Marine Specialties

Technical Bulletin

Customer Technical Service

VLSFO Field Issues

Introduction

Since mid-November there has been more and more vessels loading IMO 2020 compliant VLSFO, and particularly in December vessels have been starting to consume this fuel as their ROB of HSHFO is depleted. There have been numerous reports of issues encountered during changeover as the crews onboard learn to deal with these new fuels, however not all issues are related to fuel handing onboard and are due to the chemical nature of the fuel. This document will describe some of the potential reasons for the issues and how to mitigate the risk of them happening with the use of additives.

Issues

Many if not all of these fuel related problems will manifest themselves in a very similar way, blocked fuel filters and purifier bowls filled with some form of sludge. However there are several reasons why this may happen.

- If storage tanks have not been cleaned out, there will be remaining sludge from previous HFO bunkers remaining in the tank. As most if not all of the VLSFOs have a higher distillate percentage in than previous fuels they will act as a solvent, dislodging all of the HFO sludge and depositing it squarely in the fuel handing system. It is also important to remember that this residual sludge may render the current bunkers off spec for sulphur content
- VLSFO has come into contact with HSHFO, as these two fuels are very different this can cause incompatibility. Causing asphaltenes within in the fuel to precipitate out of suspension and form sludge, this can happen in a number of places onboard
    - Heel of HSHFO Tank before VLSFO is loaded
    - In the fuel transfer system
    - In the settling tank if not fully drained down
    - In the service tank
    - In the fuel supply system
- Distillate type material within the fuel has aged, either due to oxidation or thermal aging. This oxidised material can cause chain reactions within the fuel, leading to larger material which can block filters and purifiers, much like asphaltenes
- High molecular weight waxes can come out of suspension at purification temperatures, again this can block filters and purifiers.

General Precautions

- Mixing HSHFO and VLSFO should be avoided as much as possible
    - Bunker tanks should be stripped and ideally cleaned before loading VLSFO
    - Settling tanks should be fully drained before changeover
    - Service tanks should be lowered as much as is safe to do so before starting purification of VLSFO
- Ensure storage, purification and injection temperatures are in line with the recommendations given by OEMs and following guidance from your fuel testing lab
- Where possible, avoid comingling of different stems of VLSFO as this will increase the risk of incompatibility.

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Additive Solutions

Given the increased percentage of distillate components within VLSFO, and the high temperatures required within the fuel handling and supply systems, there is an increased risk of distillate aging of the fuel. Unlike asphaltene precipitation, distillate aging cannot be reversed, meaning it is not possible to use the fuel without issue once the aging has occurred. Therefore, it is important to additise the fuel at time of loading.

Innospec has created a new additive specifically designed to meet the challenges of VLSFO given that it may contain residual and distillate components, called Octamar ™ HF 10 Plus. HF 10 Plus should be dosed into the storage tank immediately before bunkering at a dosage of 1:10,000. This will provide protection against asphaltene precipitation and distillate aging.

As Octamar™ HF 10 Plus is a relatively new product, all vessel may not have it onboard as of yet. In order to provide increased protection against Asphaltene flocculation and will prevent further distillate aging (not oxidation if already occurred), it is possible to use a combination of Octamar™ BT-25 and Octamar™ LI 5 Plus at a ratio of 1:10,000 for both products.

For further information, please contact your local Innospec Representative.