Emergency Equipment Brochure

Mitigate Risks with VPS Solutions

Unlock the full potential of your emergency equipment with our comprehensive guide on ensuring fuel reliability. Discover how VPS expertise ensures your emergency engines operate flawlessly when needed. Learn about crucial factors affecting fuel stability, potential hazards from microbial growth, and the impact of various parameters on emergency equipment operation.

Do not wait for an emergency – proactively test your fuels to prevent fatal failures. Read on to empower your vessel operations with fuel resilience.

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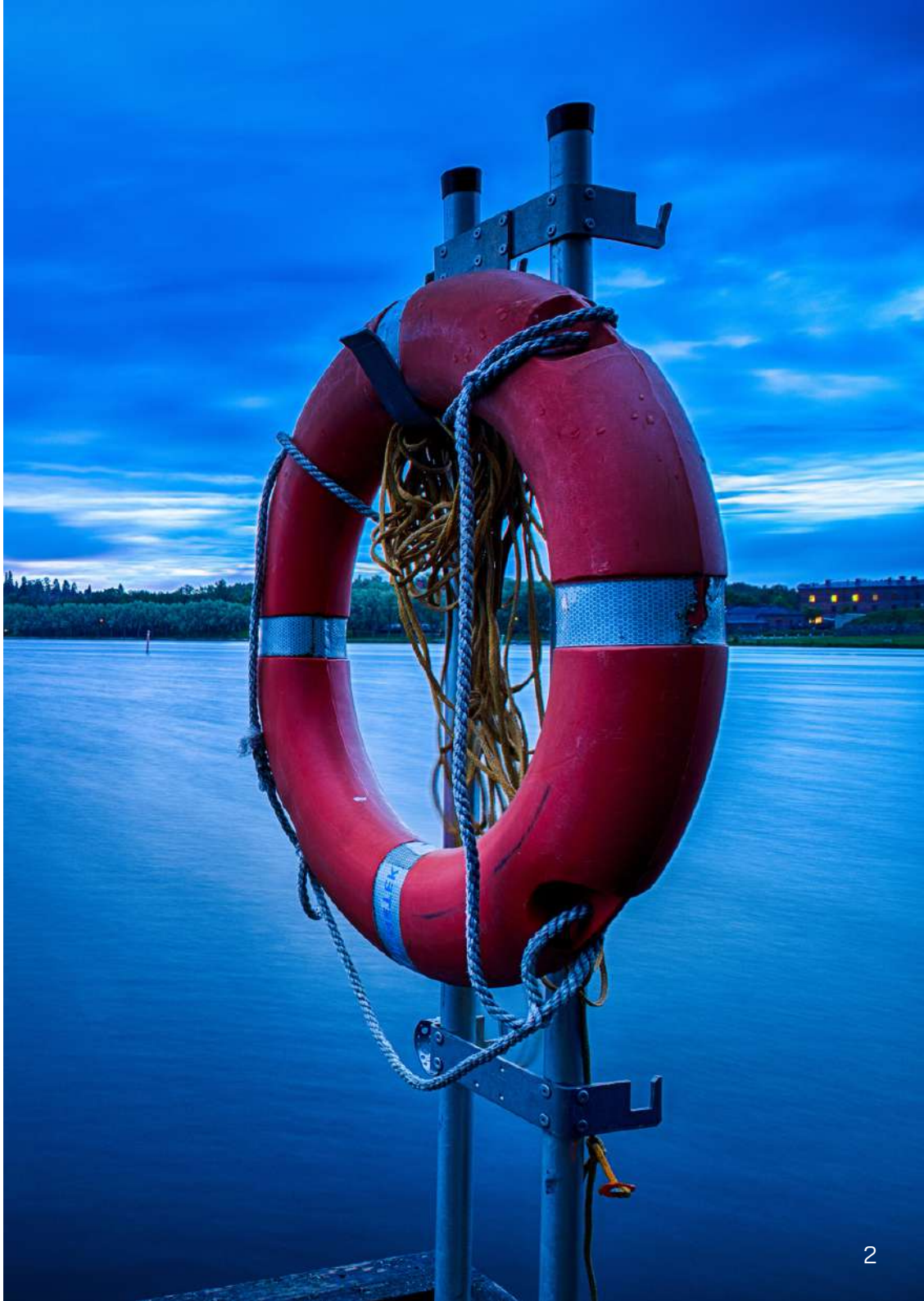
Prevent Emergency Equipment from Failing during an Emergency

Most companies and vessels have routines in place to regularly test and try out emergency equipment. However, not much attention is being paid to the quality of fuel being used within emergency equipment such as emergency generators, lifeboat engines and emergency fire pumps. Marine Fuel Grade DMX within ISO 8217 specifications is intended as the required fuel for emergency equipment.

However, since this is not a mandatory requirement, marine gas oil (MGO Grade DMA) used for other purposes onboard is often used to fill up the emergency equipment storage tanks. This can have dangerous consequences as the DMA grade fuels may not be “fit for purpose” in the first place. Furthermore, the quality of the fuel in the emergency equipment storage tanks may deteriorate during storage, especially when stored for extended time periods.

