

MARINE TECHNOLOGY

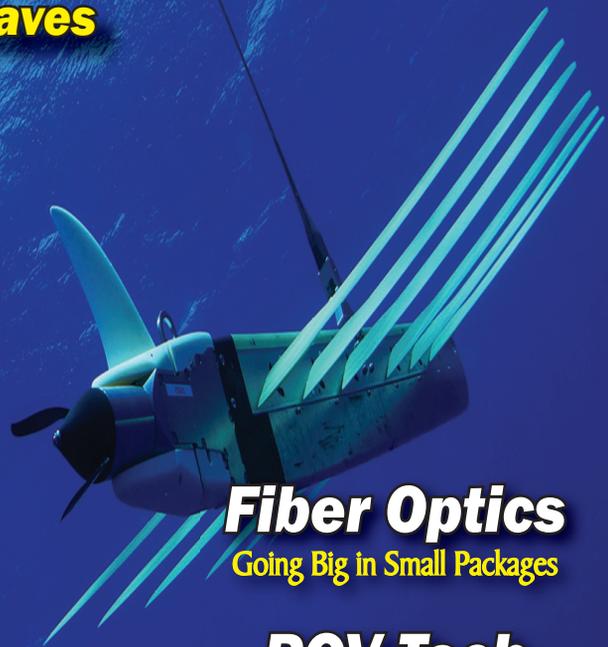
September 2014

www.marinetechologynews.com

REPORTER

Ocean Observation

Keeping Watch Below the Waves



Fiber Optics

Going Big in Small Packages

ROV Tech

Deepsea Pipeline Repair

Clear to Hear

Advancing Digital Hydrophones



Innovative Solutions Mark *SWE's Heritage*

A proud and rich history of innovation and a laser focus on customer-driven solutions are the hallmark of SouthWest Electronic Energy (SWE), which is celebrating its 50th anniversary this year.

SWE's business philosophy remains constant throughout these five decades: partner with customers to meet their ongoing needs, with a focus on service and quality.

Industry pioneer Len Benckenstein, SWE's Chairman and CEO, has been at the heart of SWE since its founding, when he was a student at The University of Texas. In the earliest days, he learned the value of listening to his customers, at first guiding the company to meet the needs of Schlumberger for specific switches, and teaming up with customers such as NASA to deliver exact solutions. Later, he entered the Lithium battery pack business with solutions for Baker Hughes and others, fueling the horizontal and directional drilling oil and gas revolution. Continuing innovation has extended to Lithium-Ion technology with cutting edge battery solutions.

In recent years, he embraced the subsea industry's challenge to find advanced battery management options and in 2013 SWE

launched its breakthrough subsea ready Lithium-Ion battery products and solutions.

Founder Benckenstein praises SWE's employees and their expertise, as well as their commitment to service, quality, reliability and innovation. "Our customer has always been, and will continue to be, our focus. I learned how important it is to always listen to our customers and not just discover how to meet their specific needs but to exceed their expectations."

Battery System Solutions

SWE has a solid niche providing advanced technology that is the foundation of its innovative custom energy management solutions, particularly Lithium and Lithium-Ion battery technology for oil and gas and subsea applications.

After extensive research, development and testing, SWE successfully found a way to provide safe, long lasting battery power for deep subsea. Proven battery management solutions, in pressure tolerant tested subsea batteries, now enable AUVs and optically tethered ROVs to actually perform deep and remote oceanographic research.



- *Longer operating life for deep-sea oil and gas infrastructure electronics and lights, and high voltage, high power for electric motors to backup hydraulics*
- *Lighter weight and local instant electric power for ROVs*
- *Deeper divers and longer missions for AUVs*

Oil and gas customers appreciate that the SWE SeaSafe battery solution enables electric powered monitoring, sensing, propulsion, feedback control, and high power electric motor support, leading to more efficient, precise and reliable subsea operations.

Other subsea ready battery components introduced by SWE include the SWE SeaSafe Battery Case, a pressure compensation case designed to hold four SWE SeaSafe Modules with Parallel Integrator Isolators.

The “intelligent” battery management system has a unique suite of safety and reliability features. The SWE SeaSafe Observer, a PC-based health and status software-monitoring package, with a graphical user interface, supports the SWE SeaSafe products by easily displaying the status of the SWE SeaSafe modules and battery systems.

Successful Pressure Testing

The SWE SeaSafe Battery Module successfully passed 10,000-psi pressure testing, achieving yet another industry milestone for SWE. During several years of functional testing, eight separate pressure tests were completed, mainly at the Southwest Research Institute (SWRI), an independent research laboratory in San Antonio, Texas.

The extensive hyperbaric pressure test included nine complete pressure cycles between zero psi and 10,000 psi, while continuously performing battery charge and discharge. (10,000-psi enables a safe operating sea depth of 6,000 meters plus margin.)

Testing and certification for the SWE SeaSafe included international shipping safety certification by the Department of Transportation.

Battery cells, as well as battery modules, must complete HAZMAT certification for shipping, and the SWE SeaSafe mod-



SWE’s new battery solutions offer the ability of continuous monitoring, which ensures safer and more reliable operations. SWE’s new battery solutions are an asset for offshore oil and gas operators who need cost-effective solutions for making oil and gas more accessible.

“Meeting with our customers, we clearly heard that the subsea oil and gas deep-water field equipment industry needed battery solutions that deliver more electrical capacity at less weight and smaller size than the old technology of sealed lead acid (SLA),” said Leon Adams, VP of Sales. Older technology has limitations because it is heavier and larger and does not last the length of time needed for the current subsea conditions, he continued.

“The result of the groundbreaking work by our research and development team is SWE SeaSafe, our pressure tolerant battery solution that delivers breakthrough safety, reliability and configure-to-order flexibility for subsea vehicles and operations,” said Adams.

Advantages

The company maintains that SWE SeaSafe Lithium-Ion batteries deliver longer life and:

- *Four times more energy*
- *Six times more available energy at colder temperatures found in the seabed*
- *Eight times longer cycle life, leading to longer missions*
- *6,000 meters deep pressure tolerance*

SWE SeaSafe Lithium-Ion is safe and reliable:

- *Lithium-Ion does not outgas during charge.*
- *SWE uses smart, automatic, autonomous battery management in each battery module that is constantly watching, balancing, and preventing charging and discharging errors.*
- *SWE SeaSafe provides health and status reporting on demand.*

Adams explains that these wide-reaching advantages bring superior solutions to subsea applications:

ule is now certified.

Woods Hole Oceanographic Institution (WHOI) provided requirements' guidance and feedback on the SWE SeaSafe modules. Sea trials of WHOI's under ice arctic ROV and the SWE SeaSafe modules showed the modules met or exceeded WHOI's requirements. SWE is exploring other considerations for deployment of SWE SeaSafe modules by WHOI and other customers.

SWE, based in the Houston area, is included in the *Marine Technology Reporter's* top 100 (MTR100) emerging technology companies. The company holds many patents, with 10 specifically in its Lithium-Ion battery management systems.

"We believe it is an honor and a privilege to provide solutions to our customers," adds SWE's long-time leader, Len Benckenstein. "Many of our loyal customers have entrusted us with their business challenges since the 1960s and we value the confidence they have in our team."

SWE serves customers in oilfield services, seismic, pipeline inspection, medical, military, remote monitoring and process control, marine, solar renewable energy, telecommunications and homeland security. As SWE proudly moves into its next half century, Benckenstein and SWE's talented and steadfast team will continue to shape SWE's strong heritage built by a solutions-driven strategy and unparalleled customer service.

