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ENERGY STORAGE & ENERGY MANAGEMENT SYSTEM WITH POWER ELECTRONICS

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ABSTARCT:

Electrical vitality stockpiling has a critical part to play in enhancing the execution of electric drive frameworks later on. This paper proposes another topology of energy gadgets and power hardware incorporated with vitality stockpiling framework and unit venture. This structure diminishes weight what's more, segment number contrasted and the topology of the to begin with, yet at the same time permits the utilization of standard machines. Vitality reserve funds and expansion framework offers full size. Concentrate on the vehicle framework consolidates year class dark city cable car, and it appears to be obvious to the point that you can accomplish vitality funds by utilizing vitality stockpiling seriously with the proposed structure. The proposed greatest vitality accessible amid stopping mechanism relies upon the active vitality and along these lines the speed what's more, heap of the cable car. The genuine vitality that can be acquired is a component of the more complex, contingent upon the level of energy what's more, stockpiling framework vitality, time and work, obviously, driving a vehicle amid ordinary braking and speed, and which employments the vitality and adjust vitality recouped to conquer mechanical misfortunes.

INTRODUCTION

With the developing accentuation on the disposal of coal on the planet economy what's more, the accomplishment of works of security, vitality and open transport to charged progressively essential part in the public eye. Contrasted and the methods for individual transportation, and give a considerable measure of vitality what's more, open transport check, particularly at top circumstances of travelers. What's more, you can accomplish carbon investment funds of others previously power lattice to permit sustainable power source furthermore, low carbon to give the main impetus. The vitality expended all through the jolted this framework can not be lessened assist by introducing vitality stockpiling frameworks (ESSS) on board the vehicle. vitality stockpiling gadgets can be utilized to renew vitality amid braking, vitality and other brake resistors or waste mechanical braking. This vitality would then be able to be reused. Vitality is put away on board the air ship utilizing capacitors electric twofold layer framework (EDLC) it is one of the promising ways to prevent failure of renewable energy rolling tools. Energy storage devices, the transformer loading / unloading and continued the main source of DC power.

II. VIABILITY ENERGY STORAGE

This technology has a long history. Build train stations in central London with the rise, this means that the trains had to climb the gradient entering the station and when he reached the station. This form of low energy loss from a small shop. Modern technology today can be more effective. The study showed that demand for energy storage in the race LRT west coast of the United States system and provide the potential energy of 23%. Financial considerations to emphasize the benefits of reducing electricity demand during the summer, although this depends on the customs and traditions of energy tariffs. But, however, the search engines and electric-powered vehicles have been shown to achieve maximum approach to storage systems accrue interest and added to reduce excess weight. The maximum power available during brakingIt depends on the kinetic energy, and thus the speed and load tram. The actual consumption of energy that can be collected in a more complicated job, according to the power system and storage of rated power, working time driving a cycle trolley through the natural course and braking due to energy balance and found the energy used to overcome mechanical losses. For this study, the braking force personnel and vehicles in

the long tram typical audience Blackpool to use the transport system of the actual unit (measure) and the data cycle as part of this research project. And to determine the effect on engine through simulations using the

integration of the electrical system of the cycle and the mechanical effects and tram motor model cycle. Media experiments to validate the model of the nature of the process of energy storage in situ without city trams and trolley class C (low cost and high efficiency concept car under development). By applying function saturation braking force personality, limiting the ability to sort the conversion, then the combination of the braking force on the engine cycle, the energy captured using the adapter specific power can be found. Note that this is due to planning Blackpool tram, and plenty of long tram "Costa also short brake Motor / / Cycles. Choose a point on the curve where Flatten slots allow conversion to be selected catches and there is enough energy available. Choose two options to consider. The first is the conversion of 50 kW, 3.1 MJ potentially allowing braking energy to be captured during the session. This solution reduces the size of the opening to ensure that a large proportion of the braking energy available for collection. 100 kW The second option, which allows more energy to be arrested relationship, is also considered.

A. choose energy storage

B.

