

Environmentally Acceptable Lubricants and the VGP

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American Chemical Technologies



- Privately owned oil company with no affiliation to other oil companies and/or base stock technology.
- Founded in 1977 outside of Lansing, Michigan.
- Main blending facility is in Michigan with a secondary facility in Bowling Green, KY.
- Supplier of:
 - Fire resistant hydraulic lubricants for steel industry
 - Power generation lubricants (gas turbines, EHC systems)
 - Marine Lubricants (Neptune)



ISO 9001 Certification

- Both of our Blending facilities are ISO 9001 Certified.
- All of our Marine products are blended in our Lansing facility to maintain the highest quality and consistency.





Vessel General Permit (VGP)

- Environmental Protection Agency (EPA) changed regulations as of December 19th 2013.
- What is in the new Vessel General Permit:
 - Ballast water treatment
 - Deck water run off
 - Oil to sea interfaces
 - In short, any system that has potential to spill into the water is going to fall under these new VGP regulations unless deemed technically infeasible.

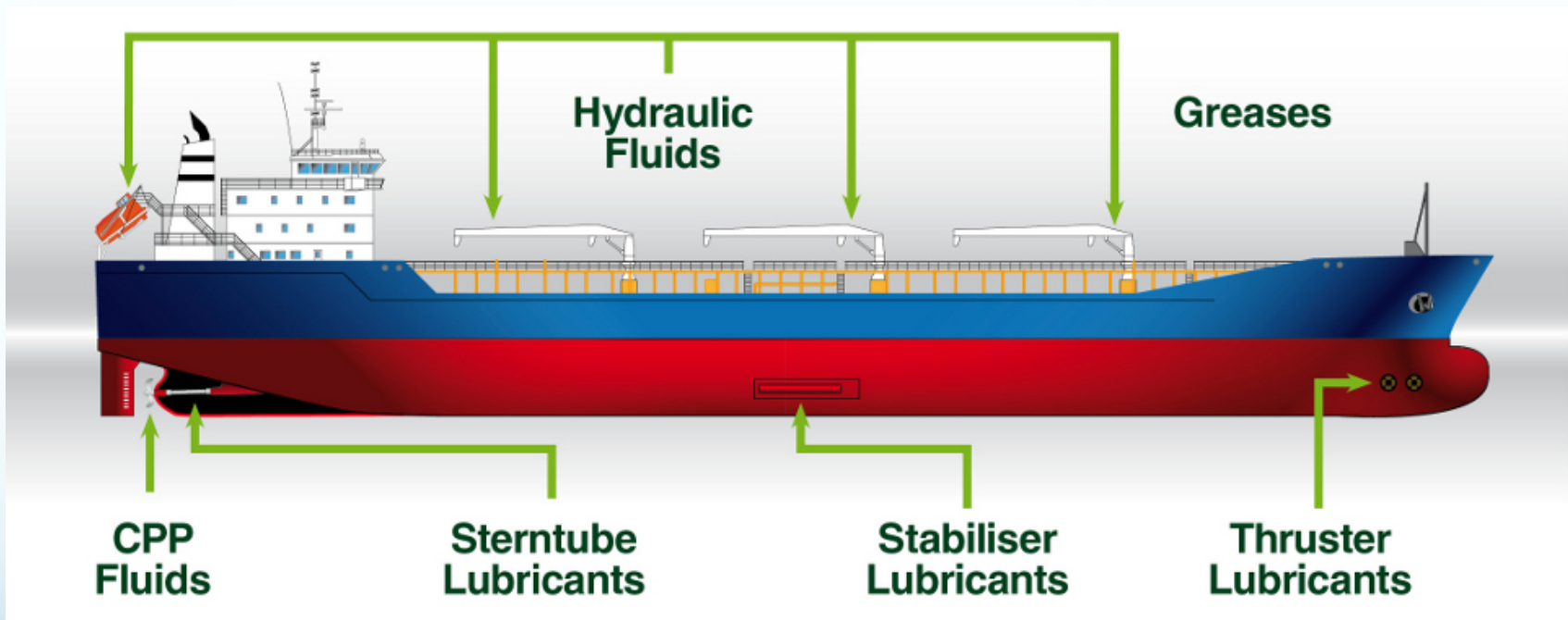
Who is affected by the VGP regulations?



