

ANALYSIS OF SHIPOWNERS' OBLIGATIONS AND TECHNICAL/FINANCIAL LIMITATIONS IN CONNECTION WITH REGULATIONS OF MARPOL CONVENTION ANNEX VI

The article focuses on the topic of MARPOL Annex VI regulations, particularly SECA, and its impact on European shipowners. The authors highlight the issue from both points of view – shipowners and industry – to deliver a complex overview and enable the public to draw own conclusions. It seems the new legislation on sulphur emissions will affect more branches than only shipping, and certainly will take its toll – not only on the shipowners, but also on ferry passengers, shipyards and as a result, European and global economy. Yet, the full impact is still to be found out. Until the ferry sector confirms its revised price structure and network capabilities, the shipowners modernise their vessels and the customers realise how much they need to pay in order to cross the Baltic Sea, we can only make assumptions as to what extent the Europeans will experience these limitations.

One is certain – it is not the question “if” – the questions are “when” and “how much”.

Keywords: SECA, MARPOL, Annex VI, Sulphur limits.

INTRODUCTION

Recently, European shipowners have been faced with a new limitation that may have a tremendous effect on the shipping business as it is today.

In 2013, the short sea shipping (SSS) in the European Union was above 1.7 billion tonnes of freight. It made up 58% of total EU maritime transport of goods in 2013, about the same as in 2012. It is particularly vital in the Mediterranean, the North Sea and the Baltic. Annex IV of MARPOL Convention is possible to affect these numbers significantly.

1. THE IDEA OF MARPOL CONVENTION

MARPOL is a short name for Marine Pollution. The convention aim is to prevent the pollution of all seas and oceans by ships. It was introduced by IMO – International Maritime Organization, and European Union, and it orders to reduce the percentage of sulphur in fuel. Starting with the 1st January 2015, it had to be cut off to 0,1%, not as it had been functioning up till then as 1%. The reason for such an uncomfortable change is high emission level of carbon dioxide and high general

pollution. Regions included are known as SECA – Sulphur Emission Controlled Area and these are: English Channel, North Sea and Baltic Sea. The area is planned to spread within 5 years to, i.e., Mediterranean Sea.

Table 1. Recent and future MARPOL Annex VI sulphur limits

Inside SECA		Outside SECA	
Prior to 1 July 2010	1.5%	Prior to 1 January 2012	4.5%
On and after 10 July 2010	1.0%	On and after 1 January 2012	3.5%
On and after 1 January 2015	0.1%	On and after 1 January 2020	0.5%

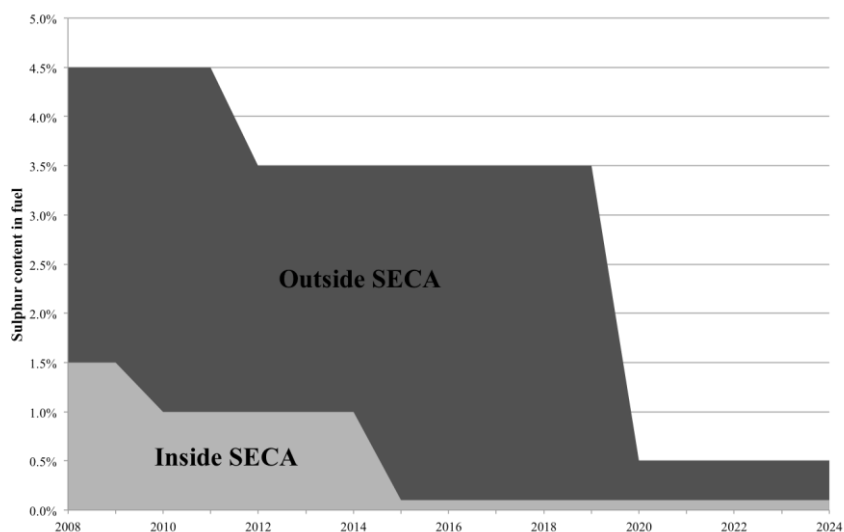


Fig. 1. Sulphur emission limits over the last years

1.1. Solutions for shipowners

- **MGO (Marine Diesel)** – fuel containing less than 0.1% sulphur, similar to diesel used in cars. Its price is nearly twice as high as of conventional fuel. On the day 16th June 2015, the price was €490 per ton, which was €175 more than IFO¹. Prices are expected to rise even as much as 20% in 2015 due to increased pressure expected on their supply.

