

USCG and ECA Enforcement, Technical and Safety Issues



USCG HQ Office of Design & Engineering Standards
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Marine Safety, Environmental Protection and Stewardship Missions

Multi-Tiered System:

- Outreach
- Prevention
- Compliance
- Enforcement



North American ECA

Submitted by the
United States to IMO:
March 2009



Adopted:
March 26, 2010

Expected entry-into-force:
August 1, 2011

Expected Enforcement:
August 1, 2012 (Reg. 14.7)



USCG Compliance for ECA

MARPOL Annex VI, Reg. 14 and 18: SO_x & Particulate Matter (PM), Fuel Oil Availability and Quality

Shipboard Requirements

- Fuel Oil :
 - Sulfur Content Caps
 - Fuel Quality Standards

- Operations:
 - Bunker Notes (18.6)
 - Bunker Samples (18.8)
 - Fuel Oil change-over procedures
 - Fuel Oil change-over log-book entries

Annex VI , Reg. 14 - Fuel Oil Sulfur Content Limits	
Global Sulfur Content Cap	
<u>Effective Date</u>	<u>Sulfur Limit %m/m (ppm)</u>
Prior to 01 JAN 2012	4.5% (45,000)
On and after 01 JAN 2012	3.5% (35,000)
On and after 01JAN 2020	0.5% (5,000)
ECA Sulfur Content Cap	
<u>Effective Date</u>	<u>Sulfur Limit %m/m (ppm)</u>
Prior to 01 JULY 2010	1.5% (15,000)
On and after 01 JULY 2010	1.0% (10,000)
On and after 01JAN 2015	0.1% (1,000)

USCG Exhaust Gas Cleaning System (EGCS) Compliance for ECA

- Future guidance likely in the form of new Appendix to CG-543 policy letter 09-01 (Annex VI Compliance Guidelines)
- EGCS-SO_x units - approved by USCG under two approval approaches - Scheme A and Scheme B in MEPC.184(59)
 - Scheme A : USCG accepted Independent laboratories.
 - Scheme B : Case-by-case approval with plan review.
- Rugged, reliable, and accurate analyzers critical to successful EGCS monitoring

USCG EGCS Compliance for ECA (Cont'd)

Foreign Vessel:

Logbook and Electronic records verification
Inspect EGCS installations

U.S. vessel:

- EGCS initial operational testing
- Washwater samples collected
- Independent lab tests (see MEPC.184(59) - section 10)
- Verification procedures during annual surveys

Fuel Switching Considerations (potential problems)



Improper fuel switching can lead to propulsion loss at inopportune times, such as during maneuvering

Fuel Switching Considerations

North American ECA

200 NM “Buffer”

Indications of propulsion loss should be detected prior to port entry.

Preventive Measures

Annex VI, Reg. 14.6

Fuel oil change-over procedures

USCG Marine Safety Alert 03-09

API Technical Considerations

ISO PAS 13613

Safety Management Systems (SMS)

Environmental Management



The image shows the cover of a United States Coast Guard Marine Safety Alert document. The header features the Coast Guard logo and the text "UNITED STATES COAST GUARD U.S. Department of Homeland Security" and "MARINE SAFETY ALERT Assistant Commandant for Marine Safety, Security and Stewardship". The date "June 16, 2009" and location "Washington, DC" are on the left, and "Alert 03-09" is on the right. The title is "Avoiding propulsion loss from fuel switching: American Petroleum Institute Technical Considerations". The main text discusses fuel switching from residual to distillate fuels to reduce emissions and mentions that the Coast Guard expects more frequent switching. It references a paper by the API and provides a URL. A list of recommendations for owners and operators is provided, including consulting manufacturers and suppliers, exercising tight control, and ensuring system readiness. An image of the "ISM CODE" book cover is shown, along with the IMO logo. The footer includes the Office of Investigations and Analysis and a subscription contact.

