Service Priorities and Programmes

Electronic Presentations

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Lift Modernization in Hospitals – For Energy Saving and Greater Safety

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Introduction

Everything has its lifecycle. Even with the best care, a lift that has travelled thousands of kilometer, making hundreds of thousands of trips over several decades, may eventually need to be replaced or thoroughly modernized. As far as the lift system in a typical acute hospital is concerned, the energy consumption is generally considered to be about 2-5% of the building electricity use, and can reach as high as 10-20% during peak operational time (e.g. visiting hours). A well-planned lift modernization exercise does not only improve the safety and reliability of the lift system, it is also an investment that pays off in reduced energy costs.

Objectives

(1) To minimize energy consumption of the lift system; and (2) to enhance safety and level of comfort when riding a lift.

Methodology

There are over 50+ nos. of lifts in the Princess Margaret Hospital and it is not feasible to modernize all of them in one go. Therefore a scoring system comprises 2 stages of assessments was adopted to prioritize the lift modernization needs. In Stage 1 of the assessment, a site survey was conducted to assess the conditions of major components of the lifts as well as to collect key maintenance data such as lift age, fault frequency, etc.. In Stage 2 of the assessment, a risk weighting factor was assigned to each installation by assessment of the consequence of the service outage of the installation. The scoring result for each lift installation was obtained by multiplying its Assessment Marking (Stage 1) and Risk Weighting factor (Stage 2). Besides, a Measurement and Verification (M&V) plan was also developed to verify the actual energy saving after the lift modernization work.

Result

In the exercise, Permanent Magnet (PM) synchronous motors, which are more compact and offer higher efficiency and smoother speed control, were adopted. In addition to the use of Variable Voltage Variable Frequency (VVVF) driving system, Energy Regeneration (ER) system and other energy efficient provisions, such as LED lighting, switching off the car lighting and car fan when the lift is not in use, etc. the

energy consumption of the modernized lift was reduced from 19,892kWh/lift/year to 9,151kWh/lift/year, there was an overall energy reduction of approx. 54%. From safety and level of comfort point of view, the highly reliable motor control system improved the ride comfort, with smooth acceleration/deceleration and highly accurate car leveling technologies. The renewed braking system ensured a comfortable, safe, quiet ride, while also minimizing noise transferred to the surrounding areas. The total no. of lift breakdown cases was reduced over 60% after the modernization work.