishing vessels adversely affect the natural environment by spillage and other forms of discharging polluting substances into the marine environment in emergency situations. To have a relevant overview of the reasons, failures connected with defects caused by factors associated with the power plant and power systems of the examined vessels are systematised in the form of tables. This study has made use of materials of the Maritime Court of Appeal in Gdynia, concerning marine incidents/accidents of Polish fishing vessels reported in the years 1999–2006. The data herein presented includes marine accidents connected with power system failures in fishing boats and cutters, reported to the Maritime Court at the Regional Court in Gdańsk, with its seat in Gdynia, and to the Maritime Court at the Regional Court in Szczecin. The analyses are supplemented with statistical data on failures of the a/m systems reported to the branches of the insurance company WARTA in Szczecin, Świnoujście, Koszalin, Kołobrzeg, Darłowo, Kamień Pomorski and Dziwnów from 01 January 1999 to 30 September 2007. In order to have a more specific overview of the machinery of the vessels mentioned above, the researchers have also used data from the Polish Register of Shipping covering the years 1999–2007. Additionally, information was used on the penalties imposed by the Maritime Office in Słupsk for environmental pollution in the years 1996–2006. It is notable that

87.2% of propulsion system failures, other than those caused by propeller fouling, occurred in vessels more than 25 years old.

2. Failures caused by propeller or propeller shaft fouled by fishing gear

It seems that one important element affecting the safety of a fishing vessel is the shape of stern of the hull and propeller shaft protection; because, out of 220 failures noted in the examined period, 71 cases (32.3%) were connected with line or net fouling the propeller or its shaft. In consequence, in many of these incidents, the stern tube was damaged which resulted in oil spills to the sea.

Conclusion

Experience gained from these partial examinations of fishing craft and the analysis results from data given in the charts have been used in order to do the following:

1. Select fishing craft for fleet stocktaking (vessel record keeping).
2. Prepare guidelines for devising VESSEL DATA RECORD CARD, which will serve for fishing vessel technical data collection during the fleet stocktaking, and
3. Prepare guidelines for devising a database for data gathering and processing.

Sources of the study

This study has been based on materials and information obtained from July to November 2007 from the following sources:

1. Maritime Offices in Szczecin, Słupsk and Gdynia,
2. Polish Register of Shipping,
3. Insurance companies,
4. Maritime Courts, and
5. At random inspections of the machinery and its technical condition on 20 fishing boats and cutters.

Recenzent:
Czesław DYMARSKI

Struktura polskich jednostek rybackich łowiących w oparciu o polskie porty

Słowa kluczowe

Rybołówstwo, silniki napędu głównego statków rybackich, napęd statków rybackich, struktura silników napędu głównego statków rybackich, silniki napędu głównego na polskich statkach rybackich.

Streszczenie

W artykule wykorzystano informacje zebrane w czasie realizacji pracy badawczej „Program modernizacji jednostek rybackich w aspekcie zmniejszenia nakładów energetycznych i oddziaływania na środowisko" w ramach grantu UE. W artykule przedstawiono zebrane i opracowane materiały dotyczące struktury silników napędowych polskich jednostek rybackich, eksploatowanych w oparciu o polskie porty. Przeanalizowano zainstalowane moce napędu głównego w różnych grupach ich wielkości statków rybackich. Analiza była podstawą do opracowania „Karty ewidencji Jednostki".