UNITED STATES COAST GUARD
U.S. Department of Homeland Security
MARINE SAFETY ALERT
Assistant Commandant for Marine Safety, Security and Stewardship

June 16, 2009
Washington, DC

Alert 03-09

**Avoiding propulsion loss from fuel switching:
American Petroleum Institute Technical Considerations**

Ships switch fuel oil from residual fuels to distillate fuels in order to reduce emissions. The Coast Guard expects ships will switch fuel more frequently to comply with new emission reduction regulations. When switching fuel oil, some ships have experienced propulsion losses linked to procedural errors or fuel oil incompatibility.

API developed a paper titled "Technical Considerations of Fuel Switching Practices" that discusses problems that lead to propulsion loss while switching fuel. It is available at <http://marineinvestigations.us> >Safety Reports. This document may be useful to vessel owners, operators, and engineers interested in preventing fuel system failures and propulsion casualties while meeting current and future exhaust emission control requirements.

In order to prevent casualties associated with fuel oil switching, the Coast Guard **strongly recommends** that owner and operators:

- Consult engine and boiler manufacturers for fuel switching guidance;
- Consult fuel suppliers for proper fuel selection;
- Exercise tight control over fuel switching procedures;
- Consult manufacturers for necessary fuel oil compatibility information;
- Develop detailed fuel switching procedures;
- Establish a fuel switching readiness checklist;
- Ensure system readiness, including fuel oil transmitters, fuel oil heaters, fuel oil filters, and fuel oil pumps;
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- Ensure a detailed fuel switching procedure is available;
- Conduct initial fuel switching trials;
- Complete fuel switching trials.

This safety alert is available at www.uscg.mil.
For more information on international safety, contact the International Safety Engineering Standards Committee, Headquarters, Washington, DC.

