

# EMISSION COMPLIANCE

with Eminox exhaust aftertreatment systems

## WHAT IS IMO TIER III?

The latest IMO Tier III is an international set of standards designed to protect public health and improve air quality by controlling emissions from ships with a specific focus in reducing nitrogen oxide (NOx) emissions.

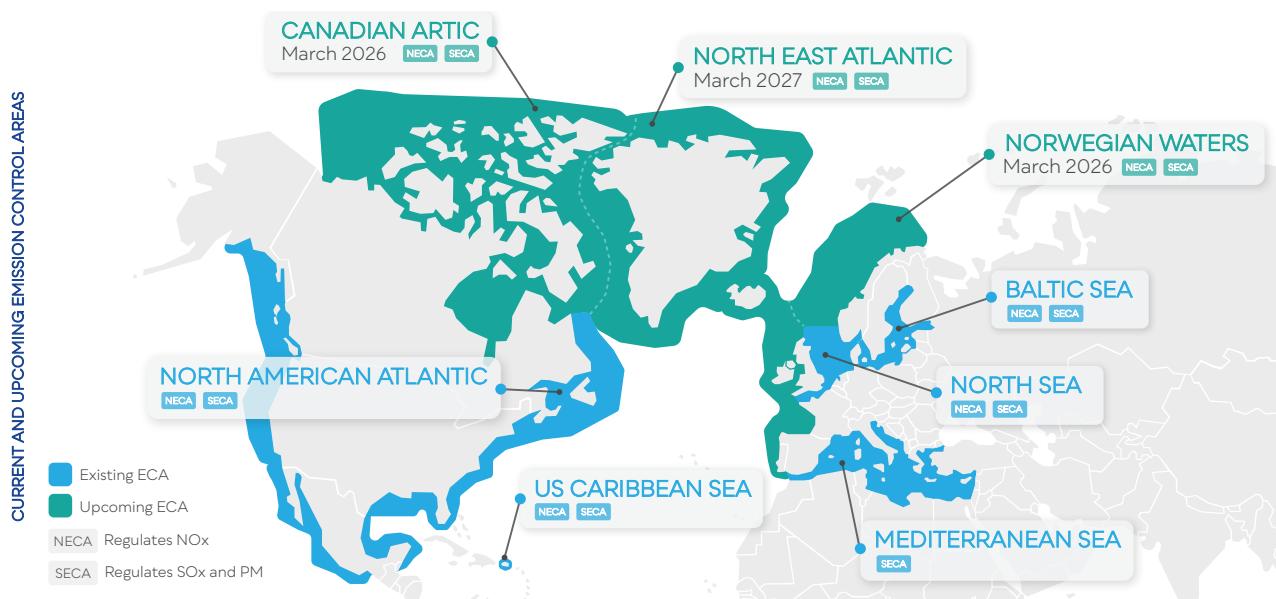
MARPOL ANNEX NO<sub>x</sub> EMISSIONS LIMIT

Tier	Date	NO <sub>x</sub> Limit, g/kWh		
		N<130	130 ≤ n < 2000	n ≥ 2000
Tier I	2000	17.0	45 n <sup>-0.2</sup>	9.8
Tier II	2011	14.4	44 n <sup>-0.23</sup>	7.7
Tier III	2016*	3.4	9 n <sup>-0.2</sup>	1.96

\* In NO<sub>x</sub> Emissions Control Areas (Tier II standards apply outside of ECAs).

## WHAT IS AN ECA?

ECAs (Emission Control Areas) are designated sea areas that have been identified by the International Maritime Organization (IMO) to minimise NO<sub>x</sub> (Nitrogen Oxides), SO<sub>x</sub> (Sulphur Oxides) and PM (Particulate Matter) emissions from marine vessels.



## EMINOX CASE STUDY FOR SCHEME B APPROVAL

### THE CHALLENGE

Upgrade an IMO Tier II engine to meet IMO Tier III emissions regulations

### THE PROJECT

The specified engines on a new vessel build only reached IMO Tier II emissions standards. This was not adequate for the emissions compliance area the vessel would be operating in. This also meant class approval could not be obtained, unless IMO Tier III compliance could be achieved.

### THE SOLUTION

Eminox's certified Selective Catalytic Reduction (SCR) technology was used to upgrade an IMO Tier II engine to achieve NO<sub>x</sub> reduction targets mandated in ECAs and ultra low emission zones.

### THE OUTCOME

The success of the project means that by implementing Scheme B on-vessel approval, it is possible to use an IMO Tier II engine and achieve IMO Tier III compliance.

