



# LIFT &



# 電梯通訊

# ESCALATOR NEWSLETTER

## Feature Article

## Applying Modular Integrated Construction (MiC) and Multi-trade Integrated Mechanical, Electrical and Plumbing Technologies (MiMEP) to Lift Construction

The lift and escalator trade has been proactively applying advanced technologies, such as the AC motor drive with variable voltage and variable frequency controller (ACVVVF), destination control system (DCS), etc., to bring quality experience to and create value for passengers and clients. In recent years, the Modular Integrated Construction (MiC) and Multi-trade Integrated Mechanical, Electrical and Plumbing (MiMEP) technologies have flourished and developed rapidly in the construction industry. The lift trade has also begun to adopt these new installation methods. In the MiC and MiMEP technologies, an innovative approach called Design for Manufacture and Assembly (DfMA) is adopted for construction components. According to the information provided by the Construction Industry Council, DfMA is a proactive design approach which focuses on the ease of manufacture and efficiency of assembly. It enables off-site manufacture of high-quality construction components and efficient assembly of the components on site to enhance productivity, safety, quality and the working environment.

In 2022, the MiC/MiMEP lift technology was first adopted in a residential project consisting of two storeys of podiums and eight storeys of residential units in Sha Tin. The MiC/MiMEP lift included a lift shaft and a machine room. Efficient and effective installation of the lift was achieved through the combined use of (i) MiC for the lift shaft with (ii) MiMEP technology for the machine room, together with the adoption of building information modelling (BIM) for meticulous preparation of the module structure drawings, planning of the transportation and assembly of electrical and mechanical (E&M) equipment.

### Pioneering MiC Lift Shaft Enhances Safety

Traditional lift installation will not commence until the construction of the entire shaft is completed, but the MiC lift shaft has made a trendsetting breakthrough. The manufacturer would pre-build the lift shaft modules in a factory, and then transport them to the module site for installation of prefabricated metal and electrical components. After completion, the modules would be packed in waterproof materials and transported to the construction site. At the design stage, the engineers had already prepared the adjustable cast-in channels for guide rails and the channels could be shifted relative to the tolerance of the modules. They had also installed a suspension system and a safety top cover at the top of the

lift shaft. After the shaft modules are assembled on site by the construction contractor, workers can carry out the remaining processes (such as installing rails and joints, laying cables for the shaft, installing the car, etc.) with a guide gondola, thus dispensing with the need for workers to climb up and down inside the lift shaft, greatly reducing the risk of working at heights and further safeguarding the safety of workers.



An MiC Lift Shaft

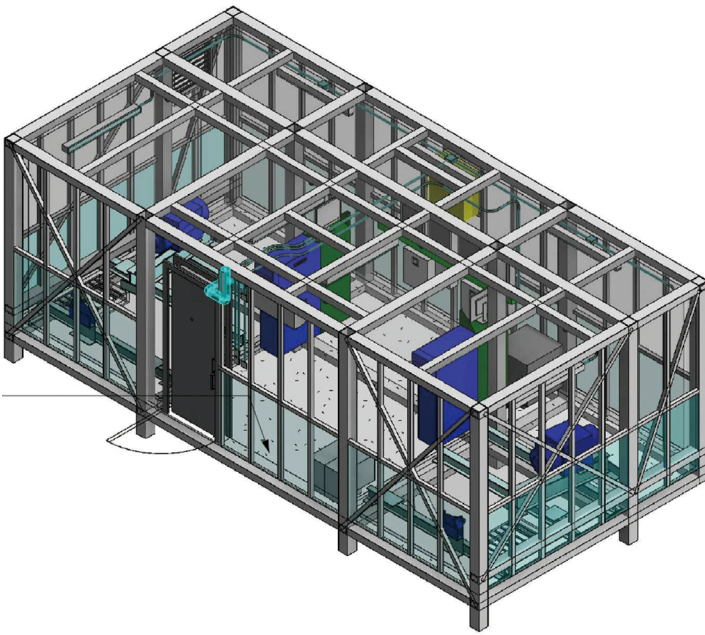
### MiMEP Lift Machine Room Saves Installation Time and Improves Site Environment

Installation of a traditional lift machine room requires formwork erection, bar fixing, concrete pouring, etc. to be carried out on site after a building is topped out. With the adoption of MiMEP technology, the above processes can be skipped. Workers would pre-install lift components, including the main frame, traction machine, overspeed governor, controller and electrical equipment, in a machine room module at the assembly site. Other E&M equipment such as exhaust fans,



fire service installations and power supply installations can be pre-installed in the machine room module as well. Then the machine room modules would be packed in waterproof materials, fixed securely and transported to the construction site for assembly at the top of the lift shaft with a large crane. Workers only need to carry out simple procedures such as fine-tuning the positions of the frame and overspeed governor and connecting the main power supply, thereby greatly reducing the installation time on site.

