

Can gravity energy storage improve the performance of a hoisting system?

This paper investigates an innovative energy storage concept which combines gravity energy storage (GES) with a hoisting device based on a wire rope with an aim to enhance the system performance. A sizing method was performed to determine the proper sizing of the hoisting system's components, mainly the wire rope and the drum.

Can a wire rope hoisting device improve the performance of gravity energy storage system?

This paper has investigated the idea of improving the performance of gravity energy storage system by the addition of a wire rope hoisting device to support the lifting of the piston. First of all, the appropriate size of the hoisting system's components was first determined. The type of the rope and the required safety factor were identified.

What is the energy capacity of GESH without a hoisting system?

Finally, the energy capacity of GESH has been found equal to 0.43 kWh; this is almost the double of the energy capacity of GES without a hoisting system. To validate the developed model, the experimental prototype developed by the University of Innsbruck has been used in this case study.

Are there different dry gravity storage methods based on hoisting methods?

In the same context, two different dry gravity storage based on hoisting methods was also proposed by Botha et al., namely the traditional drum winder hoist, and the ropeless hoisting method. This latter relies on the concept of a linear electric machine as hoist.

Does ABB manufacture or use mine hoists?

ABB has a long history with mine hoists, having first electrified one in Sweden in the 1890s. ABB manufactures or uses mine hoists according to Charles Bennett, Global Service Manager, Business Line Hoisting, ABB Process Industries.

Can disused mine shafts be used for energy storage?

Disused mine shafts can be repurposed for energy storage, filling a productive function for up to 50 years beyond their original lifetime. This can help mitigate decommissioning costs, create new job opportunities, and contribute to the green energy transition.

Modeling and performance evaluation of the dynamic behavior of gravity energy storage with a wire rope hoisting system. A Emrani, A Berrada, M Bakhouya. Journal of energy storage 33, 102154, 2021. 42: 2021: Intelligent energy management system for smart home with grid-connected hybrid photovoltaic/gravity energy storage system.

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By repurposing disused mine shafts for energy storage, mine shafts can fill a productive function for up to 50 years beyond their original lifetime, and can mitigate decommissioning costs, while simultaneously creating new job opportunities and contributing to the green energy transition. ABB is a leader in developing world-class hoisting ...

A simple and speedy boom assembly. The assembly of the LTM11200-9.1 boom on the job site can optionally be carried out with an auxiliary crane. By means of four special support jacks, the boom is lifted so that the low bed trailer can move off and the chassis of the LTM11200-9.1 can be positioned below the boom either to the front or to the rear.

Modeling and performance evaluation of the dynamic behavior of gravity energy storage with a wire rope hoisting system. A Emrani, A Berrada, M Bakhouya. Journal of energy storage 33, 102154, 2021. 46: ... Journal of Energy Storage 96, 112613, 2024. 1: 2024: 4 Economic and Optimal Analysis Sizing of Battery-Integrated Residential Systems.

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Modeling and Performance Evaluation of the Dynamic Behavior of Gravity Energy Storage with a Wire Rope Hoisting ... The literature [9] has reviewed GES technology and summarized eight types of current GES technology, as shown in Fig. 2, readers interested in this can refer to the literature [9,10].

The subject of the model research contained in this paper is an application of a motion energy-harvesting device on a crane-hoisting mechanism to power independent measurement devices. Numerical experiments focused on the selected motion energy-harvesting device (M-EHS) and its configuration properties in the context of energy-harvesting efficiency ...

Energy Harvesting in Mine Hoist Application Xiaofeng Yang 1, * ID, Piao Wen 1, Yao Xue 1, Trillion Q. Zheng 1 and Youyun Wang 2 1 School of Electrical Engineering, Beijing Jiaotong University ...

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The system uses a flywheel connected directly to the hoist motor drive as an energy storage medium. This cost-effectively improves network quality by reducing peak power demand, power sing and power demand

charge rate. The flywheel can also reduce the CAPEX and OPEX needed for a local power plant or enable full utilisation of the hoist when the ...

The subject of the model research contained in this paper is an application of a motion energy-harvesting device on a crane-hoisting mechanism to power independent measurement devices.

Battery Energy Storage System (BESS) is one of Distribution's strategic programmes/technology. It is aimed at diversifying the generation energy mix, by pursuing a low-carbon future to reduce the impact on the environment. BESS is a giant step in the right direction to support the Just Energy Transition (JET) programme for boosting green energy as a renewable alternative source.

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ABB has signed an agreement with UK-based gravity energy storage firm Gravitricity to explore how hoist expertise and technologies can accelerate the development and implementation of gravity energy storage ...

DOI: 10.1016/J.ENERGY.2017.06.029 Corpus ID: 115045808; Dynamic modeling of gravity energy storage coupled with a PV energy plant @article{Berrada2017DynamicMO, title={Dynamic modeling of gravity energy storage coupled with a PV energy plant}, author={Asmae Berrada and Khalid Loudiyi and Raquel Garde}, journal={Energy}, year={2017}, volume={134}, pages={323 ...

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This paper introduces super capacitor energy storage based modular multilevel converter (MMC-SCES) for mine hoist application. Compared with conventional MMC, the distributed super capacitor banks ...

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Photos. 1/5. Glass-coated tin nanoparticles, with the potential to be used in thermal energy-storage applications. Nanomaterials help researchers address challenges associated with strength, temperature regulation, advanced heat-transfer, and more. Photo courtesy of Western New England University. 2/5.

Then, proposes a sizing method to gravity energy storage with a hoisting system (GESH). In Section 3, we introduce a mathematical model of the most important hydraulic and electromechanical components of GES with additional wire rope hoisting system, for both the charging and the discharging modes. A case study, simulation results, and model ...

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