



## MARINE SAFETY INFORMATION BULLETIN 14-01

September 9, 2014

U.S. Coast Guard District Eleven  
Department of Homeland Security



### Preventing Losses of Propulsion and Improving Fuel Switching Safety

The purpose of this Bulletin is to increase awareness of recent loss of propulsion cases and provide general guidance, based on lessons learned, to help prevent future incidents. Coast Guard studies indicate that deep draft vessels operating in District Eleven continue to experience losses of propulsion. During the past year there were 93 incidents, with 15 of those found to be related to fuel switching.

#### **Preventing Loss of Propulsion**

An extensive analysis of loss of propulsion incidents in California has revealed that the leading causes include general mechanical issues, lack of maintenance, start air system issues including insufficient start air pressure, and issues with fuel oil systems.

<i>Incidents from June 2013 – June 2014</i>		
<i>CAUSE</i>	<i>TOTAL</i>	<i>%</i>
<b>General mechanical issues</b> (generator failure, governor failure, electrical issues, etc.)	40	43%
<b>Lack of maintenance</b>	6	6%
<b>Start air system issues</b>	21	23%
<b>Fuel oil system and fuel pump issues</b> (non-fuel switching related)	11	12%
<b>Fuel oil system issues</b> (fuel switching related)	15	16%
<b>TOTALS</b>	<b>93</b>	<b>100%</b>

Advanced planning and preventive maintenance are critical to the proper operation of a vessel's main engine and prevention of losses of propulsion. In order to manage risk and improve safety, vessel owners and operators should:

#### Maintain:

- Ensure manufacturer's technical publications are onboard and sufficient equipment/spare parts are available to perform routine preventive maintenance;
- Establish a rigorous inspection and maintenance schedule;
- Ensure engine components are maintained in serviceable condition and operated per manufacturer's guidelines, particularly start air valves and fuel system seals, gaskets, flanges, fittings, brackets and supports;

#### Train:

- Conduct initial familiarization and periodic crew training on pertinent systems and IMO/U.S./State requirements;

#### Check Fuel Systems:

- Exercise tight control, when possible, over the quality of fuel oils received;
- Ensure fuel system components are operational, including flow indicators, pressure/temperature alarms, etc.;
- Ensure a detailed fuel system diagram is available and posted in vicinity of pertinent systems; and

Check Air:

- Ensure start air supply is sufficient and fully charged prior to maneuvering.

**Improving Fuel Switching Safety**

Additionally, the following guidance may assist in preventing losses of propulsion when operating on marine distillates. This guidance will also help prepare vessels for the Emission Control Area requirements that take effect January 1, 2015.

Prepare:

- Consult engine and boiler manufacturers for fuel switching guidance;
- Establish detailed written fuel switching procedures/checklists and ensure procedures are followed. Include fuel rack adjustments to account for potential pressure differentials between residual fuel oil & distillates;
- Establish written procedures regarding speed limitations and required engine response times on marine distillates;
- Complete fuel switching procedures and engine testing (ahead/astern) well before entering restricted waters or traffic lanes;

Check Viscosity:

- Ensure proper heat management of fuel systems prior to, during, and after fuel switching to maintain minimum viscosity values and ensure fuel viscosity does not drop below engine manufacturer specifications; and

Monitor:

- Establish parameters for accelerated preventative maintenance of engine/fuel system components, monitor for accelerated wear, and re-evaluate maintenance period intervals.

For additional guidance, the American Petroleum Institute (API) developed a paper in 2009 titled “Technical Considerations of Fuel Switching Practices” and it provides useful recommendations that owners and operators can use to prevent fuel system failures and loss of propulsion casualties. The paper is available under the “Safety Reports” tab at <http://marineinvestigations.us>.

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