- Any vessel that is 79 feet or longer falls under these new regulations:
 - Large tugs (steering systems, propulsion systems)
 - Large Ships (Stern tube, thrusters, stabilizers, deck equipment, ect)
 - Dredging companies (extensive list of equipment)
- The EPA has also come out with an sVGP for vessels that are smaller than 79 feet. (December 19, 2014)
- The U.S. Coast is enforcing these regulations.



EAL Applications



Vessel General Permit (VGP)

approved base stocks

- PAO (HEPR)
- Water
- Vegetable Oil (HETG)
- Synthetic Esters (HEES)
- **Polyalkylene Glycols (HEPG)**





Polyalkylene Glycol (PAG) based lubricants

1. PAG's are the ONLY true no-sheen EAL



- PAG's pass the US EPA 40 CFR 435 Static Sheen Test
- PAG's specific gravity is greater than 1 where all other EAL's are less than one meaning they will float on the waters surface.

PAG fluid spill



PAG fluid stirred



US EPA 40 CFR 435: Static Sheen Test



	PAG Based hydraulic fluid	Vegetable oil based hydraulic fluid	Synthetic ester based hydraulic fluid	White-oil based hydraulic fluid	Petroleum based hydraulic fluid
Silvery or metallic sheen	NO	NO	NO	NO	NO
Increased reflectivity	NO	NO	YES	YES	NO
Visual Color	NO	NO	NO	NO	NO
Iridescence	NO	NO	NO	NO	NO
Oil Slick exceeding 10% of surface area	NO	YES	YES	YES	YES
Appendix 1 to Subpart A of 40CFR435 result	PASS	FAIL	FAIL	FAIL	FAIL

