



DYNAMIC POSITIONING CONFERENCE
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**Power Plant Management
Hybrid Power Systems**

Energy Storage Solutions deployed for DP vessels

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Abstract

The world's first semisubmersible drilling rig with ESS, and the world's first Jack-up rig with hybrid power plant, will be operational this year with a Siemens Blue Vault Energy Storage System™.

After several years' experience with marine installations, both with 3rd party supplied batteries, and Siemens own batteries (after establishment of factory in Trondheim in 2018), Siemens has, for the first time, introduced the Energy Storage technology to offshore drilling installations, significantly reducing the carbon dioxide and NOx footprint, fuel consumption and maintenance costs. The system also provides enhanced reliability and safety during drilling operations.

The criticality of DP operations and the strict requirements set by class have made it harder for hybrid technologies to break into this rather than other markets such as onshore installations. However, Siemens batteries, newly developed and specifically designed for marine and offshore applications have unique design features which have been the key to success in this difficult process.

This paper will touch upon these main features of Siemens batteries. "Active water cooling", "enclosed in arc proof cabinet", "tested for thermal runaway" are only a few of the key strengths that will be debated in the paper.

Further, to take the full advantages of an ESS in all relevant operational modes, advanced power electronic units for efficient system integration into any power grid is mandatory. The paper will discuss the options available for a variety of applicable power designs.

A hybrid power plant is not only about the means of energy storage, be it batteries, super capacitors, flywheel or fuel cells. The integration of the energy storage system into the power plant and its operation philosophy has a huge impact on the overall efficiency of the power plant. Not all hybrid systems are as robust or as reliable and not all provide the same degree of efficiency. This paper will outline the important aspects to take in consideration when designing a new hybrid power plant or retrofitting an old one. In particular, it will discuss some of the distinctive features of Siemens ESS solutions such as autonomy, reliability, guaranteed operational lifetime, modularity and minimal interfaces by optimized integration into any grid.

As for most of the modern electric and hybrid vehicles, new state of the art offshore hybrid power plants must keep the pace with the digital world. This paper will present the integrated standard ESS solution digitally prepared and condition monitored by SOGO Digital, which includes:

- Remote diagnostic System
- Condition based maintenance and condition monitoring
- Remote Power plant Operation Supervision. A way for onshore personnel or management to monitor remotely the Power plants performance, allowing:
 - verifications of preliminary saving calculations
 - continuous monitoring and optimization of actual plant operation.