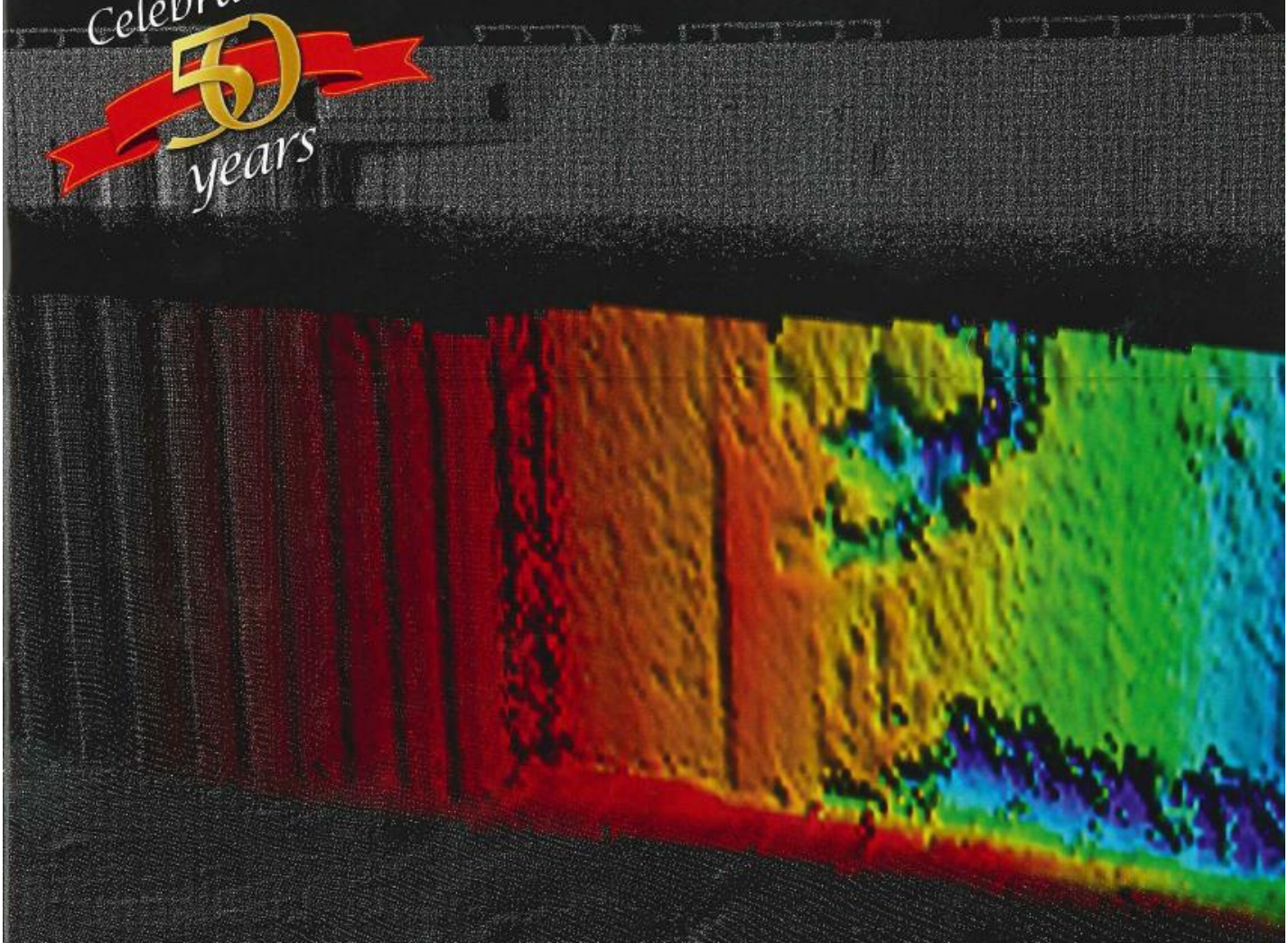
THE INDUSTRY'S RECOGNIZED AUTHORITY FOR DESIGN, ENGINEERING AND APPLICATION OF EQUIPMENT AND SERVICES IN THE GLOBAL OCEAN COMMUNITY

SEA TECHNOLOGY

MARCH 2013
SINGLE ISSUE PRICE $4.50
www.sea-technology.com

WORLDWIDE INFORMATION LEADER FOR MARINE BUSINESS, SCIENCE & ENGINEERING

Celebrating 50 years



ELECTRONIC CHARTING
VESSEL MANAGEMENT
PORTS & HARBORS
DREDGING
HOMELAND SECURITY

VGP Links Environmental Stewardship to Long-Term Industry Growth—*Mark Miller*

Mark Miller is the CEO of Terresolve Technologies, a company based in Mentor, Ohio, that provides nontoxic, biodegradable lubricating products. Miller received his bachelor's in chemical engineering from Tufts University and has an MBA from Manhattan College. He has engineered, sold and marketed lubricants and lubricant additives for more than 20 years.

