VGP – Vessel General Permit: A Summary of New Lubricant Requirements

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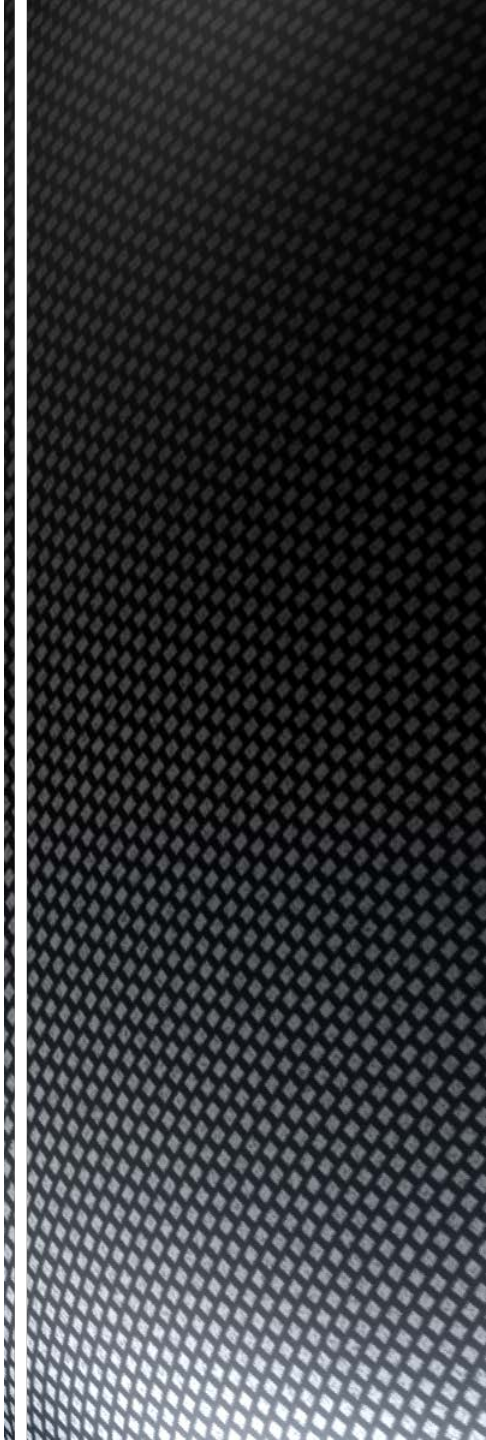

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ADVANCED TECHNOLOGY LUBRICATION FOR:

- Heavy Equipment
- Manufacturing
- Food Processing
- Transportation

INTERNATIONAL COMPANY

- Established in 1949
- Over $1 billion in annual revenue
- Global Manufacturing Facilities
- Worldwide Sales

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INNOVATIVE RESEARCH & DEVELOPMENT

- Extensive Laboratory Research and Development
- Thorough Field Testing Protocol
- Rigid Quality Control Standards

QUALITY ISO 9001 ASSURANCE

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THE LEADER IN HEAVY EQUIPMENT LUBRICATION

- Excavation and Demolition
- Concrete and Asphalt Paving
- Federal, State and Local Agencies
- Mining
- Pier and Bridge Construction
- Concrete and Asphalt
- Municipalities
- Agriculture
- Transportation
- Automotive
- General Contractors
- Oil Field Construction
- Concrete Pumping and Ready Mixed Concrete
- Other Industries That Utilize Heavy Equipment

What is the VGP (2013)?

The second issuance of the Vessel General Permit (VGP) for discharges incidental to the normal operations of a vessel

Developed by the US Environmental Protection Agency (EPA)

Works in conjunction with the Clean Water Act (CWA)

Serves to protect the US Coastline and inland waters by regulating discharge from vessels entering these areas

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What is the VGP (2013)?

The second issue of the VGP has many updates.

