

Follow Up on New Technology in the Elevator Field

By
Grisel Peña
Jennifer Borwey
Susan Ugoji

Technology is advancing at a rapid pace. The elevator industry in the United States is experiencing growth, but not at the rate of the rest of the world. Europe has been using new designs for several years. It's time for the U.S. to catch up. For over eighty years, elevator technology and safety guidelines have remained nearly constant with no strong determination to accept new changes to the standard A17 code book. Now, new technology is forcing the American Society of Mechanical Engineers (ASME) to evaluate the need for change and to accommodate new products and designs through the expansion and creation of new guidelines.

Manufacturers are striving to replace old technology with new products that have a variety of outstanding benefits. Designers are attempting to assimilate the use of more efficient elevators through new products, such as permanent magnet motors, synthetic suspension media (aramid rope, elastomeric coated steel belts, extra high strength steel belts), and machine-room-less designs. Aramid rope is a strong heat resistant synthetic material that will be used to replace the traditional elevator cables. It is stronger than steel, extremely light weight, costs about 40% less to use in manufacturing, and can hold just as much weight as currently used cables. Elastomeric coated steel belts are also light weight and cost about 30% less to use in the manufacturing process. These belts have

all the same benefits as the aramid rope. A third type of suspension media is extra high strength steel, which is very pliable, small, and thin. It is also much stronger than traditional cables, but no concrete design has been developed, as it is still in a testing stage.

Now, traction elevators are the focus of designers. Traction elevators are considered to be higher speed than the conventional hydraulic elevator motors. These elevators are used mainly in buildings with more than five floors. Part of new traction elevator designs will include using machine-room-less elevators. This new system has a base equipment control board, which operates the elevator itself from each floor. Many control boards can be raised or lowered for allowing maintenance when required. This design is space saving and cost efficient.

One possible concern to the new idea of machine-room-less elevators is that most elevator technicians are accustomed to entering a machine room to check the motor, the elevator brakes, and other parts of the elevator. Getting oriented to this new system will take time for technicians; eighty years of consistency is difficult to change, but the New Technology Committee (NTC) hopes new designs will be accepted with ease.

A motor is any device that turns electrical energy into mechanical energy. Permanent magnet motors are being

reinvented to reach a more efficient method of powering electric devices. Once these new technologies in the elevator industry have gone through sufficient testing, products such as permanent magnet motors will be included in the new draft standard.

Currently, the new technology under development cannot be used until a new safety code is written. The New Technology Committee (NTC), a sub-committee of the A17 Standards Committee, has been given the task of creating a new draft of safety codes that will include rules or procedures for description and safe installation of these new products. A meeting is scheduled for December 8, 2004 in New York City to prepare the new draft to be submitted to the A17 Standards Committee for review.

Once presented to the A17 Standards Committee, accepting the draft is very complicated because it has to pass through several committee ballots. In the committee ballots, the members of the organization revise the draft and vote in favor or against it. All these procedures take about eight weeks, and if one member of the organization votes for further revision of the draft, all comments must be addressed until a consensus is reached.

After a consensus is reached and the draft has officially become a new standard, Authorities Having Jurisdiction (AHJ) make the final decision for the use of new designs in the elevator industry. AHJs, from state to state, have varying measures of standards that creates more difficulties for new

products to be used; for example, one state may accept the new standards, but another may choose to continue relying solely on traditional standards. It is questionable if the AHJs will take the risk using new designs, but if they support the new standard and are willing to change, entrepreneurs can put new products and designs on the market. Although AHJs have the final say, the standard must be accepted by all parties for it to be publicized.

In the August 2004 issue of Elevator World, Marvin Jacobs raised quite a few concerns in the article, "The Lyrics Are Good-But Where's the Music?," regarding New Technology and the ideas presented by Jim Coaker in the article, "Vertical Transportation's 'New Technology'," from the May 2004 issue. Marvin Jacobs is an attorney who specializes in product liability cases in the elevator field; therefore, he analyzes new technology from his particular area of expertise. Jim Coaker is the vice president for ASME Codes and Standards and is also the chairperson for the New Technology Committee. He actively pushes new technology forward. Jacobs and Coaker provide different view points, which are demonstrated in the above mentioned articles.

Mr. Coaker believes that balance can be achieved between "the interests of safety, design integrity, business economics, and public service," meaning, entrepreneurs will balance their new designs with safety standards. Mr. Jacobs, however, leans towards setting priorities instead of balance, placing safety as the number priority.

Although safety should never be compromised, it is important to realize safety cannot be upheld without proper designs, guidelines, and standards. Although Coaker greatly supports new technology and the safety standards that will follow, he still raises the question, “how safe is safe?” This depends on your personal view of safety. A car, for example, can only be safe up to a certain point; manufacturers can continuously add safety features, but where do they draw the line? Will anyone ever be 100% safe? The decision to get behind the wheel lies in the hands of each individual.

Entrepreneurs are designing new products and want them on the market and Mr. Jacobs is concerned with how business economics will be handled. In this case, safety can not be compromised for money as new technology is developed. The process of getting new technology into the U.S. market, as mentioned before, is very complex. It includes approval from different organizations, such as AHJs, which apply safety guidelines to protect individuals. Among other concerns, “Who figures out the GESRs?”(Jacobs). GESR’s, or General Essential Safety Requirements, are established by the new standard. This coincides with NTC’s focus on public service. Once the new standard has been fully developed, entrepreneurs will be required to comply with these guidelines just as they have done for over eighty years with the A17 Safety Code. The new draft’s creation will balance business economics with safety, design, and public service.

The A17 Standards Committee has its own evaluative system, which does not apply to the new standards.

Consequently, it became the concern of the NTC that the accreditation system properly evaluates the new safety standard. In response to that concern, in one of the different assemblies, the NTC created a brief evaluative draft to provide a rough idea about the type of content to be found in the actual accreditation system. Essentially, the key objective is to obtain approval from Authorities Having Jurisdiction and to turn the standards into law.

If everything goes according to plan, the draft of new technology standards will be accepted by the A17 Standards Committee. Unfortunately, the process can take an indefinite amount of years due to the extensive system of voting, revising, and addressing the suggestions from the committee members. Eventually, it will be in the hands of the AHJs to allow new designs to be used. We are now in the age where computers dominate. Technology is drastically changing and advancing, but the elevator industry has remained nearly constant for over 80 years. Accepting new technology is the first step towards implementing change.