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TECHNICAL UPDATE: 2011/12/17

BUNKER FUEL SULFUR LIMIT OF 3.50% - FREQUENTLY ASKED QUESTIONS

1. What is the enforcement date for this regulation?

A. From 1 January 2012, the MARPOL Annex VI global fuel sulfur limit for fuel oil will be reduced from 4.50% to 3.50%.

2. Who is responsible for the 3.50% limit? Is the onus on the supplier or the fuel user?

A. All bunker suppliers inclusive of those supplying fuel oils outside of ECAs will have to comply with the new limit. This is in line with Regulation 14.1 of the Revised MARPOL Annex VI.

It is important for ship-owners and operators to ensure that any fuel oil on board their vessels with sulfur content exceeding 3.50% be fully consumed before 1 January 2012 and any future deliveries comply to the 3.50% limit.

3. If a ship is carrying fuel with sulfur greater than 3.50% on Jan 1 2012, will it be allowed to use up this fuel?

A. There is no provision for a period of grace as to the implementation of the 3.50 % limit. Furthermore there is no policy or period of grace as to vessels using up their stocks of fuel greater than 3.50 % beyond this date. From the point of view of supply - clearly if fuel is found to have been supplied above 3.50 % after 1st January 2012, it would be non compliant.

4. Will the authorities be tolerant of breaches of the limit?

A. No, we are told there is no grace period for the implementation since there has been a long notice period for the changeover. However a specific state port may use its discretion but, to be on the safe side, it is better to assume that there will be no grace period.

5. Is the limit exactly 3.50% and is the ISO 4259 be allowed on it?

A. Applying the principles defined in ISO 4259 when testing a fuel using test method ISO 8754:2003, a fuel can be said to meet a 3.50% sulfur limit with '95% confidence' if a single test result falls within the ranges of 3.32% sulfur to 3.68% sulfur.

However, the Marine Environmental Protection Committee (MEPC) of IMO, approved, on April 4, 2008, Unified Interpretations with regards to 'Sulfur Limits in Fuel and Fuel Oil Verification Procedure for MARPOL Annex VI', which the IMO says "should be applied from the date of approval and until the 2008 amendments to MARPOL Annex VI enter into force." The Unified Interpretations represent a tightening of the sulfur limit interpretation.

Firstly, sulfur limits previously stated as 4.5% globally and 1.0% in a sulfur emission control area under regulation 14 of MARPOL Annex VI are to be interpreted with two decimal digits, 4.50% and 1.00% respectively. Secondly, a verification procedure has been agreed for those cases when a port state control officer (PSCO) decides to check a ship's MARPOL bunker sample to determine whether the fuel oil delivered to the ship is compliant with the standards required under MARPOL Annex VI.

Since the 4.50% limit is coming down to 3.50%, the Unified Interpretations means that ultimately, a final test result in accordance with the verification protocol of 3.51% sulfur would be considered as failing the 3.50% sulfur standard.

Traditionally, when it came to disputes about sulfur test results, the prevailing argument was to apply the repeatability (r) and Reproducibility (R) principles found in ISO standard 4259 when testing a fuel using test method ISO 8754:2003. The reproducibility (R) for sulfur of 3.50% comes to 0.296%. 95% confidence value comes to $0.59 \times R$ or 0.59×0.296 which comes to 0.18%. According to those principles, a fuel can be said to meet a 3.50% sulfur limit with '95% confidence' if a single test result falls within the ranges of 3.32% sulfur to 3.68% sulfur.

The new two-digit interpretation combined with the strict sulfur verification protocol will require suppliers to provide fuels with 3.32% sulfur to ensure they do not exceed the 3.50% sulfur limit with 95% confidence.

6. How to ensure that the fuel bunkered will never cross 3.50% no matter where it is tested?

A. We would actually suggest purchasing fuel with sulfur of 3.50% - (R) where R is the reproducibility. This would mean to less than 3.20%. This way it is ensured that if the supplier tests the sample as 3.20% even if the state port draws a sample from the tank and gives it to a lab of its choice to test the sulfur, the sulfur will be found to be less than 3.50%. It is possible that the supplier may ask for a higher price for lower sulfur content.

7. If not allowed to use up this fuel, how to deal it?

A. Fuel with sulfur greater than 3.50% can be blended with a heavy fuel or MDO to reduce the sulfur content. Detailed records of the blending (including BDN's of the two fuels being blended) must be kept. A sample of the blended fuel should be sent to the lab for confirmation that the blend has sulfur less than 3.50%. This lab report can also be shown to the surveyor. To be safe, the sampling can be carried out by a 3rd party survey firm.

