



THE REPUBLIC OF LIBERIA
LIBERIA MARITIME AUTHORITY

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MARINE OPERATIONS NOTE 05/2015

(This Marine Operations Note supersedes Marine Operations Note 06/2009)

Subject: Avoiding Propulsion Loss from Fuel Switching

Ref: (a): MARPOL Annex VI, Regulations 3, 5 and 14
(b): Marine Notice POL-009
(c): API Technical Issues Workgroups “Technical Considerations of Fuel Switching Practices”

Dear Shipowners/Operators and Masters,

Purpose

This Note provides information and guidance to shipowners, operators and masters about the importance of establishing effective fuel oil changeover procedures to comply with MARPOL Annex VI emission regulations, in order to avoid machinery space fuel leakages and loss of propulsion when switching fuel to ensure compliance.

Background

On January 1, 2015, the new fuel oil sulphur limit required by MARPOL Annex VI, Regulation 14.4.3 came into effect, lowering fuel sulphur content from 1.0% to 0.10%. The ultra low sulphur (ULS) 0.10% fuel must be used the entire time the vessel is operating in an Emission Control Area (ECA).

Operational Requirements

Each vessel which uses separate fuel oils when operating in an ECA is required to develop and implement changeover procedures for switching between residual and distillate fuels in accordance with MARPOL Annex VI, regulation 14.6. The management and oversight of any changeover process including, proper control and reduction of the operating temperature of fuel supplied, varying ratios of the mixed fuels and control of mixed fuel viscosity to the engines must take place before the vessel enters the ECA or after the vessel leaves the ECA. Some of the important issues to be taken into consideration when changing over are contained in the United States Coast Guard Safety Alert 2-15, which is appended to this Marine Operations Note and may also be accessed under Safety Alert/Most Current on the link: <http://marineinvestigations.us/>

The American Petroleum Institute (API) has also developed information and guidance intended for the use of shipowners with vessels that normally run on residual fuel oil that need to change over to ULS fuel oils when entering regulated areas. The API Technical Issues Workgroup has studied this problem and produced a paper titled “Technical Considerations of Fuel Switching Practices”, reference (c) above, which may be accessed under Safety Reports on the link: <http://marineinvestigations.us/>

This document may be helpful to vessel operators and engineers to prevent loss of propulsion when switching fuel.

Operational Guidance

MARPOL Annex VI, Regulation 3.1.1 provides exception from the emission standards for any emission necessary for securing the safety of the ship or saving life at sea. Regulation 3.1.2 provides exception for emissions resulting from damage to a ship or its equipment under certain conditions. In such cases the master or owner of the ship shall report this at the earliest opportunity to the Administration and the Recognized Organization in accordance with regulation 5.5.

For Liberian Flagged vessels visiting the United States, the Coast Guard has stated they will take into consideration a vessel which has reported an accident or a defect in accordance with Annex VI, regulation 5.5 and where the Administration or Recognized Organization has issued an interim compliance scheme and an outstanding condition due to equipment casualty or failure.

If you have any questions please contact Technical Department at Technical@liscr.com or telephone +1 703 790 3434.

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MARINE SAFETY ALERT

Inspections and Compliance Directorate

March 3, 2015
Washington, DC

Safety Alert 2-15

Ultra Low Sulfur Fuel Oil & Compliance with MARPOL Requirements Before entering and while operating within Emission Control Areas

This safety alert is a reminder to vessel owners and operators about the importance of establishing effective fuel oil changeover procedures to comply with MARPOL Annex VI emission regulations. Recently, there have been several reported incidents involving substantial machinery space fuel leakages while vessels were switching fuel oil to ensure compliance. Although such leakages were contained, fuel releases of any kind may result in pollution, injury or death of personnel and shipboard engine room fires. Moreover, many losses of propulsion have occurred in different ports and have been associated with changeover processes and procedures.

