

Distillates under scrutiny

Increased use of marine distillates due to environmental legislation will not eradicate marine fuel quality concerns, nor guarantee that regulatory sulphur limits are always met.

Global and regional regulations calling for progressively lower sulphur limits in marine fuels are expected, long term, to cause a decline in residual fuel oil use and a shift to distillates for marine propulsion.

One of the advantages mooted by supporters of a future move to distillates is that these cleaner fuels are easier to handle and have fewer quality problems than fuel oil. At present, several testing agencies have noted worrying quality trends for low sulphur fuel oil (LSFO) sold to ships to meet the current 1.50% sulphur limit in existing European sulphur emission control areas (SECAs).

perspective, Jones told Bunkerworld that "not many" of the 10% off-spec distillates failed on sulphur or flash point limits.

But he said excess water was more common, which is a concern from a commercial perspective given the high price of distillates, and also a potential operational problem.

MGO sulphur limits

Several marine distillates samples have also failed to meet stricter regulatory sulphur limits in Europe. The sulphur limit for marine gas oil (MGO) delivered to ship in the European Union dropped from 0.2% to 0.1% at the beginning of the

low viscosity fuels," it explained.

It said major engine makers in their manuals require a minimum injection viscosity of about or slightly above 2 centistoke (cst).

"A study made by DNVPS indicates that as much as 70% of MGOs with sulphur below 0.05% come with viscosity below 3.0 cst at 40°C, while nearly 30% have viscosity in the range of 2.5 to 3.0 cst at 40°C.

"Since the temperatures at the fuel pumps may be well above 40°C, this implies many MGOs may be below 2 cst injection viscosity, which in the worst cases may render the fuel pumps inopera-

way into these products."

Refineries may have to resort to new production techniques or more intensive production based on current techniques to meet increased global demand for distillates, which perhaps requires a period of adjustment for 'getting it right', a spokesman suggested.

Lintec general manager Geoff Jones expressed similar views, and said he still held doubts - from a refinery perspective - whether sufficient low-sulphur fuels would be available in time.

DNVPS told Bunkerworld it is now "taking on a more thorough study of today's heavy distillates in order to predict better what may be expected in the coming years".

"ISO and CIMAC during their ongoing revision of marine fuel standards and recommendations are also likely to consider more thorough distillate fuel requirements," it said. "Finally, the supply chain will always be a potential source of contamination, either deliberately or by accident."

A trend for deteriorating LSFO fuel quality in some areas could be indication of what may be expected in the future supply chain, it suggested.

"With the increasing demand and possibly supply shortage, other by-products may also find their way into marine distillate fuels. The high fuel prices for distillates may also tempt some fuel buyers to accept lower quality products in order to stretch their dollars," DNVPS said.

Given that distillates are so much more expensive than residual fuels, DNVPS thinks fuel buyers would have an even stronger reason to determine the quality received. It also argued that the higher price of distillates means the relative cost of fuel testing will be lower, which could also be an incentive for fuel buyers to use fuel testing services.

The Marine Environment Protection Committee (MEPC) of the International Maritime Organization (IMO) is due to formally adopt new MARPOL Annex VI sulphur limits in October 2008. Only distillate fuels will be able to meet the proposed 0.10% sulphur limit in IMO-designated emission control areas (ECAs) from 2015.

A global 0.50% sulphur limit in marine fuels from 2020 or 2025, depending on the outcome of a 2018 review, will see marine distillate demand soar. Continued operation on HFO would be allowed for vessels using abatement technology solutions proven to give comparable sulphur emission reductions as the low-sulphur fuels. ■

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- DNVPS

LSFOs have displayed a trend toward increased aluminium and silicon (Al+Si), or cat fines, as well as poor ignition and combustion properties and poor fuel stability. Although the failure rate is not as high as with intermediate fuel oils (IFOs), some marine distillate samples are failing to meet the quality parameters of ISO 8217:2005 and regulatory sulphur limits in Europe.

10% 'off-specs'

According to Lintec general manager Geoff Jones, around 20% of IFO samples it tested in the second quarter of 2008 were 'off-spec' under ISO 8217, while 10% of distillates failed the standard. The 10% off-specs were caused by the distillate samples not meeting the relevant limits for viscosity, water, carbon residues, sulphur and flash point.

Perhaps most surprisingly, some MDO samples tested above 1.50% sulphur, with the maximum seen at 1.72% sulphur, Jones told Bunkerworld. This put some MDOs above the limits prescribed both by the EU and the International Maritime Organization (IMO) for ships sailing in European SECAs. They would still meet ISO 8217 sulphur limits and could be used outside SECAs.

Jones said the average sulphur content in marine distillates tested by Lintec - mostly MDO samples but also some MGO samples - was much lower at 0.32%. Singling out some of the most critical parameters from a regulatory or safety

year, under the EU 'sulphur in fuels' directive. The sulphur limit for marine diesel oil (MDO) remained at 1.5% in line with EU Directive 2005/33, which brought back a higher sulphur limit to allow ships to use MDO as an alternative to LSFO in European SECAs, or ECAs (emission control areas).

With regards MGO's meeting the EU 0.1% regulatory limit, DNV Petroleum Services (DNVPS) told Bunkerworld it "has not seen any real change in the failure" since the EU legislation came into force on January 1, 2008.

"This is true in relation to those samples with a tested value of > 0.10% m/m for the last year (1st July 2007 to 31st July 2008) or since the EU legislation came into force on 1st January 2008," DNVPS explained.

"The North Sea ECA and the Biscay area have the lowest failure levels -- around 5% -- while the Baltic ECA area has the highest failure rate, at approximately 20%. It should be noted however that not all of the Baltic is a part of the EU, hence this may account for the higher failure rate," it said.

Operational issues

DNVPS also highlighted operational issues noted in connection with very low sulphur distillates.

"Low sulphur MGOs (max 0.10% S) often comes with a very low viscosity, which may contribute to high-pressure fuel pump problems because such pumps are not necessarily designed to operate on

ble. If such fuels are to be used in today's large bore marine engines either the fuel pumps may have to be redesigned, or the MGOs will have to be cooled."

DNVPS has also noted that besides the low viscosity in some of the MGOs, those supplied out of certain ports may have low flash point, i.e. below the minimum required 60° Celsius for use on board ships.

"To some extent, this may be due to such fuels being supplied from the inland market, where lower flash point is allowed," DNVPS suggested.

Future distillate issues

Neither of the fuel testing agencies believe that increased use of marine distillates is likely eliminate fuel quality issues.

"Fuel testing will still be relevant in the future. Although distillates are of higher quality than the heavies, it doesn't mean they are always problem-free," a spokesman for DNVPS told Bunkerworld.

DNVPS said increasing demand for marine distillates, and particularly the MDOs of the future, may see refineries converting more of such fuels from crude oil.

"This is expected to have some negative impact on the ignition and combustion quality simply because the MDOs will probably be higher in density and aromaticity," DNVPS told Bunkerworld. "The heaviest diesel fuels, depending on the pre-treatment at the refineries, may also contain elevated levels of cat fines because some of the heavy cycle oils may find their