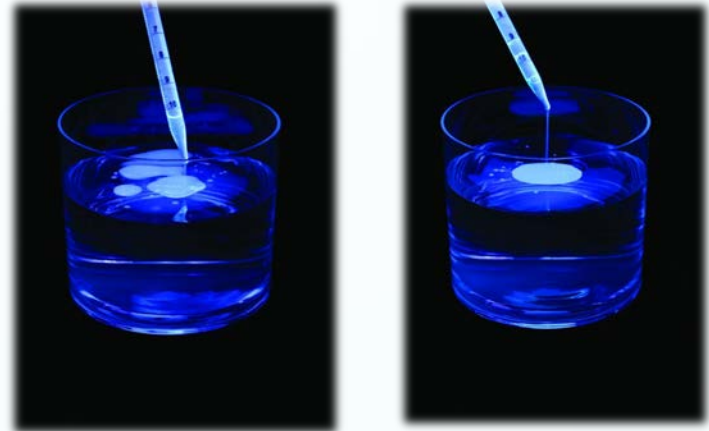
Black Light Testing



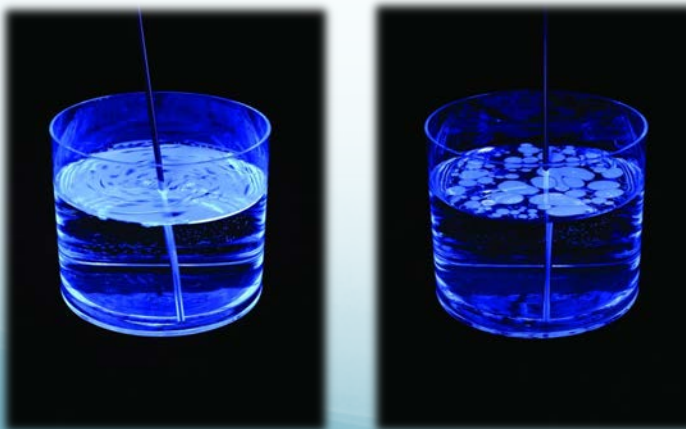
PAO oil spill



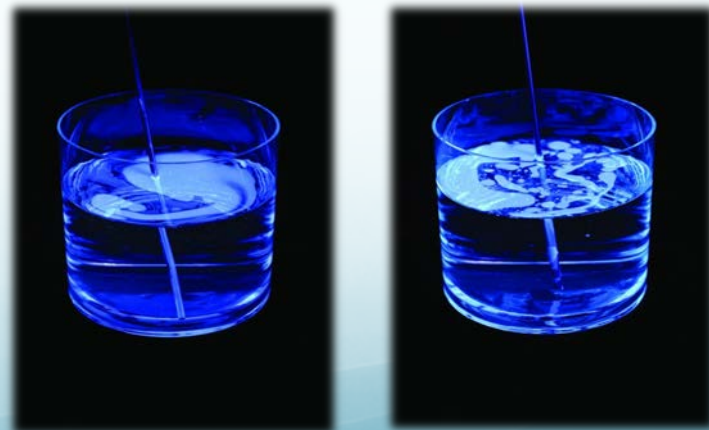
Synthetic Ester oil spill



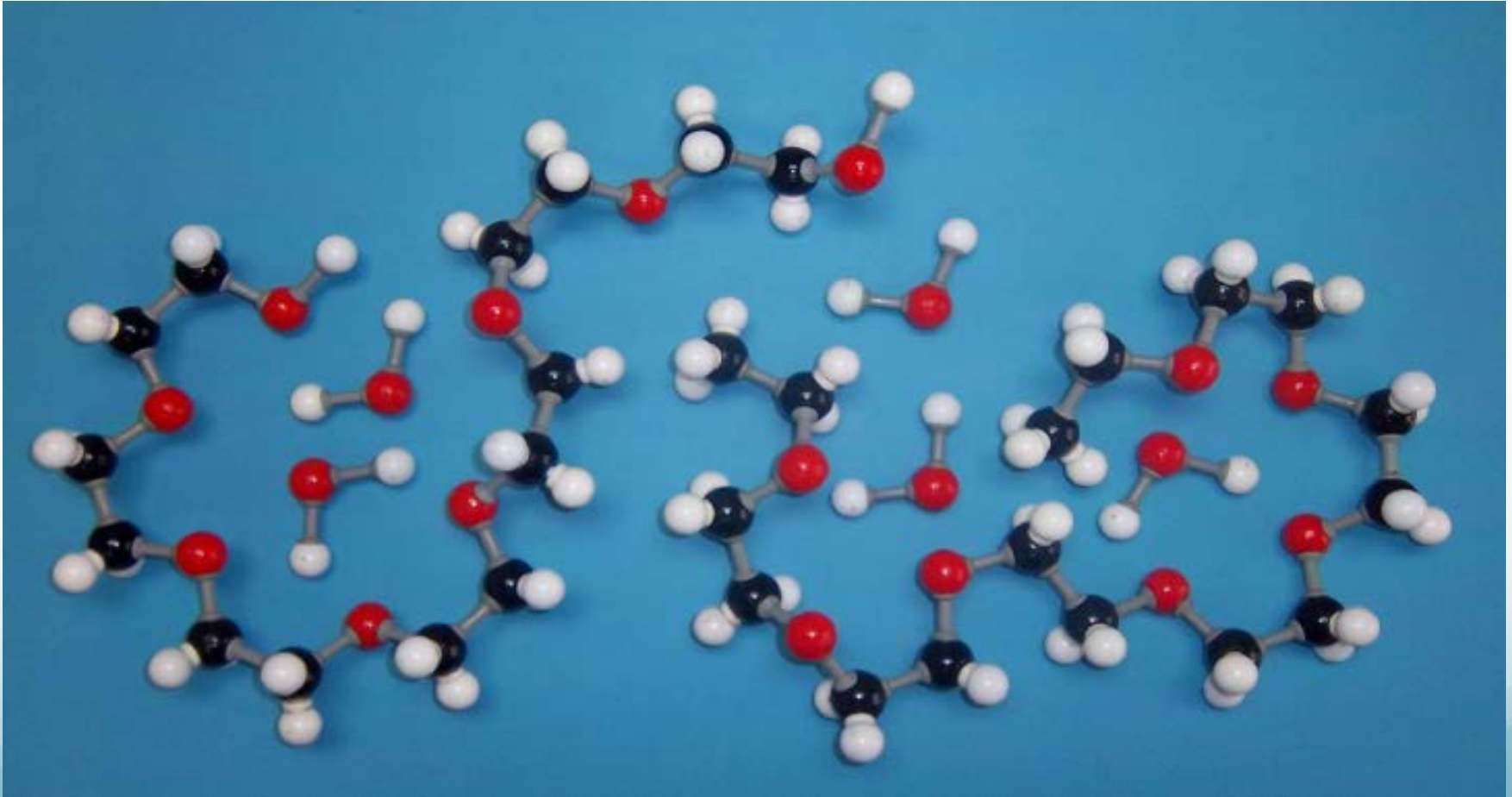
PAO oil stirred



Synthetic Ester oil stirred



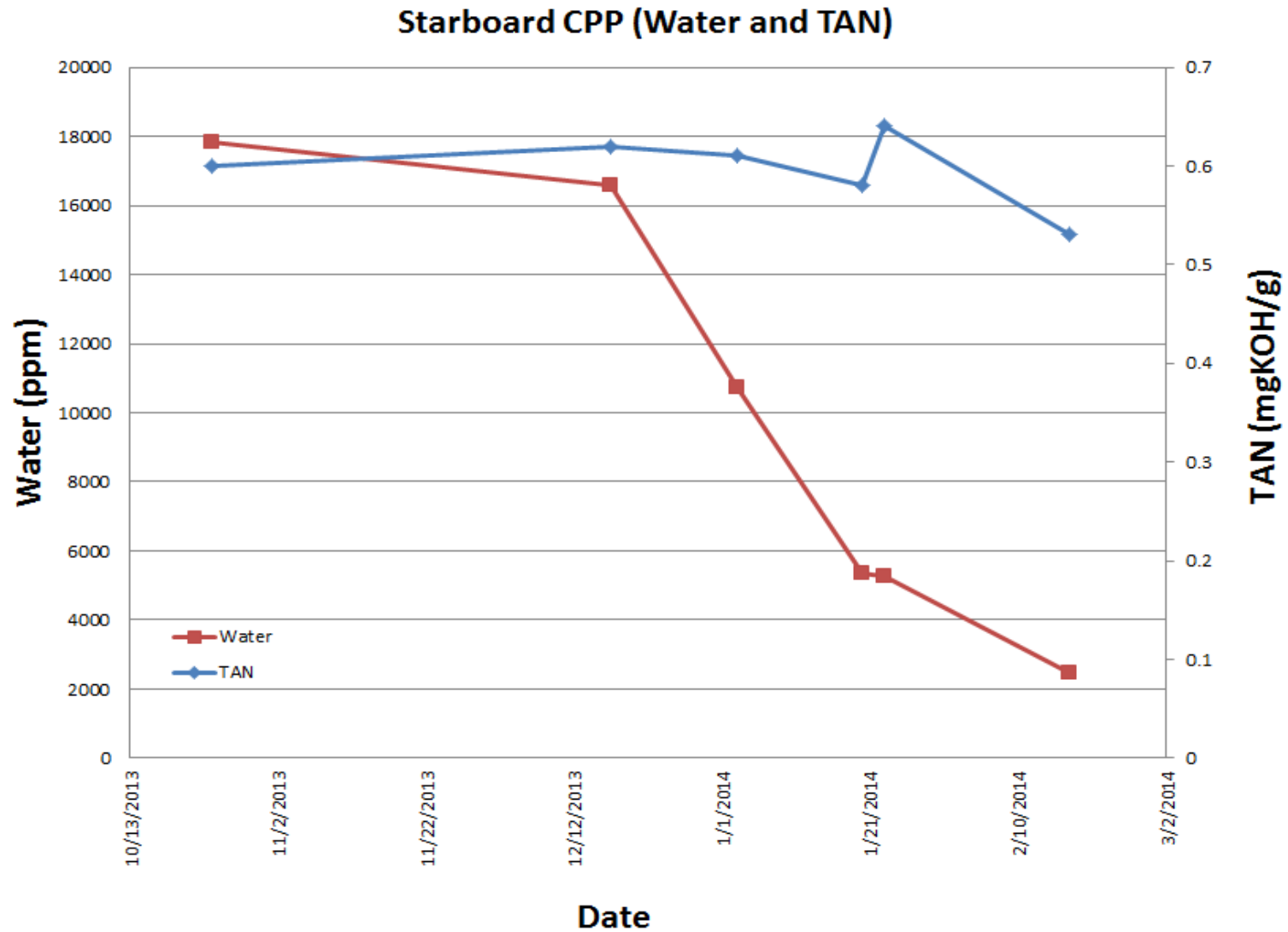
2. PAG's do not break down in the presence of water



Wheeler Dredge- Water incursion in CPP



Wheeler Dredge – Starboard CPP



3. PAG's are the highest performing EAL



- PAG's can not break down in the presence of water (water incursion into a system)
- PAG's **can not** chemically form sludge and varnish when they oxidize (unlike a PAO, ester, and veggie oil)
- ACT has 30+ years of experience with PAG's in very demanding applications



U.S.C.G. SFLC's Stance on EAL's

- USCG SFLC: (Surface Forces Logistics Center)
 - Engineering Arm for the U.S. Coast Guard
 - “The preferred environmentally acceptable lubricants for use onboard USCG cutters are the PAG based lubricants.”
 - Ed Guervara- Lubricant expert from the Navy
 - Kevin Danahy- Propulsion expert



Thank you/Questions!