

## SECA – Compliance and Control

A project created to illuminate the areas of uncertainty about the SECA requirement to reduce sulphur emissions.

Developed by a Nordic regional cooperation named NOVImaritim – a partnership between the Swedish Maritime Technology Forum, the maritime section of The Federation of Norwegian Industries (Maritim Bransjeforening) and Danish Maritime.



**NOVI**maritim

## Background

On 1 January 2015 the requirements applicable in Sulphur oxide (SOx) Emission Control Areas – in its abbreviated form SECAs – for low sulphur content are strengthened from a sulphur cap of 1% to one of 0.1%. The IMO<sup>1</sup> rules to prevent and control pollution caused by ships, including the SO<sub>x</sub> limit, allow either the use of scrubbers or of cleaner fuel to achieve this.

The areas affected include the Baltic Sea, The Skagerrak and the North Sea as well as the North American ECA.

The regulations carry extensive economic, technical and regulatory challenges.

This brochure aims to clarify the effects for authorities, shipowners and providers of technical solutions.

Compliance with the new regulations is a two-sided issue of how what the authorities can and will do to ensure that the new stricter rules are being enforced will influence the industry and how it may determine if it is possible to secure efficient enforcement of the new regulations.

## The Compliance Problem

Ship operators have a few different basic options to choose between, in order to comply with the new legislation.

### Use fuel with 0.1% sulphur content

- Marine gas oil
- LNG
- Alternative fuels
- Low sulphur heavy fuel oil

### Use abatement technology

- Scrubbers

These options are more costly than the present almost universal use of heavy fuel oil.

Those who have not installed scrubbers before 2015 will have to change fuels, which in most cases is not simply a question of changing the fuel itself. Often, the alternative fuel will require technical adaptation of the vessel, and so the choice is not one that is easily made or remade. Recent development in fuel prices has altered the basis for calculating the costs and advantages of each of these options.

For a ship operator, the method of compliance applicable for ships always operating within SECAs and those operating only partly within SECAs may differ significantly. A global operator who operates both inside and outside SECAs will only wish to incur the added cost when operating within the SECAs and must switch fuel or engage and disengage a scrubber on entering or leaving the SECA. Fuel switching is not without its complications.

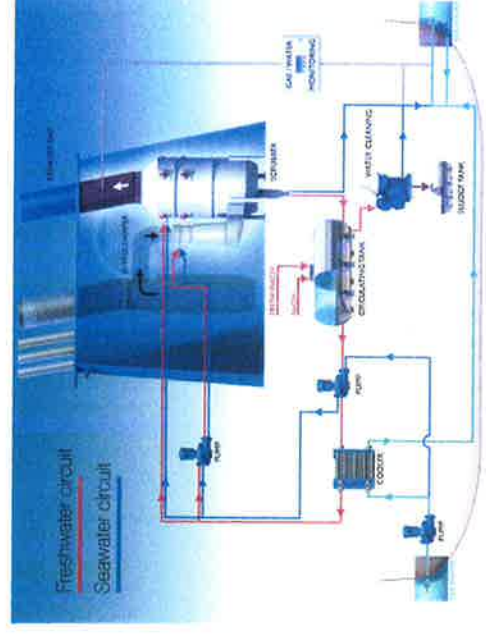
Using alternative fuels is also subject to availability. Low sulphur heavy fuel oil and LNG are not widely available and biofuels are at present mostly a promise. Methanol may be an alternative, but is not widely available.

Scrubbers require time and space to install.

For a shipowner it is important that non-compliance due to malfunction or error is not penalized in the same way as deliberate violations.



<sup>1</sup> IMO: International Maritime Organization



## The Control Problem

For port and coastal states the problem is that full compliance is expensive. The large potential benefits by not complying lead to a high risk of distortion of competition between those who do and those who do not comply. Non-compliance will also bring on a reduced environmental effect of the regulation.

Most of the countries affected along the Baltic Sea and the North Sea SECA are members of the EU, and therefore the sulphur directive (Directive 2012/33/EU) will allow the EU Commission to issues an implementing act on:

- Frequency of sampling
- Sampling methods
- Representative samples
- Reporting obligations

These issues are expected to be resolved and a regulation to be in place by 1 January 2015.

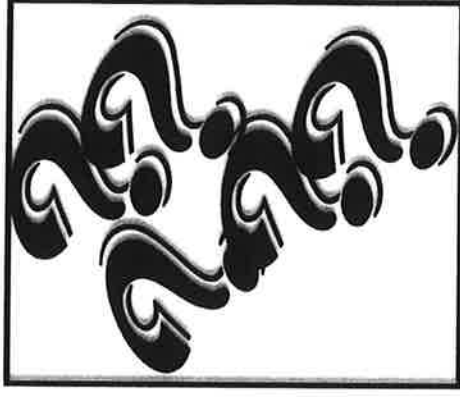
Governments seem to agree that there is a need for enhanced enforcement which will include elements such as:

- Increasing the number of fuel samples taken in ports
- Monitoring emissions from ships
- Sharing of information through the THEITS-S database system where all sulphur inspections will be registered
- Introducing sanctions

## The Communication Problem

Awareness is an important part of any compliance programme. It is necessary for everyone involved to be aware of the issues. Scrubbers are reportedly unfamiliar to some port state control officers.