Traction and durability is critical in that the energy storage traction application is to leave whenever he starts the car and stopped, and this could be equivalent to hundreds of times a day, it is essential that the energy storage device due to the load

approval -Discharge cycle deterioration is minimal. It should be possible maintenance requirements lower level. It should also be high energy and power density, but the severity of the task is less important. Storage devices intense energy meet these needs. As

the moving parts, which increases reliability and density mobile applications. In the ensuing discussion, too, capacitors can be used to store energy, and therefore must convert electricity to communicate very intensely remaining source system (DC). To discuss the design and details of the decisions of the city during class service will use the tram in Blackpool tram.

III. POWER MANAGEMENT

During braking, and should benefit as much as possible of the braking force is the maximum stored in the ultra capacitors. Braking energy dissipated not stored by the energy storage device in the braking resistors. However, only the energy stored by the

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energy conversion device and energy storage is needed It is the highest level of effort beyond that is not allowed. Typically, operating systems convert Do not allow ultracapacitors keep operations fall below the minimum effort: input voltage range for several reasons. Little extra energy is free to low voltage three-quarters of the energy available in the upper half of the voltage range. And extracting energy at the same speed requires more energy at lower voltages. Therefore, when the voltage ultracapacitors is less than the minimum of effort, which provides traction completely provide traction. The analysis shows that 40% of the energy used by dissipated in the

braking of the vehicle. This potential to be used to charge the energy storage device power. Also be a device for storing energy loss and, therefore, are not braking energy calculation does not represent the potential to save energy.

IV. ADAPTER CHOOSING PRE-ART

While both sides of the solutions of the track and of the table, it is possible, after the energy storage units in the tram will put next solution to this problem is a feature. When several trams operate in the same part of the network, and to increase the storage capacity of domestic energy if each storage TRAM maintains itself and installing energy storage devices in the car that is not a new idea. Yverdon girobús development began in 1945. He worked for the wheel of the bus, which was a traditional generator. Flywheel assembly load in three aspects periodically point. And the need to girobús complex system, consisting of three interconnected motors through reduction gears. All cars can run on two different electrode configurations, giving an effect six engine and transmission speeds of the different geological covering the required speed. Such a mechanically complex system and perhaps undesirable led to the development of a limited Jaro- BUS

SIMULATION MODEL OF THE PROPOSED SYSTEM WITH PV CELL:

The simulation circuit of simplified
power converter for integrated traction energy storage using PV cell for mixed mode operation is shown in fig 6.15.When pulses are given to traction inverter and energy storage source inverter then it is known as mixed mode operation.

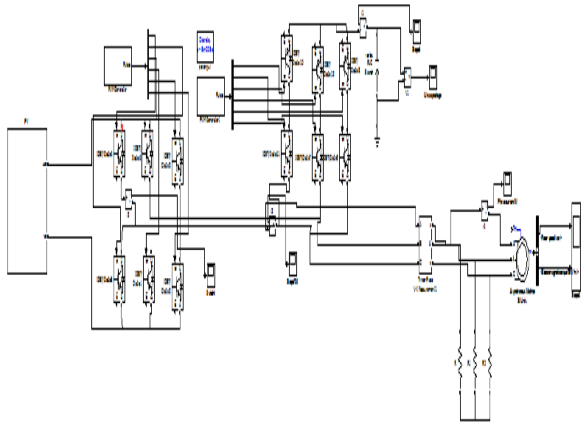

Fig 6.15 Simulation circuit of the proposed mode

The waveform of current across switch 1 for mixed mode operation using PV cell is shown in fig 6.16.The pulses are given to the traction inverter and the current across switch1 is a square wave.

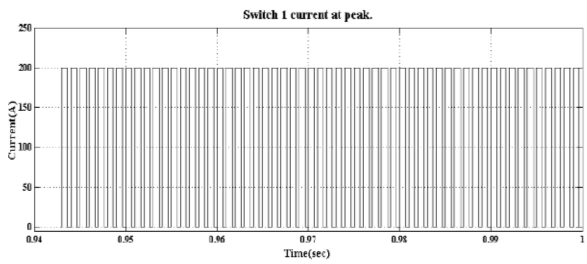

Fig 6.16 Switch1 Current

The waveform of current across switch 7 &8 for mixed mode operation is shown in fig 6.17.The pulses are given to the energy storage source inverter and the current across switch 7 & 8 is a square wave.