Furthermore, in the past, most of the work processes (such as welding, bar fixing and concrete pouring) had to be carried out on site, which would make the site dusty and undesirable especially in the summer time when workers had to work in a hot and stuffy environment, and thus some young people might be discouraged from joining the construction industry. The MiC and MiMEP technologies enable the construction process to be carried out in an off-site factory rather than on site or at the roadside, which does not only reduce the noise and dust generated by on-site construction and alleviate its adverse impact on nearby residents and pedestrians, but also helps improve the working environment and attract new blood to join the industry.



**Drawing of an MiMEP lift machine room model**

### MiC Lift Improves Quality and Saves Costs

In 2022 and 2023, the MiC lift solution and technology were successfully applied in the construction of two footbridges in Tuen Mun District and Kowloon City District, respectively. In the projects, MiC was adopted for the assembly of major lift components in an off-site workshop. The components included the guide rail structural support, cars, guide rails, counterweights, main plants, control panels, cable trunking, conduits, cables and other electrical components, as well as temporary support for ensuring safe transportation. After most of the components had been installed in the prefabricated lift shaft structure, the prefabricated structure was transported in its entirety to the construction site in Hong Kong. As nearly 90% of the lift parts and components were pre-assembled in the well-equipped and spacious workshop, the quality of installation was ensured and the on-site installation processes and costs involved were saved.



**A lift car pre-installed in the lift shaft structure**

On the arrival of the lift and the lift shaft structure at the construction site, it took the project team only a few hours to lift up and fix the shaft structure to the structural foundation on site. Since a machine-room-less design was adopted for the lift, assembly of a machine room was not required. Upon the completion of assembly of the lift shaft and exterior decoration, the engineers could carry out a commissioning test for the lift. Compared with the traditional on-site installation method, the adoption of the MiC lift technology can save up to 70% of the on-site installation time, thereby reducing the impact of the works on nearby residents.



**A MiC lift at a footbridge**

The application of the MiC lift technology is by no means limited to footbridges or low-rise buildings, and will be extended to different types and parts of buildings such as building interiors, high-rise buildings, etc. in the future. This innovative installation solution provides the traditional lift industry with more installation options to address challenges brought about by manpower shortage and to minimise risks associated with on-site installation.



## Conclusion

According to the 2022 Policy Address, the Government's annual capital works expenditure will exceed \$100 billion in the next few years, with emphasis on the development of high productivity construction methods such as MiC, as well as formulation of measures to strengthen the MiC supply chain and foster collaboration with the Greater Bay Area. In addition to expediting housing supply, these measures will strengthen

the leading regional position of Hong Kong's construction industry in the adoption of MiC. In this regard, the Lift and Escalator Contractors Association (LECA) will make wider use of the MiC and MiMEP technologies, nurture innovation and technology talent and further promote the application of innovative technology and sustainable development.

(Contributed by LECA)

### Points to Note for Adoption of MiC in Lift Installation

MiC is a method of lift installation which can shorten the installation time, improve the working environment and enhance site safety. The Electrical and Mechanical Services Department (EMSD) strongly encourages the trade to adopt this innovative construction method for lift installation.

According to the Lifts and Escalators Ordinance (the Ordinance), type approval from the Director of Electrical and Mechanical Services is required for any model of lifts to be installed in Hong Kong. The type approval process aims to ensure good design and construction of lifts, which involves evaluating the lift installation method. Therefore, additional evaluation and/or approval will be required if the installation method of a lift deviates from the arrangements set out in the type approval letter or the type examination certificate of the lift. As such, Registered Lift Contractors and Registered Lift Engineers should timely review as to whether the adoption of MiC for lift installation would deviate from the conditions or requirements of the type approval letter or type examination certificate, and seek endorsement from the lift manufacturer and independent testing institute as appropriate.

The EMSD will endeavour to facilitate adoption of MiC in lift installation by the trade. Contractors are encouraged to timely discuss the implications of adopting MiC approaches on type approval with the EMSD to avoid delays in project implementation. For details, please refer to Circular No. [2/2023](#).