This presentation will focus primarily on the requirement for the use of Environmentally Acceptable Lubricants (EALs)

EALs are now required to replace traditional lubricants in all oil-to-sea interfaces

Oil-to-sea interfaces include:

- Wire Ropes • ROV Umbilical's • Submersible Eqmt.
- Pitch Propellers • Hydraulic Fluids • Paddle Wheel Prop.
- Stern Tubes • Thruster Bearings • Stabilizers
- Rudder Bearings • Azimuth Thrusters • Prop. Pods

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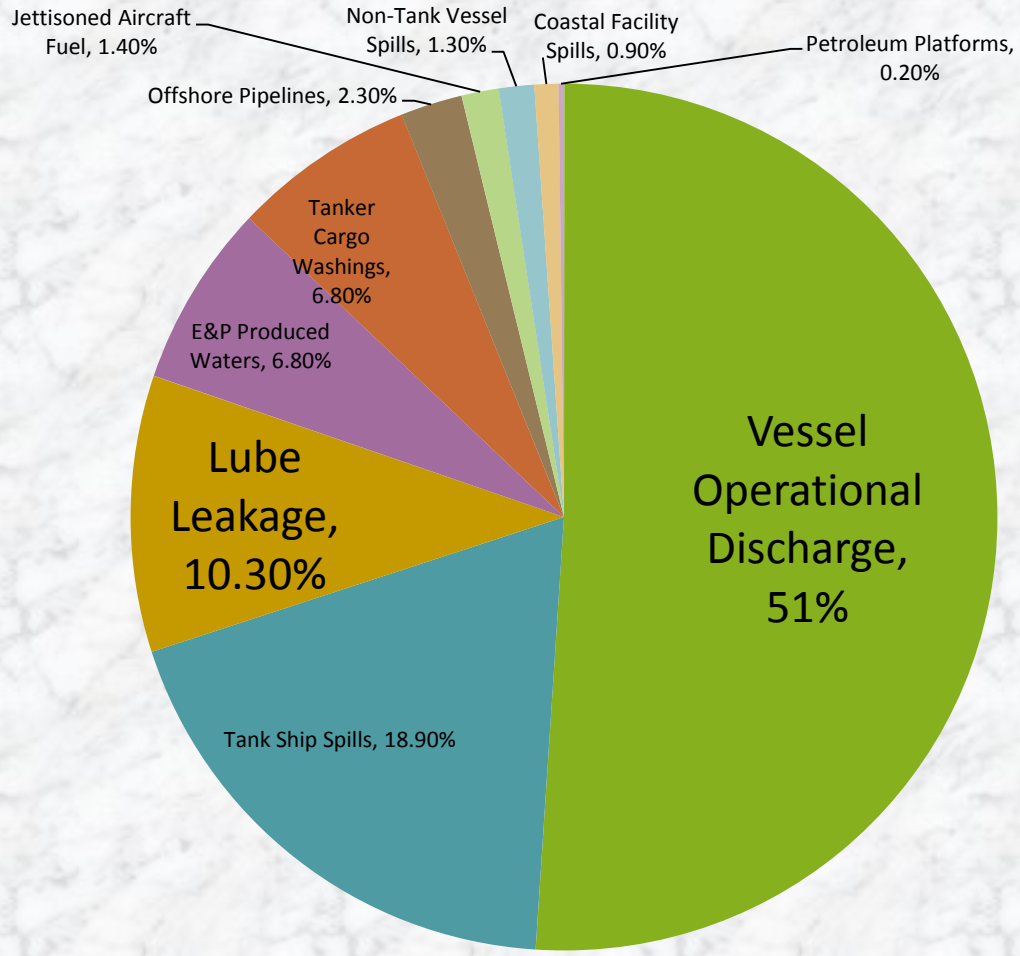
Why the VGP?

An estimated 61 million liters of lubricating oil enter the marine environment worldwide annually *(roughly 1.5x the material spilled during the Exxon Valdez disaster)*

The vast majority (over 61 percent) is a result of lubricant leakage, or vessel operational discharge

The estimated annual associated cost to the US is roughly $31 million.

Annual Oil Inputs into the Marine Environment



What is an EAL?

