Regenerating the Energy from Building Lift

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ABSTRACT
Regenerative drives are another remarkable advancement in energy-efficient lift technology. They recycle energy rather than wasting it as heat. The intention of this specification is to set out the standards of the require for lift installations. All lifts shall be robust, reliable and shall meet the department users’ requirements and expectations. Lift installation must comply with all current regulations, including Building Regulations. The appointed Design Consultant will be responsible for traffic analysis to provide the most suitable lift solution, including items such as size of lift car, contract load, type of load and its associated safety features, speed, number of passengers, etc. Major Modernization is a reasonably straightforward exercise in that, with the exception of the lift may be possible to increase the lift speed which would reduce travel time between floors. However, this is governed by strict lift regulations and is only possible where the clear headroom at the top of the lift well and the pit depth at the bottom of the lift well are sufficient to allow this. The clauses in this part of the Specification cover all items which are generally standard in this type of installation, while the Particular Specification, covers the materials and method to be used in the Works, the General and Particular Specifications are to be read as one. Any conflicts shall be brought to the attention of the Contract Administrator. The following clauses apply equally to new lift installations, major modernization and refurbishments. Where existing installations do not comply with these standards they shall be brought up to date as far as is reasonably practicable. Any remaining sections of the existing installations that do not comply with this specification shall be highlighted and drawn to the attention of the Contract Administrator prior to completion.

Keyword-- Electrical Energy, Reciprocating, Rolling.

I. INTRODUCTION
Systems design and equipment shall be sure whenever mechanical energy is connected to the generator and the electrical energy will go through an initialization routine and saves in the battery minimal associated energy conversation. This can be used regeneration of electricity. Equipment shall be designed to achieve maximum economic utilization of energy/under full and part load operation. In the event of a power failure or whenever the lift is switched off, the controller will automatically restart on the restoration or re-connection of the power supply and cause the lift to move from its static position. When the lift encounters a floor with auto position reset, the floor value in the controller will be reset and normal lift operation will resume. The design and construction of the bedplate, raft, and steel supports shall be such that the true alignment of the equipment under all conditions is maintained. Roll pins shall be used in the feet of all components to maintain their alignment and position. The power developed by the motor shall be transmitted directly to the driving sheave which is to be located on the same shaft as the motor. The main shaft shall be supported on two large bearings that may be of the sleeve, roller or ball race type.

II. LITERATURE REVIEW
The machine room less lift is to utilize permanent magnet, synchronous gearless drive technology powered by a variable frequency inverter unit matched to the machine to deliver and control the necessary torque throughout the full speed range of the machine provided. All drive equipment is to be mounted in the lift shaft without the need for separate plant rooms. Where the control panel is required to be mounted outside of the lift shaft. Lift or elevator is transport devices that are used to move goods or peoples vertically. In this project, the microcontroller based lift control system is constructed to simulate as an actual lift in the real life. This project dissertation documents the findings and results of a research on a microcontroller based lift control system. It provides useful information to those who wish to carry out a lift control system research or project.

This paper presents Power Generation for
Permanent Magnet Motor Elevator by Energy Regenerative Unit (ERU). The study reveals that permanent magnet motors with rated 5.5 kW in elevators which is working by transferring mechanical energy into electricity when the motor is rotating without power therefore the motor is capable of producing electrical energy back into the grid system. This situation is call “Regenerative mode” which is the wasted energy can be used once again. This investigated ERU and inverter in this study can be applied for future use of in existing elevator system. The Proposed ERU is used to convert DC voltage to AC voltage for gird synchronization. The investigated ERU is operating as three-phase module. From experiment, it is observed that when the motor operates as a generator then ERU will receive DC voltage from the elevator inverter system then convert to AC voltage that can be fed into the grid system.

III. EXISTING SYSTEM PROBLEM IDENTIFICATION

In the present system arrangement the power generated due to the motion of lift is unutilized. The mechanical energy generated during the up and down motion wasted. To utilize the mechanical energy to electrical energy to generate power

1. OBJECTIVES
   • Analysis of present system.
   • Suggest the best possible gear arrangement system for the existing operation system.
   • To find the properties and analysis of power generation.
   • Cost reduction of maintenance for existing operation.

2. RESEARCH METHODOLOGY TO BE EMPLOYED
   • Design & analysis of lifts.
   • Analytical Calculations.
   • Analysis of power generation using
   • Result finds out using software.
   • Traditionally, electric traction lifts were equipped with DC motors due to their easy controllability, but the development of variable frequency drives led to the introduction of the now prevalent AC induction motors or permanent magnet DC motors. These drives provide excellent ride conditions, with smooth acceleration and deceleration and high leveling accuracy.
   • There are two main types of traction lifts: geared and gearless.

   III. EXISTING SYSTEM PROBLEM IDENTIFICATION

A motor and one or more generators, with their shafts mechanically, coupled, used to convert an available power source to another desired frequency or voltage. The motor of the set is selected to operate from the available power supply. The generators are designed to provide the desired output. The principal advantage of a motor-generator set over other conversion systems is the flexibility offered by the use of separate machines for each function. Since a double energy conversion is involved, electrical to mechanical and back to electrical, the efficiency is lower than in most other conversion methods.

V. ENERGY CALCULATION

Energy = Total work of lift system + Total standby losses
Where the total work of the lift system can be approximated by the total distances lifts (i.e. work = displacement*force) assumption is made based on the findings of the project that working lift energy consumption trip is dominated by the flat peak lift motion (up trip) and not of the short acceleration/deceleration windows challenge is then to find a method to estimate the whole lift system workload using relationship.

VI. POWER CALCULATION

Power Considerations, There is the transfer of power throughout the elevator system. Electrical power put into the motor:

\[ P = IV/\sqrt{2} \]

Where, \( V \) is voltage and \( I/\sqrt{2} \) is AC current source.

This power is then transferred through the output of the motor shaft: \[ P = T\omega \]

Where, \( T \) is the torque and \( \omega \) is the rotational speed.

VII. CONCLUSIONS

Various modifications of the disclosed embodiments as well as alternative embodiments of the invention will become apparent to persons skilled in the art upon reference to the description of the invention. It is therefore contemplated that the appended claims will cover any such modifications or embodiments that fall within the true scope of the invention.

REFERENCES

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