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**FOBAS Bulletin:** Important notice on cold flow properties of distillate fuels**Applicability:** All ship owners and operators

United Kingdom's Marine Accident Investigation Branch (MAIB) recently issued a safety bulletin (SB1/2017) reporting an accident on-board a ship which resulted in one fatality and severe injuries to another member of the engine room staff. MAIB report is available via the following link;

<https://assets.publishing.service.gov.uk/media/5953cb3a40f0b60a40000072/MAIBSafetyBulletinSB1-2017.pdf>

The incident relates to an auxiliary boiler explosion which occurred when engine room staff were repeatedly trying to fire-up the boiler after several flame and ignition failures. The exact cause and operational sequences leading up to the incident is still to be confirmed in a final report. However the MAIB highlighted the quality of fuel as an important factor. At the time of the accident, fuel in use was MGO (Marine Gas Oil) and subsequent investigation of the fuel system found waxy deposits in the fuel line filter restricting the fuel flow to the boiler burner.

MGO analysis performed on a manifold drip sample in accordance with ISO 8217:2005 (Table 1) test parameters gave satisfactory results. However, after the incident, a system sample was drawn which was subjected to pour point (PPt) and additional Cold Filter Plugging Point (CFPP) analysis (noting CFPP is not included in the ISO 8217:2005 edition) to determine the probable cause of wax formation at filter with the following results;

PPt	-9°C
CFPP	+14°C

These results were considered significant to the investigation because at the time of incident the ambient temperature was only 4oC, although no fuel temperature was given in the report, this would very likely account for the wax formation found at the fuel filters being due to the high CFPP despite low pour point of the fuel in use.

These results indicate the importance of understanding the cold flow property tests of PPt, CFPP, and CP (Cloud Point) of a distillate fuel oil. The latest ISO 8217:2017 edition has included additional requirements for CFPP and CP test parameters in the table 1 of ISO 8217. Please note that FOBAS

clients have been receiving fuel analysis reports with these additional CFPP and/or CP test results on distillate samples for over 20 years, providing this additional guidance for more effective on-board fuel management.

Upcoming 2020 regulation for 0.5% m/m fuels will bring a wider range of fuel blends to the market to meet the global demand and there is much discussion about how the nature of these new blends are likely to be much more paraffinic which includes the distillate fuel oil grades. We can therefore expect higher PPT on residual marine blends and higher CP and CFPP for distillate fuel oils.

This case highlights the criticality of fuel quality assessment to manage the various fuel blends on-board. We recommend that all ship's crew are reminded of the importance of understanding the significance of the cold flow properties in the management of fuel oil and the measures needed to be taken to manage this important characteristic. Moreover, correct procedure needs to be followed for drawing the manifold drip samples during the bunkering operation for analysis to obtain representative samples and ensuring that any high PPT, CFPP, and CP fuels are stored and handled at temperatures above their reported figures for trouble free operation.

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