Therefore, it is essential to regularly test emergency equipment fuel samples to ensure that the fuel being taken into the tanks is fit for purpose and still of sufficient quality to be used when needed.



Impact of various parameters on the operation of emergency equipment

Cold Flow Properties | Cloud Point, Cold Filter Plugging Point and Pour Point

The Cloud Point (CP) of a distillate fuel is the temperature at which wax or other solid substances begins to separate from petroleum oil and form a cloudy appearance. Cold filter plugging point (CFPP) is the lowest temperature, expressed in degrees Celsius (°C), at which a given volume of diesel type of fuel still passes through a standardized filtration device in a specified time when cooled under certain conditions Pour Point is the lowest temperature at which the fuel will flow due to the amount of wax precipitation from the fuel.

Whereas additives could be used to lower the Pour Point, Cloud Point is unaffected by the use of additives. This means that even though a distillate has a very low Pour Point, the Cloud Point could be very much higher. When the fuel temperature drops to or below the Cloud Point, wax crystals start to form. These wax crystals may cause filter clogging to take place, potentially resulting in fuel starvation and engine stoppage. Satisfactory storage, transfer and filtration needs a fuel temperature about 3-5°C above the Cloud Point. The Cloud Point of fuels used for emergency equipment should be below the ambient temperatures the equipment is operating or likely to operate in.

In a recent case, fuel in a lifeboat engine storage tank had a Pour Point of -33ºC while the Cloud Point was +17ºC. This fuel can only be safely used at ambient temperatures above 20ºC.

Filter blockage due to high Cloud Point

The additives used to lower a fuel's Pour Point can also cause operational problems as some of these chemicals can potentially get absorbed by filter materials, causing them to appear blocked. This problem is exacerbated for emergency equipment which are typically fitted with very fine filters.

Fatty Acid Methyl Esters | FAME

Due to the practice of blending FAME into automotive diesel, heating oil and now some marine fuels, it is almost inevitable that some distillates supplied in the marine market contain FAME. FAME can lead to complications with respect to storage and handling in a marine environment due to its following properties:

- oxidation tendency
- long-term storage issues
- affinity to water
- risk of microbial growth,
- degraded low-temperature flow properties
- FAME material deposition on exposed surfaces, including filter elements.

Visual Appearance

Fuels grades DMA/DMZ/DMX/DFA should be bright and clear. If the fuel is hazy, it could indicate the presence of water or a high Cloud Point. Haziness could also indicate poor oxidation stability.

Cetane Index

A low Cetane Index may lead to starting difficulties at low ambient temperatures.

Sulphur Content

Vessels (including emergency equipment) required for securing the safety of a ship or saving life at sea are exempt from the Marpol Annex VI Regulation 3.1.1 Sulphur requirement. However, for the testing of other emergency equipment in an Emissions Control Area (ECA), compliant fuel with sulphur content less than 0.1 % m/m should be used.

Fuel contamination | A potential hazard

Since fuels in the emergency equipment storage tanks remain unused for long periods of time, the quality of such fuels may deteriorate due to the following:

Water can originate from contaminated fuel or condensation, and engines may not run because of water in the fuel lines. The presence of water can promote growth of micro-organisms such as bacteria, yeast and fungi, and can also lead to blockage of fuel lines and filters due to icing when ambient temperature drops below 0ºC.

Micro-organisms (bacteria, yeast, fungi & mould)

Bacteria, fungi,yeast and mould are living organisms which may be present in fuel storage tanks. These micro-organisms can grow and multiply, especially if water is allowed to build up. Distillate fuels and bio-blends are particularly prone to bacterial infection. Microbial growth can lead to slimy deposits in tank bottoms, plugging of filters, pitting corrosion on fuel tank bottoms or at oil water interface and injector fouling.

Distillate Fuel Stability

Many different chemical reactions can cause a distillate fuel to become unstable. Instability can lead to sedimentation and eventually to the formation of gums. Instability is usually indicated by a colour change over a period of time.

Mitigate your emergency equipment risks

Due to the various factors mentioned above, emergency engines may fail to operate when they are most needed. This is a critical factor to consider for vessel operators given the high importance of these emergency engines. Knowledge of fuel quality and management that goes beyond adherence to imperfect specifications is necessary to help vessel operators deal with fuels that may meet the specification numbers but give serious operational problems.

Do not wait for an emergency to happen, but test emergency equipment fuels regularly in order to prevent any fatal failures due to unfit fuels.

Join us on this journey

Join us in the journey towards a greener, more sustainable maritime industry. At VPS, we are committed to accelerating the shift towards a low-carbon future, and we invite you to be part of this transformative change.

Are you a vessel owner or a stakeholder in the maritime industry? Let's collaborate to reduce your carbon footprint and make your operations more eco-friendly. With VPS, you will gain access to data-driven solutions, expert advice, and digital tools that guide you along the path to sustainability. Together, we can create a more environmentally responsible and economically efficient maritime sector.

Contact us today and let's pave the way to a cleaner, greener future for the maritime industry.

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