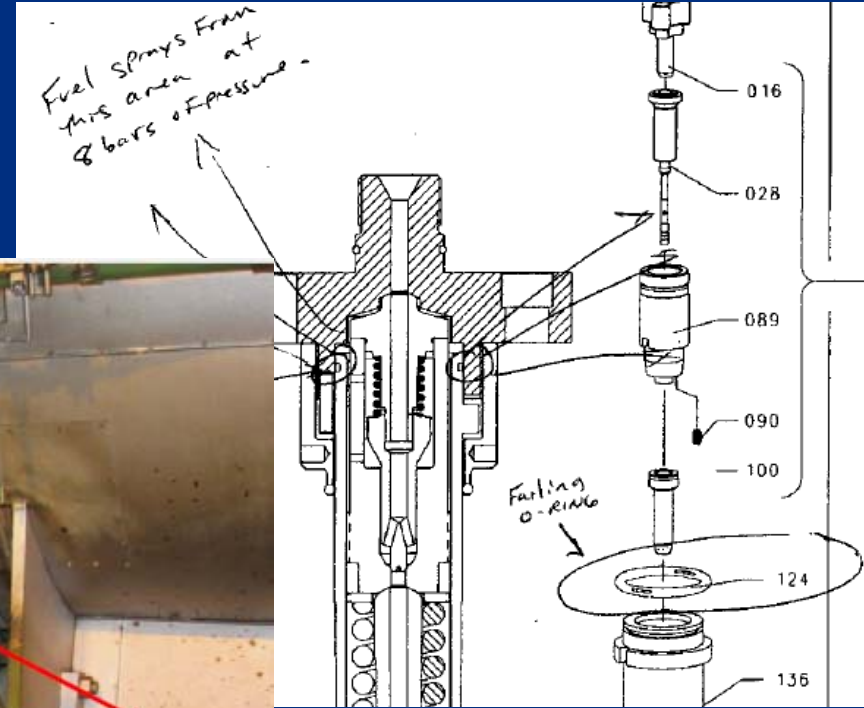
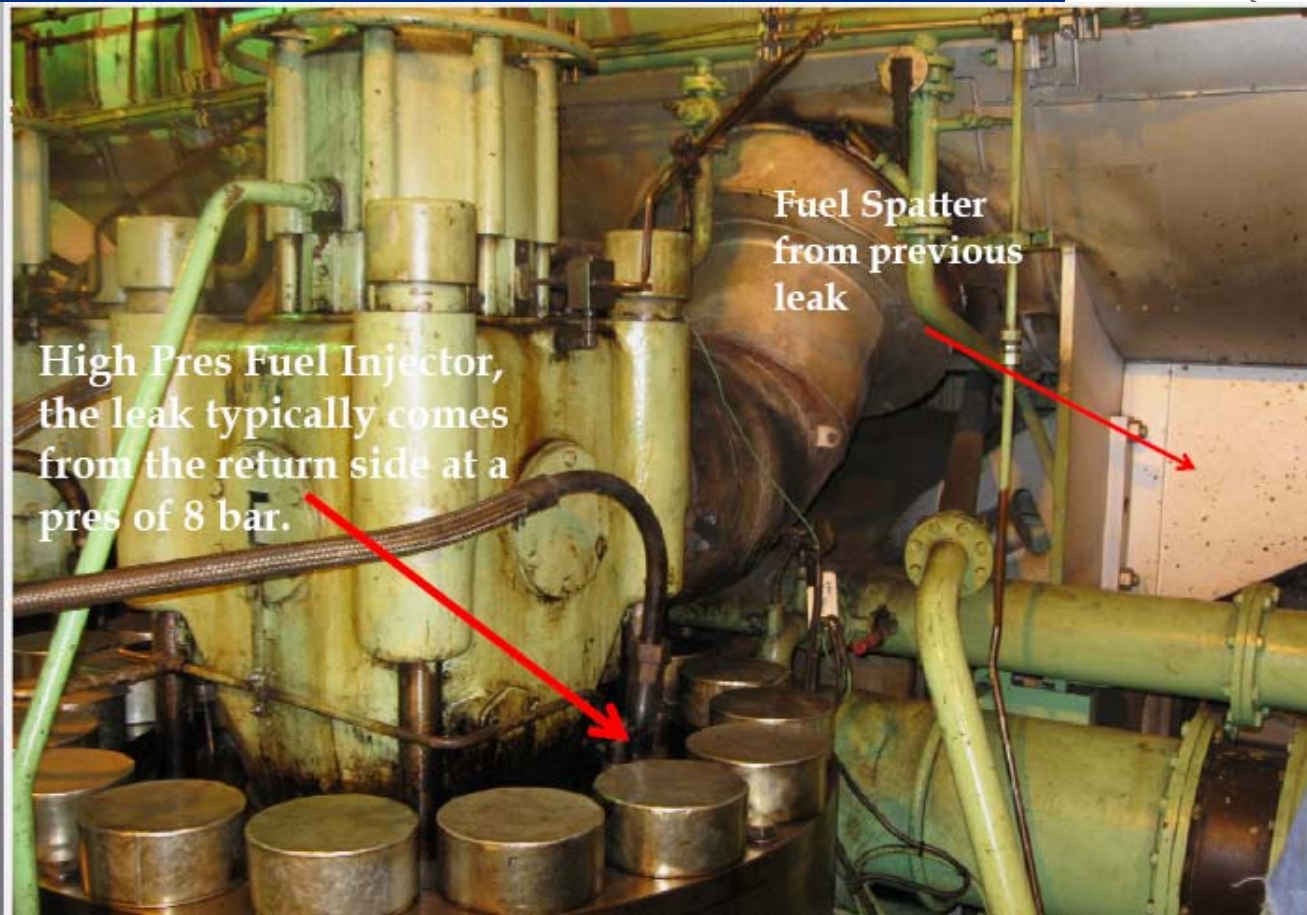
Office of Investigations and Analysis
To subscribe: kenneth.w.olson@uscg.mil