Circular No. 2/2023

## News *-in-* Brief

### Stand on Either Side and Hold the Handrail

Escalator incidents caused by passenger behaviour have always accounted for a significant proportion of the total number of escalator incidents, and many of such incidents involve passengers that tripped due to loss of balance when walking on escalators. In fact, as the height of escalator steps is generally higher than that of staircase steps and is variable during escalator operation, passengers are more likely to slip and trip when walking on escalators, thus causing accidents. Moreover, passengers walking on escalators cannot hold the handrail tightly as they are walking. If the escalator stops suddenly in case of emergency, not only are they more likely to trip due to loss of balance, they may also bump into other passengers and cause more serious incidents.

Therefore, the EMSD recommends that when using the escalator, passengers should **stand on either side of the steps, hold the handrail tightly, exercise due vigilance and refrain from giving undivided attention to mobile phones**. To further promote the safety tip of "stand on either side and hold the handrail", the EMSD launched a [video](#) in May 2023 to disseminate the relevant message.



Video

(Chinese version only)



News **-in-** Brief

## Modernisation of Aged Lifts Saves Electricity, Reduces Carbon Emissions and Enhances Lift Safety



In 2023, the EMSD produced a new [promotional video](#) on the modernisation of aged lifts by introducing three successful cases of modernising aged lifts in different types of buildings (i.e. residential, industrial and commercial buildings). In the video, the RPs concerned also shared their views on the benefits of modernising aged lifts:



Promotional video (Chinese version only)



Benefit of replacing traditional swing doors with modern automatic doors fitted with car door locks and safety edges:

- ✓ Improved convenience of daily access of residents (especially the elderly and children)



Benefit of lift replacement:

- ✓ Improved operational efficiency of the lifts
- ✓ Improved overall appearance of the building



Benefit of lift modernisation:

- ✓ Reduced frequency of lift failures
- ✓ Improved energy efficiency of the lifts

In summary, the above successful cases show that lift modernisation not only enhances lift safety and dispenses with the requirement of biannual special maintenance, but also achieves energy-saving.



Eco Building Fund

In addition, CLP Power Hong Kong Limited and the Hongkong Electric Company Limited have launched subsidy schemes, namely the "[Eco Building Fund](#)" and the "[Smart Power Building Fund](#)", respectively. Under the schemes, owners can apply for subsidies if the lift modernisation or replacement proposals of their buildings involve energy-saving elements. Please contact the relevant power companies for details.



Smart Power Building Fund



## Development Progress of the Digital Log-books for Lifts and Escalators

The EMSD has rolled out a cloud-based digital log-books platform for lifts/escalators (the Digital Log-books) to digitalise the maintenance records of lifts/escalators and replace conventional paperbound log-books. The Digital Log-books enable responsible persons for lifts/escalators (RPs), registered lift/escalator contractors (RCs), trade practitioners and the EMSD to monitor, record, manage and analyse the maintenance records of lifts/escalators in real time through a mobile app or web portal. It facilitates joint monitoring of the relevant works by various stakeholders, thereby uplifting the management and safety standard of lifts/escalators.

Since its official roll-out in November 2022, the Digital Log-books have received high acclaim from the lift/escalator trade, property management sector and RPs, and its adoption rate has been increasing steadily. Currently, more than 15 000 lifts/escalators have adopted the Digital Log-books. Besides, the EMSD added new functions to the Digital Log-books progressively in the first half of 2023 to facilitate users' management of lifts/escalators:

### New function 1 - Export log-book records

An "Export" function (Figure 1) has been added to the web portal of the Digital Log-books. Using the function, RPs and RCs can export log-book records to Microsoft Excel, which facilitates further analysis of the log-book data for better facility management.