On January 1, 2015, the new fuel oil sulfur limit authorized by MARPOL Annex VI, Regulation 14.3.4 came into effect, lowering fuel sulfur content from 1.0% to 0.10%.¹ The 0.10% fuel sulfur content must be used the entire time the vessel is operating in the North American and U.S. Caribbean Sea Emission Control Areas (ECA). As a result, vessels using higher sulfur content fuels must change to ultra low sulfur (ULS) fuel oil to comply. The vessels must use the ULS fuel oil on inbound and outbound transits, at the dock, and anytime within the ECA. Meeting this requirement requires planning and analysis before any changeover from higher sulfur content fuel oil to ECA compliant fuel oil and vice-versa. Each ship which uses higher sulfur content fuel oil is required to develop and implement changeover procedures for switching between residual and distillate fuels in accordance with MARPOL Annex VI, Regulation 14.6.

In some cases vessels may require fuel oil service or day tank modifications and fuel oil service piping modifications to facilitate safe procedures and compliant fuel operations within the ECAs. The management and oversight of any fuel oil mixing that may be part of a changeover process including, proper control and reduction of the operating temperature of fuel supplied, varying ratios of the mixed fuels and control of mixed fuel viscosity to the engines must take place before the vessel enters the ECAs or after the vessel leaves the ECAs. The amounts of ULS fuel oil onboard must be enough to satisfy the vessel's fuel demand at all times while the vessel operates within the ECAs or efforts should be made to take on additional ULSF while in port.

There are many other important technical issues associated with the use of ultra low sulfur fuel oils and fuel oil switching addressed in documents produced by class societies, insurers, engine manufacturers and industry associations. A few of these documents are presented as links at the bottom of the next page.

¹ Vessels that have an accepted exemption under Marpol Annex VI, Regulation 3 or an equivalency under Regulation 4 may not need to switch fuel depending on the requirements of their exemption or equivalency.

The Coast Guard **strongly recommends** that vessel owners and operators:

- Ensure fuel oil switching is accomplished outside of busy traffic lanes and the ECA. Generally the ECA is 200 nm from the North American Coast and 50 miles from the U.S. Caribbean coast (e.g., the Commonwealth of Puerto Rico and the U.S. Virgin Islands);
- Utilize their technical resources to develop safe operations and maintain full compliance with emission requirements;
- Consult with engine and boiler manufacturers for fuel oil changeover guidance and to determine if system modifications or additional safeguards are necessary;
- Consult fuel suppliers for proper fuel selection;
- Ensure all sensors, controls and alarms – pressure, temperature, viscosity, differential pressure, flow indicators, etc., are operational and function as designed;
- Ensure system piping, seals, gaskets, flanges, fittings, brackets, etc., are maintained.
- Ensure detailed system schematics are available;
- Review and update fuel oil changeover procedures as needed;
- Establish a fuel oil system inspection and maintenance schedule;
- Review and update fuel changeover procedures based on lessons learned;
- Provide initial and periodic crew training for accomplishing safe, effective and leak-free fuel switching;
- Remember that the energy content of a given volume of ULS fuel oil may differ from residual fuel, such that existing throttle settings may not give the desired propeller shaft RPM or generator loads and performance/speed trials on ULS fuel oil may need to be conducted and;
- Anticipate that there may be many technical challenges for operators when beginning to use ULS fuel oil as a matter of routine and compliance. These range from excessive leakages of fuel system components, increased wear and tear on these components, lack of lubricity of the fuels and the need for possible changes in maintenance schedules, operational methods, etc. The links below provide additional information on these topics.

This Safety Alert is provided for informational purposes only and does not relieve any domestic or international safety, operational or material requirement. Questions regarding this should be forwarded to the Coast Guard Office of Commercial Vessel Compliance, Foreign and Offshore Vessel Division (CG-CVC-2) at **202-372-1218** or by email at CGCVC@uscg.mil.

Note: ***The Coast Guard has collected the following links from open internet sources and re-posted them for informational purposes only. Their inclusion here is not an endorsement or expression of preference of any kind towards any specific publication or organization.***

- [MAN B&W Operation on Low Sulphur Fuels](#)
- [Wartsila Low Sulphur Fuel Guidelines](#)
- [Steamship Mutual – Risk Alert: ECAs Low Sulphur Fuel Oil Changeover Procedures](#)
- [International Council on Combustion Engines - Guidelines for the Operation of Marine Engines on Low Sulphur Fuel](#)
- [ABS Fuel Switching Advisory Notice](#)
- [DNVGL – Sulphur Limits 2015 Guidelines on Compliance](#)
- [Intertanko/OCIMF Recommendations on the Hazard Assessment of Fuel Changeover Processes](#)