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Choosing the right EAL, meeting regulations and maximizing performance

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Energy lives here™

An aerial photograph of a large cargo ship navigating a wide river. The ship is heavily loaded with colorful shipping containers in shades of red, green, and white. The river flows between lush green forested banks. The sky is blue with scattered white clouds. The text 'Choosing the right EAL and meeting regulations' is overlaid in white on the left side of the image.

Choosing the right EAL and meeting regulations

Vessel General Permit (VGP) The background

Use of Environmentally Acceptable
Lubricants (EALs)

All oil-to-sea interfaces

Maintain seals and equipment

Fines for non-compliance



Vessel General Permit (VGP) What's new?

eNOI direct reporting

EPA's electronic reporting system

Same eNOI system for registering vessels

Batch submissions via Microsoft Excel
spreadsheet

sVGP – 2018+ ?



Routes to VGP Compliance

Self certification for EALs – testing against specific EPA VGP EAL criteria

Many EALs are accredited by:



These accreditations identify products which are environmentally friendly

Challenge for lubricants is to achieve VGP compliance **AND** high performance

Example OEM Approvals

OEM approvals validate real-world, high performance benefits



Powering Business Worldwide

Eaton and Denison Hydraulics have endorsed Mobil SHC Aware lubricants



Dredging

Unique & severe operating conditions require:

VGP compliant hydraulic lubricants and greases:

Reliable, high-performance, cost effective lubrication solutions



Mobil SHC Aware™

Mobil SHC Aware™ H series

Mobil SHC Aware™ Grease EP 2

Mobil SHC Aware™ ST Series

Mobil SHC Aware™ Gear Series



Maximising performance



Mobilgard 410 NC

High performance zinc free oil

Tier IV capable

For use with after treatment and EGR

Designed for LNG and biodiesel

Approvals:

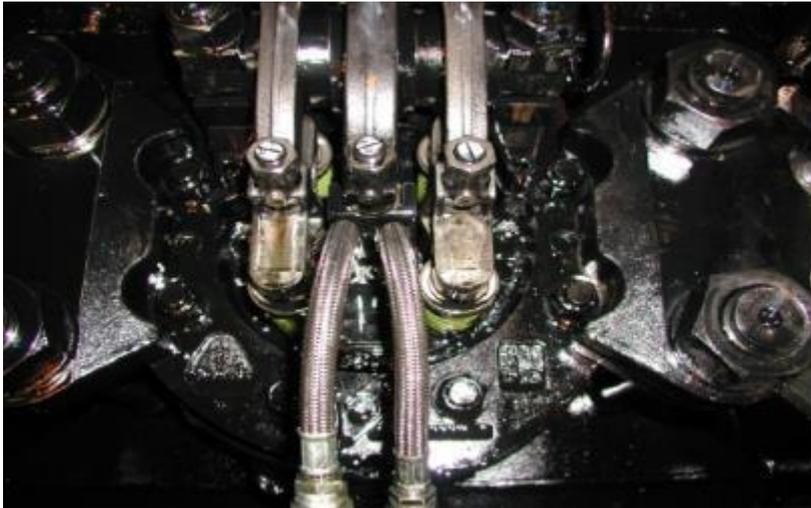
EMD

GE

Fairbanks Morse - pending

Up to 20% cleanliness improvement

Reference Oil



Mobilgard 410 NC



Mobil Delvac 1™

- High-performance synthetic diesel engine oils
- Used across 1,279 engines, 380 gear boxes
- Extend engine life & protect components at high temperatures
- Up to 10x extended drain intervals*

*Based upon field testing of Mobil Delvac 1 ESP 5W-40 in high-speed, 4-stroke marine engines, and compared with conventional heavy-duty diesel engine oil. Actual results may vary by engine type, maintenance, operating conditions, environment and prior lubricant use. Drain intervals should be established through routine used oil analysis.

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Source: ExxonMobil

Conclusion

- VGP regulations require EALs to be biodegradable, minimally toxic and not bio-accumulative
- ExxonMobil lubricants offer excellent performance benefits to promote cost effective, reliable vessel operations



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US EPA emissions Tier 2/3/4 implementation schedule

Mobilgard™ 410 NC is prepared for future operational challenges

U.S. EPA - Tier 2 and Tier 3**

Displacement (L/cyl)		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
< 0.9	>75kW	Tier 2					Tier 3						
0.9 - 1.2		Tier 2					Tier 3						
1.2 - 2.5		Tier 2						Tier 3					
2.5 - 3.5		Tier 2					Tier 3						
3.5 - 7.0		Tier 2					Tier 3						

** EPA Tier 2 and Tier 3 implementation based on displacement

U.S. EPA Tier 4***

kW (HP)		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
600-1399	805 - 1876											Tier 4		
1400-1999	1877 - 2681											Tier 4		
2000 - 3700	2682 - 4962								Tier 4					

*** EPA Tier 4 implementation based on maximum engine power

Source: EPA