

# ENERGY STORAGE APPLICATION IN DRILLING ENGINEERING



Can electric energy storage systems be used for drilling rigs? The work to develop electric energy storage systems for drilling rigs has been underway worldwide for the last 5 years, however, mainly targeting isolated offshore rigs.



Can electric energy storage be used for drilling based on electric-chemical generators? The article outlines development of an electric energy storage system for drilling based on electric-chemical generators. Description and generalization are given for the main objectives for this system when used on drilling rigs isolated within a single pad, whether these are fed from diesel gensets, gas piston power plants, or 6-10 kV HV lines.



Which rigs have energy storage systems for onshore drilling? The energy storage system developed for onshore drilling is among the world's first ones. As a foreign analog, only the project of the German rig manufacturer Bentec implemented in Oman can be highlighted. In 2017, the container-type 0.9 MW Bentec ESS with a storage capacity of 0.3 MW was put into trial operation on the KCA Deuteg T-94 rig.



Can energy storage systems improve energy efficiency of DPS-powered rigs? Based on average daily power consumption statistics and load diagrams for various rig operating modes at more than fifty pads equipped with DPS, it was proposed to improve the energy efficiency of individual DPS-powered rigs by introducing energy storage systems (Fig. 1).



Can ESS be used on drilling rigs? The total capacity of the rig power unit is 11.6 MW. The monthly saving of diesel fuel was 25%, and CO<sub>2</sub> emissions were reduced by 25%. In its basic specifications, this ESS was similar to the Australian Woodside Energy and ABB Ability ESS project. In the beginning of the article, feasibility of wide use of ESS on drilling rigs is substantiated.

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Why do drilling rigs need a permanent energy source? An energy source permanently integrated into the rig circuit will allow drilling contractors to compensate for voltage dips and surges, which will reduce emergency shutdowns and downtime of drilling equipment (Chervonchenko and Frolov 2020), minimize drilling hazards, and improve the DPS operation stability.



This series promotes and expedites the dissemination of substantive new research results, state-of-the-art subject reviews and tutorial overviews in the field of geoenery exploration and ???



This volume comprises the select proceedings of the International Conference on Materials for Energy Storage and Conservation (MESCC 2022). It aims to provide a comprehensive spectrum picture of the state-of-the-art research and ???

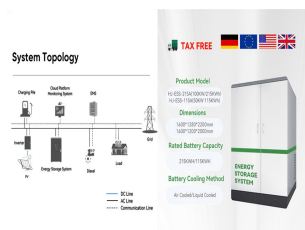


As a rapidly evolving technology, carbon capture and storage (CCS) can potentially lower the levels of greenhouse gas emissions from the oil and gas industry. This paper provides a comprehensive review of different aspects of ???



Abstract. This paper discusses applications for lithium-ion batteries in an offshore oil and gas environment and describes how battery packs/energy storage can be applied in ???

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This paper describes a study to evaluate the feasibility of adopting technology to reduce the size of the power generating equipment on drilling rigs and to provide "peak shaving" energy ???



Energy Storage and Applications is an international, peer-reviewed, open access journal on energy storage technologies and their applications, published quarterly online by MDPI. Open Access ??? free for readers, with article processing ???



This paper discusses applications for lithium-ion batteries in an offshore oil and gas environment and describes how battery packs/energy storage can be applied in hybrid, diesel ???

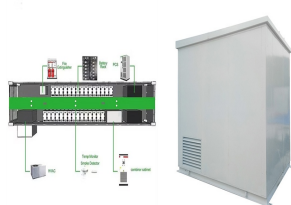


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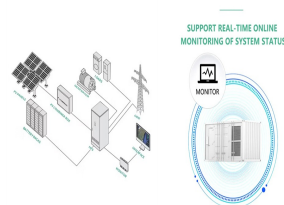


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The field of nanotechnology has shown promise in addressing major problems and improving drilling effectiveness. An overview of the difficulties encountered during oil and gas well drilling operations and the demand for ???



Most TEA starts by developing a cost model. In general, the life cycle cost (LCC) of an energy storage system includes the total capital cost (TCC), the replacement cost, the fixed ???



It is an effective approach for recycling the energy during the process of lowering drill string and casing to reduce the cost of the oil drilling rig lifting system. In the present work, ???



Foam-based drilling fluid application offers more advantages for drilling from both an operational and economic perspective: 1) Its ability to efficiently carry drilling cuttings from the wellbore to the surface ( Vaziri et al., ???



The primary focus lies on drilling rigs isolated within individual pads, which may be powered by diverse sources such as diesel gensets, gas piston power plants, or 6-10 kV HV lines. Analyzing the power operating modes of these rigs, the ???