EAL, as defined by the EPA in the 2013 VGP, stands for Environmentally Acceptable Lubricant

An environmentally acceptable lubricant is one which meets strict testing protocols in order to be classified as

1) Readily Biodegradable
2) Minimally Toxic
3) Non Bio-Accumulative

Lubricant base oil	Base oil source	Biodegradation	Potential for Bioaccumulation	Toxicity
Mineral oil	Petroleum	Persistent / Inherently	Yes	High
Polyalkylene glycols (PAG)	Petroleum - synthesized hydrocarbon	Readily	No	Low[a]
Synthetic Ester	Synthesized from biological sources	Readily	No	Low
Vegetable Oils	Naturally occurring vegetable oils	Readily	No	Low

*In order to be classified as an EAL, a lubricant must meet the requirements of *ALL THREE* under the VGP

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Readily Biodegradable

Biodegradability is a measure of how quickly the lubricant is broken down into its harmless constituents

In the instance of accidental discharge, a biodegradable lubricant will not remain in the environment long enough to cause significant harm

VGP states that a biodegradable lubricant must meet specific criteria
Very stringent and complex

Test Type	Test Name	Measured Parameter[a]	Pass Level[b]	Method
Ready Biodegradability (A substance is considered to be inherently biodegradable using any of these tests if it shows ≥20% biodegradability within the test duration)	DDAT	DOC	≥70%	OECD 301A
	Strum test	CO_2	≥60%	OECD 301B
	MITI test	DOC	≥70%	OECD 301C
	Closed bottle test	BOD/COD	≥60%	OECD 301D
	MOST	DOC	≥70%	OECD 301E
	Sapromat	BOD/COD	≥60%	OECD 301F
	Strum test	CO_2	≥60%	ASTM D-5864
	Shake flask test	CO_2	≥60%	EPA 560/6-82-003
	BODIS test	BOD/COD	≥60%	ISO 10708
Hydrocarbon degradability	CEC test	Infrared Spectrum	≥80%	CEC L-33-A-934
Screening tests (semi-official)	CO_2 headspace test	CO_2	≥60%	ISO 14593

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Minimally Toxic

Per the VGP, minimally toxic lubricants must have little to no impact on marine plant and animal life

This is determined by exposing living organisms to various concentrations of lubricants in water, and measuring their reactions, if any

The result that is usually quoted, is the lubricant concentration that kills 50% of the test organisms in 48 (daphnia), 72 (algae) or 96 (fish) hours

Test Title, with Species	Test Number
Growth Inhibition Test, Alga	OECD 201
Acute Immobilization Test, *Daphnia* sp.	OECD 202
Acute Toxicity Test, Fish	OECD 203
Prolonged Toxicity Test: 14-Day Study, Fish	OECD 204
Respiration Inhibition Test, Bacteria	OECD 209
Early-Life Stage Toxicity Test, Fish	OECD 210
Reproduction Test, *Daphnia magna*	OECD 211
Short-term Toxicity Test on Embryo and Sac-fry Stages, Fish	OECD 212

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Non Bio-Accumulative

Bio-Accumulation refers to how easily and quickly a chemical or substance is able to build in concentration within a living organism

VGP demands that EALs meet stringent bioaccumulation criteria

Test methodologies include OECD 117 & 107

Lubricant base oil	Base oil source	Potential for Bioaccumulation
Mineral oil	Petroleum	Yes
Polyalkylene glycols (PAG)	Petroleum - synthesized hydrocarbon	No
Synthetic Ester	Synthesized from biological sources	No
Vegetable Oils	Naturally occurring vegetable oils	No

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When Is VGP Effective?

Now – the second issue of the VGP was passed December 19, 2013

Full compliance with the EAL requirements is required following the **first dry dock** after this date

This issue will expire on **December 19th 2018 at midnight**. It is highly likely to be updated at this time

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Who Must Comply?

