

Buildings Systems

1 New Standard Elevator

Hitachi has released the new standard elevator, which embodies the “Human Friendly” development concept of Hitachi elevator and escalator products and services. With a simple new design developed under the direction of Naoto Fukasawa, a world-renowned product designer, this elevator incorporates various features to reduce the risk of infectious diseases for realizing a new elevator experience.

Since the elevator’s release, Hitachi has continued to add new and more attractive features, such as a “sensor-integrated touchless button” that allows users to call elevators and select the destination floor by placing their hands near the sensor without directly touching the button. Hitachi is also working to further expand its features and services to meet changing market needs, such as operation functions linked to robots and enhanced linkage with building facilities.

As competition intensifies, the ability to accurately capture these changes in market needs becomes even more important. Looking ahead, Hitachi will continue to

analyze market trends and customer demands as needed and to provide the products and services that customers want in a timely manner to the market.

(Hitachi Building Systems Co., Ltd.)

2 Functions for Enhanced Safety and Security: Development of Functional Safety Technology and Launch of MCA-ES Elevator for the Chinese Market

Hitachi has developed a functional safety technology with enhanced monitoring features for providing even greater safety and security in elevators and has begun selling the MCA-ES model, a general passenger elevator for the Chinese market, that incorporates this technology.

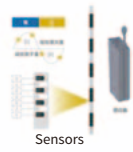
This new functional safety technology was jointly developed by Hitachi’s two bases in Japan and China. The conventional mechanical safety devices of elevators have been computerized using sensors and multiple microcomputers to enhance safety by constantly monitoring the position and speed of the elevator car and the status of



1 Inside of the new standard elevator car (left) and floor selection using the sensor-integrated touchless button (right)



Functional Safety Technology System



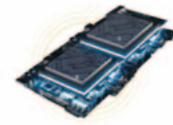
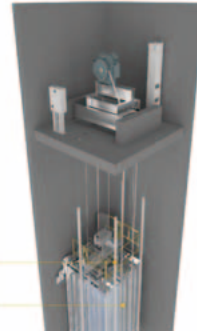
Sensors

1 Emergency Terminal Speed-limiting technology

Optimization of hoistway dimensions by forced deceleration

2 Smart auxiliary braking

Function for mitigating the force on passengers in the event of an emergency stop



Microcomputers

3 Multifaceted monitoring technology

Third-party certification and mutual monitoring for enhanced safety

4 Life prediction

Improving operational efficiency by predicting power converter lifetime

2 MCA-ES general passenger elevator for the Chinese market

the safety devices. Also, this technology satisfies SIL 3, the industry's highest safety integrity level (SIL) for elevators, which indicates the degree of safety and has been certified by a third party to meet Chinese national standards.

Making the best of the technology mentioned above, Hitachi has launched the MCA-ES model, a general passenger elevator for the Chinese market. This model offers even greater security and safety by being equipped with a smart auxiliary braking function that mitigates the force on passengers in the event of an emergency stop of the elevator car and a life prediction function for the power converter that powers the elevator.

3 Effects of Implementing Building Common Platform Solution in the Hitachi Building Systems Head Offices and Its Future

The spread of the COVID-19 has accelerated the trend toward adding value to offices as the environment surrounding office buildings and workers changes.

With this background, Hitachi developed Hitachi office worker solution and Hitachi building Internet of Things (IoT) solution as building common platform solution to support new ways of working in the new normal where the Hitachi office worker solution is implemented

Office worker solutions

Hitachi office worker solution

- News and events
- Space booking

Enables checking of daily information and registration for events by smartphone

Enable selection of and booking a workspace based on the availability of office space

Building IoT solutions

Hitachi building IoT solution

- Example of analysis incorporating a wide range of data

Analyzes the amount of electricity used per person by utilizing information on electricity usage and people flow for enabling further energy savings

3 Implementing the building common platform solution

at the head office of Hitachi Building Systems Co., Ltd. and the Hitachi building IoT solution at the Kameari General Center of Hitachi Building Systems.

The Hitachi office worker solution integrates the various services of an office building into a smartphone application and provides custom-tailored services to each individual. By implementing this system, Hitachi is striving to improve productivity by increasing the degree of freedom in work, such as choosing places to work that match the purpose.