Shipowners' actions: Brittany Ferries use MGO on their unmodified vessels since 1st January 2015;

- **LNG (Liquefied Natural Gas)** – natural gas converted to liquid by cooling it to approximately -162°C . By its usage, one can reduce the emission of SO_x and NO_x up to 90%, as well as particulate matter. Unfortunately, the cost of building

¹ *Intermediate Fuel Oil*, a blend of gasoil and heavy fuel oil, with less gasoil than marine diesel oil.

new vessel with such propulsion is high – it can go up to a €300M. Conversion from HFO² is high-priced as well, its costs are €1,000/kW. It sums up to €3-5M per ship.

Shipowners' actions: *Brittany Ferries* are to pay €250M for the newbuilding due for delivery in early 2017. The company is also going to convert three other vessels to LNG from mid-September 2015 to mid-May 2017;

- **Methanol** – a colourless liquid that can be produced from natural gas, coal, biomass or CO₂. It is currently used mainly in racing cars. Methanol is liquid at room temperature, which facilitates its storage. Conversion to methanol is less expensive than to LNG – the cost is €350/kW. It turns conventional engines into dual fuel engines – methanol (main fuel) with MGO (backup). Methanol usage reduces the emission of SO_x (99%), NO_x (60%) and particulate matter (95%), comparing to conventional bunker fuels. The price of such fuel is €390 per ton (ex works³).

Shipowners' actions: *Stena* has been considering converting to methanol since October 2013. In March 2015, *Stena Line* launched the world's first methanol ferry, the *Stena Germanica*, which had been out of service for a couple of months in order to obtain necessary modifications. The conversion was carried out in Gdansk, Poland, at the Remontowa shipyard, and it cost €22M;

- **Scrubbers** – equipment fitted in the exhaust system of a vessel, removing pollutants from exhaust fumes. Once installed, it is able to remove about 90% of SO_x and also about 70% of particulate matter (they are not suitable for NECA). This solution seems to be the most popular, yet, it is still costly. It requires additional space on the vessel, reducing cargo carriage capacity, vital to sea transport. One scrubber is required for each engine. Older vessels may be harder to retrofit than newbuildings. There is also a potential problem of meeting the rapidly increased demand by the suppliers.

Shipowners' actions: *Brittany Ferries* installed scrubbers on 6 vessels, the cost was around €14M per vessel, €2M per scrubber. *DFDS* paid €100M for 21 vessels – that equals almost €5M per scrubber;

- **Hybrid propulsion** – propulsion is achieved using a power source with fuel (e.g. a diesel engine) or through a stored energy source (e.g. set of batteries). It reduces the emission of SO_x.

Shipowners' actions: *Scandlines* invested €14M in hybrid propulsion systems for four ferries;

² *Heavy Fuel Oil*, pure or nearly pure residual oil.

³ The rule places minimum responsibility on the seller, who merely has to make the goods available, suitably packaged, at the specified place, usually the seller's factory or depot. The buyer is responsible for loading the goods, all export procedures, onward transport and any costs arising after collection of goods.

- **Reducing operations and adapting to new situations** – that could be avoiding ECAs to reduce fuel surcharges and expensive modifications, which may result in increased transportation time. Another idea is slow steaming – operating vessels at speed significantly lower than maximum in order to consume less fuel.
Shipowners' actions: Stena claims it is possible, e.g. by modal shift⁴;
- **Cheating** – not the solution MARPOL should expect, but still possible. The European rate has not been published yet, although one may assume it can amount up to \$25,000, per violation, per day, just as in US SECA.
Shipowners' actions: this summer, a Dutch vessel was first to be fined for violating SECA regulations in Norway. The operator was fined 100,000 kr (around \$12,250).