### THE RESULTS

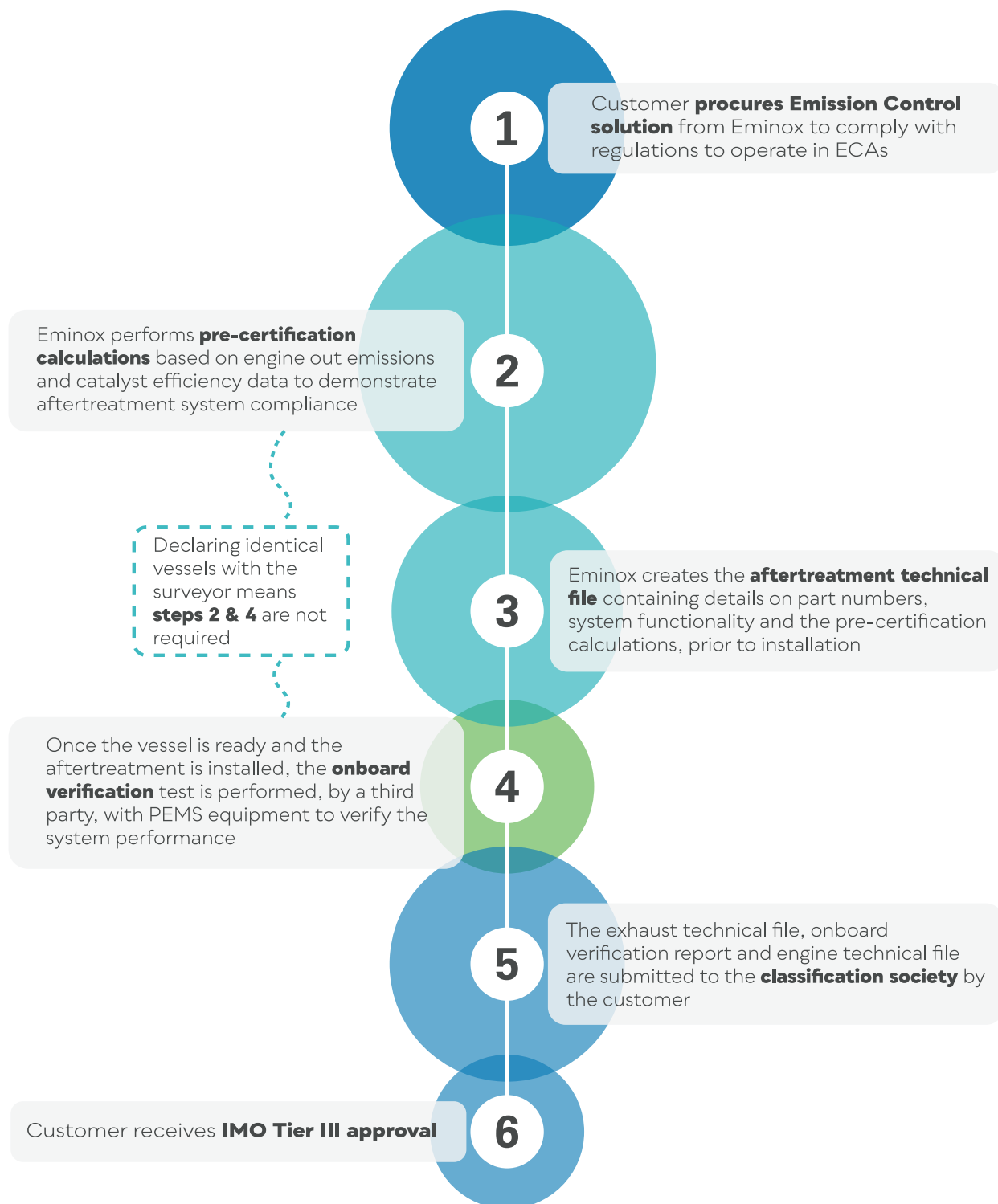
Under strict Portable Emissions Measurement System (PEMS) testing it was proven that the Eminox system reduced NO<sub>x</sub> emissions by 87.1% at 25% load, 80.6% at 50% load and 90.6% at 75% load, far exceeding the IMO Tier III requirements.

This resulted in achieving full on-vessel approval and receiving single vessel emissions approval on the first submission review from the class society.



# SCHEME B APPROVAL

for IMO Tier III Emissions Regulations



By working collaboratively with Eminox this process takes as little as 3-6 months



Declaring subsequent identical vessels will take significantly less time