The Hitachi building IoT solution provides central collection and storage of building facility data and uses an open application programming interface (API) to link to a variety of applications. Hitachi is working to improve the quality of building operations by analysis of data from a wide range of sources such as electricity usage and people flow information, which were previously collected separately.

Looking ahead, both locations will be used as a place for collaborative creation with customers and partners to expand to even more attractive services.

The accuracy of this simulator is important because the design of the building facilities determines whether the elevators and other facilities can be used smoothly after actual building operation starts. In this study, Hitachi analyzed the surveillance camera data of an actual building and evaluated the accuracy of its human flow simulator using the elevator waiting time as an index.

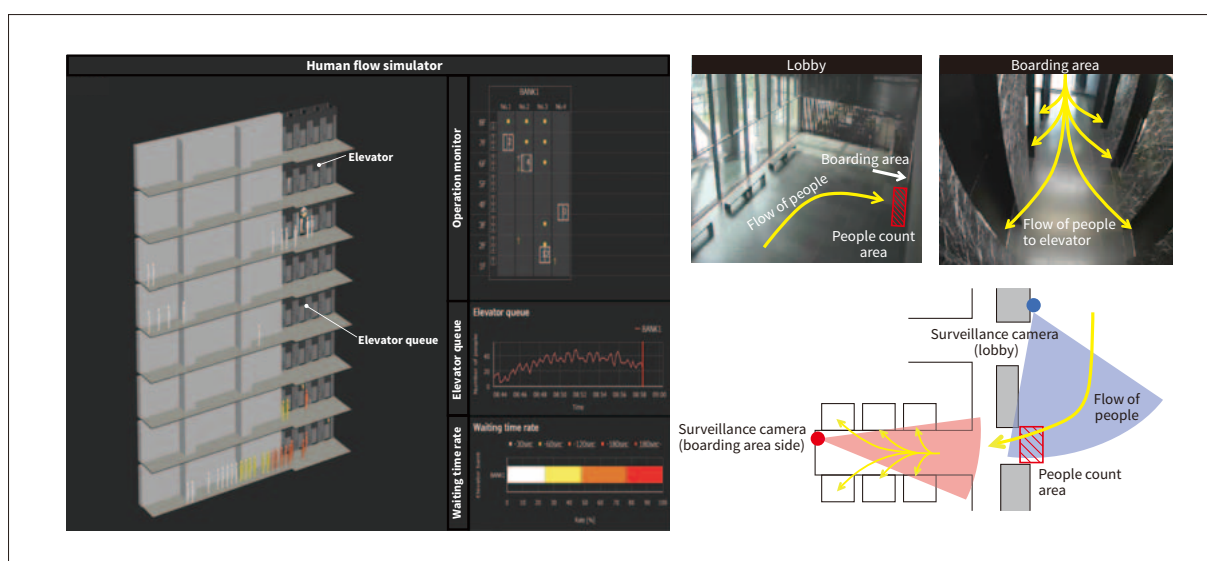
To measure the waiting time from the surveillance camera data, the arrival of users to the boarding area and the boarding of users onto the elevator were detected by image analysis from multiple videos, and the difference between the time at which a cumulative number of people are at the boarding area and the time at which that same cumulative number of people have boarded the elevator was defined as the waiting time for one person.

The error rate between the elevator waiting time measured from the surveillance camera data and the waiting time output by this simulator was less than 10%, and it was confirmed that the simulator successfully modeled the actual flow of people. Backed up by the results of this demonstration test, Hitachi will implement collaborative creation with customers by using the human flow simulator to support building installation planning and by developing and providing solutions to facilitate the flow of people in buildings to contribute to the construction of smart buildings.

The accuracy evaluation was conducted with the cooperation of the Waterras Business Group and Yasuda Real Estate Company. (Hitachi Building Systems Co., Ltd.)

4 Using Surveillance Camera Data to Evaluate the Accuracy of a Human Flow Simulator

When planning the construction of a high-rise building, building facilities are designed to facilitate the smooth flow of people, and Hitachi is using a human flow simulator developed in-house to support this design evaluation.



4 Accuracy evaluation of human flow simulator using surveillance camera data