All commercial vessels which are 79 feet (24.08 meters) or greater in length

Vessels that have discharges incidental to their normal operations

Vessels operating in a capacity as a means of transportation

Only exceptions include recreational vessels and government/military vessels

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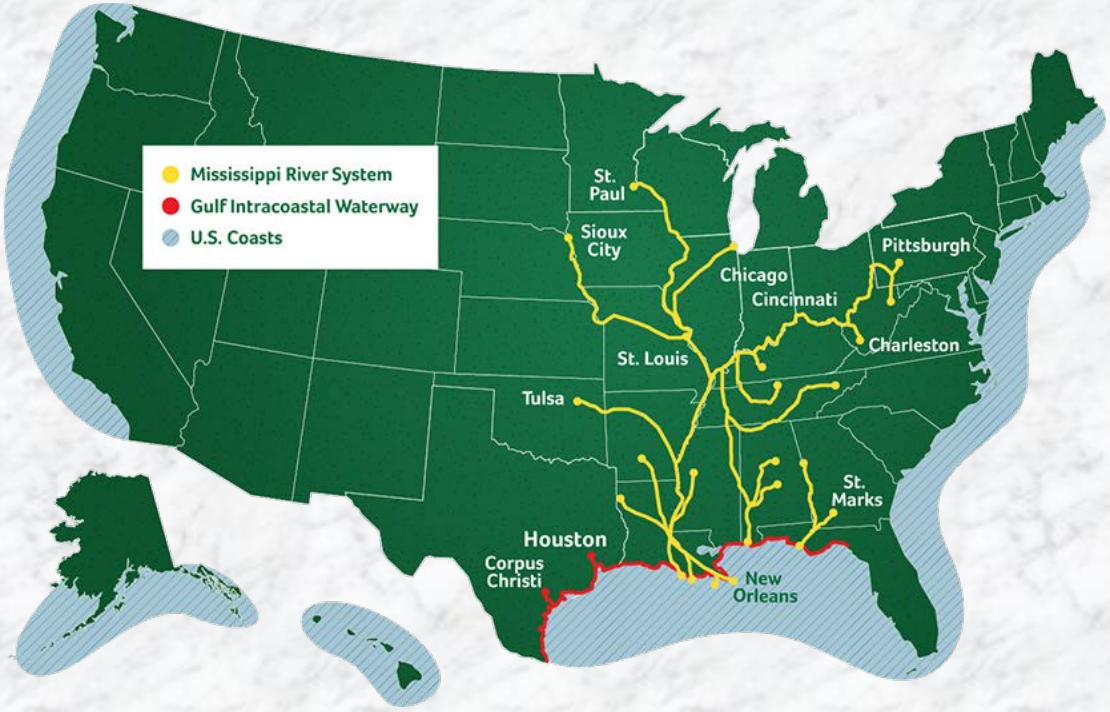
Where Does VGP Apply?

The VGP is applicable to discharges incidental to the normal operation of a vessel in “waters of the United States”

These are waters up to three nautical miles from the coast of the USA and all navigable waters of the Great Lakes

Any vessel subject to the requirements of the VGP entering these waters will be required to comply, no matter the reason for entry



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Why Comply?

The EPA has the power to enforce the VGP using legal action including administrative penalties and judicial action

First time violations may lead to $10,000 fines (per violation) or imprisonment for up to two years

Further violations may lead to $20,000 fines (per violation) or imprisonment for up to four years

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Potential Pitfalls

Creative Marketing
- Biodegradable DOES NOT = EAL

Burden of Proof
- Ultimately falls on the end user
- Should be able to rely on vendor to supply needed documentation

Reciprocal Programs
- Some foreign environmental certifications are accepted

Helpful Resources

EPA 2013 VGP:
https://www3.epa.gov/npdes/pubs/vgp_permit2013.pdf

Final VGP Brief Overview:
https://www.epa.gov/sites/production/files/2015-08/documents/vgp_overview2013.pdf

VGP Fact Sheet:
https://www.regulations.gov/document?D=EPA-HQ-OW-2011-0141-0950

EPA Definition of EAL:
https://www3.epa.gov/npdes/pubs/vgp_environmentally_acceptable_lubricants.pdf

Thank You

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