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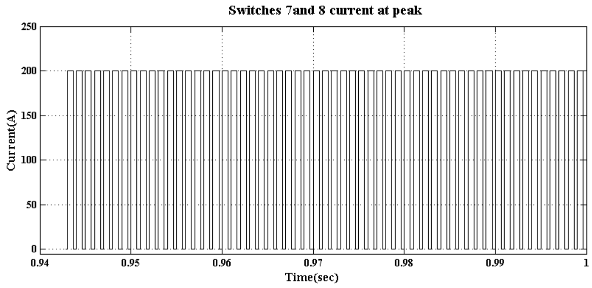


Fig 6.17 Switch 7&8 Currents.

The waveform of capacitor voltage for mixed mode operation is shown in fig 6.18 and it is maintained at a constant voltage of 420v.

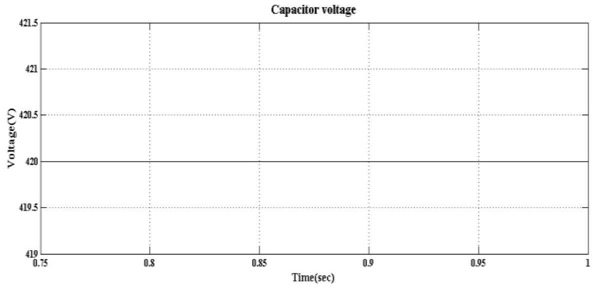


Fig 6.18 Capacitor Voltage.

The waveform of motor phase current for mixed mode operation using PV cell is shown in fig 6.19.

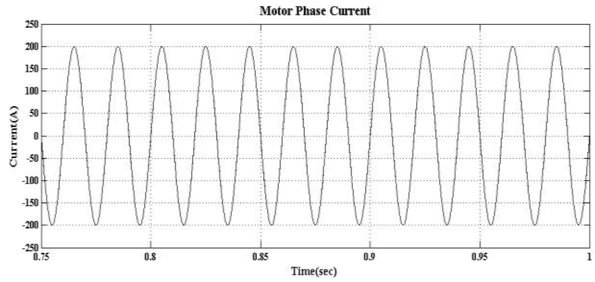
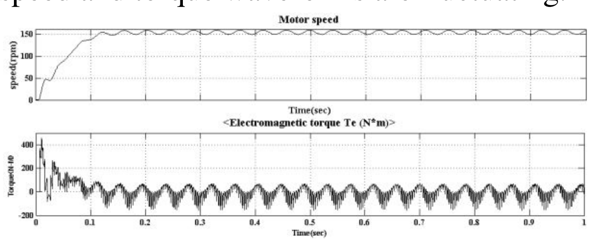


Fig 6.19 Motor Phase Current.

The waveforms of speed versus time and torque versus time is shown below fig 6.20. Depending up on the load conditions the speed and torque waveforms are fluctuating.



6.20 Speed and Torque Waveforms

CONCLUSION

This undertaking has displayed another converter topology for light rail footing. The Blackpoll cable car framework in the U.K. has been taken as an investigation case. It has been demonstrated that vitality stockpiling locally available each cable car can considerably lessen vitality utilize per kilometer. Another converter circuit has been given PV cell. It has been appeared that further vitality savings(30%) per kilometer can be accomplished with the novel converter rather than customary power gadgets topology. A diminishment of vitality utilization is along these lines natural and - in the not so distant future - efficient reason capable. It has been that ultra capacitor utilized is more productive at vitality cycling than batteries. Ultra capacitors are electrical vitality stockpiling gadgets, which offer high control thickness, amazingly high cycling ability and mechanical vigor. It has been demonstrated that this topology decreases weight and part tally when contrasted and past topologies. The recreation comes about are acquired utilizing MATLAB/SIMULINK programming.

REFERENCES

[1] ―Central London railway,‖ Engineering,vol. 65, pp. 214–216, 1898.

