Technical Bulletin

Vessel General Permit as from December 19th 2013

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AEGIR-Marine PRIME Seals and VGP compliance

As from December 19th 2013, the new Vessel General Permit (VGP), issued by the United States Environmental Protection Agency (EPA) came into force.

The VGP calls for the use of Environmental Acceptable Lubricants (EAL’s) in any oil to water interface. This includes, but is not limited to, stern tubes, thrusters, CPP’s, rudder shafts, hydraulic doors etc. The VGP is applicable for any vessel with a length of 79 ft (24.1 m) or longer, trading in US inland or coastal waters.

The use of an EAL is compulsory, unless ‘technically infeasible’.

Technically infeasible means:

- No EAL products are approved for use in a given application that meet manufacturer specifications for that equipment.
- The change over and use of an EAL must wait until the vessel’s next dry-docking.

If a vessel is unable to use an EAL, it must be documented sufficiently. The use of a NON EAL should be reported in the Annual report.

EAL’s

The base requirements for an EAL are:

- Rapidly biodegradable
- Minimally toxic
- Non bio accumulative

There are different types of biodegradables available in the market:

- Vegetable based esters (HETG)
- Synthetic based esters (HEES)
- Glycol based lubricants or PAG’s (HEPG)
- Poly-Alpha-Olefins (HEPR)
**Synthetic and vegetable based Esters** are known to be water reactive. A process called hydrolysis may chemically affect the seal rings. Hydrolysis may occur when an ester based EAL is mixed with water. Therefore, we limit the water content in the EAL in our systems to 5%. Temperature also has an impact on this hydrolysis process. Therefore, oil temperature in the system should not exceed 55°C.

**Glycol** based EAL’s require a thorough flushing of the system to remove any residue of the previously used lubricant, when changing over. Furthermore, Glycol based lubricants mix with water to such an extent that it does not allow water to be drained out of a system. Therefore AEGIR-Marine does not approve the use of glycol based EAL’s in combination with AEGIR-Marine PRIME seals.

**Poly-Alpha-Olefins (PAO’s)** are not water reactive and therefore are not affected by hydrolysis when mixed with water. Unlike Glycol based EAL’s, they do accept a certain percentage of residue when changing from a petroleum based lubricant to an EAL. Some PAO’s however, are known to be bio accumulative. In case a lubricant is bio accumulative, it is not considered to be an EAL under the VGP. The PAO’s in the AEGIR-Marine compatibility list are not bio accumulative and, by statement of the maker, a VGP accepted EAL.

**Stern tube seals without pipe system to seal chambers or with 1-pipe system to seal chambers**

When a vessel is equipped with a stern tube seal without the possibility of lube oil flushing, the oil cannot be properly cleaned or renewed while the vessel is in operation. In these cases we cannot ensure the standard lifetime of 5 years for our elastomer seal components. AEGIR Marine therefore defines the normal operation of the installed stern tube seal system with an EAL for more than 2 years as technically infeasible.

**AEGIR-Marine products affected by the VGP regulations**

As the VGP calls for the use of EAL’s in any oil to water interface, all AEGIR-Marine PRIME products are affected, except the PRIMAIR systems* and the PRIME blue systems**. AEGIR offer products and spares for stern tube seals, thrusters and Controllable Pitch Propellers (CPP’s). Occasionally, AEGIR-Marine offers spares produced by other makers. In such cases, only the specific manufacturer of such parts can make a
statement regarding the compatibility of the subject products with specific EAL’s

* The PRIMAIR systems eliminates the oil-to-water interface in normal operations condition.

** the PRIME Blue systems are water lubricated, so not EAL related.

**Compatible EAL’s**

AEGIR-Marine has a list of EAL’s, compatible with AEGIR-Marine Prime products, available for our customers. It is important to realize that the compatibility of many of these lubricants with AEGIR-Marine Prime products could only be tested in a laboratory so far. Field experience for many of these EAL’s with any stern tube seal or propulsion system, including AEGIR-Marine Prime products is often limited. Based on the lab test, AEGIR-Marine does not expect a negative impact on the expected lifetime of our products when using our products in combination with the tested and approved EAL’s on our list, as long as the critical conditions are respected.

It is furthermore to be expected that more EAL’s will be introduced in the nearby future. AEGIR-Marine will update our list of compatible EAL’s regularly. Please contact your regional AEGIR-Marine office or your local AEGIR-Marine agent for the latest information. In case you desire to use any specific EAL, not listed on the AEGIR-Marine EAL list, you can have the specific oil tested. Please provide us with a sample of at least 20 liters for a compatibility test.

**EAL’s and AEGIR-Marine Prime products**

With the introduction of the AEGIR-Marine Prime range of products in 2004, our company choose to use a FPM (DIN/ISO), FKM (ASTM) or Viton material with a much higher chemical resistance then other products available in the market. It is therefore that our Prime products can be used for petroleum based products as well as with the EAL’s listed in our compatibility list.

**Changing over to EAL’s with existing systems**

When changing over to an EAL with an existing system, proper flushing and cleaning of the system is required. For flushing purposes it is advised to use some of the new oil in favor of flushing fluids, as also residues of the flushing fluid can contaminate the EAL. The use of new seals is mandatory. The change over from a petroleum based lubricant to an EAL
without changing the seals is considered ‘technically infeasible’ by AEGIR-Marine. The changeover should wait until the first scheduled dry-docking of the vessel.

**Cathodic protection**

The new VGP also has an impact on the use of zinc anodes for cathodic protection. When the anodes are changed during dry-dock or by divers, aluminum or magnesium anodes must be used. Aluminum anodes are preferred over Zinc anodes, as aluminum is less toxic. AEGIR-Marine will quote the correct material for the installation, when offering spare parts or retrofit installations.

**Further questions and customer support**

Your regional AEGIR-Marine offices are available to support you with any additional questions related to the new VGP regulations. Your local AEGIR-Marine agent will be happy to assist you with the latest AEGIR-Marine list of compatible EAL’s or any applicable service bulletin that may come out in future.

Wijk bij Duurstede, February ‘17