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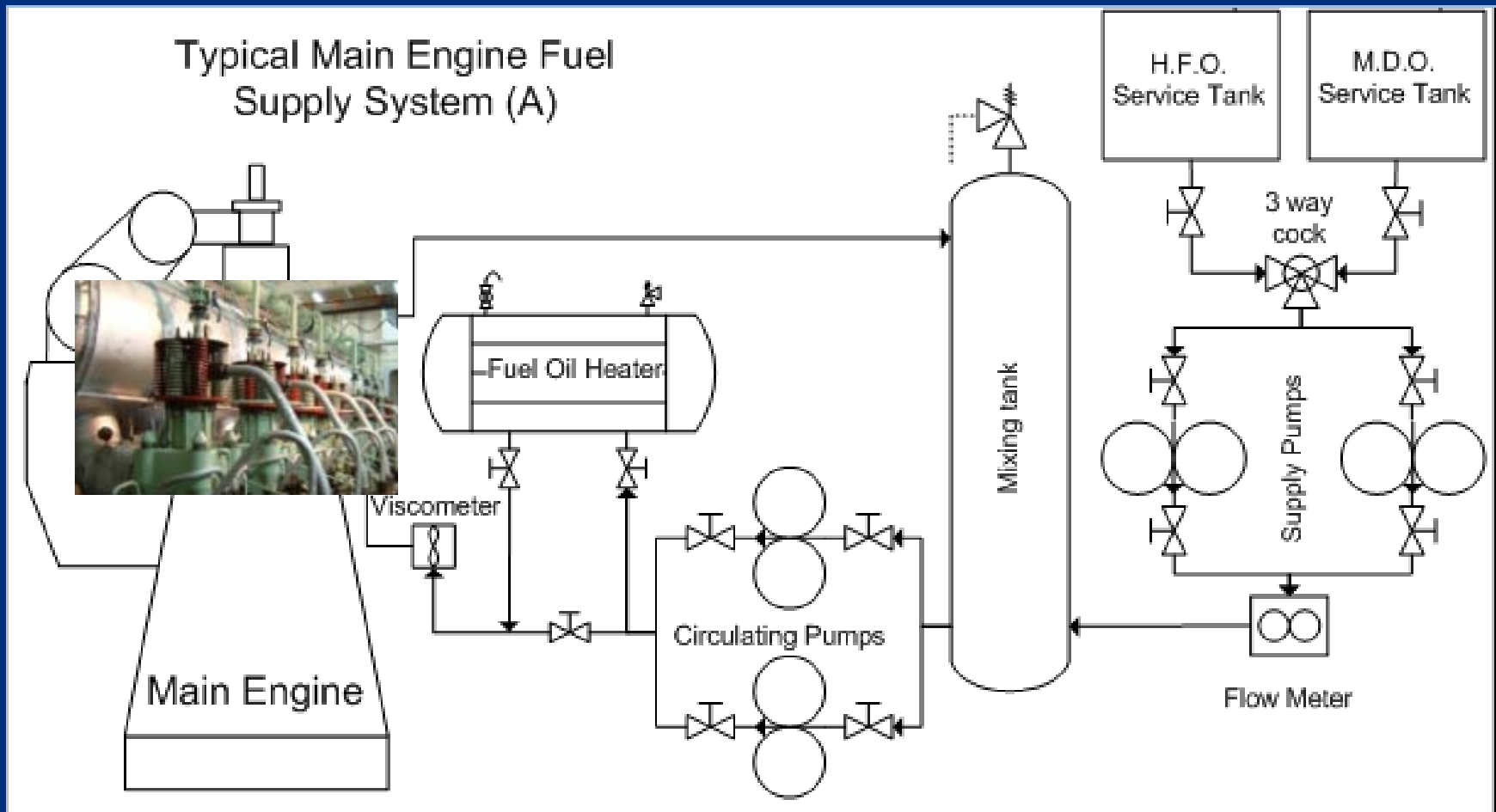
IMO

Fuel Switching Considerations (potential problems)