8. What is the best way to blend to bring down sulfur content? Another HFO or MDO?

A. Blending high sulfur HFO to low sulfur HFO is preferable to blending with MDO/MGO to bring down sulfur. Compatibility of the fuels must be checked before any blending is carried out. Viscosity will be seriously affected when HFO is blended with MDO/MGO. For example if 10% MDO is added to a 380 cSt HFO, the viscosity will drop from 380 cSt to 180 cSt. Please keep this factor in mind.

9. Is onboard blending allowed? Any points to note while blending

A. Blending onboard is not advisable. If it is unavoidable, first check for compatibility. The compatibility can be checked onboard using the attached procedure (Annex 1). The compatibility can also be checked in the fuel testing lab. Secondly, the blending has to be carried out in a certain order. A lower density fuel should be pumped on top of a higher density fuel, circulate the fuel as much as possible, heat the fuel to achieve mingling through thermal convection currents.

10. How is the sulfur limit enforced?

A. The standard procedure is for the port state surveyor to ask for the BDN. It is possible that he can ask for a lab certificate for the sulfur content. The third possible scenario is that the port state surveyor may draw a sample from the service tank and give it to a lab ashore for checking on the sulfur content.

11. Will Port State Surveyor take the Marpol sample supplied by the supplier or will he draw sample from service tank?

A. The port state surveyor has the option of choosing the Marpol sample for testing or drawing a sample from the service tank.

12. What are the penalties if the vessel is using fuel that has more than 3.50% after Jan 1, 2010?

A. Detention of the ship is one. Stiff fines may also be levied.

13. Under what conditions will greater than 3.50% be accepted.

A. If abatement equipment (such as scrubbers) is fitted onboard, fuel with sulfur more than 3.50% can be used.

14. Are there several areas in the world where sulfur at greater than 3.50% is supplied?

A. The global sulfur value for heavy fuels of all grades is 2.35% for the year 2011. 7.3% of the deliveries were higher than 3.50%. There are some countries which have average sulfur close to or over 3.50% with a significant number of deliveries over 3.50%. These were:

COUNTRY	AVERAGE SULFUR	% OF DELIVERIES OVER 3.50%
ITALY	3.05	24.6
KOREA	3.16	13.7
KUWAIT	3.63	81.6
OMAN	3.71	94.2
SAUDI ARABIA	3.32	15.3
SRI LANKA	3.02	13.2
UNITED ARAB EMIRATES	3.37	42.5

16. What is your advice?

A. Bunker fuel purchase agreements and charter party agreements have to be suitably amended to reflect the 3.50% sulfur limit.

Please do not hesitate to contact us with any questions.

Best regards,
Dr.Vis

ANNEX 1

Stability/Compatibility test procedure

A brief procedure to do compatibility test is given below:

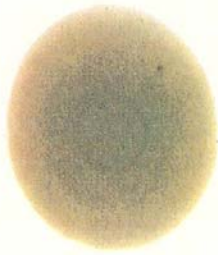
1. Mix the two samples in the ratio 1:1.
2. Heat it to 90°C to 95°C and keep at the same temperature for 20 minutes. The sample has to be stirred frequently to ensure that the sample is homogeneously heated and well mixed.
3. After 20 minutes, take a glass rod, dip the rod into the hot sample, lift it and discard the very first drop. Put the second drop on a dry filter paper and dry it at 100°C in an oven for an hour. Test paper should be kept level and the portion with the spot should not be in contact with any surface.
4. If the samples are compatible, you can see a homogeneous spot with no inner ring. If they are incompatible, you can see well defined inner ring or in worst case, even a very dark solid area in the center. Central area will be much darker than the background.

Test Method for
**COMPATIBILITY OF FUEL OIL BLENDS
BY SPOT TESTS**

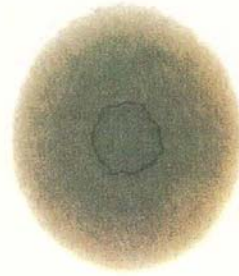
REFERENCE SPOT



No. 1



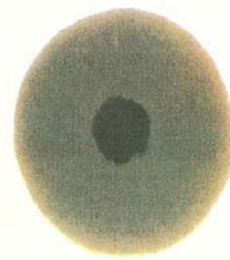
No. 2



No. 3



No. 4



No. 5



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