2. CONSEQUENCES OF RECENT MARPOL ANNEX VI REGULATIONS FOR SHIPOWNERS

Consequences for shipowners:

- rising cost of bunker fuel due to increased demand;
- rising cost of transportation;
- mechanical problems arising from fuel switching – the variation in sulphur content has a significant impact on the fuel properties. Unless systems are carefully maintained and prepared, significant issues may arise when using the same systems with the different fuels. Pump failure can occur from increased wear due to a lower hydrodynamic lubricating fuel oil cover exists, driven by the low viscosity. Switching and changing of the lubricant supply to the main engine at the same time is complex and can result in ship's loss of power and, in the worst case scenario, an engine room fire. There may be incidents because of such changes. There is also a possibility of efficiency loss;
- vessel adaptation cost.

3. CONSEQUENCES FOR PASSENGERS

- rising cost of ferry tickets due to increased BAF⁵;
- route closures – notably long distances;
- reduced frequency on marginal routes.

⁴ Modal shift bases on moving away from conventional, heavily polluting environment transport methods towards alternative, more environment friendly solutions. It means replacing already saturated means of transport with another, what contributes to development of less traditional ways of transporting goods and can also reduce time required for the transport.

⁵ Bunker Adjustment Factor – an additional surcharge to basic sea freight cost customers pay as a reflection of the increases in bunker fuel prices; for DFDS it is about €3 per lane meter (an area of deck two metres wide and one metre long), but it varies depending on route: Copenhagen–Oslo €4.25, Dover–Calais €1.25, Klaipeda–Kiel €5.25.



Fig. 2. Ferry ticket price and its components – before and after newest SECA regulations

4. POLISH SHIPYARDS TO BENEFIT

As a result of newest SECA limitations, renovation shipyards are to thrive on all required modernisations and installations. Polish shipyards are to earn almost €1BN for the newbuildings. Remontowa S.A. in Gdańsk and Nauta S.A. in Gdynia were ones of the first to be prepared to meet the shipowners' requirements in Europe. By the day of 15th September 2014, Remontowa S.A. had already mounted over 20 scrubbers on DFDS vessels. 30 similar operations were expected in 2015. Nauta S.A. would also fit scrubbers on 6 ro-ro vessels.

Currently, there are over 40 scrubber systems to choose from. Since getting the best system for each vessel is crucial, the shipyard help is irreplaceable. Remontowa S.A. is capable enough to help the shipowner choose the best system for their vessel, according to her type, size and exploitation mode. Thanks to the professionalism and experience, Poland gains new regular customers.

5. THE EFFECT ON ROAD TRANSPORT

A few factors stand against the common agreement that land transport would become relatively cheaper, comparing to ferries. The road distance may increase in order to reach the least expensive ferry crossing due to the changes in prices and sailing frequencies. Also highways and key roads are predicted to be overcrowded so the transportation time would extend. As the final consequence, diesel fuel cost is foreseen to increase due to lower refinery production.

6. AIDING OWNERS

In order to help owners with such unfortunate scenario, IMO, EU and other public institutions could try to credit as many conversions as possible. Any kind of financial assistance would be much appreciated. A global solution would be to find tools in order to enlarge freights, but on free market it seems to be difficult.

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ANALIZA WPŁYWU REGULACJI ANEKSU VI KONWENCJI MARPOL NA DZIAŁALNOŚĆ ARMATORÓW

Streszczenie

Artykuł skupia się na temacie regulacji Aneksu VI Konwencji MARPOL – w szczególności na SECA – oraz ich wpływie na europejskich armatorów. Problem ukazano z dwóch punktów widzenia – armatorów oraz przemysłu – w celu ukazania kompleksowego obrazu sytuacji oraz umożliwienia zainteresowanym wyciągnięcia własnych wniosków. Nowe limity emisji siarki będą miały wpływ nie tylko na transport morski, ale i na inne gałęzie przemysłu. Z pewnością dadzą się we znaki zarówno armatorom, jak i pasażerom promowym, stoczniom oraz w konsekwencji europejskiej i światowej gospodarce. Do czasu, gdy sektor promowy potwierdzi dostosowaną strukturę cen oraz możliwości sieci połączeń, armatorzy zmodernizują swoją flotę, a klienci zrozumieją, ile przyjdzie im zapłacić za przeprawę przez Morze Bałtyckie, można jedynie przypuszczać, do jakiego stopnia Europejczyków dotkną ustanowione limity. Jedno jest pewne – pytanie nie brzmi „czy” – tylko „kiedy” i „ile”.

Słowa kluczowe: SECA, MARPOL, Aneks VI, limity siarkowe.