Incorrect fuel temperature & viscosity control can result in dangerous fuel leaks



Fuel Switching Considerations (equipment)



In general, fuel systems designed for use with two different fuels will require additional equipment, adding cost and complexity

Fuel Switching Considerations (technical recommendations to prevent casualties)

- Consult engine and boiler manufacturers for fuel switching guidance
- Develop detailed fuel switching procedures
- Ensure a detailed system diagram is available
- Complete fuel switching well offshore prior to entering restricted waters or traffic lanes, such that the system is stabilized
- Control LSF temperature to avoid excessive fuel temperature and low fuel viscosity

Fuel Switching Considerations (technical)

- Exercise tight control when possible over the quality of the fuel oils received
- Establish a fuel system inspection and maintenance schedule
- Ensure system pressure and temperature alarms, flow indicators, filter differential pressure transmitters, etc., are all operational
- Ensure system purifiers, filters and strainers are maintained
- Ensure system seals, gaskets, flanges, fittings, brackets and supports are maintained

Fuel Switching Considerations (technical)

- Consult manufacturers to determine if system modifications or additional safeguards are necessary for intended fuels
- Consider that, in certain engines, fuel leaks may cause fuel dilution of lubricating oil, which can degrade the lubricating properties and damage critical engine components
- Monitor the total base number (TBN) of the lubricating oil when the Sulfur content of the fuel is not consistent

Fuel Switching Considerations (technical)

- Vessels should have a specific plan in place that outlines the steps and associated timelines in the process. Fuels with substantially different viscosities will likely necessitate a controlled rate of change
- Lack of a controlled process when switching can result in overheating of the distillate, which can result in improper fuel flow and engine shutdown. Some engine manufacturers have recommended a transition temperature change rate of no greater than 2 degrees C per minute

Fuel Switching Considerations (technical)

- Vessel owners and operators should consult engine manufacturers to determine the potential long-term problems associated with fuel switching. Such issues may include damage to cylinder liners, fuel pumps and valves
- Cylinder liner damage over time can result from incompatibility of the cylinder lube oil with distillate fuel, and fuel pumps can be damaged because of the reduced viscosity and lubricity of distillate

Fuel Switching Considerations (technical)

- It is important that the correct viscosity fuel is supplied to the engine fuel pumps. This may even necessitate a cooling process for low viscosity distillate fuels. Engine and individual cylinder performance should be monitored to ensure that the correct amount of fuel is delivered, and that differences in fuel specifications are not negatively affecting fuel pump performance

Fuel Switching Considerations (technical)

- Vessel owners and operators may wish to seek the opinion of a third party such as a classification society expert to review and certify their fuel switching procedures
- Owners are reminded that modifications to associated fuel supply and control systems may require approval by the vessel's classification society in order to ensure that class is maintained.

Future USCG Efforts with Fuel Switching Issues

- Issue additional Marine Safety Alerts for safety and maintenance concerns as needed
- Inform stakeholders of additional guidance for fuel switching issues found in ISO specification 13613
- Develop guidance for spot-checking bunker delivery notes to verify fuel sulfur content
- Continue training CG inspectors on fuel switch equipment & compliance processes.

USCG Compliance for ECA (Cont'd)



Resources

Coast Guard and Marine Safety:

The Homeport website: <http://homeport.uscg.mil>

The USCG's Main website: www.uscg.mil/

Prevention Policy Directorate for Marine Safety, Security, and Stewardship (CG-54) website: <http://www.uscg.mil/hq/cg5/cg54/>

Coast Guard Marine Safety Blog website: <http://cgmarinesafety.blogspot.com/>

Annex VI:

Homeport Annex VI web page: select the following links: Missions > Domestic Vessels > Domestic Vessel General > MARPOL ANNEX VI

EPA Ocean Going Vessels Air Emissions Web Page:

<http://www.epa.gov/otaq/oceanvessels.htm>

USCG and ECA Enforcement

Questions?



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