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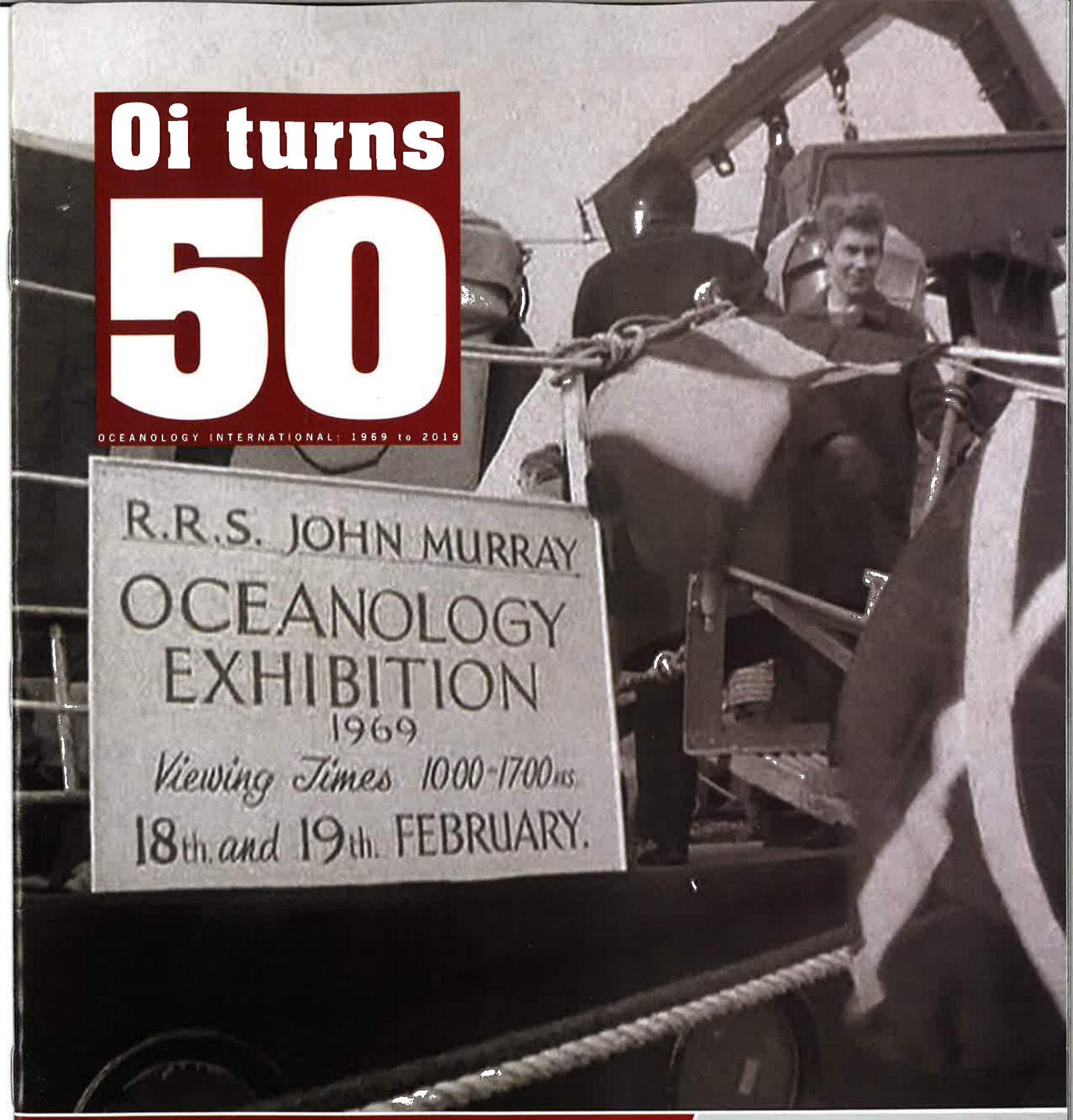
OCEANOLOGY INTERNATIONAL: 1969 to 2019



Oceanology International
Celebrates 50 Years as *the* Connection for Subsea Business & Technology

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Safely powering subsea operations

By Leon Adams, Vice President

Squeezing more power and lifetime out of battery packs has never been more important for subsea operations. Such operations, whether for underwater vehicles, subsea infrastructure, or long-term monitoring needs, are becoming smarter and more electric focused. Southwest Electronic Energy Corp's solution delivers a six-fold lifetime improvement on the previous industry standard of lead acid batteries at significantly less size and weight.

The newest battery packs for powering subsea vehicles also increase mission run time by up to four times compared to the same size lead acid batteries.

Going into the oil and gas industry's latest downturn, many electrical subsea operations were powered by umbilicals, but those can be costly and require significant lead time. At the same time, other subsea vehicles used sealed lead acid, which made them heavy and bulky, or batteries within 1 atmosphere pressure vessels, which can be expensive and heavy.

The industry has expressed an eagerness to do things differently and more efficiently, and as a battery packs pioneer, SWE continues to respond to those changing demands.

Working in conjunction with Woods Hole Oceanographic Institution in Massachusetts, SWE developed the SeaSafe pressure-tolerant lithium-ion polymer subsea battery pack, which went to market in 2013.

The original SeaSafe battery represented an efficient move away from the heavy sealed lead acid batteries toward using lighter, more powerful lithium-ion batteries, which take up less space and are easier to install.

The second generation SeaSafe II incorporated lessons learned, reliability improvements and American Bureau of Shipping (ABS) Certification. SeaSafe Direct, which can be placed directly into the water without requiring a pressure vessel, entered the market in 2017.

At its core, the SeaSafe II is powered by large lithium-ion polymer cells that are specially engineered into modules to provide 30V at 28Ah or other size options. The battery packs are able to operate in water depths to 6,000 meters. Multiple SeaSafe batteries can be hooked together to meet the voltage and power needs of various applications.

The batteries have been used in short duration, high power demand applications and long-duration low-power demand situations. Applications include autonomous underwater vehicles for propulsion, control, and instrumentation; in remotely located infrastructure equipment for valve control and pipe shearing; and in oceanography sensing set-ups such as those for monitoring the salinity and temperature of ocean water over a period of time.

The level of intelligence in these batteries is very new to the subsea world. Because of condition-based monitoring growing importance, these smart batteries can track and report the status of the batteries, which is crucial to reliable operations. Supporting this is the built-in user-friendly Battery Management System (BMS), patented by SWE.