Energy storage system subway

Based on the same idea, the work presented in [14] optimizes the train timetable of subway systems with energy storage devices. Other interesting methodologies are presented in [15], where a ...

DOI: 10.1016/J.ENCONMAN.2011.11.019 Corpus ID: 109012849; Stationary super-capacitor energy storage system to save regenerative braking energy in a metro line @article{Teymourfar2012StationarySE, title={Stationary super-capacitor energy storage system to save regenerative braking energy in a metro line}, author={Reza Teymourfar and Behzad ...

Energy -- Efficient Operation in Subway Systems: Tracking Optimal Speed Profile with on Board Supercapacitor Energy Storage System June 2021 Indian Journal of Science and Technology 14(23):1914-1928

The on-board supercapacitor energy storage system for subway vehicles is used to absorb vehicles braking energy. Because operating voltage, maximum braking current and discharge ...

Benefiting from the dual function of energy-saving and voltage balance, OESD is being sought after by researchers . Recently, many energy storage-related technologies have been studied, such as flywheels, ...

In order to reduce the peak power of traction substation as much as possible and make better use of the configu-ration capacity of battery energy storage system (BESS) in urban rail transit, a ...

With the development of urban rail transit, the energy consumption and carbon emissions of subway operation are increasing. How to reduce the energy consumption of subway operation, lower costs, and carbon emissions has become an important issue to be addressed in the subway industry. Energy feedback and ground energy storage technologies, as two key technologies in ...

Improving the energy efficiency of transportation systems is essential for accelerating decarbonization. Integrating regenerative braking energy (RBE) in subway stations is challenging for power systems. The existing multimodal transport of electric bicycles and subways lends subway station energy storage resources to manage the RBE.

An energy storage system (ESS) in electric railways can be installed on a train, at trackside, or at substations. The main purpose of the ESS application is to reduce energy demand and peak power with good voltage regulation. This paper presents a control strategy for efficient regenerative braking of a vehicle equipped with an on-board ESS (OBESS) and evaluates the ...

Abstract: In order to reduce the peak power of traction substation as much as possible and make better use of the configu-ration capacity of battery energy storage system (BESS) in urban rail ...

The application of a stationary ultra-capacitor energy storage system (ESS) in urban rail transit allows for the recuperation of vehicle braking energy for increasing energy savings as well as for ...

This paper proposes a novel energy management strategy (EMS) of an onboard supercapacitor (SC) for subway applications with a permanent-magnet (PM) traction system, in which the flux-weakening operation is taken into account to minimize the copper loss. This paper proposes a novel energy management strategy (EMS) of an onboard supercapacitor (SC) for ...

TES systems are divided into two categories: low temperature energy storage (LTES) system and high temperature energy storage (HTES) system, based on the operating temperature of the energy storage material in relation to the ambient temperature [17, 23]. LTES is made up of two components: aquiferous low-temperature TES (ALTES) and cryogenic ...

The purpose of this facility would be to capture and reuse regenerative braking energy from subway trains, thereby saving energy and reducing peak demand. This chapter provides a ...

This paper aims to study how to mix energy feedback and ground energy storage technologies to achieve efficient collection and utilization of subway energy during operation. The research ...

The on-board supercapacitor energy storage system for subway vehicles is used to absorb vehicles braking energy. Because operating voltage, maximum braking current and discharge depth of ...

DOI: 10.1016/j.jrtpm.2018.03.003 Corpus ID: 264257712; Energy saving in metro systems: Simultaneous optimization of stationary energy storage systems and speed profiles @article{Ahmadi2018EnergySI, title={Energy saving in metro systems: Simultaneous optimization of stationary energy storage systems and speed profiles}, author={Saeed Ahmadi and Ali ...

The experimental results show that HESS could stabilize the metro voltage within a safe voltage of 580 V and achieve 100% braking energy recovery by optimal energy distribution between two different types of energy storage systems, which are only 79.9% and 39.2% in other single energy storage system by contrast.

The recovery of regenerative braking energy has attracted much attention of researchers. At present, the use methods for re-braking energy mainly include energy consumption type, energy feedback type, energy storage type [3], [4], [5], energy storage + energy feedback type [6].The energy consumption type has low cost, but it will cause ...

Benefiting from the dual function of energy-saving and voltage balance, OESD is being sought after by researchers . Recently, many energy storage-related technologies have been studied, such as flywheels, supercapacitors, hybrid energy storage systems, which can be divided into stationary energy storage devices (SESD) and OESD. Different ...

The introduction of flywheel energy storage systems in a light rail transit train is analyzed. Mathematical models of the train, driving cycle and flywheel energy storage system are developed. These models are used to study the energy consumption and the operating cost of a light rail transit train with and without flywheel energy storage.

The simulation results show that the supercapacitor bank based on power, capacity and discharge depth can meet the requirement of braking energy recovery for subway vehicles and the economic evaluation of the project shows that the project will achieve good social and economic benefits. The on-board supercapacitor energy storage system for subway ...

Objectives: To verify the energy efficiency operation of electrified trains on the certain metro line, in Vietnam by combining two solutions to recover regenerative braking energy with on-board supercapacitors and tracking the optimal speed profile.Methods: This study proposes an integrated optimization method: applying Pontryagin"s maximum principle (PMP) finds the ...

The on-board supercapacitor energy storage system for subway vehicles is used to absorb vehicles braking energy. Because operating voltage, maximum braking current and discharge depth of supercapacitor have a great influence on its rational ... the total number of the supercapacitors required for energy storage system can be obtained ...

Regenerative braking energy can be effectively recuperated using wayside energy storage, reversible substations, or hybrid storage/reversible substation systems. This chapter compares these recuperation techniques. ... As an illustrative case study, it investigates their applicability to New York City Transit systems, where most of the ...

This paper proposes a coordinated energy management strategy of onboard energy storage system. By receiving the charging threshold of the wayside energy storage system and the ...

At this time, the remaining regenerative braking energy is directly absorbed by the on-board ESS to stabilize the voltage at the threshold. When the train is traction, when the voltage of the traction network drops to the discharge threshold of the energy storage system, the energy storage system releases the stored energy for train operation.

The paper suggests a control technique for improving energy saving in metropolitan trains equipped by energy storing devices. The most important feature of time scheduling of train"s movement in traction systems, is on time and satisfactory transportation of passengers, it can be shown that the consumed electrical energy could be optimized by proper design of trains" ...

The wayside energy storage system has been widely used in the subway, but it cannot solve the "regeneration failure" problem. Therefore, an implement using onboard energy storage system to replace onboard braking resistor is proposed, which has the potential to eliminate the "regeneration failure" problem. This paper

proposes a coordinated energy management ...

The paper deals with the actual theme of power management in traction systems presenting a study about the use of regenerative braking energy in electric subway transportation. Storage systems on board of the vehicles or on fixed plants can give advantages both to contain the costs of the electric power and to limit power losses along the traction line. ...

With this consideration, this paper particularly investigates a train timetable problem in a subway system, which is equipped with a series of energy storage devices at ...