Under the Draft 2013 Vessel General Permit (VGP) and Small VGP, EPA will require vessel owners and operators to adopt environmentally acceptable lubricants (EALs) into their operations to further reduce their environmental impact starting in December 2013. This regulation brings a twofold benefit to the industry by boosting the bottom line of both small and large vessel operations, while engendering positive change that ensures the preservation of ecosystems in which these vessels operate.

The wording of the 2013 VGP is purposefully broad. Vessels, as referenced in the 2013 VGP, cover "every description of watercraft or other artificial contrivance used as a means of transportation" on U.S. waters. The 2013 VGP affects any vessel owner or operator whose business depends on traveling through U.S. waters. The language of the regulation points specifically to "oil-to-sea" interfaces, which includes mechanisms such as thrusters, stern tubes, azipods, ramps, watertight doors and many others.

Every vessel that does not currently use EALs in all oil-to-water interfaces will experience incremental costs associated with phasing in environmentally acceptable products, but in the scope of yearly vessel operations, the increase is negligible.

EPA upper-bound projections estimate a 120 percent cost increase and their lower-bound projections estimate an increase of 50 percent for an average annual increase of $555 to $1,111 per vessel. Of course, depending on a vessel's lubricant consumption rate and the type of EAL selected, costs will vary.

To put these cost increases into perspective, Nordic American Tankers (Hamilton, Bermuda), a major international tanker company, announced net voyage revenue per vessel per day of $16,200 in its second-quarter 2012 report. Using the high-end estimate from EPA of the annual costs of phasing in EALs to tank barges and tank ships, it would take slightly more than one hour of voyage time per vessel to recoup these costs.

For a lubricant to be considered an EAL, it must be biodegradable and nontoxic. Technically, all lubricants are inherently biodegradable, meaning they will biodegrade eventually, but they can be toxic and persist much longer in the environment than their readily biodegradable counterparts.

Readily biodegradable lubricants meet the Organisation for Economic Co-operation and Development's guidelines for biodegradability, breaking down at least 60 percent within the first 28 days and reaching the 60 percent level within 10 days of reaching the 10 percent level (10-day window criterion).

Currently, there are four categories of EALs that vessel owners and operators can choose from: triglycerides, polyglycols (PAGs), synthetic esters and synthetic biopolyolefins.

EPA estimates that EALs from vegetable sources are 10 percent to 50 percent more expensive than conventional lubricants and also noted that synthetic-based lubricants tend to be significantly more expensive than mineral-based lubricants (two to four times more expensive).

In terms of application, vegetable-based EALs demonstrate lower performance metrics and usable life spans when compared to synthetic alternatives. Vegetable-based EALs have an upper temperature threshold of only 180° F and tend to break down when mixed with water. Perhaps most importantly, the expected change-out time for vegetable-based EALs is 1,000 to 2,000 hours.

PAGs tend to be highly toxic and demonstrate less effective performance than other EALs. In addition, PAGs take years to biodegrade, which makes for a poor investment compared to readily biodegradable fluids.

Biopolyolefin synthetics have an upper temperature threshold of 400° F, are water-resistant and last 10,000 to 15,000 hours or more. Even though synthetic products can cost up to four times more than vegetable-based products, they last 10 times longer, while performing at the same level as conventional, mineral-based lubricants.

Overall, biopolyolefin fluids are the optimal choice for complying with the 2013 VGP regulations, maintaining peak performance of vessel systems. In addition, these lubricants are readily biodegradable, which helps to mitigate cleanup and remediation costs following leaks and spills.

Based on the low capital requirements needed to phase in EALs to oil-to-water interfaces, the use of environmentally acceptable lubricants produces significant returns by reducing cleanup and remediation costs on fluid spills and leaks. Initial cleanup and containment efforts will always be costly to extract as much of the leaked fluid as possible.

However, long-term remediation (continuing action to control lingering environmental effects like chemical toxicity and sheening) represents about 60 to 70 percent of spill containment costs that involve conventional lubricants and oils. The remediation schedule of EALs as compared to conventional lubricants is a matter of weeks versus a number of years.

Noncompliance will bring penalties and fines that vary depending on the severity of the case. EPA grants enforcement authority to the U.S. Coast Guard (USCG), which will assist EPA in upholding the statutes in the 2013 VGP.

The Draft 2013 VGP's focus on proliferating environmentally acceptable lubricants across the industry helps preserve fragile ecosystems in American waters and offers vessel owners and operators a significant return on a marginal up-front investment. EPA is still reviewing public comments regarding the Draft 2013 VGP and will take them into consideration before finalizing the 2013 VGP. The full draft is available at http://1.usa.gov/WoUNg1. ■