

Understanding Resolution MEPC 227(64)

White paper

On 1 January 2016, Resolution MEPC 227(64), adopted by the Marine Environmental Protection Committee of the International Maritime Organisation in October 2012, will enter into force.

The revised guidelines on the implementation of effluent standards and performance tests for onboard sewage treatment could make existing treatment plants incompatible and non-compliant with the new rule, should they fail to pass new type approval processes.

At its 64th meeting, the MEPC adopted MEPC 227(64) which ostensibly changes the discharge requirements and test protocols adopted by Resolution MEPC 159(55), with the specific aim of reducing nitrogen and phosphorous from the treated water, preventing the acceleration of nitrification of the seas.

The revision prohibits black (sewage) water discharge into the Baltic Sea special area, with the exception of vessels equipped with a type-approved wastewater treatment system that meets effluent discharge requirements of less than 10mg/l of nitrogen and less than 1.0mg/l of phosphorous.

Special Area designation and clarification of "Passenger Vessel" definition are determined and detailed with the IMO MEPC 200(62) resolution. Currently the only IMO designated special area is the Baltic Sea, but more areas are in the process of applying for similar recognition.

But IMO MEPC 227(64) also applies to non-passenger vessels globally as this new resolution supersedes IMO MEPC 159(55) and currently there are only a limited number of ship wastewater treatment plant technologies on the market that meet the new requirements. This is largely due to the fact that systems that have hitherto relied on dilution as a part of the treatment process will have difficulty in meeting the effluent standards and test protocols of the revised Resolution.

What's more, according to a survey carried out in 2012, one IMO Member State found that a significant number of treatment systems did not meet the existing standards, due to improper use of detergent, a lack of maintenance or simply because operators failed to follow the plant manufacturer's operating instructions. The Member State furthered that few ships' wastewater treatment plant actually satisfied the less stringent demands of the rules adopted in MEPC 2 (1976), let alone those rubber stamped at MEPC 55 (2006) and MEPC 62 (2012).

MEPC 62 adopted resolution MEPC 200(62) amending MARPOL by designating the Baltic Sea as a special area under Annex IV and prohibiting the discharge of sewage effluent from passenger ships operating in special areas, unless a passenger ship has in operation an approved sewage treatment plant implementing effluent standards and performance tests defined in the 2012 Guideline.

The Guidelines amend the previously revised guidelines, adopted by resolution MEPC 159(55), by including the standards of section 4.2 that only apply to passenger ships which operate in MARPOL Annex IV special areas and which intend to discharge treated sewage effluent into the sea.

The requirements, with the exception of the requirements in section 4.2, will apply to sewage treatment plants installed on or after 1 January 2016 on: ships, other than passenger ships, in all areas; and passenger ships outside MARPOL Annex IV special areas. The requirements of these Guidelines, including those in section 4.2, will apply to sewage treatment plants installed on:

- New passenger ships when operating in a MARPOL Annex IV special area and intending to discharge treated sewage effluent into the sea on or after 1 January 2016; and
- Existing passenger ships when operating in a MARPOL Annex IV special area and intending to discharge treated sewage effluent into the sea on or after 1 January 2018.

The regulation states that "an approved sewage treatment plant has to meet the technical specifications in Section 4 and the test protocols set out in revised guidelines. However, section 4.2 on nitrogen and phosphorous removal applies to passenger ships operating within a special area intending to discharge treated sewage effluent into the sea. It should also be noted that, when ships are operating approved sewage treatment plants, MARPOL Annex IV also provides that the effluent shall not produce visible floating solids or cause discoloration of the surrounding water."

It also states that an approved sewage treatment plant should not rely solely on dilution of wastewater. And whilst amounts of dilution are deemed essential to a treatment process, effluent standards have to meet more stringent criteria.

Mark Beavis, Managing Director of wastewater treatment systems specialist ACO Marine, has a different view: "Lots of technologies use dilution, but dilution is not a solution to pollution; it is not treating it, it is reshaping it; we can treat it and remove the pollutants," he has said, referring to the development of the company's new patented "ACO Bio Sword" technology, which is at the heart of ACO Marine's next generation Clarimar MF and Maripur NF wastewater treatment units.

Both the ACO Marine Maripur NF and Clarimar MF treatment plants incorporate a unique patented ACO-MF filtration technology removing the requirement for settling and chlorination stages. Disinfection of the treated effluent is in-line ultra violet lamp and there is no requirement for chemicals in any part of the treatment process. Furthermore the units are completely unaffected by ship movement or vibration.

The unique properties of the ACO "Bio-sword" allow operation with bio-mass concentrations in the activation chamber up to four times higher than those of conventional settling type sewage treatment plants. By operating at much higher concentrations a greatly reduced volume of activation tank is achievable with an overall significant reduction in both the footprint and maintenance envelope requirement.

The new technology can reduce pollutants to well below the mandatory requirement.

And whilst the effluent values required to comply with MEPC 227(64) are the same as those mandated in the regulation's previous revision, ACO Marine units have been proven to reduce Coliform Bacteria, Total Suspended Solids (TSS), Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) to much lower than the regulatory standards.

This has been verified during MEPC 227(64) type-approval testing for both Clarimar MF and Maripur NF variants.

For instance, the requirements stipulate that the maximum allowable Coliform Bacteria discharge is 100/100ml, but tests have shown that the both the ACO Clarimar MF and ACO Maripur NF systems can reduce this to 25/100ml. TSS content in the effluent, mandated not to exceed 35mg/l, can be reduced to <14mg/l; BOD at 25mg/l can be treated to <3mg/l; and COD to <25mg/l, 100mg/l less than the mandatory requirement.

Acidity/alkalinity levels, not restricted in MEPC(2), are now mandated not to exceed 6-8.5pH. The ACO Marine plant has a pH value of 7.44. Chlorine is neither used nor produced.

Whilst the clear effluent is not potable, the treated water can be redirected for reuse as technical fresh water for toilet flushing, deck washing or laundry applications. Alternatively it can be discharged overboard without reproach by the authorities.

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