[2] L. Romo, D. Turner, and L. S. B. Ng,―Cutting traction power costs with wayside energy storage systems in rail transit systems,‖ in Proc. ASME/IEEE Joint Rail Conf., 2005, pp. 187–192.

[3] A. Jaafar, C. R. Akli, B. Sareni, X. Roboam, and A. Jeunesse, ―Sizing and energy management of a hybrid locomotive based on flywheel and accumulators,‖ IEEE Trans. Veh. Technol., vol. 58, no. 8, pp. 3947–3958, Oct. 2009.

[4] Y.-J. Lee, A. Khaligh, and A. Emadi, ―Advanced integrated bidirectional AC/DC and DC/DC converter for plug-in hybrid electric vehicles,‖ IEEE Trans. Veh. Technol., vol. 58, no. 8, pp. 3970–3980, Oct. 2009.
[5] M. Chymera, A. C. Renfrew, andM. Barnes, ―Measuring the performance of a centenary class tram on the Blackpool tramway,‖ in Proc. Power Electron., Mach. Drives Conf., 2008, pp. 645–649.
[6] Maxwell Technol., HTM Power Series 390v Datasheet.
[7] ―The Oerlikonelectrogyro—Its development and application for omnibus service,‖ Automobile Eng., vol. 45, pp. 559–566, Dec. 1955.
[8] S. Lu, K. A. Corzine, andM. Ferdowsi, ―A unique ultracapacitor direct integration scheme in multilevel motor drives for large vehicle propulsion,‖ IEEE Trans. Veh. Technol., vol. 56, no. 4, pp. 1506–1515, Jul. 2007.
[9] M. Yano, T. Mizumura, and A. Kuramochi, ―A study of energy storage systems for railway rolling stocks using transformers connected in series to motor windings,‖ in Proc. IEEE Power Convers. Conf., 2007, pp. 342–347.
[10] ALSTOM, The flywheel, a solution for energy conservation. [Online]. Available: http://www.transport.alstom.com/
[11] Bombardier, Bombardier Mitrac Energy Saver. [Online]. Available: http://www.bombardier.com/en/transportation/
[12] M. Steiner and J. Scholten, ―Energy storage on board of railway vehicles,‖ in Proc. IEEE 11th Eur. Conf. Power Electron.Appl., 2005.[CD-ROM].
[13] Railway Technology, Nice Tramway, France, 2009.
[14] M. Steiner, M. Klohr, and S. Pagiela, ―Energy storage system with Ultra- Caps on board of Srailway vehicles,‖ in Proc. Eur. Conf. Power Electron. Appl., 2007, pp. 1– 10.
[15] M. Steiner and J. Scholten, ―Energy storage on board of DC fed railway vehicles,‖ in Proc. IEEE 35th Annu.Power Electron. Spec. Conf., 2004, pp. 666–671.
[16] D. M. Fröhlich, M. Klohr, and P. S. Pagiela, ―Energy storage system with UltraCaps on board of railway vehicles,‖ presented at the 8th World Congr. Railway Res., Amberg, Germany, 2008.
[17] M. Meinert and K. Rechenberg, ―Providing travelers with a seamless journey in public transport,‖ presented at the 1st UITP MENA Congr. Showcase, Dubai, United Arab Emirates, 2007.
[18] Y. Taguchi, M. Ogasa, H. Hata, H. Iijima, S. Ohtsuyama, and T. Funaki, ―Simulation results of novel energy storage equipment series-connected to the traction inverter,‖ in Proc. Eur. Conf. Power Electron. Appl., 2007, pp. 1–9.
[19] M. Yano, T. Mizumura, and A. Kuramochi, ―A study of energy storage systems for railway rolling stocks using transformers connected in series to motor windings,‖ in Proc. IEEE Power Convers. Conf., Nagoya, Japan, 2007, pp. 342–347.
[20] M. Yano, T. Mizumura, and A. Kuramochi, ―A new energy storage systems for railway rolling stock using transformers connected in series to motor windings,‖ in Proc. IEEE Int. Elect. Mach. Drives Conf., 2007, pp. 112–117.