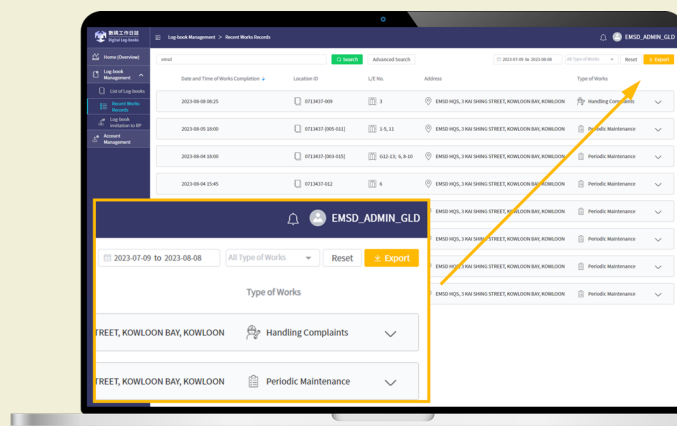


Figure 1 – Export log-book records

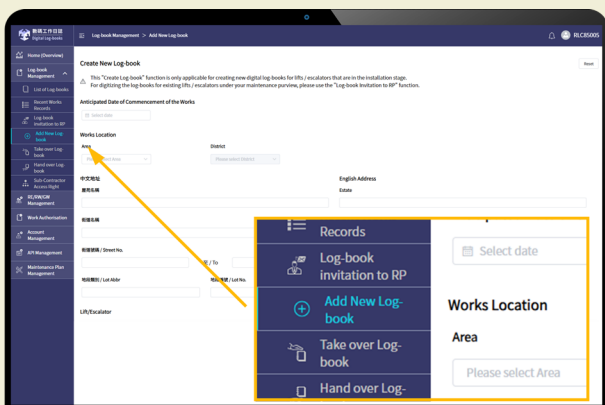


Figure 2 – Add new log-books

### New function 2 - Add new log-books

An "Add new log-books" function (Figure 2) has also been added to the web portal of the Digital Log-books. RCs can create Digital Log-books for newly installed lifts/escalators by filling in the address of the relevant lifts/escalators and clicking "Submit".

To accelerate the transition from using the existing paperbound log-books to the Digital Log-books, the EMSD requires RCs to adopt the Digital Log-books for all new lifts/escalators commencing installation on or after 1 August 2023. RCs are encouraged to adopt the Digital Log-books for new lifts/escalators as early as possible to spare the need for switching from paperbound log-books to Digital Log-books. For details, please refer to Circular No. [3/2023](#).

### Activation of the Digital Log-books System

The Digital Log-books has been officially launched for use free of charge. For those who are interested in using the Digital Log-books, please complete the [online form](#). Designated staff of the EMSD will contact you and activate the relevant Digital Log-books upon receipt of the form.

For further details, please call the hotline for the Digital Log-books on 3741 8880 (for enquiries related to information technology) or 9761 6685 (for enquiries related to the operation) between 9am and 6pm from Monday to Friday (except public holidays). Members of the public may also visit the following [website](#) to learn more about the various functions and benefits of the Digital Log-books.



Circular No.  
3/2023



Online form



Website

**News -in- Brief**

## Innovation and Technology Project – Image Analytics System for Lift/Escalator Components

The EMSD plans to launch an innovation and technology project in June 2023 with the aim of developing an artificial intelligence (AI) system that can accurately analyse the photos of lift/escalator components through image analytics and deep learning technologies. After the relevant photos are uploaded to the AI system, the system will identify and classify different lift/escalator components in the photos and assess the health condition of the components.

The target of the first phase of the project is to develop an AI system for identifying 12 different types of major lift/escalator components and analysing the health condition of suspension ropes and brake pads. The system is expected to be completed in 2025. The EMSD will invite registered lift/escalator contractors for system trial when appropriate. Upon the completion of the AI system, trade practitioners could enjoy the convenience brought by technology in carrying out timely maintenance and replacement of lift/escalator components to reduce the failure rate, as well as making proper use of limited manpower resources to improve the overall service quality of lifts/escalators.

In addition, in order to enhance the performance and accuracy of the AI system, the development team is collecting relevant photos to build a database for the development of the AI system. If you are interested in providing photos, please contact our staff on 2808 3174.

**News -in- Brief**

## Proper Management of Liftwell Rescue Doors

Recently, a serious industrial accident occurred in which a cleaner opened the liftwell rescue door (rescue door) at 30/F of a building and fell into the liftwell, resulting in the unfortunate death of the cleaner. According to the Code of Practice for Building Works for Lifts and Escalators issued by the Buildings Department, when the distance between consecutive landing doorsills in a building exceeds 11m, intermediate rescue doors shall be provided for emergency rescue personnel to rescue trapped passengers through the liftwell when necessary. The design and use of rescue doors shall also comply with the relevant requirements of the above Code. In addition, according to the Code of Practice on the Design and Construction of Lifts and Escalators published by the EMSD, rescue doors shall be provided with electrical safety devices for proving their closed position. Opening such doors will trigger the electrical safety devices to stop the lift operation immediately.

The property management companies of buildings are in general responsible for matters related to the management, structure and maintenance of rescue doors. To prevent the occurrence of similar accidents, the property management companies should be notified immediately of any suspected or identified defect in connection with rescue doors for appropriate follow-up.

## Feedback

Your comments and suggestions, whether on editorial style or contents, are most welcome. Tell us how we can improve and make the Lift and Escalator Newsletter a truly informative and interesting publication for you. The Lift and Escalator Newsletter is available on our website at <http://www.emsd.gov.hk>.

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