

Compliance with IMO's Tier III NOx rules demands thorough planning



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Simon Hodgkinson, Global Head of Loss Prevention discusses planning as the key factor as the shipping industry rises to the challenges presented by new air pollution rules.

The impact of nitrous and sulphur oxides on the health of crews and coastal communities is becoming an ever-more prominent issue for regulators, and air pollution rules are becoming one of the fastest evolving areas in the maritime industry. This drive has been behind the creation of several landmark regulations in recent years, as well as the expansion of NOx Emissions Control Areas (ECAs).

ECAs were created by MARPOL Annex VI to govern emissions in specific high-impact areas, especially in coastal locations. These areas can cover SOx, NOx, and/or particulate matter, depending on the specific rules of the ECA.

The North American and Caribbean Sea NOx ECAs came into effect in 2016, creating a roadmap for many pollution minded policymakers. These regulations impose different and progressively more stringent emissions to power output standards of vessels based on when they were built, split into three Tiers; Tier I covering ships built after 1 January 2000, Tier II covering ships built after 1 January 2011, and Tier III covering ships built after 1 January 2016.

Since then, China has created two domestic ECAs, including one that regulates NOx emissions – covering the Pearl River Delta, the Yangtze River Delta and the Bohai-Rim Area including Beijing, Tianjin and Hebei. Two additional NOx ECAs came into effect on the 1st of January this year, covering the North Sea and the Baltic Sea and enforcing the Tier III standard against ships built after 1 January 2016. It is unlikely that these are the last that will be created. Shipowners must be aware of these new regional rules, and ensure that they are in full compliance.

Complying with Tier III regulations

Any qualifying vessel built after 2016 that passes through a NOx ECA requires an approved and working control systems such as a Selective Catalytic Reduction (SCR) to trade. These SCR systems reduce the NOx content in the exhaust gasses of a ship's engines by injecting a reducing agent into the exhaust system at a relatively low temperature. This injection causes a reaction between the NOx particles and the agent, creating harmless nitrogen and water.

This means that shipowners and crews need to stay up to date on the boundaries and classifications of ECAs, and that a vessel will need to turn on its SCR system when entering a restricted area.

Most SCRs use a solution of urea as the reducing agent, although it is possible to use the ammonia systems utilised by on-land systems utilised in many power generation operations. At the moment, urea has a distinct advantage, as it is more stable and can be stored in normal atmospheric tanks.

Any compliant SCR will have received approval from flag states and classification societies for the engine it is to be installed on to verify that it meets the regulatory pollution reduction standards for the ship engine in question. Provided that no critical or listed parts in either the SCR or the engine are then modified, it should be as simple as turning the system on at the right time.

The implications for shipowners

ECAs have persistently represented geographic peculiarities for shipowners, and this is especially true for NOx ECAs. Ensuring that vessels comply with applicable regulations always requires planning, especially when new machinery was required, and regional differences exist in the rules.

On 1 January 2021, the Baltic Sea and North Sea became NOx ECAs in Europe. For some shipowners, SCR systems and Tier III compliance is becoming a new point of negotiation when concluding shipbuilding contracts.

This has pushed some shipowners to assign older tonnage to these areas to comply with the regulations, without requiring additional investment. Others have been tasked with either fitting a compliant system or finding new routes or owners for ships currently plying trade in the area.

Non-compliance from an insurance perspective

The fundamentals of NOx emissions regulation are simple. If your vessel is Tier III, it either must use a compliant system or not enter an ECA. SCR systems are generally very reliable, and measuring compliance is relatively simple.

However, logistics represents a real challenge. The reducing agent used within the system must be externally supplied, and the global urea supply chain is not as stable or extensive as many shipowners would like. Indeed, it isn't regularly available in sufficient quantities in many global ports.

It can thus be difficult for shipowners and ship managers to ensure that urea tanks remain full, especially for ships operating tramp services on the spot market. Owners and managers must remain vigilant about regional or port-specific supply issues, and plan ahead to maintain a reliable supply.

Poor planning or mis-operation, however, are not exceptional circumstances, are not likely to be covered, and could lead, if not compliant, to the inability of a vessel to enter or trade in an ECA.

The emphasis on planning

Thorough planning is critical for so much in shipping. This is especially true for NOx emissions regulations. Shipowners must ensure that they have the right systems for the geographic areas of their vessels, in good time. They must also think strategically about where their vessels are deployed.

For the foreseeable future, this extends to supply chains. Confidently and reliably securing urea in the right quantities for vessels means understanding the ports that ships are sailing to, and the local market conditions. This is no easy task, especially if an owner has not yet built this administrative capacity.

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