



MAXIMIZING HIGH-LEVEL PERFORMANCE AND RISK REDUCTION IN THE MARINE INDUSTRY

RSC ENVIROLOGIC® CASE STUDY WITH NOBLE DRILLING AND NATIONAL OILWELL VARCO



Performance and risk reduction are two criteria with continued importance in the marine industry, especially when it comes to selecting equipment lubricants.

Performance is a must-have for a wide range of components to function properly, while on the environmental front, risk and liability, regulatory oversight and changing corporate mindsets are providing an opportunity for enhanced sustainability.

Marine applications contain a variety of equipment and machinery that require lubricants, oils or greases.

“THE ENVIROLOGIC SERIES HAS BEEN DELIVERING HIGH-LEVEL PERFORMANCE AND ENVIRONMENTAL STEWARDSHIP IN COUNTLESS SYSTEMS AROUND THE WORLD, AND NOW WITH NOV’S APPROVAL, COMPANIES CAN HAVE EVEN MORE CONFIDENCE TO UTILIZE THESE PRODUCTS.”

The list includes deck hydraulics (winches, cranes, ring line and pipe handling), stabilizers, bow thrusters, stern tube and continuous pitch prop, stern and elevator ramps, water-tight doors and even anchor

equipment. Each of these equipment types tests the performance and sustainability of lubricants. Determining which fluids deliver that performance and sustainability was the mission for three companies in the marine drilling industry.

BACKGROUND

Over the years, many drilling contractors have learned about environmentally friendly functional fluids by trial and

error—sometimes resulting in significant equipment and maintenance costs. When dealing with hydraulic fluids, Noble Drilling's goal to reduce its potential exposure to lubricant leak and spill risks without adverse impact to assets led them to partner with original equipment manufacturer National Oilwell Varco (NOV) and sustainable fluid manufacturer RSC Bio Solutions.



Noble is a leading offshore drilling contractor for the oil and gas industry. Noble performs contract drilling services with a fleet of 79 offshore drilling units (including three ultra-deepwater drillships and seven high-specification jackup drilling rigs currently under construction). Noble has operations worldwide, including in the U.S. Gulf of Mexico and Alaska, Mexico, Brazil, the North Sea, the Mediterranean, West Africa, the Middle East, India, Malaysia and Australia.



National Oilwell Varco is a worldwide leader in the design, manufacture and sale of equipment and components used in oil and gas drilling and production operations, the provision of oilfield services and supply chain integration services to the upstream oil and gas industry.

RSC Bio Solutions is a leading provider of high-performance chemistries that are safer, non-hazardous and environmentally responsible, including readily biodegradable*

RSC EnviroLogic® functional fluids and oils that have been tested and proven in some of the most challenging environments possible..

CHALLENGE

A number of challenges were faced by these partner companies. The first hurdle to overcome was the ambiguous terms used to describe fluid products—environmentally friendly, eco-friendly, green, biodegradable, inherently biodegradable, readily biodegradable, biobased, renewable and recycled.

All of these terms can be used in unquantifiable ways, so it became necessary to review and utilize accurate definitions and standards to provide measurable information for testing and use in equipment.

The lack of guidance and actual field testing with hydraulic component manufacturers was also a problem. Environmental oil manufacturers often independently perform standard, generic industrial testing, but not in conjunction with hydraulic component or equipment manufacturers. After internal tests, the oil manufacturers issue a letter stating the products meet a specific equipment company's requirements. Such a letter implies an actual endorsement, even though the equipment company was not actually involved in the actual testing.

Another challenge for this new partnership was that not all environmentally friendly oils are created equal. Environmental conditions and storage of fluids can affect the performance of certain types of environmentally friendly oils. Exposure to heat or warm ambient temperatures and humidity can also cause problems.

*ASTM 5864 and ASTM D7373 compliant

Quality assurance policies of lubricant manufacturers can also impact lubricant field performance.

Finally, there is a general lack of standardized acceptance for environmental products by coastal state regulatory entities. This affects not only the regulations concerning fluid use, but also corresponding remediation requirements should a spill occur.

SOLUTION

As the interest and demand increases for reduced liability and exposure related to offshore hydraulic applications, equipment and fluid manufacturers are starting to work together. This solution and cooperation between Noble Drilling, National Oilwell Varco and RSC Bio Solutions led to the development of testing methods. After assessing the relative hydraulic fluid performance specifications from six major hydraulic system manufacturers and ASTM methodology, it was apparent that different manufacturers had different requirements for lubricants, and the testing had to be tailored accordingly.

The testing process included numerous filterability, wear performance, compatibility, cold weather cycling, pressure differential and viscosity analyses. Tests were run internally by the partner companies, as well as with filter companies Parker and HYDAC since industry standard solutions did not always exist. Afnor standardized testing was utilized along with other outside research by Southwest Research Institute in San Antonio, Texas, and the Texas Institute of Science in Richardson, Texas.

Identifying and testing various kinds of ISO 6743-4 hydraulic environmental (HE) series

fluids against the specifications allowed Noble, NOV and RSC Bio Solutions to determine the best type of fluid solution to meet not only the environmental requirements and definitions, but also the mandatory performance in terms of equipment manufacturers' specifications.

The fluids reviewed included petroleum-based, synthetic esters (HEES) and polyalphaolefin-based (HEPR) fluids.

RESULTS

The range of applications and working conditions for environmentally friendly hydraulic fluids continues to expand. These



partner companies now have a standard methodology and testing to share with others in the industry. While the industry still has a need for a holistic and comprehensive standardized testing suite, the foundation has been laid by these three industry leaders.

After the testing concluded, the results clearly showed that HEPR fluids provided the defined environmental and technical performance.

Specifically, RSC Bio Solutions EnviroLogic® series of fluids were approved for use on all NOV crane and winch products, including all legacy AmClyde™, BLM™, DRECO™, Hydralift™, Molde™, National™ and Unit™ brand crane and winch products.

“The wide range of testing conducted with NOV and Noble proved once again what we have seen in the field for many years—that our readily biodegradable RSC EnviroLogic fluids deliver the same performance as top-tier commercially available petroleum-based fluids,” said Mark Miller, executive vice president of marine sales, RSC Bio Solutions. “The RSC EnviroLogic series has been delivering high-level performance and environmental stewardship in countless systems around the world, and now with NOV’s approval, companies can have even more confidence to utilize these products.”



ABOUT RSC ENVIROLOGIC® HF HP SERIES†

Well suited for marine applications, the RSC EnviroLogic® HF HP Series is a high-performance line of readily biodegradable hydraulic fluids. These products can perform in extremely high-temperature (250° F), low-temperature (-40° F) and high-pressure (5000+ psi) applications. Formulated from readily biodegradable low-toxicity base stocks that afford exceptional oxidation and thermal properties, the RSC EnviroLogic HF HP Series of products is ideal for demanding hydraulic systems operating in environmentally sensitive areas, like marine transport and other offshore oil and gas applications.

The fluids exhibit enhanced wear protection, cleanliness and longer life than conventional petroleum hydraulic oils, while meeting ISO and SAE grade specifications. RSC EnviroLogic HF HP Series products are direct replacements for a broad range of ISO/SAE grades of petroleum-based hydraulic fluids and reduce environmental impact in the event of a leak or spill.

†Previously EnviroLogic® 3000 Series

For more information about RSC Bio Solutions, visit us at rscbio.com or call +1 704.684.6100.



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