The easiest task lies in informing the vessels that operate continuously in the SECA. The owners may be assumed to know about the requirements and the master can be reminded at every port of call, and the availability of high sulphur fuel will at least in theory be limited to vessels that have a scrubber installed.



The SECA limits are not fundamentally new. The limits in the SECA have existed since 2000 – originally at the 1.5% level, and until the end of 2014 reduced to 1%. However, the new reduction from 1% to 0.1% is a change in kind not just one in degree. In practice, it will in many cases mean that ships entering the SECAs will have to switch fuels, from heavy fuel oil to marine gas oil.

Under some circumstances switching from heavy fuel oil to marine gas oil can put equipment at risk. The difference in operating temperatures of the two fuels is one critical issue, and changing the temperature at an incor-

rect rate may cause fuel pump seizures or other malfunctions. The viscosities of the fuels are different and vary with temperature. Another challenge is finding the optimum time for the change-over process in order to ensure that it is completed before entry into the SECA area.

If the ships are equipped with a scrubber, the operation at the edge of the SECA is different and much easier, but the crew must still be aware that a border is being crossed.

Similarly, the entry into a SECA must be prepared well in advance so that the correct fuel and installations are available and operational.

While it is not likely that any shipowner is unaware of the requirement to limit SO<sub>x</sub> emissions in the SECAs by 1 January 2015, it is still worthwhile to ensure that the master of each vessel is presented with a reminder of the new regulations on his entry in to the protected area.

Getting the message to each ship and from there to the operator or owner is the first task. Presenting the case that non-compliance will result in costly delays in a manner that ensures swift compliance is possibly more challenging.

# The Regulatory Framework

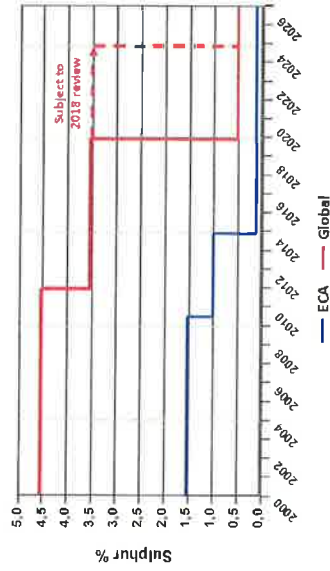
MARPOL Annex VI concerns air pollution and seeks to minimize airborne emissions from ships and their contribution to local and global air pollution and environmental problems. Annex VI entered into force on 19 May 2005 and a revised Annex VI with significantly tightened emissions limits was adopted in October 2008. The annex establishes limits on the sulphur content of any fuel oil used on board ships, limiting it originally to 4.5%. In the revision, this limit was lowered to 3.5% and from the year 2020 the sulphur content of any fuel oil used on board ships globally shall not exceed 0.5%.

At the time, it was assumed that the requirement would be fulfilled only by using low sulphur fuel. Since then, as concerns were raised that this fuel

might not be available, it was decided, that in 2018 a review would be performed possibly postponing the global 0.5% limit until 2025, if sufficient fuel would not be available in 2018.

MARPOL is the basis that establishes the so-called Emission Control Areas where member states experience the need for more stringent regulation for any of a number of pollutants. SECAs are defined internationally and adopted as amendments to MARPOL. This is what makes the more stringent requirements that apply in these areas legally binding on all ships.

There is no review provision attached to the SECA limits or to the limits in EU legislation, so no postponement is possible.



# The Future

The global limits applicable from 2020 will mean a greater change for most ships than the 2015 limits which apply only in SECAs. The difference in cost of operation will be reduced again so

that the added cost of shipping in the SECAs will be lower.

The problems of compliance should be easier to overcome with a global scheme.

# Impediments

Obstacles as they are perceived by operators and authorities.

Problem	Comment
Economic impact	The cost of transport may rise as the cost of fuel goes up, but the cost of fuel may change rapidly in either direction, and the changes may not influence all types of fuel equally. Fuel savings can further reduce the impact of the higher cost.
Economic advantage of non-compliance	The advantage to a ship operator of not complying with regulations is greater the higher the cost of compliance. This is a mathematical fact, but in many trades inside the SECAs the option of non-compliance will not be present. For a few ships, it will indeed be possible to enter the SECA without changing fuel, but detection is possible and there is the potential to develop controls and the intention to do so. If non-compliance becomes a problem, the sanctions applied will most probably be augmented until this becomes atypical.
Fuel Availability	The availability of low sulphur diesel fuel is not the only relevant factor, since there are alternative heavy fuel oils with low sulphur content, LNG, and of course scrubbers that allow continued use of HFO.
Scrubber reliability and performance	Any technology may be questioned, but marine scrubbers can perform within the required parameters. They are in some cases of a size that can be problematic, and naturally installing a scrubber that is too small will give performance problems.
Shift to road and rail transport.	The estimates made for the economic cost increase for shipping are based on models. If the worst case turns out to be correct, congestion on roads and capacity limitations on rail will lead to price increases and a new balance will be achieved. If this is environmentally unacceptable, policies will have to be found to redress the situation.



## About the NOVimaritim Workshop:

On Monday 17 November 2014, NOVimaritim co-hosted a workshop called 'Game-changer or business as usual?'

Presentations by national authorities, ship managers and suppliers of technical solutions given at the workshop are the basis of the information contained in this brochure. We would like to thank the Danish Society of Engineers and the Danish Society for Naval Architecture and Marine Engineers for their help in organizing the workshop.

