

## Performance-based Safety Code seeks to enhance new elevator technology

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An elevator's condition invariably makes a statement about a building. Basic functionality is expected, but increasingly building professionals are looking for the added benefits that new elevator technology can supply. While new technologies are available and in use globally, building professionals in North America may be unable to deploy them due to limitations imposed by the Safety Code for Elevators and Escalators, ASME A17.1/CSA B44.

Under ASME A17.1/CSA B44, there is no uniform process for validating the compliance of new technologies with the safety requirements, often making their adoption inefficient and burdensome. This is why the American Society of Mechanical Engineers (ASME) and the Canadian Standards Association (CSA), supported by the National Elevator Industry, Inc. (NEII), recently published the Performance-Based Safety Code for Elevators and Escalators (PBC), or ASME A17.7/CSA B44.7. The PBC is a companion code to A17.1/CSA B44, not a replacement and the latest version of ASME A17.1/CSA B44 - 2007 recognizes compliance with the PBC as an equivalent or complementary method of compliance with the Safety Code for Elevators and Escalators.

When adopted across all jurisdictions in the United States and Canada, the PBC will allow building professionals to keep pace with elevator technology while maintaining or exceeding the safety requirements under ASME A17.1/CSA B44. Instead of having to meet prescriptive safety requirements like those in the existing code, the PBC requires that all elevator designs meet performance requirements called Global Essential Safety Requirements (GESRs), which provide safety objectives that an elevator manufacturer must meet, but also provide flexibility in how those objectives are met.

When developing new elevator and escalator technology, manufacturers must perform a risk assessment to show compliance with the GESRs for their designs. The designs are then reviewed and analyzed by an independent Accredited Elevator/Escalator Certifying Organization (AECO), which examines a manufacturer's technical documentation and performs tests to verify that the elevator system meets all applicable PBC requirements, including GESRs. On March 13, the American National Standards Institute (ANSI) accredited three organizations to act as AECOs: Underwriters Laboratories, TÜV SÜD American and Liftinstituut. These and other groups that gain accreditation in the future can help AHJs in the decision-making process by using expertise and tools often unavailable to AHJs.

This structured review process allows new technology to be applied to elevator designs in new buildings as well as existing structures to provide safer, faster and more efficient transportation. As the PBC is adopted in more jurisdictions, it will allow the elevator industry to meet the growing demand for more innovative and functional elevator products, while

improving the passenger experience and creating savings for building management – both for new construction and modernization.

### Safety

Safety is the most important aspect of the design of an elevator system. Under the PBC, there are numerous review processes to verify the safety of a new technology. Elevators will continue to maintain the stellar safety record that they are known for, while allowing manufacturers and construction specifiers to apply state-of-the-art technology to the designs. New safety measures such as sophisticated braking systems, laser sensors and advanced speed governors, which may not be specifically addressed by the original prescriptive code, ASME A17.1/CSA B44, will increase overall elevator safety for the riding public, if adopted.

### Speed/Capacity

Elevator speed, capacity and efficiency are also limited by current codes as designers must utilize specified building materials, control devices and driving machines. The PBC will allow architects and specifiers to incorporate elevators manufactured with strong, lightweight synthetic or composite materials, high-tech, computerized control devices and evolutionary drive designs. These types of advances will allow for lighter and faster elevators capable of safely moving more passengers in less time. This should lead to shorter customer and employee wait times, improving building traffic flow. Passengers will get to their floor more quickly and building employees will be able to provide faster service.

### Comfort

The use of advanced building materials, controls and drives will enable not only faster transportation, but also more comfortable transportation for all passengers. Aerodynamic designs, lightweight building materials and advanced speed controls allow for extremely smooth starting and stopping of elevator cars and whisper-quiet operation. Many new designs also incorporate aesthetically pleasing lighting systems and high-tech monitors to view news programming or important messages. Elevator designs will be more customizable to the particular building to fit both the style of the building and the needs of the building population.

### Accessibility

While elevators are already required to conform to standards for universal access, new designs will allow increased accessibility for guests with impairments. One advance in this area is the development of destination-orientated elevator systems. These systems require passengers to enter their destination floor on an entry device located in the elevator lobby. The passenger is then directed to the elevator that will provide the most direct and fastest transportation to the desired floor. This innovative design has improved the accessibility of elevator systems and allowed for more efficient and productive movement of people throughout a building.

### Energy Efficiency

Though passenger safety and satisfaction are essential, new elevator technology also offers numerous operational benefits to building management. A high-tech elevator system can

positively effect a business's bottom line, since new systems are substantially more energy efficient, require less space and should be more reliable than most elevators used in North America today.

Elevator energy consumption makes up a significant portion of building energy use, but new technology is making elevators more and more efficient. According to industry sources, new technologies, including advanced motors and drives, lighter materials and sophisticated control software, can reduce elevator energy use by up to 40% and eliminate waste byproducts. These savings could reduce a hospitality venue's energy costs and help it become more eco-friendly.

### Space Savings

The value of space in newly constructed buildings is huge to architects and owners. Whether specifiers want to maximize rentable space or allow for a flat, usable roof deck, new technologies are being developed to meet these needs. The demand for space-saving elevator shaft and machine room designs is a key market driver and has led to machine room-less elevator systems with control hardware housed in a small, easy-access cabinet or built into the shaft.

Additionally, to save space and provide increased elevator capacities, elevator systems around the world are beginning to use multiple cars in single elevator shafts. The most common of these designs utilizes a "double-decker" elevator car with entrance doors on two floors of a building at one time. New technology also allows for two independently operating elevator cars to move within the same shaft. This system uses destination-based dispatch software and advanced safety systems to operate at maximum efficiency while maintaining a minimum safe distance between the two cars at any time.

### Reliability

As elevator technology advances, so does elevator reliability. New or modernized elevator systems are more reliable, requiring less time out-of-service and establishing lower maintenance costs. Some new systems offer offsite monitoring, which can allow a problem to be identified and corrected before the customer may realize there is one. Building management will be able to spend less time and money repairing elevators, and guests will feel less frustrated by out-of-service elevators.

The National Elevator Industry, Inc. is working with other organizations to promote adoption of the PBC in other jurisdictions across the U.S and Canada. As more jurisdictions adopt the PBC, advanced elevator technology will become increasingly available. The PBC will allow buildings to integrate or install the latest technology in a timely and advantageous manner. Building professionals and passengers alike will benefit from safer, more reliable and more efficient elevator systems. For the first time, North America will be able to maintain its high safety standards while matching or exceeding the level of technology that already exists in other parts of the globe.